WHAT'S NEXT ?

CONNECTING THE HYDROGEN VALLEYS

The S3 Hydrogen Valleys Partnership

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EUROPEAN HYDROGEN VALLEYS PARTNERSHIP

What's next?
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The S3 Hydrogen Valleys Partnership welcomes the **recent advancements of Hydrogen Valleys** that go in the right direction. Underpinned by the ambitious objectives of REPowerEU, the increasing financial support of the Clean Hydrogen Partnership and the Commission's recent dedicated Roadmap, **Hydrogen Valleys are spreading throughout the European Union (EU)**. Boosting the production, storage and uses of renewable hydrogen in relevant regions and ecosystems is indeed one of the key solutions to achieve the REPowerEU objectives, contribute to the Green Deal Industrial Plan and ensure EU's energy self-sufficiency and competitiveness.

While we need to pursue our effort to accelerate the deployment of Hydrogen Valleys, **we, the members of the S3 Hydrogen Valleys Partnership, would like to highlight the importance of supporting the connection between Hydrogen Valleys across Europe.** We think this next step is crucial to scale up the European hydrogen economy and ensure the large-scale production and distribution of renewable hydrogen throughout the continent to cut CO2 emissions and decarbonize our industries.

Since 2019, the S3 Partnership is bringing more than 60 European regions together including 7 Hydrogen Valleys, to learn from each other and to share best practices. Witnessing the significant benefits of connecting European regions, in terms of fostering interregional cooperation (facilitating partner contacts, replicability activities within projects...), as well as enhancing collective dynamics, we advocate for **tangibly implementing such connections between Hydrogen projects and Valleys at infrastructure levels.**

Why do we need to connect the hydrogen valleys?

Based on hands-on experiences, we notice that **regulatory barriers between countries remain significant obstacles to the deployment of Hydrogen Valleys**. Infrastructure projects such Hydrogen pipelines which cross national borders and federal states, require substantial investment, but must also navigate various legislative frameworks. While bilateral collaboration has been fruitful, more EU initiative is needed particularly in establishing **common standards for Hydrogen quality/purity and transport pressure**. Currently addressed only by member state technical working groups, these issues could benefit from the European Commission's leadership in setting standards with member states, regions, and TSOs.

How do we ensure connectivity of H2 valleys?

- **Connect valleys at relevant territorial scale**

Since Hydrogen Valleys are deployed in given geographical areas, the regional and local authority level remains the most relevant for addressing the linking and integration of valleys. In this regard, we believe it makes more sense **to connect Hydrogen Valleys at relevant territorial scales**, i.e., geographical areas with specific characteristics of their own (see appendix for tangible examples). These areas generally share the same constraints in terms of technologies, infrastructures and use cases. Moreover, they can leverage existing collaborations at political and institutional levels that may already link them.

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- **Foster the cooperation at EU level among Hydrogen Valleys**

As Hydrogen Valleys remain particularly innovative projects, it is essential to share best practices and lessons learned, in line with evolving technologies and challenges. These exchanges are also essential regarding "soft" measures such as developing the right skills - especially vocational education and training (VET) and lifelong learning initiatives, which play a key role to ensure that all relevant stakeholders are equipped with the latest hydrogen technologies skills and knowledge - or fostering stakeholders' and citizens' engagement. Convinced that cooperation between valleys is crucial, **the S3 partnership is committed to pursue its efforts to connect Hydrogen Valleys and their territories on a European scale**. The S3 partnership also wishes to deepen its collaboration with the Regional Pillar of Hydrogen Europe and the European Regions Research and Innovation Network (ERRIN) in order to facilitate matchmaking with industry and tackle innovation challenges together.

- **Dedicate specific fundings to connect Hydrogen Valleys**

The S3 Partnership suggests **launching a future call for projects focusing on the coordination of Hydrogen Valleys**. The allocated funds should support existing valleys on connectivity activities at both physical and institutional levels. We endorse the Clean Hydrogen Partnership's initiative to establish a Hydrogen Valleys facility, which should also contribute to fostering connectivity. Furthermore, to ensure optimal Hydrogen Valleys interconnection, **Hydrogen vehicles should become eligible for EU support**, via the CEF AFIF calls and the Just Transition Fund. These dedicated funds will contribute to build up a European-connected hydrogen market and scale up the European hydrogen economy.

This is why **the S3 partnership for Hydrogen Valleys** is calling on the next Commission and Parliament **to actively support better connections between Hydrogen Valleys and ecosystems.**

The S3 Hydrogen Valleys Partnership

The European Hydrogen Valleys S3 Partnership was created in June 2019 as a Smart Specialisation Strategy (S3) partnership under the JRC Platform for Industrial Modernisation to share information, promote investment and develop regional policy planning around hydrogen.

The European Hydrogen Valleys Partnership is the main network in Europe for hydrogen regions aiming to strengthen the European hydrogen value chain by having a regional voice in Europe, facilitating knowledge exchange and collaborating on cross-regional hydrogen projects. The European Hydrogen Valleys S3 partnership is coordinated by four pioneer regions in the field of hydrogen: Aragon, Auvergne-Rhône-Alpes, Normandie and Northern Netherlands. It involves more than 60 European regional authoriyies located in over 14 European countries, ranging from Norway to Bulgaria.

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APPENDIX

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This appendix contains **testimonials from several S3 member Regions** on the relevance of connecting hydrogen valleys and projects, **based on local experience**. All of them are calling for connecting hydrogen infrastructures and deepening interregional cooperation.

- *Alpine Regions*

The Alpine regions are located at the heart of Europe, on several strategic corridors (48 regions in Austria, France, Germany, Italy, Slovenia + Switzerland and Liechtenstein). Facing common challenges related to mobility and energy transition, as well as **unique geographic constraints requiring specialized technical solutions**, the Alpine regions are deploying hydrogen valleys and projects to decarbonize their territories. Keenly aware that **mountains are twice as vulnerable to global warming**, the Alpine regions are pressing for urgent action. Connecting hydrogen valleys and projects across the Alps is therefore the next logical step to scale up the clean hydrogen economy. **Already integrated within the European Strategy for Alpine Regions (EUSALP)**, the Alpine regions are already actively involved in cross-border cooperation and are eager to deepen it on hydrogen. The leadership of certain regions, which are already deploying large hydrogen valleys (North-Adriatic and Auvergne-Rhone-Alpes), as well as their economic and technological dynamism, make the Alpine regions a particularly relevant scale for connecting hydrogen valleys and projects.

- *Czech, Polish and German cross-border Regions*

Support and more intensive development of cooperation between the regions - hydrogen valleys of the Czech Republic, Germany and Poland is essential for several reasons. All three countries have to deal with the impacts resulting from decarbonization processes, which fundamentally affect traditional industries that are (at least in the case of their border regions) significant for these countries - brown coal mining, energy, chemical industry and steel industry. The development of hydrogen economies in these regions represents **one of the most significant transformational opportunities**, which at the same time have the potential to significantly **influence the structure of local economies**. In addition, a number of projects across the entire hydrogen value chain are already being intensively developed in the mentioned regions. The development of cross-border cooperation can then lead to **significant economic and social synergies**, which can be further underlined by the use of specific, historically conditioned know-how in the field of hydrogen production and usage, which is present in these regions. Last, but not least fact supporting the importance of the cooperation of these regions is the fact that the border regions of the Czech Republic, Germany and Poland play (not only due to their geographical location) a **significant role in the context of the development of the European Hydrogen Backbone** as a basic element for the development and scaling of the use of hydrogen across Europe.

- *Medio Tejo for the European Maritime Hydrogen Alliance*

A growing electrification of the energy system is expectable. However it faces limitations for more energy-intensive uses, such as long-distance road transport, shipping or aviation. As an alternative energy vector or carrier, clean hydrogen is expected to play a key role in a future climate-neutral economy, also enabling emission-free transport. Connecting hydrogen maritime regions together by creating an European Hydrogen Maritime Corridor, adds immediate value to the energy system as whole and enables a significant role for a **geography balanced hydrogen value chain**. This depends on a number of factors, namely, create a market for clean hydrogen in the maritime sector, **make the production more flexible** and **cut the production costs**, and create infrastructures for its transport and storage.

These factors converge to a stronger role of Hydrogen in the European Energy system, provided **consensualized standards, synchronized investments and cross-fertilized innovation ecosystems** are in place, notably including, integrating and prioritizing maritime regions. It will also benefit maritime regions bringing their unique assets and **environmental constraints and ecological sensitiveness**.

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In response to the need of boost the participation of Maritime Regions on the emerging European Hydrogen Society, establishing an European Maritime Hydrogen Alliance is proposed to scale-up impact, reinforce outcomes and rollout innovation as a result of cooperative strategic approach to the success of European Hydrogen, and broadly decarbonization strategy and goals.

- *Grand-Est with Saarland and Luxembourg*

As part of its Hydrogen Strategy 2020-2030, the Grand Est Region aims to produce 150,000 tons of hydrogen annually by 2030. Several key projects are already underway to achieve this objective, notably the MosaHyc project, which involves the construction of a **hydrogen pipeline connecting Saarland (Germany), the Grand Est, and the Luxembourg border**. Another ongoing project is the Rhyn project, aiming to connect the Grand Est region with Baden-Württemberg in Germany. Indeed, due to its geographical location, bordering Belgium, Luxembourg, Germany, and Switzerland, the Grand Est Region is particularly well-positioned for the development and connection of cross-border hydrogen valleys and projects.

- *Northern-Netherlands with Ruhr Region*

As a leading Hydrogen Valley and because of its geographical position, the Northern Netherlands have **the potential to become a major hydrogen supplier in Western Europe**. For example, to the Ruhr region in Germany, one of the largest industrial areas in Europe. Infrastructure projects such as these cross not only national borders but also federal states. Large-scale cross-border infrastructure projects must therefore navigate not just two, but **a multitude of legislative frameworks**. In particular, **common standards for Hydrogen quality/purity** as well as the pressure at which Hydrogen will need to be transported will need to be agreed upon. So far there have only been technical working groups at member state level addressing this question. We see a potential role for the Commission to take leadership on setting these standards together with member states, regions and TSOs.

- *Rh2ine initiative : Facilitating a European hydrogen ecosystem in inland waterway transport*

Sustainable solutions for decarbonizing inland waterway transport play a key role to meet the climate goals of the Green Deal. In order **to facilitate the transition of the shipping sector** two provinces, South-Holland in the Netherlands and North-Rhine Westphalia in Germany, set-up the RH2INE initiative in 2019. The overall aim of the network is to facilitate **zero-emission inland shipping along the North Sea - Rhine -Mediterranean corridor** by using **hydrogen as an alternative propulsion technology**. This includes creating the conditions for increasing demand and cost-efficient and reliable supply as well as an infrastructure for hydrogen application. Furthermore, accelerating the implementation and scale-up of hydrogen through **standardisation, business case development and the provision of appropriate governance tools** are integral components of the initiative. RH2INE is functioning as a platform enabling the implementation of projects, exchange of know-how and information and **creating the necessary interlinkages between regional, national and EU-levels**. Within the last years the initiative has been constantly growing to a partner network of 40 stakeholders. In addition to private partners seven regions from the Netherlands, Belgium, Germany and Austria making significant contributions to make climate-neutral inland shipping a reality.