



Hydrogen
Europe

A Clean Industrial Deal for the European hydrogen industry

January 2025

A Clean Industrial Deal for the European hydrogen industry

The formal adoption of European Green Deal was a crucial step in the creation of a more sustainable Europe, setting out the roadmap for the EU to achieve climate neutrality by 2050.

However, decarbonising Europe's industry while remaining globally competitive is no small task. **High energy costs, aggressive global competition for clean technology industrial leadership, overly complex legislation** slowing down investment decisions are not only challenging Europe's climate neutrality ambitions, but also its industrial capacity and **economic security** aspirations.

Supporting Europe's hydrogen ecosystem is a no-regret policy: it provides the necessary flexibility to our renewables, helps decarbonise energy, transport and industrial sectors still relying on fossil fuels whilst reducing strategic dependencies

Despite significant progress since the 2020 Hydrogen Strategy, the European hydrogen ecosystem still requires improved market conditions to lower costs and increase global competitiveness. Hydrogen supply and demand are critically connected. Off-takers seeking or compelled to decarbonise face challenges in adapting to clean hydrogen. Regulatory ambiguity, delays in the national implementation of targets, insufficient off-take, slow infrastructure development, and intense global competition challenge Europe's competitiveness and the ramp up of the sector.

A Clean Industrial Deal addressing market failures, simplifying regulations, and catalysing private sector investment is urgently needed. The European hydrogen ecosystem is needed to reach both the objectives of the energy transition and those of the Pact for European Competitiveness to ensure sustainable, prosperous, competitive, and resilient of European economies.

Policy recommendations



I. Affordable energy & raw materials

- Accelerate renewables deployment
- Design EU strategies for hydrogen imports, grids and energy storage; revise the Hydrogen Strategy
- Develop critical raw materials procurement, processing & recycling
- Improve permitting for advanced materials & raw materials



II. Simplification

- Adapt the RFNBO delegated act
- Swiftly adopt a clear Low-carbon hydrogen delegated act
- Enhance RED III compliance
- Facilitate workable environmental regulation



III. Demand for EU sustainable products

- Incentivise off take of green products and, stimulate demand in lead markets
- Develop resilience and sustainability-based non-price criteria



IV. Global competitiveness

- CBAM scope review
- Develop global hydrogen certification schemes
- Act against unfair trade practices



V. Funding and financing

- Strengthen the Hydrogen Bank, including its international leg
- Ensure CEF support for hydrogen infrastructure
- Keep current State Aid designs and enhance NZIA support schemes



VI. Skills & fair transition

- Build up the NZIA Academies
- Streamline training funding opportunities
- Develop common European training certifications and standards

Pillar I: Affordable energy and raw materials

Europe's hydrogen ecosystem faces significant systemic challenges. A scarcity of affordable renewable electricity (RES) hinders the development of clean hydrogen production sites within the EU. **The absence of robust energy storage mechanisms, of flexibility options for grids curtailment, and of long-term planning limits the integration of hydrogen as a cornerstone of Europe's energy mix.** Developing infrastructure will be critical to enable this shift. **A revised Hydrogen Strategy and a dedicated Hydrogen Infrastructure Strategy** under the upcoming Clean Industrial Deal should address these elements.

Supporting the domestic production of hydrogen by building out infrastructure will not only ramp-up the uptake of the hydrogen market but will also reduce electricity grid costs and support variable RES (VRES) integration through the systemic gains provided by sector coupling: more flexibility, a cheaper infrastructure, and more efficient energy transport¹.

While Europe fosters its domestic development, the availability of abundant, cheap, clean electricity abroad presents an opportunity to accelerate decarbonisation through clean hydrogen imports, by the means of pure hydrogen, its derivatives, and liquid organic hydrogen carriers (LOHC). Yet, **a consistent strategy for such imports has yet to be designed. Such a strategy must** notably integrate infrastructure developments needs in seaports and inland ports.

An **EU-wide energy storage strategy** with flexibility and network-planning considerations must be developed in the coming months. **A hydrogen grid strategy** to reinforce the advancing European electricity grid is also needed.

Critical raw materials are a key cost-driver. Europe's limited global footprint in mining constrains its position. Bold action on existing and new processing and recycling—particularly for Platinum group Metals (PGMs) and nickel—could strengthen the availability of resources for the hydrogen sector, thus increasing security of supply. The same applies to advanced materials. **Streamlined permitting and stronger procurement rules** for raw and advanced materials are essential to reducing the levelized cost of hydrogen (LCOH).

In summary, to bring the cost of renewable electricity and critical raw materials down – thereby reducing the cost of hydrogen – Europe must:

- **Accelerate the deployment of renewables enabling large scale production of reliable and competitive hydrogen and derivatives in Europe, laying the pathway towards a 2040 climate framework.**
- **Design and promote an EU Hydrogen Grids Action Plan and a strategy for imported hydrogen, in line with the RED. Energy storage should have dedicated strategies.**
- **Foster the development of processing and recycling infrastructure for critical raw materials, without which the targets and obligations described in the Critical Raw Materials Act (CRMA) and the Net-Zero Industry Act (NZIA) are toothless.**
- **Modernise permitting rules notably for e-fuels, advanced materials production, and processing sites by introducing streamlined solutions like those of NZIA and REPowerEU, allowing for the expansion of these sectors in the EU.**

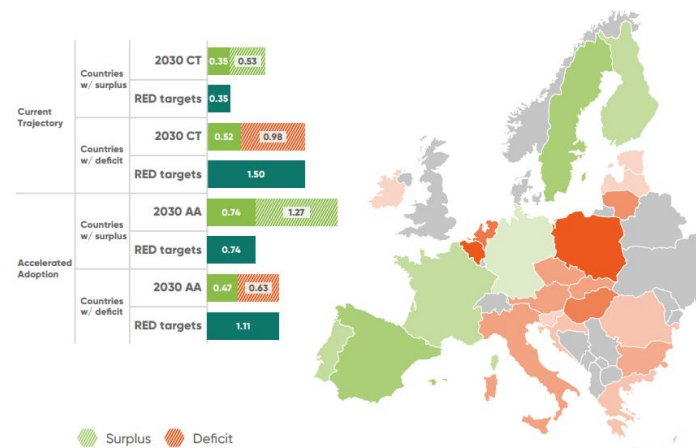
¹ Developing a pan-European hydrogen network in a multi-energy model over the 2030-2050 timeframe could save up to €330 billion compared with a more isolated approach, “Assessing the benefits of a pan-European hydrogen transmission network” report, March 2023, Link [here](#).

Pillar II: Simplification of existing regulation

A significant barrier to the large-scale deployment of electrolyser technologies is the uncertainty stemming from existing legislation, which undermines investors' and off-takers confidence in clean molecules and related technologies. As also stated in the Draghi report, the EU should take a major step in reduction of red tape in regulations and competitive mechanisms.

The major regulatory drivers for hydrogen demand in Europe are REFueLEU Aviation and the Renewable Energy Directive (REDIII), but it is essential that the **REDIII be transposed into national legislation swiftly and effectively**. Delays in the submission of National Energy and Climate Plans (NECPs) are concerning. Delays in the transposition of Fit-for-55 legislation should be avoided.

The European Commission needs to provide certainty and clarity to the market that the binding targets within the REDIII will be implemented and enforced. Any hesitation on direction or ambition will delay projects and final investment decision by offtakers.



Hydrogen supply deficit and surplus relative to the minimum RED III targets by country based on two scenarios for 2030. The map shows results for the Accelerated Adoption scenario

In addition, getting production projects off the ground is proving to be challenging given the **overly complex framework of RFNBO additionality**, which significantly increases the cost of hydrogen. The European Commission should **simplify the framework**, make it more flexible while ensuring any change does not negatively affect projects under development.

A consistent, well defined, and quick publication of the **low-carbon hydrogen Delegated Act** will be essential to accelerate the development of low-carbon hydrogen and RFNBO production projects.

Besides production pathways, the availability of components and materials is also an important issue. For instance, PFAS-based components such as **fluoropolymers (a PFAS subtype)**, which are **indispensable for the hydrogen industry**, should not be threatened by a one-size-fits all approach as foreseen under REACH. Their durability in harsh environments and ability to meet high performance and reliability standards are critical to ensure resilient EU supply chains.

In order to simplify legislation and prevent counterproductive measures on component supply, the EU should therefore:

- **Adapt the RFNBO Delegated Act by extending the transitional period to enable more competitive production while ensuring changes do not negatively affect projects under development.**
- **Swiftly adopt a clear low-carbon hydrogen Delegated Act, consistent with the linked hydrogen regulatory framework.**
- **Enhance compliance with Renewable Energy Directive (RED) III RFNBO targets by defining penalties for non-compliance, and ensuring national transposition is timely and harmonised across countries.**
- **Include an exemption for clean technologies' industrial use of fluoropolymers.**

Pillar III: Demand for sustainable and EU-made products

Supporting the ramp-up and demand for those sustainable products where Europe has an industrial comparative advantage enhances energy security, reduces external dependencies, and channels taxpayer money into the continent's development. Hydrogen technologies is one of those sectors where Europe still holds a relative global lead. Products made in Europe, with EU-standards used as a benchmark can pave the way for a stronger Europe in the future global market for hydrogen. Industrial off-takers are expected through regulation to shift from fossil fuels to fossil-based hydrogen to renewable hydrogen consumption. The important price premium attached makes this transition challenging, especially when competing in global markets. It is essential to support the **creation of downstream markets for green products** that would help de-risk offtaker projects. Incentives through **tax breaks** (e.g., lower taxes when buying cars with green steel, products with green aluminium or products based on green fertilisers) should be considered. The public sector is a significant user of those products (e.g., public procurement drives approx. 50% of the steel demand). Governments should introduce **specific requirements and incentives in public procurement** to drive demand for green steel or other green products.

The Net-Zero Industry Act (NZIA) introduces **resilience and sustainability criteria in national procurement and auction schemes**, adding a quality layer for bidders. These measures should be implemented promptly and strengthened with **safety and performance standards** to ensure funds are directed toward the most innovative and reliable hydrogen technologies.

To increase demand for sustainable, local products as effectively as possible, the EU should:

- **Incentivise the offtake of green products, stimulate demand in lead markets by developing labelling mechanisms for sustainable products, tax incentives, or support mechanisms for purchases of sustainable products.**
- **Develop the resilience and sustainability-based non-price criteria in public procurement and in other competitive bidding schemes to bolster EU-based clean tech production.**

Pillar IV: Global competitiveness

The EU is advancing domestic hydrogen production and manufacturing but must also navigate the realities of a globalised economy, where trade of hydrogen and its derivatives can accelerate decarbonisation and help achieve national targets. This comes with a significant risk of having to deal with the different market practices of our global competitors, which are capable of undermining the EU hydrogen industry's competitiveness. Imports of products not aligned with EU standards—whether on CO₂ content, safety, performance, or social criteria—could disadvantage European players bound by stricter rules.

The **Carbon Border Adjustment Mechanism (CBAM)** aims to address the carbon leakage challenge; however, its **scope should be widened**. CBAM coverage should extend to all hydrogen derivatives (only hydrogen and ammonia are covered so far) and to downstream goods, such as machinery with high steel content, to ensure fair competition and uphold EU environmental and industrial standards.

The absence of globally harmonised **hydrogen certification schemes and mutually recognised guarantees of origin (GOs)** creates fragmentation and uncertainty in international hydrogen trade. **Standardised digital product passports** for hydrogen products would facilitate traceability, compliance, and off-takers confidence, accelerating the adoption of clean hydrogen solutions.

A delicate balancing act is required, and it is also important that market reciprocity with international competitors is effectively implemented. **Reinforcing trade defence instruments**, leveraging public procurement rules would level the playing field for EU industries.

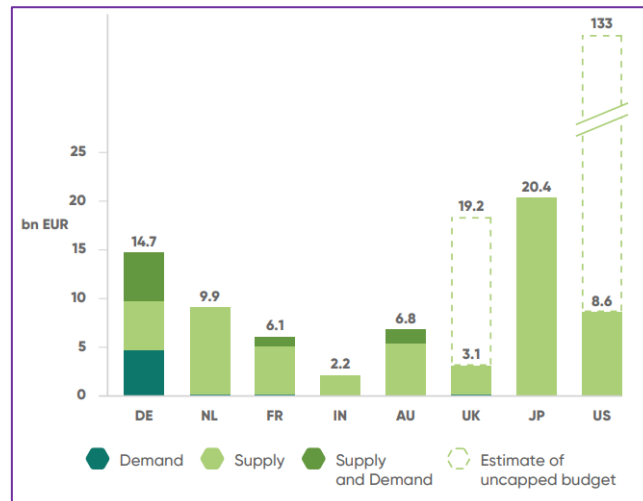
Develop mutually beneficial **Clean Trade and Investment Partnerships** with 3rd countries through investments, tech transfer, resources trade, and green industrialisation.

To best improve Europe's global competitiveness in hydrogen and clean tech, the EU should:

- **Facilitate the timely review of the scope of CBAM, reflecting on global carbon markets developments and potential competitiveness losses. Consider the status of downstream goods, especially those with high CBAM-good content (e.g., machinery with high steel content).**
- **Foster the development of global hydrogen certification schemes (incl. RFNBO and low-carbon hydrogen), mutually recognised guarantees of origins and standards, while developing a digital product passport for hydrogen products.**
- **Strengthen action against unfair trade practices and circumvention.**

Pillar V: Funding frameworks

Financial support for hydrogen, its derivatives and technologies must remain a priority in the **upcoming Multiannual Financial Framework (MFF)**, especially from an international perspective. The EU should capitalise on complementary support schemes like the **ETS Innovation Fund, the Hydrogen Bank, or Sustainable Aviation Fuels (SAFs) allowances**, which demonstrate the potential for targeted funding mechanisms to drive innovation, market uptake and the matching of hydrogen supply and demand.



Estimation of announced public funding for clean hydrogen by selected countries, split between supply and demand (by 9/2024)

These tools can be improved by introducing **indexation and cumulation** with other financing schemes. The **Hydrogen Bank should cover offtakers and address imports**. Further, more Member States should embrace the EC's proposal to use the Hydrogen Bank mechanism as **"auctions-as-a-service"**, as it has proven to be an effective and simple instrument to redirect national resources towards hydrogen projects.

Substantial funding is critical for high-capital-intensive segments such as **hydrogen infrastructure**, the backbone of the hydrogen economy. This could be done via the Projects of Common Interest (PCI) framework. This should include **increased funding through the Connecting Europe Facility (CEF)**, revised selection criteria to prioritise hydrogen projects, and higher maximum support rates to accelerate their deployment.

Equally important is expanding **subsidies to better cover operational expenditures (OPEX)**, which represent a significant portion of hydrogen's cost structure in Europe: fluctuating costs can hinder scalability and competitiveness. Focused on OPEX, the **Sustainable Transport Investment Plan (STIP)** should address the low support for mobility projects in the Innovation Fund, Alternative Fuels Infrastructure Facility, and Hydrogen Bank. De-risking tools and guarantees for clean industries should facilitate sustainable investments, ensuring that financial instruments are designed to attract both public and private capital. An investment plan should facilitate the mapping and financing for energy infrastructure, including storage capacity.

State aid has proven to be an effective tool for de-risking and incentivising hydrogen projects. It should be continued, both for manufacturing and for OPEX support, in production and use. To avoid an uneven playing field among Member States due to disparities in national budgets, it should be balanced with an enhanced European funding mechanism for strategic projects, including hydrogen. Notably, the **NZIA currently lacks dedicated EU funding**: establishing a dedicated funding envelope to support the NZIA would help tackle these structural imbalances and ensure a more equitable approach across the EU.

To improve the availability of funding opportunities for strategic hydrogen production and infrastructure projects, the EU should:

- **Grant the Hydrogen Bank an increased budget of €3 billion per year and design it to address indexation to inflation and cumulation. A mechanism to cover off-taker risks should also be introduced. Auctions as a service scheme should be increasingly endorsed by Member States. The promised international leg of the Hydrogen Bank is long overdue and must be developed.**
- **Ensure sufficient support for hydrogen infrastructure projects through the Projects of Common Interest via increased Connecting Europe Facility (CEF) funding, revised selection criteria, and maximum support rates for hydrogen projects.**
- **Keep and improve current state aid designs, while enhancing EU support budget towards NZIA strategic sectors, especially for hydrogen technologies and projects.**

Pillar VI: Skills and Fair transition

The **Net-Zero Industry Act foresees the establishment of Academies** in strategic sectors, including hydrogen, which would ensure accredited learning programs and materials are available to train, upskill, and reskill students and workers and promote the career opportunities of net zero industries. Initiatives such as GreenSkills4H2 and Hy-Academy can be combined with the NZIA Academies to improve effectiveness.

Several EU programs (RRF, MF, JTF) offer opportunities for national and regional authorities to set up funding for training schemes. They need to be accessible, easy to understand and simple to apply to. **Involving the industry at the programming stage would ensure the schemes match the sector's needs.** Other initiatives aimed at preparing workers for new technologies and attracting talent should be explored: tax incentives for training staff and workers, EU guidance on levels of taxation of skilled labour. **Certification systems for training and educational programs** would guarantee their quality and assist the industry in selecting the best candidates for jobs.

To best secure the future of the energy transition, the EU should:

- **Advance the NZIA Academies and couple them with existing training structures.**
- **Streamline funding opportunities for trainings. Explore tax incentives for skilled labour.**
- **Develop common European certifications and standards for hydrogen education and training.**

HYDROGEN EUROPE

Avenue Marnix 23

1000, Brussels / Belgium

www.hydrogeneurope.eu



Hydrogen
Europe