EUROPEAN RESILIENCE ALLIANCE

for Clean Hydrogen & Derivatives

Securing Europe's Energy and Industrial Future

Unlocking Europe's Clean Hydrogen Economy: pragmatic path from policy to bankable projects.

Competitiveness. Resilience. Impact.

Prepared by

EUROPEAN RESILIENCE ALLIANCE

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in cooperation with

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Executive Summary

The Challenge: Building a European Clean Hydrogen Market

Europe stands at a defining moment. Geopolitical instability, rising energy insecurity, and intensifying global competition are undermining Europe's industrial base and competitiveness. Clean, resilient energy is therefore no longer just a climate objective; it is a matter of economic security and sovereignty. Clean hydrogen[1] is central to that effort: it can cut dependence on imported fossil fuels, decarbonize core industrial sectors, and improve the resilience of Europe's energy system.

A massive pipeline of clean hydrogen projects across the value chain and a comprehensive regulatory architecture exists – yet fewer than 7% of projects have reached Final Investment Decision (FID). The barriers are structural: fragmented national regulations, high power cost components, complex rules for Renewable Fuels of Non-Biological Origin (RFNBO), no clear role for low carbon hydrogen in the current policy framework, uncertain infrastructure timelines and – above all – an absence of bankable demand. As a result, clean hydrogen remains significantly more expensive than fossil alternatives, widening the gap between policy ambition and market reality.

The challenge is no longer vision – it is execution.

The European Resilience Alliance: A Platform to Support Delivery

What makes the European Resilience Alliance for Clean Hydrogen & Derivatives (ERA) both unique and strategically valuable for European policymakers is its comprehensive scope and unprecedented coordination. For the first time, Europe's leading companies across the entire clean hydrogen value chain – from production to infrastructure to end-use – have aligned around a shared goal: building a functioning European hydrogen market. This level of industrial alignment has never existed in the hydrogen sector, creating a unique opportunity for policymakers to unlock billions in private investment through targeted, coordinated action.

[1] Definition of clean hydrogen used in this paper: all hydrogen made in a way that is compatible with climate neutrality, including RFNBOs and verifiable forms of low-carbon hydrogen.

The Solution: from Policy to Market

Breaking the current deadlock requires a shift from regulatory ambition to market construction, anchored in four mutually reinforcing priorities that require support from policymakers:

1 Demand must drive clean hydrogen production.

Europe must move beyond indicative targets and focus on driving demand by enforcing rules more consistently across the EU. This requires:

- Immediate and full transposition of the Renewable Energy Directive III (RED III) across all Member States, alongside faster, harmonized implementation of ReFuelEU Aviation and FuelEU Maritime.
- Creation of 'lead markets' in hard-to-abate sectors (steel, chemicals, aviation, maritime, as well as defense) through EU-wide Carbon Contracts for Difference (CCfDs), tax incentives, and mandatory clean public procurement criteria.
- Recognition of clean hydrogen-based decarbonization pathways in hard-to-abate sectors under the Industrial Accelerator Act (IAA), while keeping the market fair and competitive.

Demand must become bankable – providing long-term visibility for investors and enabling FIDs.

2 Clarity and simplification of clean hydrogen support frameworks is key.

Currently for electrolyzer-based hydrogen, 70% of the Levelized Cost of Hydrogen (LCOH) comes from electricity, making it vital to lower the cost of carbon-free power production to make clean hydrogen competitive. This can be done by lowering electricity costs (grid fees, levies, taxation) and extending exemptions beyond 2030. Beyond this, it requires:

- Enabling large-scale carbon-free Power Purchase Agreements (PPAs) with long-term price stability.
- Redesigning support instruments such as the European Hydrogen Bank to fully close the funding gap, prioritizing large-scale, strategically located projects with anchored demand.
- Allocate limited resources (water, grid capacity, public funding) strategically to projects where production and demand are already concentrated, enabling economies of scale.

3 Turn private capital into clean hydrogen power.

Public policy must enable – not replace – private investment. A predictable and sufficient greenhouse gas price under the Emissions Trading System (ETS) and Carbon Border Adjustment Mechanism (CBAM) is central. All revenues from ETS auctioning, including those flowing to Member States and from the gradual phase-out of free allocation should support the low-carbon transition. A substantial share should be recycled to reward companies investing in decarbonization. Beyond effective carbon pricing, this requires:

- Simplifying RFNBO requirements during the ramp-up phase and extending transitional provisions well beyond 2030.
- Introducing a state-backed portfolio guarantee mechanism to reduce counterparty risk.
- Establishing a dual-auction system for hydrogen supply and demand, operating on a contingent liability basis.
- Strengthening EU funding instruments (Innovation Fund, Industrial Decarbonisation Bank) with greater predictability and scale.

By lowering risk premia and improving financing conditions, these measures can unlock billions in private capital and accelerate project deployment.

4 Infrastructure as the lifeline of an integrated European energy market.

The European hydrogen market cannot exist without physical integration. This requires:

- Accelerating Projects of Common Interest (PCI) and using Connecting Europe Facility (CEF) funding for hydrogen infrastructure.
- Delivering coordinated cross-border planning between the European Commission, Member States, regulators and Transmission System Operators (TSOs).
- Providing long-term visibility on the European Hydrogen Backbone.
- Introducing EU-wide de-risking mechanisms for early-stage infrastructure investments.

The Cost of Inaction

The cost of inaction is severe: industrial job losses, capital flight, stranded assets, missed climate goals, defense concerns, falling behind technologically, and erosion of political credibility. Meanwhile, global competitors – particularly China – are accelerating rapidly. Europe must respond with equal determination and urgency.

European Resilience Alliance stands ready to reverse this trajectory. With bankable projects, committed capital across the full value chain, and cross-border coordination that simplifies the policy dialogue, the Alliance offers policymakers a credible industrial partner and an engine behind accelerating clean hydrogen deployment. What is needed now is political resolve to act – industry and policymakers together.

Who are we?

The European Resilience Alliance brings together companies across the entire hydrogen value chain – from production and infrastructure to end-use. We offer policymakers coordinated industry input: a practical partner committed to making Europe‘s hydrogen transition both competitive and resilient.

As a CEO-led, pan-European initiative, the Alliance identified regulatory bottlenecks, tested policy frameworks against economic reality, and made concrete proposals to accelerate Europe’s hydrogen deployment.

1. Introduction

Europe stands at a decisive moment, as growing geopolitical instability, weaponized energy dependencies, and increasing pressure are placing its industrial and defense base under strain. Recent crises have shown that energy dependence is not just an economic vulnerability, but a strategic and security risk. Strengthening Europe's resilience therefore requires secure, affordable, and domestically anchored energy systems that can support industry, infrastructure, and defense readiness.

Clean hydrogen is Europe's answer to multiple challenges at once. It can reduce dependency on imported fossil fuels, decarbonize hard-to-abate sectors and enable large-scale storage of renewable power. Clean hydrogen is not only a climate solution: it is about sovereignty – essential to reinforce Europe's industrial competitiveness, reduce external dependencies, and safeguard long-term geopolitical autonomy and security.

Europe is uniquely positioned to lead. It offers world-class technology providers, a strong industrial base, great potential for renewable and clean energy, and comprehensive regulatory architecture already in place. Yet the market ramp-up remains too slow. Large-scale projects across Member States continue to struggle to reach bankability, and investment decisions remain stalled.

The market is caught in a deadlock where low demand also keeps supply low, preventing investments to scale. Investors will never commit capital without bankable offtake agreements. Industrial off-takers hesitate to commit without certainty that supply and infrastructure will materialize. Demand signals remain fragmented, implementation of EU mandates delayed, and energy-intensive buyers cannot provide the long-term guarantees that financiers require. Without predictable demand, projects cannot secure financing, and without financed projects, demand remains theoretical.

The clean hydrogen challenge is not national – it is systemic. Production, infrastructure, demand, and financing span borders. Yet implementation remains fragmented across Member States.

Key players across the entire hydrogen value chain have therefore come together in a cross-Member-State European Resilience Alliance, ready to invest and deploy.

Important note on “strategic resilience”

This White Paper focuses on how to ramp up clean hydrogen production and deployment within the EU:

- The EU has excellent locations to produce clean hydrogen at competitive costs. However, future demand, especially in hard-to-abate sectors like aviation, steel, chemical and maritime, will require imports of clean hydrogen derivatives.
- Besides imports, locally produced low-carbon hydrogen production will be crucial to kick-start the European hydrogen value chain. This will ensure early, reliable supply giving renewable hydrogen production time to scale up.

Strategic resilience does not mean self-sufficiency; it means a diversified and secure supply base.

2. Deployment Gap

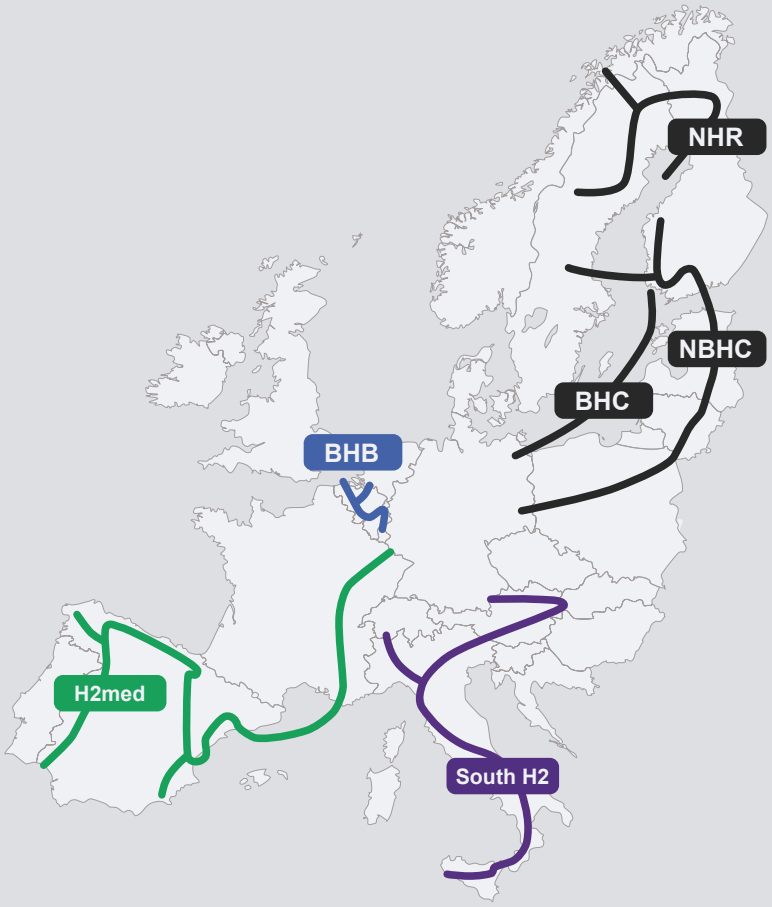
Europe has built a comprehensive regulatory framework for clean hydrogen: from hydrogen targets to carbon pricing mechanisms and infrastructure support. Industry has responded with an unprecedented pipeline of announced projects across production, transport and storage. Yet a critical gap has emerged: announced capacity is not translating into investment decisions. This deployment gap – between regulatory ambition and bankable projects – is the central challenge facing Europe's hydrogen economy.

Europe has built a comprehensive policy architecture for clean hydrogen:

- The Renewable Energy Directive III (RED III) mandates that by 2030, 42% of hydrogen used in industry must be renewable (RFNBOs), rising to 60% in 2035; transport must reach at least 1% RFNBO (within a 5.5% combined advanced biofuels/RFNBO target). This translates to a demand for at least 2.5 Mtpa renewable hydrogen in 2030 and 3 Mt in 2035.
- ReFuelEU Aviation introduced a Sustainable Aviation Fuel (SAF) mandate with an eSAF (RFNBO) sub-quota of 1.2% in 2030, ramping to 35% by 2050, creating a structural pull for renewable hydrogen.
- FuelEU Maritime requires Well-to-Wake GHG intensity cuts from 2% (2025) to 80% (2050), with a mandatory RFNBO quota of 2% from 2034 if the share is less than 1% of the bunker mix by 2031; shore power mandatory from 2030 for container and passenger ships.
- The EU Emissions Trading System's (ETS) revised free allocation benchmarks (eligible from 2026) create a level playing field: clean hydrogen now receives the same free allocation of EU allowances per ton as unabated fossil fuel-based hydrogen.
- The Carbon Border Adjustment Mechanism (CBAM) (definitive regime from 1 Jan 2026) includes hydrogen, requiring importers to surrender CBAM certificates priced to the traded ETS allowance price averages for any carbon footprint above EU domestic free allocation levels, closing competitiveness gaps and rewarding clean hydrogen supply.
- The Net-Zero Industry Act (NZIA) sets a benchmark for the EU to manufacture at least 40% of its annual deployment needs for strategic net-zero technologies domestically by 2030, including electrolysers, renewables, batteries, grids and CCUS, supported by priority permitting and resilience-based criteria in public procurement and auctions.

- The European Grids Package recognizes hydrogen infrastructure, with H2Med and SoutH2 designated as “Energy Highways”. Other essential parts of the European hydrogen backbone include the Belgian Hydrogen Backbone, as well as projects in Northern Europe such as Nordic Hydrogen Route, the Baltic Sea Hydrogen Collector and Nordic Baltic Hydrogen Corridor, which have been designated as Projects of Common Interest (PCI). CEF Energy funding is available for hydrogen PCIs/PMIs with 2025 calls allocating over €250 million to hydrogen infrastructure studies.

Infrastructure as the Lifeline of an Integrated European Energy Market



Source: Map by ERA/FGS. Data: H2MED and SouthH2 corridors from Euractive, (URL: https://www.euractiv.com/news/how-brussels-hopes-to-fast-track-eight-urgent-energy-projects/) and Nordic corridor from Elering (URL: https://elering.ee/en/nordic-baltic-hydrogen-corridor)

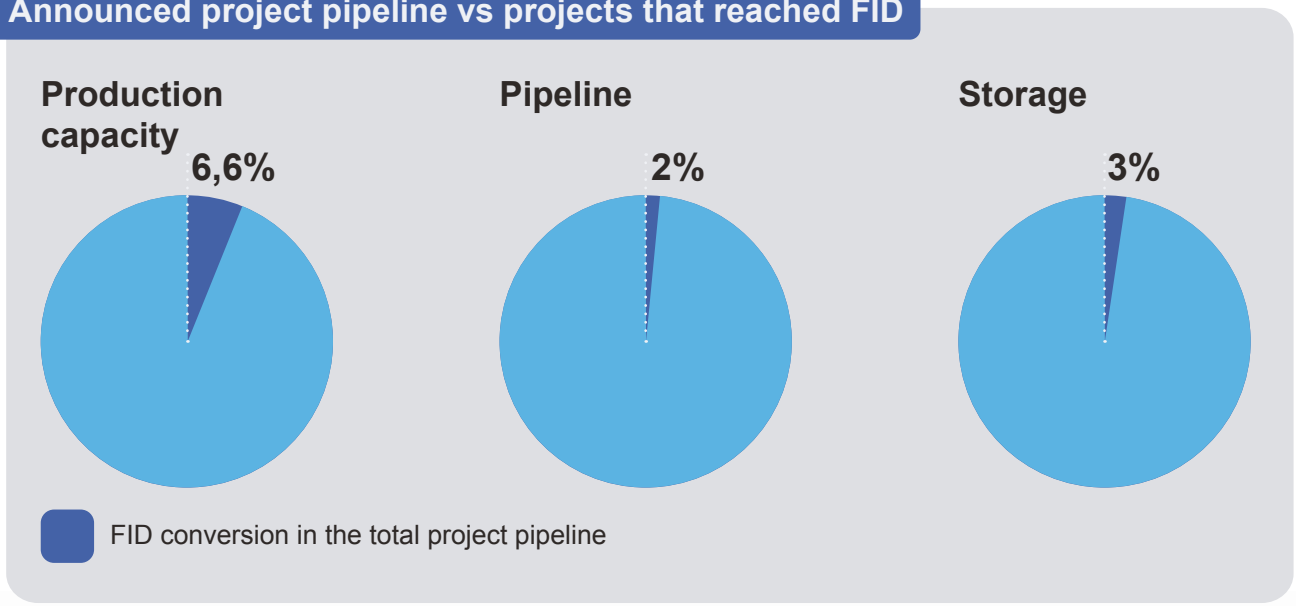
Strong project pipeline, weak investment conversion

Industry has responded to this regulatory framework with significant announcements. According to the International Energy Agency's database (as of September 2025), Europe has announced:

- ~9 Mtpa of clean hydrogen production capacity by 2030.
- ~32,000 km of hydrogen pipeline length by 2030.
- ~10,500 GWh of underground storage capacity by 2030.

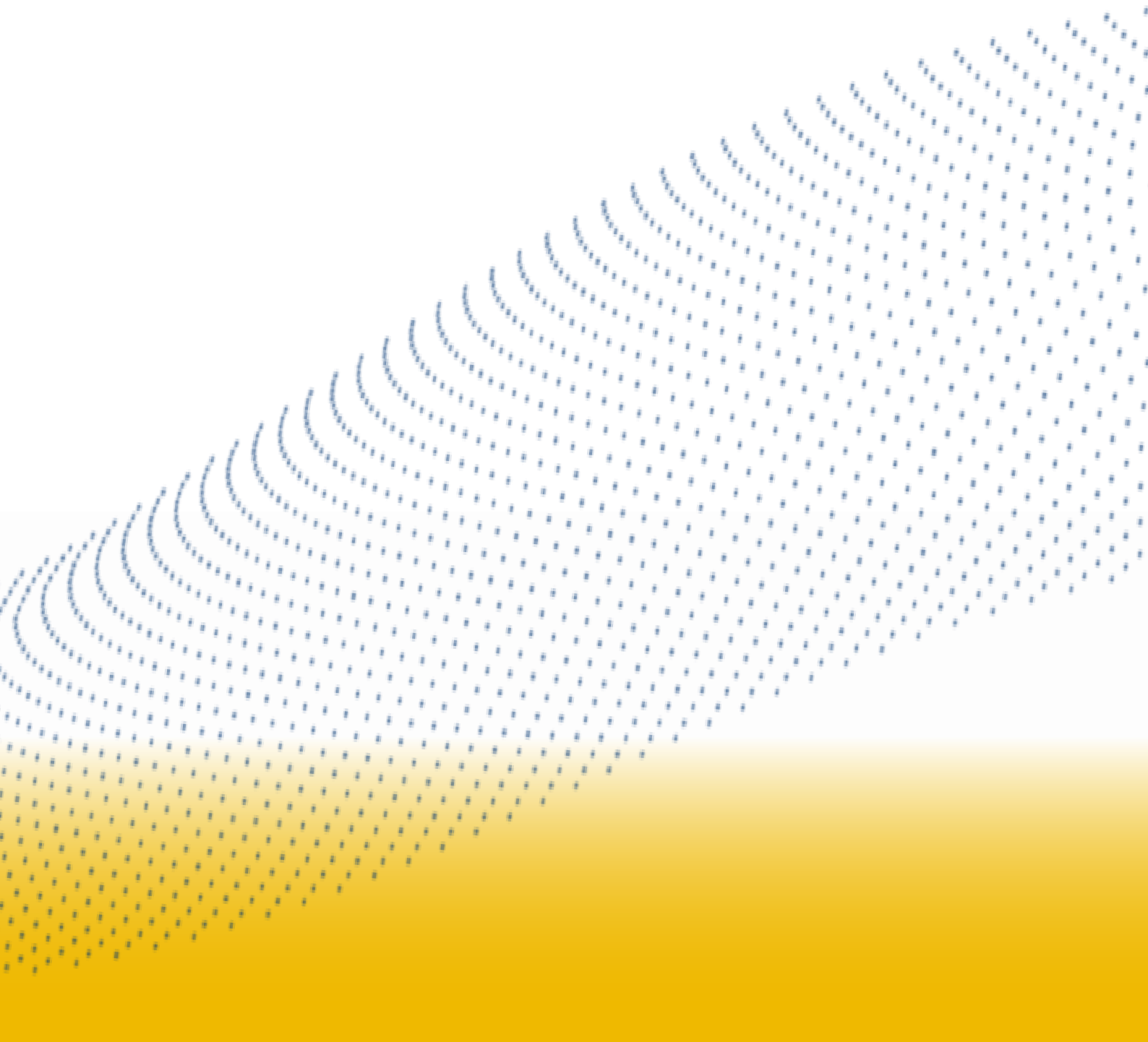
Yet these announcements are not converted into FIDs. The contrast is stark:

Announced project pipeline vs projects that reached FID



Source: International Energy Agency, Hydrogen Tracker (as of September 2025),
URL: https://www.iea.org/data-and-statistics/data-tools/hydrogen-tracker

The regulatory framework exists, the technology is proven, and the project pipeline is substantial. Yet less than 7% of announced projects across production, infrastructure, and storage have secured financing. The absence of bankable demand creates conditions investors cannot underwrite. The result: elevated risk premiums, stalled projects, eroding investor confidence, and capital flowing to markets with clearer investment frameworks. Europe risks losing its industrial base and technological leadership in a sector it helped create - not due to lack of ambition, but due to the gap between ambition and bankability.



3. Why the Current Model Is Not Working

The gap between ambition and deployment is not only due to technology itself. It is largely driven by a fundamental cost problem: regulatory complexity and fragmented implementation have made clean hydrogen uncompetitive, even where the underlying conditions for production are favorable.

The cost gap: regulatory barriers, not only technology

Recent industry analysis reveals the scale of the challenge. Under the current legal framework for 2030, the full cost of renewable hydrogen for end users could range from approximately €6/kg H_2 in Spain and Finland to €11/kg H_2 in Germany - compared to around €2-3/kg H_2 for grey hydrogen (excluding CO_2 costs[2]).

Crucially, this gap between Member States is largely driven by (para)fiscal policies such as levies on electrolyzer installations. On top of that, electricity itself is also heavily taxed while it accounts for approximately 70% of the LCOH. The same applies to low-carbon hydrogen (€4–6/kg H_2), which could complement renewable hydrogen in meeting EU decarbonization targets. A wide range of levies and taxes differing across Member States, as well as limited access to flexibility revenues, artificially inflates the cost of clean hydrogen, and makes the prices of it unnecessarily volatile.

[2] Disclaimer: cost calculation from a German view.

RFNBO rules add costs with uncertain climate benefit

The RFNBO Delegated Act's additionality and hourly correlation requirements[3], designed to incentivize new renewable electricity production and improve environmental integrity, may increase hydrogen production costs by approximately €2/kg H_2. These rules limit access to competitively priced renewable electricity and increase the need for physical storage due to intermittent production.

In addition, the rules in the implementing act for low-carbon hydrogen also use an overly complex methodology that hinders the ramp-up of low-carbon hydrogen.

[3] Additionality requires that renewable electricity used for hydrogen production comes from new renewable generation assets (not existing ones), ensuring hydrogen demand drives additional clean power capacity. Hourly correlation requires that renewable electricity and hydrogen production occur within the same hour, preventing producers from averaging renewable supply over longer periods (e.g., monthly).

Transitional support is expiring before scale is achieved

Several transitional measures designed to support market ramp-up are set to expire before scale is achieved, artificially widening the cost gap by 2030:

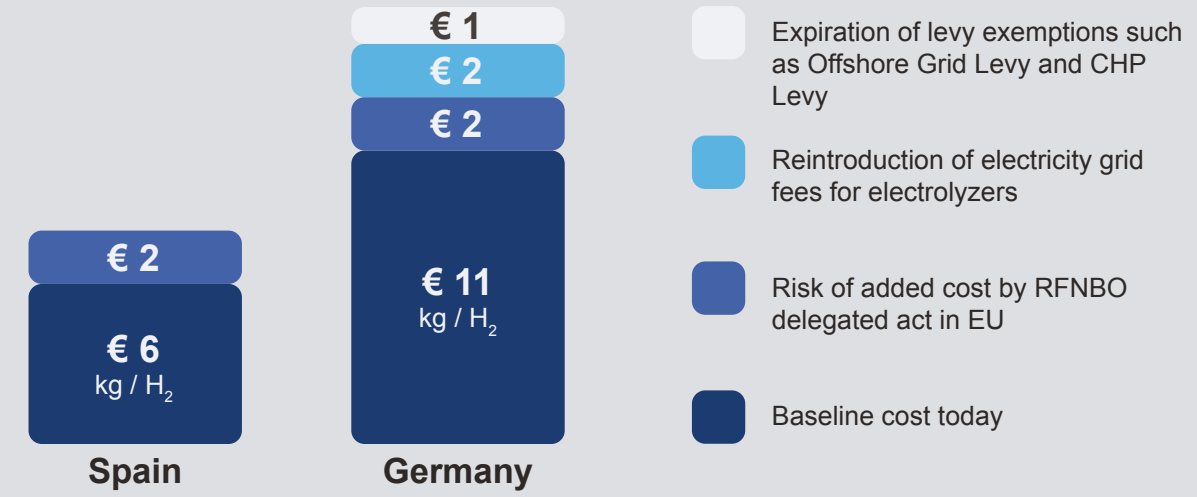
- **Germany:** Reintroduction of electricity grid fees for electrolyzers after August 2029 (~€2/kg H_2 impact); expiration of levy exemptions such as Offshore Grid Levy and CHP Levy (~€1/kg H_2 impact).

- **EU:** Expiration of facilitated renewable power procurement mechanisms that currently enable competitive electricity access for hydrogen production (transitional exemption from additionality requirements, ending January 2028).

Instead of bridging the cost gap between renewable and fossil hydrogen during the ramp-up phase, current regulatory provisions risk increasing total delivered hydrogen costs at precisely the moment when scale should be driving costs down.

The figure illustrates how different regulatory frameworks increase and create vastly different cost structures, even within the EU single market. These are not natural cost differences – they are policy choices that can be addressed.

Hydrogen price increase and fragmentation across member states



*Cost calculations might differ depending on assumptions

Source: Cost calculations and estimations made by ERA in this section

Investment risks compound the cost barrier

Even where production costs might be manageable, two critical risks prevent projects from reaching bankability:

Fragmented demand creates offtake uncertainty

Member States have taken divergent approaches to implementing RED III - some using quotas, others financial support, and many missing the May 2025 transposition deadline entirely. As of March 2026, only 5 out of 27 EU MS have transposed the RED III RFNBO mandates for transport and industry into law, well past the 21 May 2025 deadline. This delay is creating serious barriers to hydrogen deployment.

This fragmentation undercuts offtake certainty and makes it impossible for investors to model bankable demand. Energy-intensive off-takers often cannot provide the long-term guarantees that financiers require, creating counterparty risk that stalls projects even where production economics might otherwise work.

Policy frameworks currently struggle to accommodate the diversity of national energy systems, limiting the ability of some Member States to meet decarbonization targets efficiently. Without allowing a clearly defined role for some use of low-carbon hydrogen as long-term bridge alongside RFNBOs, these Member States risk higher costs, slower deployment, and reduced flexibility in achieving RED III decarbonization objectives.

Infrastructure uncertainty creates „island asset“ risk

Developers fear that without coordinated pipeline and storage deployment; early projects will become isolated „island assets.“ Uncertainty over infrastructure timelines inflates transport tariffs and deters investment. Early utilization uncertainty makes it impossible to model long-term returns, further compounding the cost and risk barriers already created by power costs and regulatory complexity.

The result

Despite Europe’s regulatory leadership, technological strength, and renewable potential, the current model has created conditions that make clean hydrogen unbankable. Projects remain stuck in pre-FID limbo, capital is flowing elsewhere, and Europe’s industrial competitiveness is at risk. The following chapters outline the four strategic levers needed to reverse this trajectory to unlock Europe‘s hydrogen economy.

4. Alliance Policy Asks to Unlock the Ramp-Up

1 Demand must drive clean hydrogen ambition.

It starts with buyers. No company will invest in new clean hydrogen production if no one is ready to sign contracts and pay for the product. While clean hydrogen remains more expensive than fossil alternatives and infrastructure is not yet fully in place, Europe needs clear rules that create stable demand to support first movers, give investors' confidence, and turn policy ambition into real projects, jobs, and industrial growth. These rules, together with more consistent implementation across Member States and stronger support for first movers, will be essential to turn Europe's regulatory lead into real projects, industrial scale, and global competitiveness.

The European Resilience Alliance calls to:

- **Make RED III deliver now:** Each member state must immediately transpose RED III into legislation with clear incentives for industry to reach its targets. Harmonized and transparent implementation of the RED III RFNBO mandates is essential across the EU. Where industries meet RED III targets, funding support must be made available to ensure they stay competitive.

- **Accelerate and harmonize implementation of ReFuelEU Aviation and FuelEU Maritime:** With both regulations already in force, inconsistent readiness across Member States risks delaying demand and investment. Governments must urgently ensure full enforcement, functioning compliance systems, and adequate fuel and infrastructure availability to enable industry to meet mandates cost-effectively.

- **Create harmonized EU clean hydrogen market:** As part of upcoming RED IV and the framework for low-carbon hydrogen, the EU should apply clear and consistent rules across all Member States. This would avoid fragmented national approaches and give investors' confidence. Renewable hydrogen (RFNBOs) should remain the EU's main long-term decarbonization solution, while low-carbon hydrogen can play a complementary role during the scale-up phase. At the same time, it is important to recognize that some sectors, for example chemicals and steel, may face difficulties in passing on the additional costs associated with using clean hydrogen. Any quotas on sub-sector or installation levels should only be implemented if the corresponding demand and off-take certainty are ensured by policy measures creating a secure demand for clean hydrogen derivatives.

- **Create lead markets for clean hydrogen:** 'Lead markets' should be created at both EU and Member State levels to reinforce RED III implementation and expand demand in hard-to-abate sectors such as industry and transport as well as into new sectors such as defense. This can be done through measures such as tax credits and production premiums, EU-wide CCfDs, and mandatory minimum clean criteria in public procurement. Priority areas include low-carbon materials (e.g., hydrogen-based steel) in infrastructure and public transport, as well as renewable and low-carbon fuel procurement in defence. Clear 2030 milestones are essential to anchor early demand, de-risk investments, and scale new value chains.

- **Reward hydrogen-based pathways in the Industrial Accelerator Act:** Decarbonization performance under the Industrial Accelerator Act (IAA) should be differentiated to reward clean hydrogen-based production pathways across hard-to-abate sectors (e.g., transport, steel, ammonia, refining, chemicals), while ensuring a competitive and fair market framework. A voluntary label and clear definitions should create robust investment signals along the hydrogen value chain. Any implementing and delegated acts should clarify and incentivize demand for clean hydrogen-derived materials made in Europe, ensuring a level playing field that rewards low-carbon production based on transparent and non-discriminatory criteria. The voluntary label for low-carbon steel – omitted in the final IAA proposal – must be reinstated during the legislative process and should be used to define "low-carbon steel" in the IAA.

- **Bring CO_2 standards incentives forward to 2030:** The proposal to include low-carbon steel and e-fuel credits in the CO_2 emission standards for cars and vans is positive. To create a clear investment signal for the first movers and clean hydrogen projects awaiting FID, the credit flexibility should kick-in already in 2030 (currently 2035). It should also recognize hydrogen-enabled low-carbon materials and fuels within vehicle value chains, accelerating cross-sector demand for renewable and low-carbon hydrogen. If fully utilized, the flexibility for low carbon steel could result in a strong demand amounting to over 5 Mt of clean hydrogen derived steel per year.

2 Clarity and simplification of clean hydrogen support frameworks is key.

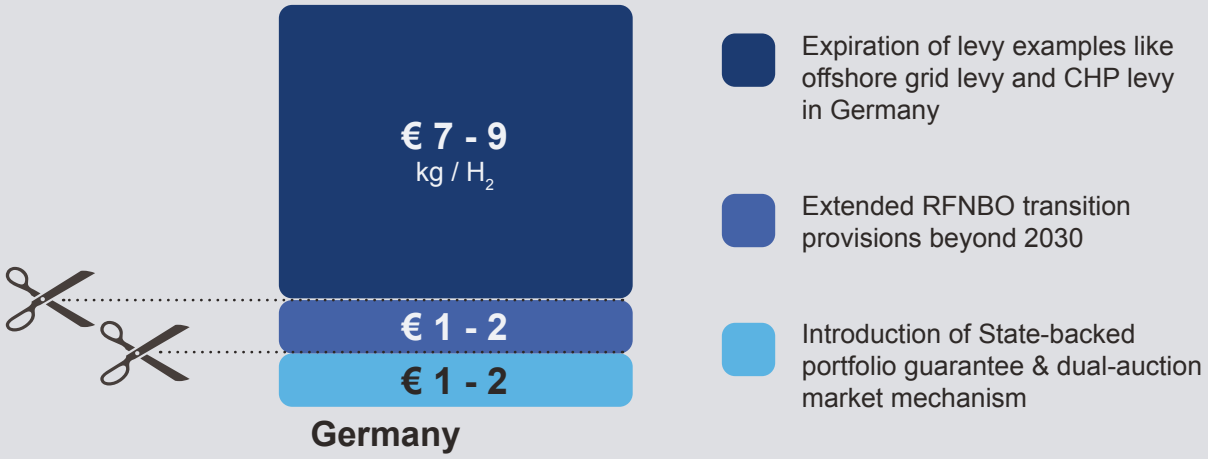
The EU needs to shift from regulatory rigidity to industrial pragmatism. It must be easier to invest and expand clean hydrogen projects in the EU. Current framework must be simplified to avoid delayed or abandoned FIDs.

The European Resilience Alliance calls to:

- **Cut Power Costs to Cut Clean Hydrogen Costs:** Currently for electrolyzer based hydrogen, 70% of the LCOH comes from the electricity supply, hence it will be critical to introduce measures to lower the cost of carbon-free electricity generation.
  - **Extend power price compensation beyond 2030:** The Indirect Cost Compensation Mechanism (ICC) should be prolonged after 2030 and coordinated at EU level to be more harmonized in the Member States. Some share of the ETS auction revenues will need to be set aside for this purpose. For example, in Germany, permanent extension of electricity price compensation mechanisms beyond 2030 could reduce delivered hydrogen costs by €1–2/kg H_2 and significantly improve industrial competitiveness[4]. The same would apply in other Member States if the mechanism is fully utilized and funded by the ETS auction revenues.
  - **Keep levy exemptions in place:** Extending existing exemptions from levies such as Offshore Grid Levy and CHP Levy to installations commissioned after 2030 would further reduce hydrogen production costs by ~€1/kg H_2[5].
  - **Unlock carbon free Power Purchase Agreements (PPAs):** Enable carbon-free PPAs, including nuclear, at scale to give hydrogen projects predictable long- term power prices, cut volatility risk, and accelerate investment in both new and existing clean generation through simplified rules and permanent de-risking guarantees.

[4-5] Disclaimer: cost calculation from a German view.

Closing the gap: hydrogen cost reduction potential* in Germany



*Cost calculations might differ depending on assumptions

Source: Cost calculations and estimations made by ERA in this section

- **Cut regulated electricity charges:** Reducing regulated power costs (apart from those linked to the production of electrons, e.g., ancillary services, grid costs, taxes and access tolls among others), by the following specific measures:
  - **Apply the lowest possible tax burden** (VAT and energy taxation) to electricity used in hydrogen production to unlock investment, accelerate scale-up of renewable and low-carbon hydrogen, and strengthen EU industrial competitiveness in line with the Clean Industrial Deal.
  - **Treating hydrogen as a strategic system asset** by enabling electrolyzers to provide flexibility and participate in ancillary and redispatch markets under proportionate, transparent grid and market rules, reducing congestion costs and reliance on grid expansion.
  - **Let batteries support RFNBO compliance** by allowing front-of-the-meter batteries to count toward RFNBO production compliance.

- **Fix subsidies so projects reach FID:** Redesign EU hydrogen subsidies, e.g. the European Hydrogen Bank auctions, to fully close the funding gap. This means prioritizing large-scale projects (those anchored with industrial demand that offer the most efficient locations to scale renewable hydrogen and derivatives). Ensure compatibility and aggregation with national State Aid schemes, accelerating award timelines, and covering both CAPEX and OPEX, so that projects can realistically reach FID and build the supply side at scale.

- **Make EU funding simpler and more bankable:** Strengthen and optimize EU funding instruments (Innovation Fund auctions and the Industrial Decarbonisation Bank) by increasing budget predictability, simplifying procedures, and critically assessing auction outcomes to ensure support mechanisms remain effective, bankable and aligned with Europe's industrial competitiveness objectives.

- **Direct scarce resources where they matter most:** Allocate resources to strategic projects that can bolster the clean hydrogen market: resources are limited (water, grid capacity, public funding or grants) and to maximize decarbonization they must be allocated where production and demand are already concentrated (as foreseen in EU's 2020 Hydrogen Strategy).

  - **Prioritize recognized strategic projects:** Priority for relevant EU projects that have been duly recognized by labels given their strategic importance (e.g., PCI, STEP, IPCEI, NZIA, etc.).

  - **Give strategic projects priority grid access:** Specifically, grant priority grid access to such strategic renewable hydrogen projects, as well as to renewable generation assets linked with PPAs.

- **Simplify the Low-Carbon Hydrogen Framework:** by establishing clear, pragmatic, and harmonized EU-level rules that reduce administrative complexity, clarify eligibility criteria, and align certification and accounting requirements. A streamlined Low-Carbon Hydrogen Act would accelerate project development, improve investor confidence, and enable faster scale-up without undermining climate integrity.

3 Turn private capital into clean hydrogen power.

Europe's hydrogen ramp-up is at risk. Current market structures place a disproportionate risk on individual industrial off-takers, with financial guarantees and requirements that often are too large for energy-intensive industrial buyers. As a result, mature projects fail to reach FID.

The European Resilience Alliance calls to:

- **Use ETS and CBAM revenues to fund transition:** The GHG price should be secured sufficiently high under the ETS and CBAM so that it makes low-carbon solutions competitive. With the level playing field for clean hydrogen in the ETS free allocation, the current ETS can reduce the overall cost for low-carbon and renewable hydrogen cost by 0.5–1 €/kg up to 2030 (assuming ETS price levels in range with the last three years historic prices). All revenues from the auctioning of ETS allowances in the ETS system should be deployed to support the low-carbon energy and industrial transition, including those flowing to the Member States. A large share of the revenues from existing ETS auctioning and all the revenues from the upcoming additional auctioning stemming from the gradual phase out of free allocation to some industry sectors should be recycled back to reward companies investing in decarbonization projects. The proposed EU-wide Industrial Decarbonisation Bank can work as vehicle for this and the amounts that can be generated are several 100 billion Euros over the next 10 years. Potential instruments under the IDB could be EU-wide Carbon Contracts for Difference (CCfDs) supporting the production of industrial materials and fuels using of clean hydrogen.

- **Prolong RFNBO flexibility to lower ramp-up costs:** Extend the RFNBO transitional provisions to well beyond 2030 to reduce ramp-up costs and security requirements. A longer transition period would enable more flexible renewable electricity procurement and lower power input costs. Cost reduction potential in the overall hydrogen price is 1–2 €/kg during the ramp-up phase[6].

- **Back hydrogen deals with state-backed guarantees:** Introduce a state-backed portfolio guarantee and a dual-auction market mechanism operating on a contingent liability basis. Member State funds would be deployed only in the event of a verified payment default (e.g., by the off-taker), not as recurring expenditure. By lowering the risk-premia and security requirements, the mechanism reduces the hydrogen costs by 1–2 €/kg[7].

[6-7] Disclaimer: cost calculation from a German view.

4 Infrastructure as the lifeline of an integrated European energy market.

Infrastructure is the backbone of the hydrogen market – without it, every project remains isolated. Integrated planning of pipelines, storage facilities and import terminals is essential to ensure a needs-based and comprehensive supply for industry. Sufficient market capacity is equally necessary, because without it the business case for building and operating infrastructure weakens, and the economies of scale needed to reduce costs over the long term will not materialize.

The European Resilience Alliance calls to:

- **Scale up funding for the hydrogen backbone:** Strengthen European funding (PCI, CEF and other infrastructure instruments) while providing long-term planning visibility on hydrogen backbone development.
- **Coordinate cross-border planning and delivery:** Reinforce the need that cross-border infrastructure planning is coordinated between the EU Commission, Member States Ministries, National Regulatory Authorities and TSOs. This cross-border infrastructure should link clean hydrogen production and demand clusters, providing market participants with planned timelines on infrastructure availability to unlock bankable FIDs.
- **De-risk early infrastructure investment:** Introduce EU-wide de-risking instruments for investments in cross-border hydrogen infrastructure, acknowledging that initial infrastructure utilization will be low and will require risk-sharing mechanisms on both EU and Member State level to crowd in both producers and off-takers.

5. The Cost of Inaction

Europe's clean hydrogen build-up is no longer just a matter of the hydrogen sector alone. The cost of inaction will be felt across sectors and throughout European society.

Industry cost

Over the past year alone, more than 250,000 industrial jobs have been lost across the EU, many of them in the energy-intensive sectors such as steel, chemicals, refining and heavy manufacturing. If we are serious about stopping Europe's industrial decline and growing our economy again, we must tackle our energy challenges heads-on: not least hydrogen. As long as over-regulation and high costs remain at the center of Europe's clean hydrogen model, industrial investments will continue to relocate outside Europe, affecting the entire downstream ecosystems – from engineering services to logistics and maintenance.

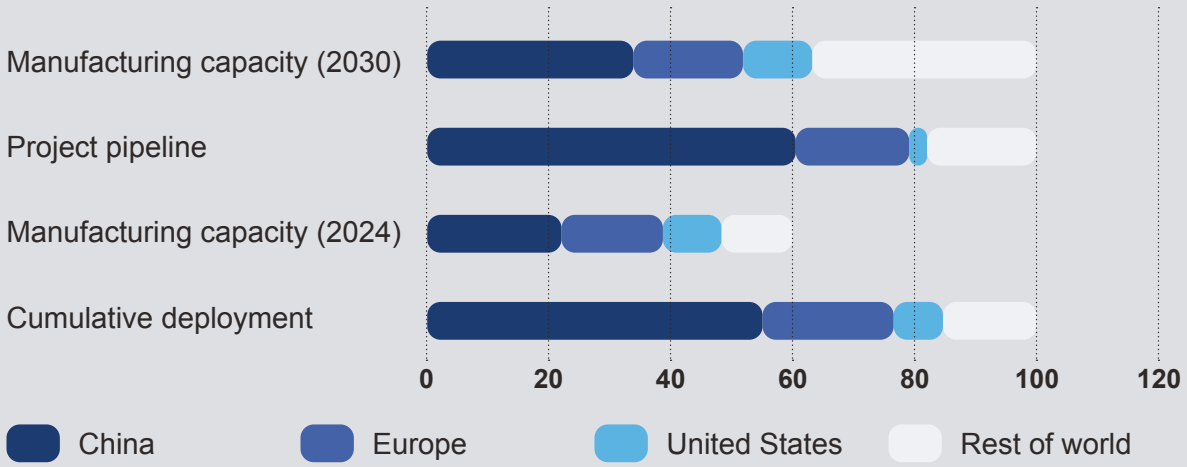
That is why it is so important to drive up the number of final investment decisions in clean hydrogen projects: each postponed investment cycle represents billions of euros in lost domestic value creation.

Meanwhile, China is pursuing its ambitious hydrogen strategy, rapidly scaling production, infrastructure, and technology leadership. With massive state-backed investment and accelerating industrial deployment, China is positioning itself to dominate the global hydrogen value chain. EU electrolyzer manufacturers may appear to be competitive at first glance (in terms of LCOH), but what really matters is: are they competitive vis-à-vis Chinese producers with their low-CAPEX offers?

If we fail to scale our own hydrogen ecosystem significantly and quickly, we will lose competitiveness in all core industrial sectors that depend on clean and affordable energy.

Without access to competitively priced clean hydrogen, existing industrial installations risk becoming stranded before the end of their technical lifetime, potentially resulting in multi-billion-euro write-downs.

Electrolyzer manufacturing capacity and deployment by region (%), 2024-2030



Source: International Energy Agency, Global Hydrogen Review 2025.
URL: https://www.iea.org/reports/global-hydrogen-review-2025/five-key-questions-about-hydrogen.

Climate Cost

Failure to scale clean hydrogen in time would also mean making the 2030 and 2040 emissions targets economically and technically unattainable.

Initiatives such as the development of European lead markets for low-carbon materials are an important step in the right direction but must be extended to strategic infrastructure projects that underpin the energy transition.

A good example of this is the projected deployment of over 120 GW of offshore wind capacity in the North Sea over the next two decades. This will require substantial volumes of low-carbon steel for turbine foundations, transmission infrastructure and maritime logistics.

There is a real political risk behind this: the widening gap between announced climate targets and actual industrial deployment risks undermining public confidence in Europe's transition strategy.

Geostrategic cost

Another political risk behind the failure to diversify into European clean hydrogen is that it leaves Europe permanently exposed to weaponization of energy.

European leaders have demonstrated in the past that decisive and coordinated action is possible in times of crisis – whether during the COVID-19 pandemic or in response to Russia's war against Ukraine.

The current geopolitical context demands pragmatic and immediate action, guided by industrial feasibility rather than ideological preference.

Ensuring that most European industrial assets are manufactured using clean hydrogen-based steel would create stable demand for domestically produced strategic molecules. Making Europe less dependent on foreign energy and more resilient at the geopolitical level.

For Europe to create a hydrogen market on a scale is a big and important thing to achieve. It means securing our continent's industrial future, while at the same time achieving our climate goals and becoming a credible and stable player at the geopolitical level. But everything stands or falls with the execution on the ground: creating the necessary flexibility to store, transport and utilize surplus renewable electricity at scale.

With this paper, the European Resilience Alliance wants to offer policymakers a practical tool: a coordinated industry input across the full clean hydrogen value chain. By bringing together companies from production, infrastructure, and end-use in a CEO-ledinitiative, the Alliance can help translate policy ambition into deployment reality – identifying regulatory bottlenecks, stress-testing proposed frameworks against real project economics, and ensuring that measures designed to accelerate clean hydrogen actually work in practice.

We do not claim to have all the answers, but we can provide policymakers with a clearer line of sight from regulation to investment decision.

The European Resilience Alliance stands ready to work together with policymakers to enhance both the availability and affordability of clean energy and chemical base materials within the European Single Market.

Annex 1 – Key Concepts

Bankability
The condition under which a project has sufficient revenue certainty, risk mitigation, and financial structure to secure financing and reach Final Investment Decision (FID).

Clean Hydrogen
All hydrogen made in a way that is compatible with climate neutrality, including RFNBOs and verifiable forms of low-carbon hydrogen.

Clean Hydrogen Demand
Committed, enforceable offtake agreements or regulatory mandates that create predictable, long-term purchase obligations for clean hydrogen, enabling producers to secure financing.

Counterparty Risk
The financial risk that an off-taker (buyer) may default on long-term hydrogen purchase agreements, deterring lenders from financing production projects.

Derivatives (e.g. ammonia, methanol, e-fuels, Hot Briquetted Iron - HBI)
Chemical compounds or synthetic fuels produced using hydrogen as a feedstock, enabling energy storage, transport, and use in hard-to-abate sectors such as steel, aviation, maritime, and chemicals.

First-Mover Risk
The commercial and technical risk faced by early-stage projects that infrastructure, supply chains, or demand may not materialize as expected, leaving investments stranded.

Infrastructure / European Hydrogen Backbone
The network of pipelines, storage facilities, and import terminals required to transport and store hydrogen across borders, connecting production centers with industrial demand hubs.

Lead Markets
Sectors or applications (e.g., steel, aviation, maritime, defense) where targeted policy measures create early, stable demand for clean hydrogen, de-risking investment and enabling scale.

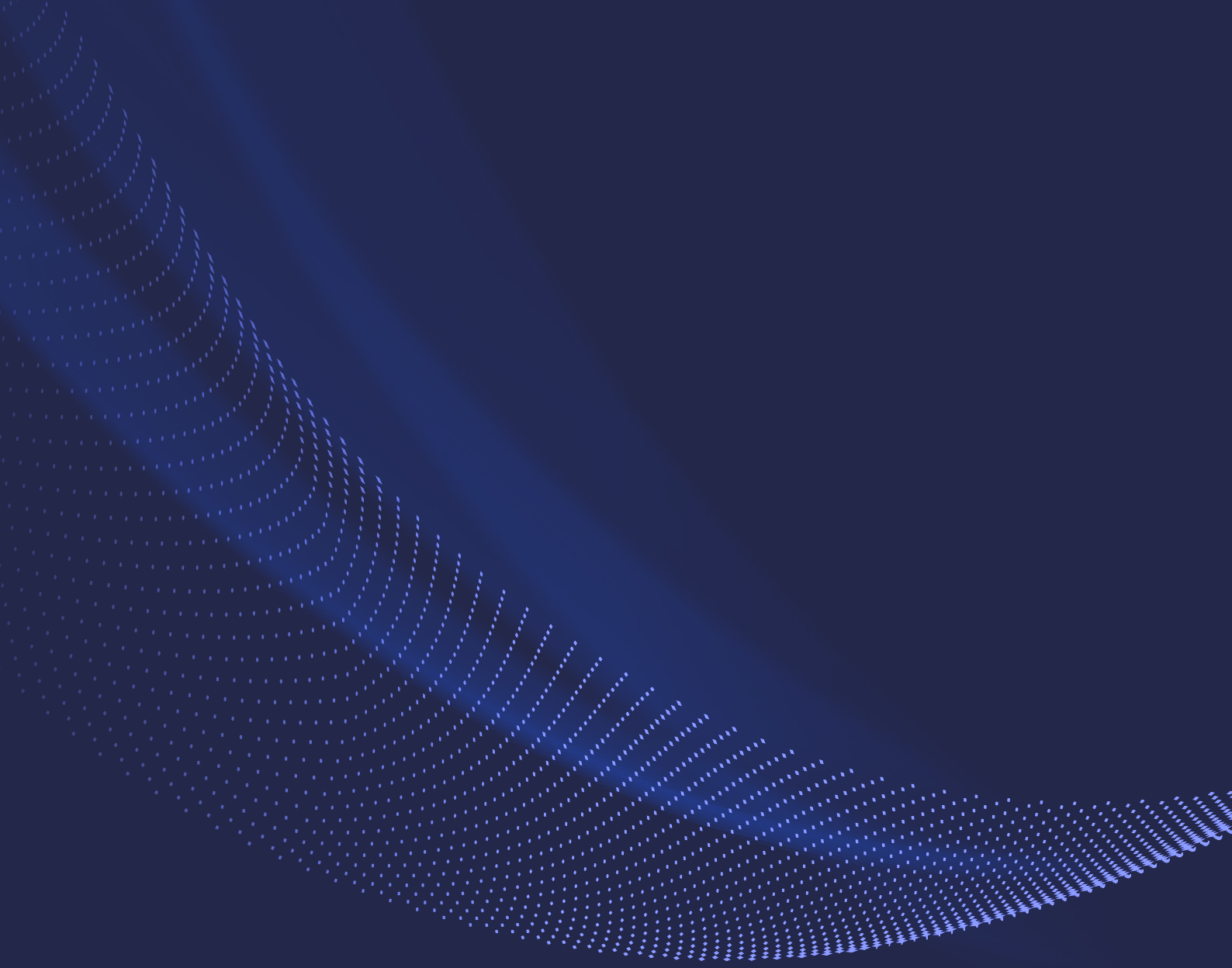
Private Capital
Investment from non-public sources (commercial banks, institutional investors, project finance) that requires bankable revenue streams and risk-sharing mechanisms to deploy at scale.

Annex 2 – Glossary

Abbreviation	Full Term
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CCfD	Carbon Contract for Difference
CCS	Carbon Capture and Storage
CEF	Connecting Europe Facility
CHP	Combined Heat and Power
eSAF	electro-Synthetic Aviation Fuel
ETS	Emissions Trading System
EUA	EU Allowance
FID	Final Investment Decision
H2Med	Hydrogen Mediterranean Pipeline
IAA	Industrial Accelerator Act
ICC	Indirect Cost Compensation
IPCEI	Important Project of Common European Interest
ktpa	Kilotonnes per annum
LCOH	Levelized Cost of Hydrogen
Mtpa	Megatonnes per annum
NZIA	Net-Zero Industry Act
OPEX	Operating Expenditure
PCI	Project of Common Interest
PMI	Project of Mutual Interest
PPA	Power Purchase Agreement
RED III	Renewable Energy Directive III
RED IV	Renewable Energy Directive IV (upcoming)
RFNBO	Renewable Fuels of Non-Biological Origin
SAF	Sustainable Aviation Fuel
SoutH2	South Hydrogen Corridor
STEP	Strategic Technologies for Europe Platform
TSO	Transmission System Operator

References

- International Energy Agency
- European Commission
- Industry reports



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