



Hydrogen
Europe

Hydrogen Europe Position Paper

Critical Raw Materials Act – Hydrogen Europe's views

June 2023

Executive Summary

Hydrogen Europe welcomes the European Commission's aim to strengthen the European value chain for the extraction, processing and recycling of the critical raw materials that are key for clean techs and, more broadly, the overall transformation of the energy system. Renewable hydrogen has been considered a strategic technology, hence the critical raw materials needed for its key components (electrolyser and fuel cells, and downstream applications) have been correctly identified within the Critical Raw Materials Act. The Act was presented by the European Commission in March 2023 and the European Parliament and Council are now defining their positions on the file. As the discussions are ongoing, Hydrogen Europe would like to highlight several areas for improvement, to strengthen the supply chain of CRMs used in the hydrogen sector in Europe and to ensure the diversification of the global suppliers of those strategic raw materials.

Main recommendations on the Critical Raw Material Act

- **Clarify rules behind the three benchmarks for Strategic Raw Materials extraction, processing, and recycling. Objectives should be targeted to each specific material and a coherent governance for achieving the objectives should be put in place.**
- **Keep in mind natural, unavoidable dependencies for the sourcing of some materials (such as Platinum Group Metals (PGMs), which originate mainly from South Africa) for the definition of the 65% import dependency target.**
- **Increase the ambition of the 15% recycling benchmark progressively, according to impact assessments conducted by the CRMs Board. Also, more guidance and incentivisation for Member States to implement circularity practices (e.g., take-back systems) would be welcome.**
- **Recognise the essential character of strategic processed materials (such as fluoropolymers and electrocatalysts) next to critical metals and minerals across the hydrogen value chain.**
- **Implementation of strategic cooperation frameworks with international partners, regrouping all other initiatives like SIFAs, FTAs (as mentioned in the Communication) under the same umbrella, such as MoUs. (e.g., South Africa, Zimbabwe, Canada...).**
- **The Commission should clarify whereas impacts linked to environmental reporting that might distort the fair level playing field between EU manufacturers of downstream products (i.e., products that contain critical raw materials as components) and non-EU manufacturers of downstream products.**

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1. Context

There will be no clean transition without sufficient, sustainable, and continuous supply of critical raw materials. Clean hydrogen, identified as a critical sector for its contribution to EU competitiveness/strategic autonomy and climate objectives, is no exception.

Electrolysers and fuel cells are two of the core equipment needed for the hydrogen economy, as it is clearly acknowledged under the Net-Zero Industry Act (NZIA) proposal. Some of the technologies for mobility and hydrogen production (as well as hydrogen transportation and its end uses), such as Proton Exchange Membrane (PEM), rely heavily on certain metals and could potentially find major bottlenecks in worldwide supply e.g., platinum group metals (PGMs¹). Alkaline and Solid Oxide technologies depend instead, in some cases, on rare earths like Niobium, Lanthanum and Cerium. Nevertheless, all hydrogen technologies are equally dependent on more common strategic materials such as Cobalt, Nickel, Manganese and Boron, which would not be difficult to retrieve but will be highly demanded by competition across other clean technologies. The emerging Anion Exchange Membrane (AEM) electrolysis method presents similar dependencies. On another hand, other materials could become critical in the coming years when replacement of some precious CRMs with cheaper and more common materials will be viable. The EU should be able to also mitigate the potential supply shortages resulting from this expected trend. As an overview, Annex I presents a list of the CRMs in electrolyser and fuel cell technologies.

In this context, Hydrogen Europe warmly welcomes the European Commission's proposal of the Critical Raw Materials Act (CRMA), aiming to set a common EU strategy and legal framework to secure access to those materials and to ensure a higher degree of availability and affordability. As Europe seeks to achieve its strategic autonomy ambition, we need to build up a supply chain to reduce dependencies on 3rd countries while developing technological solutions to decrease their use intensity for better performances.

Whereas the proposed CRMA is an ambitious proposal, further clarifications and new concepts should be included by policymakers, for facilitating access and ensuring diversification for EU's strategic raw materials supply.

¹ Platinum Group Metals (PGMs) comprehend Platinum, Iridium, Palladium, Ruthenium, [...] all referred as PGMs).

2. Hydrogen Europe recommendations on the Critical Raw Materials Act draft proposal

Hydrogen Europe has identified 8 key issues that would deserve further assessment, clarification, or revision to allow the proposed CRMA to achieve its desired outcomes. On the side of each point, a reference to the Article or Section of the draft Regulation is added.

2.1. Targets

SRMs benchmarks (Art. 1 par.2a) The draft Regulation sets 10%-40%-15% targets for Strategic Raw Materials (SRMs) regarding their extraction, processing, and recycling, respectively. These targets are applied in an aggregated manner for all SRMs, thus sending a positive message for more common materials that are also needed for hydrogen technologies (e.g., nickel, copper). On the other hand, these measures do not allow to implement more targeted strategies based on the singularities of materials or material groups. In its cumulative form, the target might give an overrepresentation of more common materials, leaving unaddressed other SRMs that might be critical for the hydrogen sector (e.g., PGMs), where overall import quantities (in volumes or mass) are much smaller.

Recommendation: The European Commission should assess the specificities of each SRMs, taking into consideration the bottlenecks and best practices that Europe has to offer. Hydrogen Europe proposes to determine sub-targets for some SRMs (e.g., iridium, platinum) for the relevant steps (e.g., processing/recycling).

Recycling target: 15% benchmark (Art. 1 par.2a(iii)). While the mining industry is taking steps to uphold responsibility and sustainability in its activities, extracting the finite resources from the ground, processing them, and shipping the metals over long distances still has environmental impacts. This is further reinforced by the fact that some of the key materials for these technologies are issued far away from where hydrogen technologies will operate. These environmental impacts can be significantly reduced by resorting to circular economy practices. Implementation of take-back systems will allow systematic collection of end-of-life products and their parts for their recycling (not least PGMs and, increasingly, fluorinated materials like membranes). Increasing the recycling rates will enhance productivity, sustainability, create new skills, employment opportunities, business cases, and, finally, reduce the environmental impacts of CRMs use. EU certification schemes for SRMs should be developed in parallel with ambitious recycling targets, to guarantee that what companies have purchased from secondary raw material streams will also contribute to benchmarks that the Regulation is setting. Currently Europe can demonstrate several virtuous examples of circular loops for precious minerals, but it should develop and promote new practices for closing loops that might be leaking outside of the EU (e.g., autocatalysis in vehicles, printed circuit boards).

Recommendation: Hydrogen Europe suggests increasing the EU recycling target for SRMs (above 15%), yet advocates that this needs to be done in parallel with accompanying measures, such as mandatory takeback and scrap collection systems at national level to make products more accessible for EU recycling (e.g., automotive sector closed recycling loops in the EU for PGM-rich catalysts).

Imports benchmark (Art. 1 par.2b)). Contrary to the previous targets, the 65% target for diversification of imports is set per SRMs. It will be however extremely challenging to meet it for some of the metals used in hydrogen technologies, as PGMs in fuel cells and electrolyzers are mostly sourced from few supplier countries. Indeed, a large dependency *vis-à-vis* South Africa for those metals cannot be avoided (71% for Platinum² and 93% for Iridium), as well as for other countries which, for geopolitical reasons, are today circumvented (e.g., Russia is the world's second PGMs supplier). Moreover, it is important to clarify how the target will be measured as the import of the material can be done in both their ore/raw material status, or in its processed stage (powder or unwrought state).

Furthermore, CRMs are often imported within intermediate or downstream products. Additional measures should be then considered, in the case where a fair level playing field between EU manufacturers of downstream products (using SRMs subject to the import benchmark) and non-EU manufacturers (using SRMs not subject to the import benchmark) is not observed. The impacts resulting from compliance with this target for EU manufacturers could distort this necessary equal footing.

Recommendation 1: The EU should define different targets for each SRMs individually and based on their characteristics (not least geological reserves, relationship with supplying countries, etc.) or keep a general target of 65% but introduce some material-specific singularities/exemptions. Co-legislators should also clarify how the values considered for the import target will be assessed in practice (ore/raw material vs processed, units used for the ratio, etc.).

Recommendation 2: The import benchmark should be revised every few years (e.g., 2 years), to be fit-for-purpose in cases where new CRM mines have been discovered in the meantime or relationship with a given supplier evolves.

2.2. Strategic and critical raw and processed materials

Strategic processed materials (Annex I). The inclusion of critical metals relevant for the hydrogen value chain in the Strategic and Critical Raw Materials lists is fundamental, as bottlenecks in their supply must be mitigated. However, the safe supply of critical metals cannot be considered in silo from that of strategic processed materials, such as electrocatalysts or fluoropolymers.

As an example, fluoropolymers are essential in core application components such as the Proton Exchange Membrane (PEM) and Membrane Electrode Assemblies (MEA) in fuel cells and electrolysis³, and also critical for all strategic net-zero technologies (PVs, wind turbines, power grids, batteries...).

³ Both PEM and Alkaline technologies

The inclusion of fluoropolymers (which meet the OECD criteria for “polymers of low concern”) under the PFAS restriction proposal⁴ recently initiated by five European countries, threatens the whole hydrogen economy and other uses in other vital sectors (clean tech, digital, medical tech, etc.), generating massive investment uncertainty. Beyond this major issue, Europe could also face supply risks for strategic processed materials like fluoropolymers due to the fast ramp up needs and the regulatory unpredictability withholding investments. Additionally, no breakthrough valid alternative to fluoropolymers in the short-medium term is foreseen, creating thus an intrinsic bottleneck that would make impossible the ramp up of the hydrogen sector.

Recommendation: The role of fluoropolymers, as essential strategic processed materials for the ramp up and deployment of the hydrogen economy next to raw materials as defined by the JRC report⁵, should be explicitly acknowledged in the CRMA. The same should be also done with electrocatalysts.

Battery grade definition (Annex I, section 1). In Annex I of the Regulation, it is specified that some of the strategic and critical raw materials have entered the list in their *battery/metallurgy grade* form (e.g., Nickel – battery grade; Boron – metallurgy grade). Hydrogen technologies usually do not need top purity-grade metals for their applications, creating regulatory uncertainty for electrolyzers and fuel cells that would require those metals as well, yet, in their basic form. In some exceptional applications, it may occur that high levels of purity are instead needed for the deployment of certain hydrogen technologies, but not reaching battery or metallurgy grade (>99.8% purity). If not compliant with the list, we risk that the SRMs will have exclusive use only for instance in batteries or solar panels.

Recommendation: The European Commission should not exclude from the SRMs list those materials that do not require battery grade purity in some hydrogen applications (e.g., Nickel or Manganese), but for which a great purification level is still required (close but less than 99.8% purity).

Materials recovery from extractive waste (Art.26). In addition to the enhancement of EU capabilities of mining, processing and recycling of strategic and critical raw materials, further screening of EU extractive waste⁶ is a welcomed proposal. This could lead to retrieving additional needed resources, with a limited environmental impacts and reduced reliance on external suppliers.

Recommendation: Member States should increase their efforts towards the material recovery from extractive waste, to retrieve the needed materials for the transition without opening new mines whereas not essential.

⁴ <https://echa.europa.eu/restrictions-under-consideration/-/substance-rev/72301/term>

⁵ Joint Research Center (JRC), [Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU – A foresight study](#) (2023)

⁶ By-products of past or current mining activities in EU Member States.

2.3. Strategic Projects

Company risk preparedness (Art.23). The proposed Regulation states that Member States shall identify large companies in their territory which manufacture strategic technologies⁷, that will have a strong impact on the related strategic raw materials supply chains for hydrogen. The identified companies should perform an audit of their supply chain (every 2 years) through a mapping of SRMs dependencies on 3rd countries and through periodic stress tests of their supply chain.

Recommendation: The Results of these regular audits should only be made available to a limited set of recipients and be treated with highest level of confidentiality. Hydrogen Europe strongly recommends processes to be lean and to avoid cumbersome or highly bureaucratic enquiries from CRMs Board or national authorities into companies' processes, not least for SMEs.

Enabling conditions (New article). A lack of public acceptance for extractive activities is one of the main barriers to achieving targets for domestic sourcing of SRMs. Co-legislators must carefully consider measures that could be put in place to overcome resistance to mining in Europe, and initiatives to showcase the crucial role that SRMs play in achieving the EU's climate goals. These measures could include awareness raising campaigns, government involvement in community engagement, and exploring ways in which communities can share in the benefits of the projects. Ensuring public acceptance will not only be critical for domestic projects but also outside the EU.

Recommendation: Hydrogen Europe recommends considering public acceptance more strategically in the CRM Act and ensure that public authorities and operators work hand in hand.

2.4. Circularity and Sustainability

Circularity measures (Art. 25). The CRMA is proposing that circularity measures should be tackled directly by Member States, with a further degree of coordination and efficiency. The draft Regulation outlines that each Member State shall, within 3 years after the legislation comes, adopt and implement national programmes containing measures to improve and enforce circular initiatives, such as collection of waste with CRMs, reuse of products and components, increased use of secondary CRMs, or skills management. The process should be accelerated (circularity programmes adopted after 1.5 year), further detailed with reinforced framework (more guidelines to Member States, not least on responsible manufacturing, recycling, scrap collection, and takeback systems). The Commission's proposal should be supplemented to ensure that it reflects the role of processed materials and product design in ensuring the resource efficient use of critical raw materials. In

⁷ In line with the Net-Zero Industry Act Annex I.

particular, the impact of decisions under other policy frameworks, e.g., the European Sustainable Product Regulation (ESPR) and REACH should take into careful consideration the impact they have on product durability and a resulting increase in demand for and need to replace critical raw materials.

Recommendation 1: Member States should provide comprehensive circularity plans-within 1.5 year after of the Regulation coming into force.

Recommendation 2: The European Commission should further develop measures or guidelines to Member States on how to improve responsible manufacturing, recycling infrastructure (including takeback systems), and durable design. Responsible manufacturing should be built on a science-based approach, for monitoring key performance indicators supporting a sustainable supply chain, including responsible manufacturing of strategic processed materials as per best available abatement technologies.

Environmental footprint declaration (art. 30). The Commission is empowered to adopt delegated acts by establishing rules for the calculation and verification of the environmental footprint of different CRMs, in accordance with Annex V and taking into account scientifically sound assessment methods and relevant international standards. In addition, the footprint declaration proposed by the Commission should be carefully assessed by the co-legislators, as it shall be limited to only one impact category: the risk of burden-shifting between impact categories (i.e., decreasing carbon footprint while increasing other types of impacts) is high, and thus needs to be considered per each SRMs.

Loopholes for downstream products should be avoided, to ensure a level playing field is provided between EU and non-EU manufacturers of downstream products (i.e., products that contain critical raw materials as components). Indeed, if EU manufacturers are subjected to a higher administrative burden for those imported CRM, there could be a risk that demand for those downstream products shifts to non-EU suppliers that would be able to place their downstream products on the EU market without any environmental footprint declaration requirement on their raw materials used as components. This topic must also be considered along with the CBAM (carbon border adjustment mechanism) where downstream products such as electrolyser and fuel cells are excluded.

Recommendation 1: To avoid burden-shifting between impact categories, the European Commission should consider what is already developed at EU level, envisaging a streamlining and simplification of the EC's Environmental Footprint initiative.

Recommendation 2: the European Commission should push for allocation methods to be fixed and the impact categories to be weighted and studied.

Recommendation 3: Additional measures should be taken, in the case where impacts linked to environmental reporting and that distort the fair level playing field between EU manufacturers of downstream products (i.e., products that contain critical raw materials as components) and non-EU manufacturers of downstream products are observed.

2.5. Investment needs and funding opportunities

Need for funding (new article). To increase the global mining, processing and recycling capabilities of SRMs and strategic processed materials, considerable amounts of money should be mobilised for research, demonstration and deployment. As a matter of fact, in the draft CRMA Regulation, no additional resources are foreseen. Flexibilities given in the context of state aid for net-zero technologies and their manufacturing are welcomed, but Europe should run the extra-mile and include mining, processing, recycling of SRM in the state aid framework (e.g., GBER and CEEAG). An increase of aid intensities for critical raw materials projects within the TCTF would be also welcomed.

Furthermore, Hydrogen Europe advocates for the possibility of funding EU projects related to SRMs and strategic processed materials with the establishment of an EU Sovereignty Fund: this could offer another financing solution to those member states with less fiscal room to subsidise their own projects. It is important that the Commission makes a proposal on the Sovereignty Fund in the upcoming months, jointly with the revision of the EU's Multiannual Financial Framework 2021-2027.

Recommendation: Streamlining of EU state aid framework for SRMs projects, for instance within the GBER and CEEAG. A further increase of aid intensities for critical raw materials projects within the TCTF is also welcomed.

EU co-funding (new article). The uncertainty related to the SRMs and advanced materials projects in the EU is still high, as the nature of those projects is by default capital-intensive and might be subject to market failures due to the fluctuations and singularities of such market. The European Commission should be able to absorb part of that risk, being SRMs and advanced materials the very starting block for the upscale of net-zero technologies. As observed for other net-zero sectors, a quite successful mechanism could be setting up public-private partnerships for these key subjects, CRMs and processed materials.

Recommendation: The European Commission should create two new public-private partnerships, a co-funded one on critical raw materials and a co-programmed one on advanced materials, as proposed in the Communication accompanying the draft CRMA.

2.6. International partnerships

3rd countries Strategic Projects assessment (Art. 5-7). Strengthening while decarbonising mining capacity in 3rd countries for key materials for the EU market can also be considered strategic, and for this reason, Strategic Projects may not only be deployed in Europe. It is still not clear how the Critical Raw Materials Board would be able to streamline permitting procedures for projects in third countries, making them compliant with EU environmental and labour rules.

Recommendation: The Regulation should provide further guidance on how to streamline permitting procedures for projects in third countries, allowing more visibility to European players with investment abroad.

Stockpiling (Art. 21-22). The European Commission has identified stockpiling in the EU as one of the solutions to avoid supply shortages. At the same time, this could be poorly received by the international market, and it could potentially lead to spiralling prices of CRMs, at the detriment of EU competitiveness for the electrolyser and fuel cell manufacturers. However, the Commission proposal does not mention specific measures about EU stockpiling, but rather exhorts Member States to consider it. The Critical Raw Materials Board will have coordination and advisory powers on the matter.

Recommendation: Policy makers should reconsider the articles on stockpiling, as this could unnecessarily drive prices up in an already constrained market (especially with regards to scarce and precious metals).

Strategic Partnerships (Art.33). No concrete measures for strategic partnerships are proposed. The draft Regulation leaves freedom to the CRM Board to identify which 3rd country the EU should pursue CRMs agreements with (e.g., Memoranda of Understanding (MoUs) or other forms of cooperation).

Recommendation 1: For the hydrogen sector, a special focus should be given by the CRMs Board to South Africa, and other countries that have the capabilities of extracting, processing and recycling SRMs necessary for electrolyser and fuel cells (e.g., Canada, Zimbabwe, Democratic Republic of Congo, UK, Australia and Chile [...]).

Recommendation 2: As already done with Canada, Kazakhstan and Namibia, the EU should implement these strategic cooperation frameworks with every strategic international partner, regrouping all other frameworks like investment/free trade agreements (as mentioned in the Communication) under the same umbrella, such as MoUs. More simplicity and transparency for international contracts would be beneficial for fostering clearer rules and profitable investments for companies. To ensure that these agreements can achieve their goals, it is important that relevant private sector actors have a formalised role in trade delegations.

2.7. Skills

Lack of legislative proposal regarding skills (New article). Concrete proposals on skills are more developed in the CRMA Communication (non-binding) rather than in the Regulation, in which they are barely addressed. To bring essential training to bigger shares of the workforce, adequate funding programmes for large enterprises are needed. Complementing the existing funding programmes with measures aiming at actual implementation, and not just on the conceptualisation of up- and reskilling measures, would also help to raise the overall skill level. To counter the shortage of skilled workers, Europe should strive to attract more expert workers and talents in the field of CRMs from its Member States and abroad.

Recommendation 1: Co-legislators should translate some provisions of the Communication into the Regulation, such as the possibility to crowd-in resources for skills for CRMs (from other programmes like ESF+, ERDF and JTM) and the establishment of a large-scale skills partnership on CRMs with stakeholders and public authorities under the EU Pact for Skills.

Recommendation 2: A link with the Net-Zero Academies should be made, as proposed in the CRMA Communication by the establishment of a Raw Materials Academy.

2.8. The governance: Critical Raw Materials Board

Lack of industry collaboration (Art. 35). The current governance proposed by the Act (CRMs Board) foresees a structure composed of an EC representative, plus a high-level representative per Member State, in charge of assessment of Strategic Projects applications, monitoring purposes, discussing implementation of MS measures. The Board can furthermore invite experts, other third parties or representatives of third countries to attend meetings. No mention of industry representatives is foreseen, not even in the form of relevant industrial alliances (e.g., European Clean Hydrogen Alliance, Electrolyser Partnership).

Recommendation: We recommend the establishment of a permanent coordination group for the hydrogen sector through the relevant industry body and Industrial Alliances, in order to maintain the level of exchange fit-for-purpose to the evolving challenges. Hydrogen Europe, as well as the Electrolyser Partnership, should be considered.

ANNEX I – List of SRMs and CRMs present in electrolyzers and fuel cells

Electrolyzers		Fuel Cells	
SRMs	CRMs	SRMs	CRMs
PGMs	Vanadium	PGMs	Yttrium (heavy rare earth element)
Copper	Yttrium (heavy rare earth element)	Cobalt	Lanthanum (light rare earth element)
Graphite	Scandium	Nickel – battery grade	Strontium
Nickel – battery grade	Strontium	Manganese – battery grade	
Manganese – battery grade	Baryte	Gadolinium – for magnets	
Natural graphite – battery grade	Bauxite	Cerium – for magnets	
Magnesium metal	Tantalum		
Cobalt			
Cerium			
Boron – metallurgy grade			
Gadolinium			
Lanthanum			

NB: mentions next to metal name (e.g., “battery grade,” “metallurgy grade,” or “for magnets”) are taken from the Commission’s list under Annex I of the CRMA Proposal. Hydrogen Europe proposed their deletion.

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