

H2eart for Europe Alliance

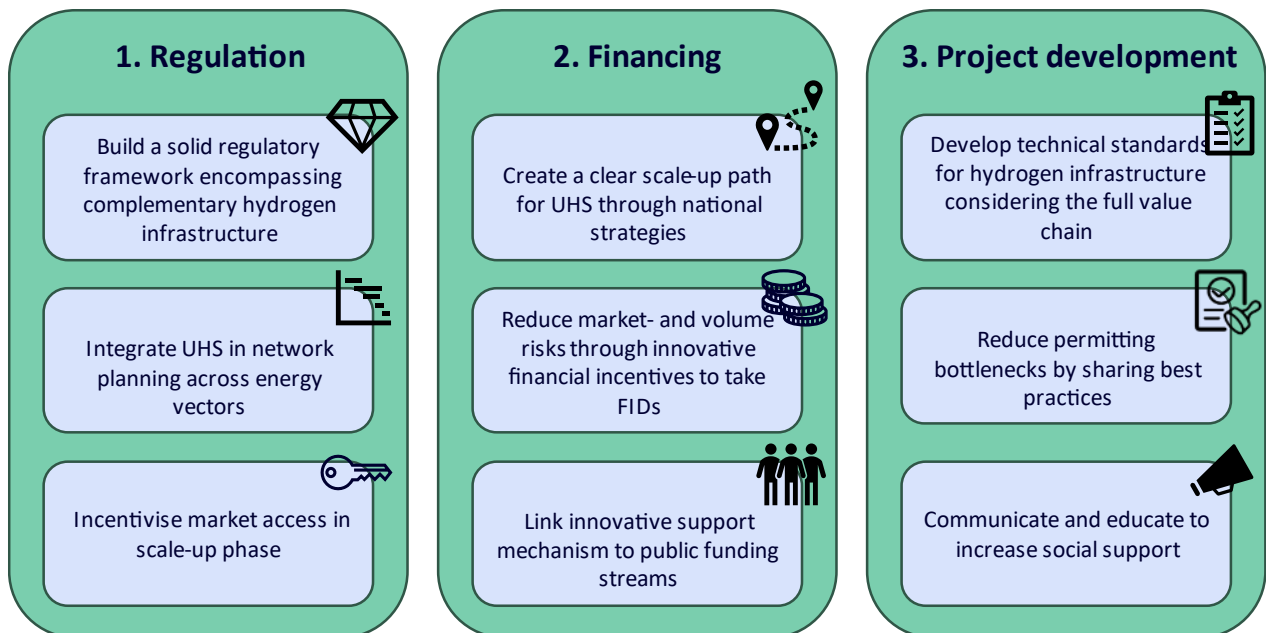
Whitepaper: Advancing EU infrastructure through the national implementation of the EU Decarbonised Gas and Hydrogen Package

Connecting policy, financial support mechanisms and market creation

Executive Summary

On March 6th, the H2eart for Europe alliance hosted a high-level workshop in Brussels, bringing together key European and Member State stakeholders—including policymakers, regulatory authorities, industry leaders, and financial institutions—to drive forward the implementation of the EU Decarbonised Gas and Hydrogen Package. The event served as a pivotal platform for shaping strategies to accelerate hydrogen infrastructure development and enhance Europe’s energy resilience. Within this document, a summary is given of the two panels of the day first.

This whitepaper distils the key insights and consensus reached during the day, presenting a widely supported perspective on the regulatory, financing, and project development measures needed to scale up hydrogen storage and infrastructure. The following elements followed from the strategic prioritisation and can be seen as immediate actions that are required to enable the development of a robust and decarbonised energy system:



Results from strategic prioritization – Immediate actions for UHS implementation



Regulatory and market challenges and opportunities: Transposing the EU Gas Package

The first panel focused on the challenges and opportunities in **implementing the EU Decarbonised Gas and Hydrogen Package at the national level**. Panellists highlighted that while the package establishes a solid regulatory foundation for Europe's hydrogen market, its success depends on effective transposition and regulatory clarity. A key concern was the risk of regulatory fragmentation, with Member States interpreting provisions differently and the alignment of national hydrogen strategies with EU objectives was seen as crucial to prevent fragmentation.

Third-party access and the role of ENNOH

At the national level, practical implementation challenges are permitting bottlenecks and legal uncertainties around **third-party access (TPA)**. For this reason, streamlined permitting processes and integrated network planning across energy carriers are essential to create a resilient future energy system. In addition, hydrogen storage demand must be assessed on regular basis and integrated into the network planning. There is an **important role for ENNOH** to sufficiently consider UHS while shaping future regulatory developments. It would also be valuable if specific hydrogen storage codes would be developed in addition to the network codes.

Market scale-up and grandfathering

In addition, in a nascent market, there are risks for over-regulation that should be avoided. **Regulation should allow for creativity and market progression by first mover investments**. This particularly holds for the period from August 2026 till 2033, when **grandfathering** for TPA is not permitted.¹ These rules must be reconsidered and should create certainty for contracting of hydrogen storages over the long term (beyond 2033) and support the development of the hydrogen market. Regulation must be implemented as soon as possible to reduce risks, as the first hydrogen storages will come to market towards 2027. If not, there is a risk that further investments in hydrogen storages will dry up.

Permitting and project development

There are also **practical steps that need to be taken to accelerate project deployment**. Developers working on real-world UHS projects stressed that while regulatory and financial support is slowly improving, **permitting delays and infrastructure bottlenecks remain critical issues**. **Permitting processes should be streamlined**, ensuring that projects can move forward at a pace that matches hydrogen market expansion.

To conclude, the priorities for 2030 to unlock hydrogen storage's full potential is to build a solid regulatory framework, including **streamlined permitting, clear financial incentives and integrated network planning**. A pragmatic regulatory approach—balancing ambition with investment security—is key to ensure that hydrogen storage plays a central role in Europe's decarbonized energy system. Therefore, a coordinated transformation considering the future demand for methane and hydrogen storage is also essential in terms of Security of Supply.

¹ Article 37 (3) of the Directive 2024/1788 ([Link](#))



Bridging the hydrogen storage investment gap: De-risking the business case

The second panel opened with a discussion on the current investment climate for underground hydrogen storage (UHS), highlighting **that financial and regulatory uncertainty remain major obstacles**. While the EU Decarbonised Gas and Hydrogen Package provides a long-term vision, it lacks detailed mechanisms to ensure bankability for early-stage projects. Investors and project developers have difficulties to secure long-term offtake agreements and finance projects under the current nascent market conditions. There is a need for **clear business cases for UHS**, particularly in relation to its flexibility value for integrating renewables, enhancing grid stability for both molecules and electrons, and supporting the overall energy system security.

Financial de-risking instruments

Targeted financial instruments are needed to de-risk investments and attract private investments. Instruments such as direct funding Contracts-for-Difference (CfDs), an amortisation account model, minimum revenue floor mechanisms or blended finance models are as potential solutions. Lessons can be learned from the UK and German hydrogen financing models, which **provide government-backed price and volume guarantees** to reduce investor risk depending on the tariff regime. In particular, the supporting schemes should assure guarantees for a complete cost recovery to trigger investment decisions of operators. EU institutions, including the European Investment Bank (EIB), are invited to **align their funding mechanisms with the unique challenges of UHS** by offering tailored financial guarantees and risk-sharing mechanisms. A nation-wide market survey by German storage association INES reveals that investor confidence is closely tied to regulatory stability and long-term policy commitments: **A hybrid approach – combining EU-wide guidance with national-level flexibility – could be the most effective financing model for hydrogen storage infrastructure.**

To conclude, securing investments in UHS will require a mix of regulatory clarity, financial de-risking, and strong public-private cooperation. Without this, hydrogen storage risks becoming a bottleneck rather than an enabler of the hydrogen economy. **Immediate action is required** on financing frameworks, permitting simplifications, and infrastructure planning **to ensure that Europe can meet its 2030 and 2050 hydrogen targets and bridge the investment gap.**

Strategic Prioritisation: Defining immediate actions for UHS implementation

This section serves as the basis for further discussions with national regulators and EU institutions to advance legislative action. During the interactive workshop H2eart for Europe consulted a broad and diverse group of representatives from EU institutions, Member State ministries and regulators, hydrogen value chain actors and storage operators.

Participants engaged in a structured discussion, identifying a broad range of regulatory, financial and project-related challenges before agreeing on a set of priorities for the most urgent actions needed in the next six months. The following priorities were derived on the topic of regulation, financing and project development.

1. Regulation – Strengthening the Legal and Economic Framework

Build a solid regulatory framework encompassing complementary hydrogen infrastructure

A sound, stable and incentivising regulatory framework is essential for hydrogen infrastructure developments. Main features of such a framework should include the certainty of cost recovery (i.e. by reducing price risks via inter-temporal cost allocation and market risks by financial support mechanisms), appropriate remuneration levels and support to long-term commitments. Regulatory risks need to be eliminated, and it should be clarified how TPA rules will work hand in hand with de-risking approaches from Member States; be it direct grant or financial support mechanisms. The Project of Common Interest (PCI) criteria should be adapted to properly value hydrogen storage projects as part of European energy infrastructure. These elements will be of vital importance for the planning and development of hydrogen infrastructure as part of the full value chain and energy system.

Integrate UHS in network planning across energy vectors

The decarbonisation of Europe's energy system requires a coordinated approach across electricity, gas, and hydrogen networks. The long lead times of UHS emphasize the necessity of integrating hydrogen storage demand into cross-sector planning early on, to work towards a compatible and optimised future energy system. The Ten-Year Network Development Plans (TYNDPs) of ENTSO-E and ENTSOG/ENNOH should include hydrogen storage infrastructure as a core component, accounting for (seasonal) storage needs due to increasing share of variable renewable energy sources and flexibility needs, creating a resilient electricity network. Integrated infrastructure planning shall also facilitate a coordinated transition of storage capacities on the methane market and future hydrogen market.

Incentivise market access in scale-up phase

In the early phase of market development, reducing obligations will encourage private-sector participation to kick-start the market. For example, the storage TPA grandfathering provisions should be extended from 2026 towards 2032. This will incentivize first-mover projects while ensuring they remain viable as regulations evolve. Additionally, unbundling exemptions for storage operators could be considered to maintain project viability in an early stage.

2. Financing: Creating certainty and developing profitable business models

Create a clear scale-up path for UHS through national strategies

Market actors and infrastructure need clear signals of what they can expect in the scale up of the hydrogen market in Europe. This transition path needs to be set out by policymakers in European and national strategies to create a sustainable market scale up. The European institutions should provide clear guidance to Member States on this as part of the transition to a net-zero energy system and society.

Reduce market- and volume risks through innovative financial incentives to take FIDs

Without business case, no financial investment decisions (FIDs) will be made. Long-term contracts and offtake agreements will be needed to reduce investment risk and trigger FIDs. In addition to this, innovative financial incentives are required to create different types of revenue streams and reduce market and price risks. A flexible and agile financing framework should be developed based on (initially regional) needs of storage developers and industrial actors. They should facilitate the scale up of the market and energy system needs, supporting financial incentives for services like security of supply, peak shaving and grid balancing.

Link innovative support mechanism to public funding streams

Governments should take an active role to de-risk UHS investments. Examples of this can be state-backed volume/price guarantees or capacity payment mechanisms, like the ones for strategic gas reserves in some Member States. Examples of this are Contracts for Difference (CfD), an amortization account approach to ensure predictable revenue streams, specific capacity remuneration mechanisms (CRMs) to ensure energy security, or tax incentives and depreciation schemes for UHS investments.

3. Project Development: Addressing Technical and Market Barriers

Develop technical standards for hydrogen infrastructure considering the full value chain

The lack of technical standards and specifications for hydrogen storage and infrastructure project causes delay from the very start. Most permitting authorities have a lack of knowledge in dealing with applications and need to build this up from the start, and they should learn from pilot projects that are gathering experience. Therefore, the hydrogen network codes need to be developed as soon as possible, including technical specifications like hydrogen purity and quality requirements, pressure thresholds and connections procedures. An optimal hydrogen purity and quality standard should consider all value chain actors to be operationally feasible and cost-effective.

Reduce permitting bottlenecks by sharing best practices

Permitting requirements are excessive and time-consuming due to varied reasons, including the technical standards and lack of authority knowledge described above. In addition to this, the administrative burden should be minimized. As projects develop across the EU, the knowledge and learnings of project promoters should be collected and disseminated proactively. This could be done by European institutions or infrastructure operator associations to avoid further delays and inefficiencies. Based on the learnings of (pilot) projects across Member States, also streamlined permitting procedures should be developed as soon as possible.

Communicate and educate to increase social support

Underground hydrogen storage projects are large and complex. Authorities, both on Member State and local level, and the public need to be educated on the benefits of UHS for the energy system, for instance regarding the integration of renewables, the link between the hydrogen and the electricity system via flexible hydrogen-fired power plants, and the security of supply on the long term. This could be done by stakeholder engagement and media campaigns and is needed to facilitate project approvals and community acceptance.



About H2eart for Europe

H2eart for Europe is an EU-wide, CEO-led alliance committed to accelerating the decarbonisation of the European energy system at the lowest cost to society by scaling up the deployment of underground hydrogen storage (UHS). Launched in Brussels on 23rd of January 2024, the alliance aims to provide fact-based reports and analysis that can serve policymakers as guidance, and that utilise and build on the experience of our members, leading companies paving the future of hydrogen storage across Europe. We are committed to investing in scaling up UHS infrastructure to meet the flexibility demand in a decarbonised energy system.

The organisations listed below are the members of H2eart for Europe.



For media inquiries, please contact h2eart@guidehouse.com.

Pictures of the day:



Panel discussion moderated by Nathalie Croisé. Participants include (left to right): Abel Enriquez (Director, Pre-ENNOH), Benedikt Klauser (Policy Officer, DG ENER, European Commission), Ines Bouacida (Climate & Energy Researcher, IDDRI), Jorgo Chatzimarkakis (CEO, Hydrogen Europe), Leigh Hancher (Professor of European Law, University of Tilburg and EUI), Ruven Fleming (Scientific Coordinator, Groningen Centre of Energy Law & Sustainability).



Workshop session led by Georg Dorfleutner (Managing Director, RAG Energy Storage GmbH) and Silvia Yordanova (Managing Consultant, Guidehouse)



H2earth for Europe Co-Chair, Michael Schmöltzer (Functional Head of Business Support and Office Austria, Uniper Storage GmbH)