Statement on the European Commission's Green Deal Industrial Plan

In February 2023, the European Commission published its communication "A Green Deal Industrial Plan for the Net-Zero Age" that consists of four pillars of action (see illustration 1).[1] The Green Deal Industrial Plan is to be seen as an industrial-policy complement to Fit for 55, a climate-policy package, and to the REPowerEU plan, which was motivated by security-policy concerns. In addition, this new plan constitutes the European response to the US Inflation Reduction Act, which signals that the global energy transition entails not only a race towards climate neutrality but also competition over technology leadership, investments and industrial sites.

Figure 1: Pillars of the Green Deal Industrial Plan

Regulation	• Create a new and simplified regulatory framework • ***Net-Zero Industry Act, Critical Raw Materials Act****, EU Electricity Market Design, Ecodesign Directive, Infrastructure Dossiers, Competitiveness Check*
Financing	• Enhance access and availability of funding • *Leverage existing funding (RRF, InvestEU, Innovation Fund), state aid reform (TCTF, GBER, IPCEI),* ***Strategic Technologies for Europe Platform (STEP),*** *pilot auctions for H2 production (EU H2 Bank)*
Qualification	• Develop skills and attract workforce for EU net-zero industry • *European Year of Skills 2023, European Pact for Skills, European Skills Agenda*
Trade & Supply Chains	• Build robust partnerships and supply chains • *Open Strategic Autonomy: international engagement (e.g. WTO), new partnerships (e.g. Critical Raw Materials Club, Clean-Tech/Net-Zero Partnerships), trade defence instruments*

Source: own illustration

The following analysis and the recommendations derived from it are focused on the Net-Zero Industry Act, the Critical Raw Materials Act and the Strategic Technologies for Europe Platform because these have the highest potential and most direct entry point for shaping and accelerating the market ramp-up of renewable hydrogen and its derivatives.

[1] European Commission, The Green Deal Industrial Plan, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_en

Executive Summary

In February 2023, the European Commission published its communication "A Green Deal Industrial Plan for the Net-Zero Age". It contains regulatory and financial initiatives that hold direct entry points to accelerating the development of the powerfuels market. The most promising elements are the Net-Zero Industry Act (NZIA), the Critical Raw Materials Act (CRMA) and the Strategic Technologies for Europe Platform (STEP). The following statement by the Global Alliance Powerfuels analyses the relevance of these elements to the powerfuels market and derives policy recommendations.

The NZIA needs further clarity as well as stronger instruments and incentives in order to accelerate market uptake and support the competitiveness of European powerfuels projects.

The Global Alliance Powerfuels generally welcomes the NZIA but finds that that it needs further improvement. The 40% goal introduced in the NZIA is inadequate and fails to account for technology-specific differences. Further clarification is needed on the reference value for achieving the 40% in order to provide a strong and clear investment signal. The NZIA also lacks strong instruments for supporting the local manufacturing of strategic net-zero technologies. Its reliance on accelerated permitting is insufficient and jeopardises the enforcement of the introduced 2030 target. Integrating sustainability and resilience criteria in public procurement can play a crucial role in the creation of lead markets for the application of net-zero technologies such as electrolysers. However, the introduced 10% cost cap provides a major obstacle. While the labelling of some net-zero technologies as 'strategic' is a welcome step, the criteria for the selection of strategic projects need to be sharpened and openness towards future technological development needs to be guaranteed.

The CRMA will need to include a stronger circular economy as well as a more holistic approach to ensure all critical raw materials integral for powerfuels are taken into account.

Overall, the Global Alliance Powerfuels supports the CRMA and its goals to strengthen the resilience of the EU's critical raw material supply. However, enhanced recycling rates and stronger circularity are needed in order to reduce the environmental footprint of critical raw materials. Furthermore, differentiated extraction and import targets for each critical raw material can strengthen Europe's resources supply compared to the currently rather general targets. The Alliance also supports the addition of bauxite, alumina and particularly aluminium to the list of critical raw materials within the CRMA. Aluminium is a particularly integral material in the construction of electrolysers.

The STEP falls considerably short of estimated funding required for clean technologies and fails to match up to the US Inflation Reduction Act.

While the Alliance generally welcomes the announcement of investments towards clean technologies, the absence of a new dedicated fund for this purpose, along with the current poor design of the STEP, makes it inadequate to meet the goals of the Green Deal Industrial Plan. In its current version, the STEP fails to resolve the EU's key financing issue, namely its highly fragmented funding landscape. Clearer and concrete linkages between the STEP and the NZIA are needed; i.e. dedicated funding for (strategic) net-zero technologies with clearer assigned budget streams from the STEP to the NZIA. The Alliance also

suggests introducing additional de-risking instruments to mitigate the shortcomings of the STEP. This is particularly important for the powerfuel sector since its development is still in early stages and several investment risks still need to be overcome.

Net-Zero Industry Act

What's in it for Powerfuels?

The Net-Zero Industry Act (NZIA), proposed In March 2023 by the European Commission, introduces an overall goal, albeit a non-binding one, that the EU shall endeavour to meet 40% of its net-zero technology needs in 2030 by local manufacturing. For some technologies, it further introduces specific indicative targets; e.g., installed electrolyser capacity deployed in the EU is supposed to reach at least 100 GW by 2030.[2]

The NZIA further contains a list of **strategic net-zero technologies**, including electrolysers, fuel cells and carbon capture and storage (CCS). Being labelled as strategic gives the respective net-zero technology manufacturing project certain privileges, for example, accelerated permitting and legal conflict resolution processes. However, in order to obtain this label, projects need to comply with certain criteria, to apply and be qualified by Member States (MS).

The NZIA's **main instruments** for fostering local manufacturing of net-zero technologies within the EU include provisions to accelerate permitting processes, the introduction of sustainability and resilience criteria in public procurement and auctioning schemes, regulatory sandboxes for innovative net-zero technology projects (<TRL8), and net-zero academies to foster the development of the skilled workforce needed.

Global Alliance Powerfuels' Assessment and Recommendations:

The Global Alliance Powerfuels generally welcomes that the NZIA was introduced as a response to the Inflation Reduction Act and to provide further guidance, new incentives and a simplified regulatory framework to accelerate the industry transition. The European Union has long been at the forefront of driving international powerfuels market development but it is currently on the brink of falling behind.[3] While the EU's regulatory and funding framework for supporting the powerfuels market uptake is quite advanced, it tends to be over-complex and highly fragmented. This translates into a European market

[2] This equals the RePower EU target of 10 Mt domestic hydrogen production by 2030.
[3] Hydrogen Council, Hydrogen Insights 2023, https://hydrogencouncil.com/en/hydrogen-insights-2022/

with a high number of announced powerfuels projects, but a low rate of final investment decisions.[4] Introducing further clarity, comprehensiveness and incentives for investments in European powerfuels production capacities would, therefore, be highly appreciated and necessary to accelerate market uptake. However, in its current version, the NZIA mostly fails to meet these expectations.

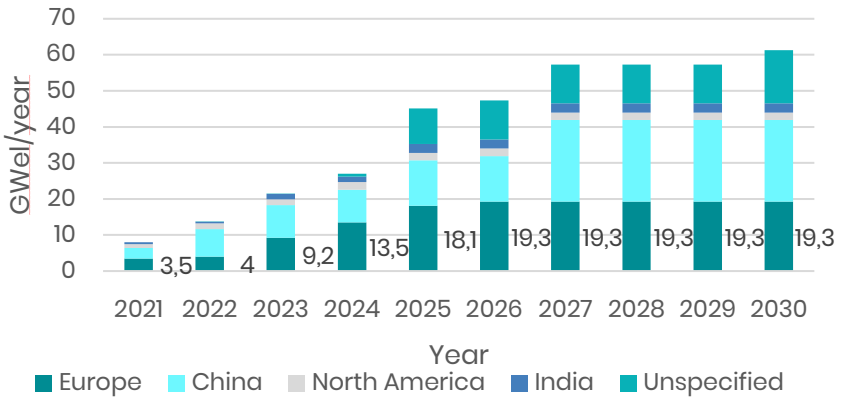
The 40% goal introduced in the NZIA is inadequate and fails to account for technology-specific differences.

First, the 2030 goal in the NZIA is poorly defined. For instance, it remains unclear both what the reference value for measuring the achievement of the 40% goal is and to which key components the benchmark further applies. More specifically: if the goal applies to electrolyser manufacturing capacity, does it also apply to the manufacturing of membranes used in electrolysers? Further clarification of these unanswered questions is needed during the positioning and subsequent trilogue of the EU institutions in order to provide the strong and clear signal to investors needed to go forward.

A new study by Bruegel (2023)[5] further shows how the EU's competitive advantage differs considerably between the technologies covered by the NZIA, as does its dependency on imports from single third countries. These technological differences in current clean-tech manufacturing capacities are not accounted for in the above-mentioned 40% target by 2030. While PV manufacturing is clearly dominated by China and, hence, the EU is largely dependent on PV module imports from China, Europe still holds significant shares of current (see Bruegel) and planned (see figure 2) global electrolyser manufacturing capacities. The Alliance therefore supports the introduction of more nuanced targets for each strategic net-zero technology. While reaching 40% of the EU's PV technology needs in 2030 domestically seems overambitious, reaching 40% of the EU's electrolyser needs domestically might be stacked too low.[6] [7]

[4] Ibid.
[5] Sgaravatti, G., Tagliapietra, S., Trasi, C. (2023) Cleantech manufacturing: where does Europe really stand? https://www.bruegel.org/analysis/cleantech-manufacturing-where-does-europe-really-stand-0
[6] However, while Europe leads in PEM and SOEC electrolyser development, China captures most of the alkaline electrolyser market (see https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/120621-china-scaling-up-electrolyzer-manufacturing-base-for-domestic-export-markets). Hence, an even more detailed technology differentiation could be necessary.
[7] For reaching the goal of 10 Mt domestic hydrogen production in 2030 (see RePowerEU), 90-100 GW_{LHVH2} (140 GW_{el}) are needed (see https://ec.europa.eu/docsroom/documents/50014/). This equals the set indicative target of 100 GW electrolyser capacity installed by 2030.

Figure 2: Planned electrolyser manufacturing capacity



Source: own illustration based on data derived from IEA, 2022

The NZIA lacks strong instruments for supporting the local manufacturing of strategic net-zero technologies. Its reliance on accelerated permitting is insufficient and jeopardises the enforcement of the introduced 2030 target(s).

While the Global Alliance Powerfuels generally welcomes that the NZIA addresses long and complicated administrative processes as a weak spot of the EU, these are not necessarily the predominant barrier for manufacturing projects of powerfuels technologies and the current proposal is passing too much of the responsibility to the Member States.[8]

Integrating sustainability and resilience criteria into public procurement, another instrument advanced by the NZIA, can play a crucial role in the creation of lead markets for the application of net-zero technologies (e.g., electrolysers) and resulting goods (e.g., green hydrogen and its derivatives)[9]. For example, incentivising public authorities to buy green steel for their building projects or fuel cell buses for their public transport systems can potentially create a demand-pull effect for powerfuels technologies and introduces a financing mechanism for the associated green premium. However, green premiums tend to surpass the currently proposed 10% cost cap and so it is likely that the sustainability and resilience criteria will rarely be applied during the public procurement of powerfuels technologies.[10] To put this into context, moreover, the IRA has set a ceiling of 25%. The introduced 10% cost cap therefore nullifies the

[8] See e.g. European Clean Hydrogen Alliance, *Joint declaration*, European Electrolyser Summit, (2022), https://hydrogeneurope.eu/joint-declaration-ec-electrolysers/; Tagliapietra, S., Veugelers, R., Zettelmeyer, J (2023) Rebooting the European Union's Net Zero Industry Act, https://www.bruegel.org/policy-brief/rebooting-european-unions-net-zero-industry-act

[9] See e.g. https://www.bmwk.de/Redaktion/DE/Publikationen/Ministerium/Veroeffentlichung-Wissenschaftlicher-Beirat/transformation-zu-einer-klimaneutralen-industrie.pdf?__blob=publicationFile&v=8; https://www.unido.org/news/worlds-largest-steel-and-concrete-buyers-make-game-changing-push-greener-solutions

[10] See https://breakthroughenergy.org/our-approach/the-green-premium/

generally good intentions. Furthermore, the opt-out possibility for Member States from the non-price criteria in auctions should be deleted and the non-price criteria should be clearly defined so all Member States apply it in a uniform manner.

The Global Alliance Powerfuels therefore strongly recommends a strengthening of EU guidance on permitting as well as a general revision and reinforcement of the provisions on public procurement. Member States will also need more guidance on how to implement sustainability and resilience criteria in their public procurement processes. Otherwise, implementation throughout Europe could further aggravate the fragmentation issue the EU is already facing.

The Global Alliance Powerfuels generally supports the labelling of some net-zero technologies as 'strategic'. However, criteria for the selection of strategic projects need to be sharpened and openness towards future technological development needs to be guaranteed.

Regarding limited financial and human resources available for supporting and implementing net-zero technologies, a certain prioritisation of net-zero technologies seems to be inevitable in order to not intensify existing bottlenecks that hamper the industrial transition and ramp-up of manufacturing capacities. However, the set of criteria that led the European Commission to the existing list of strategic net-zero technologies has not been traceable. For instance, coming from a powerfuels value chain perspective, it is unclear why CCS technologies are labelled strategic, while CCU technologies are not (see figure 3).[11] The Global Alliance Powerfuels therefore recommends that the set of criteria applied for labelling certain net-zero manufacturing projects as strategic is sharpened and made transparent.[12] One possible general guiding principle could be that upstream technologies should be prioritised over downstream technologies if necessary, as these help all subsequent technologies alongside the value chain to materialise. For instance, renewable energy technologies, electrolysers and CCU technology are a prerequisite for the production of sustainable aviation fuels.

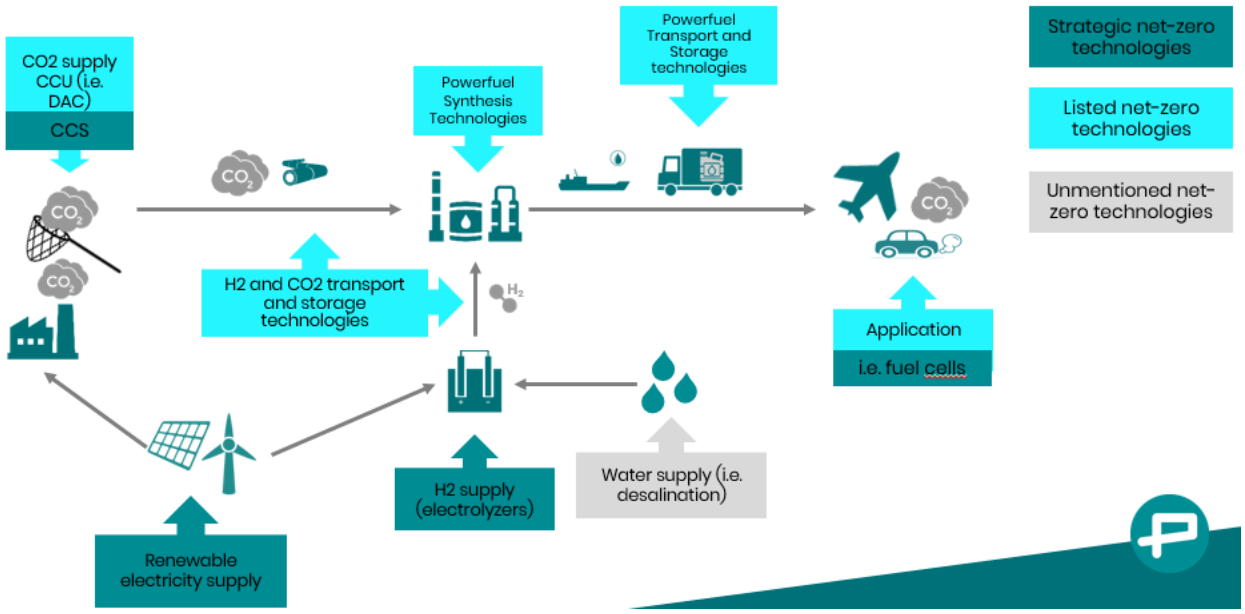
Furthermore, more transparency and clarity are needed with regard to strategic net-zero technology components. The Global Alliance Powerfuels therefore recommends including an annex to the NZIA that lists the different identified net-zero technologies, their key components as well as their scoring in the agreed-upon criteria of what constitutes 'strategic'.

Regarding the full list of net-zero technologies, further clarity is needed on what counts as RFNBO technologies. Moreover, water supply technologies (e.g., desalination) will play an increasingly important role in the energy systems, and in the powerfuels market ramp-up in particular. It is therefore incomprehensible why these have so far been entirely left out of net-zero technology listing(s) by the European Commission (as well as by the ITRE committee). Also, general openness to innovation and

[11] Furthermore, the dual approach of having both a predefined list of strategic net-zero technologies and a qualification process that manufacturing projects must go through in order to be labelled strategic seems unintuitive and an unnecessary duplication.
[12] The question of whether it is a technology where the EU currently tends to have a good competitive advantage should play a part in the selection process.

technological development needs to be guaranteed, despite taking a top-down approach. Particularly in nascent markets, like the powerfuels market, further innovation is very likely and key for the development of an effective and efficient market. Accordingly, the Global Alliance Powerfuels supports the introduction of a mechanism that allows for inclusion of new net-zero technologies and components after the adoption of the NZIA (as well as their later attribution as strategic). Such an update of the net-zero technology list could be realised via a delegated act, as currently proposed by the ITRE committee and supported by the Global Alliance Powerfuels.

Figure 3: Powerfuels technologies alongside the value chain and their consideration in the NZIA as proposed by the European Commission



Source: own illustrations

Critical Raw Materials Act

What's in it for Powerfuels?

In the coming years and decades, European economies will **require increasing amounts of raw materials** to produce the clean technologies (e.g. electric cars, PV, electrolysers) needed for reaching their energy and climate targets. However, currently Europe relies heavily on raw material imports. This could put the EU's effort to meet its climate goals at risk and lead to unbalanced trade relations. To mitigate these risks, the EU Commission passed the **Critical Raw Material Act** (CRMA)[13] on 16th March 2023. Its main goal is a **secure, diversified, affordable and sustainable supply of critical raw materials**.

[13] European Commission, Proposal for a regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amend Regulations (EU) 168/2013,

For this purpose, the Commission has suggested a set of internal and international actions. The CRMA introduces an updated **list of critical raw materials**[14]; identifies a list of **strategic raw materials** which are crucial for clean and digital technologies[15]; and sets clear 2030 benchmarks[16] for domestic capacities along the strategic raw material supply chain. In the Commission's proposal **'equipment related to hydrogen production and utilisation'**, such as electrolysers, catalysts for powerfuels production and transport and storage technologies, are **highlighted as strategic technologies**. Hence, supply of critical raw materials for these applications is in the narrower focus of the act. According to the German Mineral Resources Agency (DERA) the following raw materials are especially important for the construction of electrolysers: **Ir**, **Pt**, **Ti**, Al, **Cu**, **Zr**, **Sc**, Y, La, **Ni**, **Co**, **Mn**, **Ce**, **Cr**[17] (raw materials listed as critical or strategic in the Commission's proposal are highlighted in bold). For further hydrogen technologies and applications, other raw materials like graphite, palladium and other heavy rare earth elements will additionally be needed.

Regarding the CRMA's core instruments, it intends to **improve access to finance, introduce lower administrative burdens and shorter permitting timeframes** for selected strategic projects; support the implementation of national measures to **improve** the collection of critical raw materials rich waste and its **recycling into secondary critical raw materials;** and diversify the Union's imports of critical raw materials by establishing strategic partnerships and sufficiently diversified value chains.

Global Alliance Powerfuels' Assessment and Recommendations:

Overall, the Global Alliance Powerfuels supports the Critical Raw Materials Act and its goals to strengthen the resilience of the EU's raw material supply and thereby to secure the EU's green transformation via net-zero technologies. However, in order to reach its objectives while simultaneously mitigating possible negative effects, the following aspects need to be adapted:

Adopt a stronger circular economy approach, which helps to mitigate unwanted negative side effects.

Net-zero technologies require an enormous amount of raw materials and thus come with a large environmental footprint. The CRMA's focus on expanding domestic mining and extraction of critical raw

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(EU) 2018/858, 2018/1724 and (EU) 2019/1020, 2023, https://eur-lex.europa.eu/resource.html?uri=cellar:903d35cc-c4a2-11ed-a05c-01aa75ed71a1.0001.02/DOC_1&format=PDF

[14] Sb, As, Bauxite, Baryte, Be, Bi, Co, Coking Coal, Cu, Feldspar, Fluorspar, Ga, Ge, Hf, He, Rare Earth Elements, Li, Mg, Mn, Graphite, Ni, Nb, Phosphate Rock, P, Ru, Rh, Pd, Os, Ir, Pt, Sc, Si, Sr, Ta, Ti, W, V.

[15] Bi, B, Co, Cu, Ga, Ge, Li, Mg, Graphite, Ni, Mn, Ru, Rh, Pd, Os, Ir, Pt, Nd, Pr, Tb, Dy, Gd, Sm, Ce, Si, Ti, W.

[16] 1. At least 10% of the EU's annual consumption for extraction / 2. At least 40% of the EU's annual consumption for processing / 3. At least 15% of the EU's annual consumption for recycling / 4. Not more than 65% of the Union's annual consumption of each strategic raw material at any relevant stage of processing from a single third country.

[17] Deutsche Rohstoffagentur, DERA Rohstoffinformationen. Rohstoffe für Zukunftstechnologien, (2021) https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-50.pdf?__blob=publicationFile&v=4

materials risks negative side effects (e.g., air and water pollution, soil erosion, deforestation) – risks that are currently also borne by third countries where critical raw materials destined for the European market are extracted. Enhanced recycling rates and stronger circularity can reduce the material footprint of clean technologies. However, for many critical raw materials, there are only a few collection, end-of-life-treatment and recycling facilities in existence today.[18] With precise interim goals and benchmarks, the CRMA could contribute to kick-starting a more sustainable kind of clean-tech manufacturing, support the development of a forward-looking infrastructure for critical raw materials to enable circularity rather than linear value chains and ensure Europe's supply of critical raw materials. The Global Alliance Powerfuels, therefore, recommends more ambitious targets to be set by the CRMA for recycling critical raw materials, thus strengthening sustainable raw material supply for powerfuels technologies.

Furthermore, the CRMA needs to go beyond its narrow focus on just recycling; it must acknowledge and implement all aspects of circularity: sharing, leasing, reusing, repairing, refurbishing and recycling.[19] Financial incentives and support schemes have to be implemented to boost circularity, and the CRMA has to be accompanied by advanced legislation to set standards for product design to promote re-use and second use application, e.g. reusing batteries from fuel cell vehicles as battery energy storage systems (BESS) for off-grid locations. In addition, Member States need to be incentivised to fulfil their already existing obligations and national action plans on transitioning to a circular economy. As a recent study by the European Court of Auditors revealed, the average circularity rate of all 27 EU countries increased by only 0.4% between 2015 and 2021.[20] Here, the CRMA could be a starting point for improvement.

Individual extraction and import targets for critical raw materials can strengthen Europe's resources supply.

The EU relies heavily on imports for many of the listed critical raw materials: only 5% of raw materials were extracted and 40% were processed within the EU27[21]. The Global Alliance Powerfuels proposes more individual extraction goals for certain raw materials rather than generalised targets. While Europe's deposits of some raw materials – for example lithium – are comparably large, other raw material reserves are only located outside Europe. Individual but ambitious exploration targets for commonly occurring raw materials are therefore more effective. For other critical raw materials, it will be very challenging to meet the 65% target for diversification of imports. Different import targets for each critical raw material or at least exemptions for certain critical raw materials will be necessary, as certain

[18] Ritthoff et al., Embracing Circularity: A pathway for Strengthening the Critical Raw Materials Act, (2023) https://www.corporateleadersgroup.com/files/cisl_embracing_circularity_report_v5.pdf
[19] European Parliament, Circular Economy: definition, importance and benefits, (2023), https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits
[20] European Court of Auditors, Circular economy: Slow transition by member states despite EU action, (2023), https://www.eca.europa.eu/ECAPublications/SR-2023-17/SR-2023-17_EN.pdf
[21] European Commission, Critical Raw Materials for Strategic Technologies and Sectors in the EU: A Foresight Study, (2020) https://rmis.jrc.ec.europa.eu/uploads/CRMs_for_Strategic_Technologies_and_Sectors_in_the_EU_2020.pdf

country-specific dependencies for some resources cannot be avoided. In the powerfuel value chain, for instance, over 70% of platinum[22] and almost 90% of iridium[23] are produced in South Africa. Both raw materials are key elements for the production of PEM as well as alkaline electrolysers.

Regarding the listed strategic and critical raw materials in the CRMA, the Global Alliance Powerfuels recommends taking a more a holistic approach, to make sure that all critical raw materials important for powerfuels are taken into account.

Looking at the identified list of critical raw materials, the Global Alliance Powerfuels supports the addition of bauxite, alumina and especially aluminium to this list. Aluminium is a core material for the construction of electrolysers.[24] Nonetheless, introducing a review and, if necessary, update mechanism to the CRMA is necessary, as new technologies with different resource-intensities might emerge.

Strategic Technologies for Europe Platform

What's in it for Powerfuels?

In September 2022, the establishment of a Sovereignty Fund was announced by EU Commission president Ursula von der Leyen which was meant to financially ensure 'that the future of industry is made in Europe'.[25] Following this announcement, a proposal for a regulation to establish a **Strategic Technologies for Europe Platform (STEP)** was put forward in June 2023. While the initial idea of a Sovereignty Fund suggested the creation of a new funding programme and additional money for the support of strategic technologies, so far the STEP mainly seeks to reinforce and channel existing funds towards the common objective of reducing strategic dependencies and facilitating cross-border investments across the Single Market. By leveraging existing programmes such as InvestEU, Innovation Fund, Horizon Europe, EU4Health, European Defence Fund, Recovery and Resilience Facility and cohesion policy funds, the Commission expects **new investments of up to €160 billion**. The Commission further proposes to allocate an additional €10 billion to targeted programmes via the amendment of the Multi-annual Financial Framework (MFF). However, so far, there is no indication of the Member States agreeing to the additional €10 billion proposed in the STEP.[26]

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[22] Mining Technology: Platinum production in South Africa and major projects, (2023) https://www.mining-technology.com/data-insights/platinum-in-south-africa/

[23] Power Engineering International, Imagining green hydrogen production without iridium, (2023) https://www.powerengineeringint.com/hydrogen/imagining-green-hydrogen-production-without-iridium/

[24] Deutsche Rohstoffagentur, DERA Rohstoffinformationen: Rohstoffe für Zukunftstechnologien, (2021). Other core critical raw materials for electrolysers are: **Ir**, **Pt**, **Ti**, **Cu**, **Zr**, **Sc**, Y, La, **Ni**, **Co**, **Mn**, **Ce**, **Cr** (raw materials listed as critical or strategic in the Commission's proposal are bold).

[25] European Commission, 2022 State of the Union Address by President von der Leyen, (2022), https://ec.europa.eu/commission/presscorner/detail/en/speech_22_5493

[26] At the moment, the amendment to the MFF 2023-27 regulation is in the preparatory phase in the European Parliament and the STEP regulation is awaiting committee decision.

The STEP will target **three technological priority areas**, namely deep and digital technologies, bio technologies and clean technologies. Among the list of clean technologies provided within the STEP, those specific to powerfuels include RFNBOs, sustainable alternative fuels, electrolysers and fuel cells, carbon capture, utilisation and storage, hydrogen and water purification and desalination.

One of STEP's main instruments to leverage the expected investments is a **sovereignty seal**, a quality label ascribed to all high-quality projects contributing to the STEP objectives. This will enhance the visibility of each project to investors and facilitate their access to the diverse EU funds. STEP also hosts a **sovereignty portal** which is intended to be a platform to aid project promoters and companies seeking funds to find relevant and pooled information about the diverse EU funding opportunities available.

Global Alliance Powerfuels' Assessment and Recommendations:

While the Alliance generally welcomes the announcement of investments towards clean technologies, the absence of a new dedicated fund for this purpose, along with the current poor design of the STEP, leaves the regulation with much to be desired and inadequate to meet the goals of the Green Deal Industrial Plan.

The STEP falls considerably short of estimated funding required for clean technologies and fails to match up to the US Inflation Reduction Act (IRA).

In contrast to the original implication in communications surrounding the Sovereignty Fund, the STEP regulation merely commits to a repurposing and reshuffling of existing funds, while at the same time broadening the scope of technologies captured under its umbrella. The lack of any substantial new funds is the biggest drawback of the Green Deal Industrial Plan. It sends a weak signal to actors looking to invest in clean-tech manufacturing in Europe. According to a study by the Jacques Delors Centre, the EU will need to spend an estimated €264 billion in order to match IRA subsidies.[27] This is clearly not being reached by the expected investments to be triggered by STEP. While sending a counterproductive political signal, the STEP is further jeopardizing the goals introduced in the NZIA and CRMA. The measures proposed within the NZIA will require a considerable amount of funding. According to REPowerEU estimates, implementing hydrogen and powerfuels projects will require direct investments of €84-124 billion in key hydrogen infrastructure in the EU.[28] In its communication on the European Hydrogen Bank, the European Commission estimates investment needs in the range of €335-471 billion to produce, transport and consume 10 million tonnes of green hydrogen. Investment needs for electrolysers alone are estimated to be €50-75 billion by 2030.[29] This would already absorb big shares of the €160 billion earmarked for all STEP target investment areas.

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[27] Jansen, J., Jäger, P., and Redeker, N., Policy Brief: For climate, profits, or resilience? Why, where and how the EU should respond to the Inflation Reduction Act, (2023), https://www.delorscentre.eu/en/publications/ira-europe-response.
[28] International Energy Agency, Global Hydrogen Review 2022, p.247, https://www.iea.org/reports/global-hydrogen-review-2022.
[29] European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the European Hydrogen Bank, (2023).

The current design of the STEP fails to resolve the EU's key financing issue: its highly fragmented funding landscape.

As outlined in the Global Alliance Powerfuels' report on public funding (2023)[30], and further described by the Florence School of Regulation (2023)[31], the overall sum of funding available for financing powerfuels projects in the EU is quite high and can even match up with the budget proposed by the IRA. However, the EU funding landscape is characterized by a high degree of fragmentation. The STEP's approach to introduce, both a sovereignty seal to enhance projects' access to different EU funding programs and a sovereignty portal to bundle information on the diverse funds is a good first step towards addressing this challenge. However, more clarity is needed on the functioning of the sovereignty seal, while the sovereignty portal should be developed further into a real one-stop shop for providing funding for strategic net-zero technologies.

Clearer and concrete linkages between the STEP and NZIA needed.

In the NZIA policy scenario presented within the NZIA staff working paper, EU manufacturing would need to increase its market shares in the period 2023-2030 to the benchmarks as stipulated in the NZIA. Investment for cleantech manufacturing capacity required within this scenario amounts to a total estimated value of €88 billion. This would account for nearly 50% of the proposed funding earmarked for the STEP. Considering that STEP funding caters to digital and bio technologies as well, it becomes difficult to see how NZIA financing needs for cleantech will be effectively met. As such, the Global Alliance Powerfuels highlights the need for dedicated funding for cleantech with clearer assigned budget streams from the STEP to the NZIA.

Similarly, it is unclear why the STEP undertakes another cleantech listing approach that moreover does not match the list brought forward by the NZIA. The Alliance therefore recommends that the STEP should instead refer to the strategic technologies identified in the NZIA, in order to enhance policy coherence and regain focus.

The Global Alliance Powerfuels strongly suggests a mitigation of the shortcomings of the STEP by introducing additional de-risking instruments.

Manufacturers of nascent clean technologies, such as many technologies within the powerfuels value chain, have limited capital available while at the same time facing a massive scale-up challenge. In the case of green hydrogen and powerfuels, there are several limitations that pose a risk to investments in these projects, such as the timely availability of additional renewable power, water, sustainable CO2 sources and dedicated transport and storage infrastructure, as well as remaining high cost gaps and technical risks, to name only a few. To facilitate and aid involved actors in the ramp-up of powerfuels

[30] Global Alliance Powerfuels, Report: Public Funding for Powerfuels Projects Vol. II (2022), https://www.powerfuels.org/news/publikationsdetailansicht/pub/report-public-funding-for-powerfuels-projects-vol-ii/

[31] Florence School of Regulation, Hydrogen funding flows in the European Union (2023), https://fsr.eui.eu/hydrogen-funding-flows-in-the-european-union-2023/

technologies, the introduction of de-risking instruments is crucial. The EU has already introduced such a de-risking tool with the InvestEU Fund implemented in partnership with the European Investment Bank (EIB) and other financial institutions, such as National Promotional Banks and Institutions (NPBIs). This aims to mobilise private investments for the EU's top policy priorities such as the green transition. However, its current structure poses several challenges to the eligibility of powerfuels projects.

The InvestEU Fund is composed of four policy windows (sustainable infrastructure; research, innovation and digitalisation; SMEs; and social investment and skills). It consists of an EU budget guarantee, set at €26.2 billion, to back the financial products provided by the implementing partners. The EU guarantee is expected to mobilise at least €372 billion of investment across the EU in the 2021-2027 period (multiplier effect of 11.4).

The Global Alliance Powerfuels strongly supports the underlying principle of the InvestEU Fund to mobilise investments in prioritised policy areas and increase the risk-taking capacity of implementing partners by enabling them to approve and finance projects and operations with a higher risk profile than their usual portfolio. However, the volume of the EU guarantee constitutes only a third of what was envisaged in initial proposals in 2020[32], and the overall climate spending target of InvestEU funding constitutes only 35 per cent (it is higher, at 60 per cent, for the sustainable infrastructure window). As a consequence, the investment that can be expected to be channelled towards powerfuels remains limited, and projects are competing for funding with other technologies that may already have a higher degree of technological advancement or commercialisation. A dedicated fund backed by EU guarantees for renewable hydrogen and other powerfuels (with a scope similar to the Australian CEFC Advancing Hydrogen Fund) could therefore create additional investment certainty and support the growth of the European hydrogen industry in a more targeted and effective way.

[32] European Parliamentary Research Service, InvestEU programme - The EU's new investment support scheme (2021). https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659364/EPRS_BRI(2020)659364_EN.pdf

The **Global Alliance Powerfuels** was founded in 2018 and is backed by 14 member organisations and an international network of over 20 partner institutions. It is coordinated by the German Energy Agency (dena). The strategic objective of the Alliance is to foster the development of a sustainable global market for powerfuels.

The term **powerfuels** denotes not only renewable hydrogen but also all other gaseous and liquid energy carriers and feedstocks from power-to-X processes that draw their energy content from renewable electricity. This includes, but is not limited to, synthetic gas (e.g. methane, hydrogen) and synthetic liquid fuels (e.g. methanol, ammonia, and Fischer-Tropsch products).

Powerfuels complement the direct use of renewable energy and are crucial where direct electrification is not technologically feasible or economical. By offering climate-neutral options to applications with no viable alternatives, powerfuels allow for more far-reaching de-fossilisation of all end-use appliances, across all sectors – thus enabling system-wide emissions reductions in a technology-neutral approach. Powerfuels can also accelerate the integration of the energy system by replacing fossil energy sources in existing end-use consumer equipment in the short-term and offering flexibility as a long-term storage option.

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