



Through the Valley to the Top:

Why the EU needs a dedicated roadmap for Hydrogen Valleys

Europe has embarked on the world's most ambitious decarbonisation programme with the European Green Deal, aiming for at least 55% greenhouse gas reduction by 2030, and a pledge for Europe to become the first climate-neutral economy by 2050. With the REPowerEU Plan, the EU responded to the hardships of the global energy market disruption following Russia's invasion in Ukraine, while at the same time highlighting the European ambition of accelerating the roll-out of renewable energies. This great transformation should be systemic to build a resilient and long-term sustainable EU, where no region is left behind. To achieve these objectives, **we, members of the European Hydrogen Valleys S3 Partnership, believe Hydrogen Valleys could foster clean, in particular renewable, hydrogen as a reliable decarbonisation pathway. This will accelerate the energy transition and enable the EU to meet its objectives as the world's climate action leader. Moreover, it is an opportunity to attract new investments and to generate new jobs.**

This position paper describes the route how the development of Hydrogen Valleys contributes to the goals described in the Green Deal Industry Plan and what is needed in terms of regulatory and financial incentives, research and innovation, skills and public acceptance.

Hydrogen Valleys are defined as geographical areas where clean hydrogen is produced and directly distributed and used by transportation, the industry, and other application areas. A Hydrogen Valley is, therefore, a powerful instrument to kick-start local hydrogen markets and to demonstrate how the hydrogen economy works concretely. Moreover, it is a stepping stone towards further hydrogen scale-up by linking or integrating existing and emerging valleys.

Regions supporting Hydrogen Valleys are willing to work together to develop joint investment projects across EU regions and along the hydrogen value chain, as illustrated by initiatives such as the European Hydrogen Valleys S3 Partnership (see box).

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-Rhone-Alpes, Normandie and Northern Netherlands. It **involves more than 60 European regional authorities located in over 14 European countries, ranging from Norway to Bulgaria.**

This partnership has facilitated the set-up of joint investment projects among its members such as the **Hy2Market** project, supported by the I3/Interregional Innovation Investment programme. This project, coordinated by the New Energy Coalition (NL), involves stakeholders from 11 regions from 9 different Member States to set-up projects along the whole H2 value chain.



EUROPEAN HYDROGEN
VALLEYS PARTNERSHIP

In addition, the geographical coexistence of technology development and application also plays an important role in Hydrogen Valleys. Only by connecting all aspects of the hydrogen value chain can it be possible to reach market readiness in an iterative process through innovation and demonstration.

Hydrogen Valleys have, thus, a very solid potential to contribute to the REPowerEU objectives as well as the Green Deal Industrial Plan by kick-starting and scaling up the renewable hydrogen production, fostering supply and meeting the growing demand from industry, transport and other sectors while also supporting technology development and market introduction. Furthermore, Hydrogen Valleys are fully in line with the objectives of the New European Innovation Agenda, which identifies “regional innovation valleys” (including Hydrogen Valleys) as key frameworks to foster place-based innovation and connect innovation stakeholders.

This is why we strongly support the European Commission’s project to publish a dedicated Hydrogen Valleys roadmap. We believe strategic commitment at all levels of government is needed to make this ambition a reality. The dedicated roadmap must be fully compliant with the goals and ambitions set in the Green Deal Industry Plan.

Regional and local authorities play a key role in developing Hydrogen Valleys. They do so by providing a strategic framework, planning of projects and bringing together all the stakeholders of the regional and local ecosystems such as big and small companies, research & innovation, and education institutions, users and citizen representatives. They can also act as a ‘launching customer’ in certain cases (e.g. hydrogen use in public transport), by providing early public co-finance. They are also the only ones being able to position hydrogen activities within the broader picture of their unique ecosystem (availability of renewable, cities, industrial clusters, solid/weak infrastructure in terms of energy, telecommunications, transport, water).

Additionally, the EU Hydrogen Valleys S3 Partnership fosters cooperation across borders for developing interregional large-scale projects with a critical mass of hydrogen users. We are, thus, convinced that investments in Hydrogen Valleys lead to employment, social value creation and sustainable growth along with clean hydrogen offtake, which will spread out the benefits of Hydrogen Valleys to the entire EU.

The member regions of the European Hydrogen Valleys S3 Partnership call on the European Commission to pay particular attention to the following areas in its future Hydrogen Valleys Roadmap:

Regulatory Incentives

- Many projects call themselves “Hydrogen Valleys” whereas they do not meet all the requirements for such a classification. To clarify the framework, **the roadmap for H2 Valleys should include a definition of the typical characteristics of a Hydrogen Valley**, building on the existing definitions of the Clean Hydrogen Partnership. This definition could also be legally anchored in the EU’s hydrogen and decarbonised gas market package. The success of Hydrogen Valleys also depends on different forms and use cases. Not all regional conditions are the same, but all initial situations should be considered, including those that may not be able to produce H2 themselves or have no local industry as a customer.
- By linking individual sub-projects to achieve systemic integration, a Hydrogen Valley fosters the large-scale hydrogen use and application deployments. However, they are still hampered by regulatory issues, as these applications are very new. A combination with business models that are ramping up the hydrogen ecosystem, broader than only demonstration projects is needed. For demonstration projects, **Hydrogen Valleys should be used as regulatory sandboxes, i.e. as a test bed for a new hydrogen regulatory framework.** Such regulatory sandboxes may also pave the way for simplification of the process of authorisation/certification for placing products in the market. These procedures can now be lengthy, slowing the introduction of innovative products and representing a significant burden especially for SMEs and start-ups.
- Currently, many regulatory experts gain experience in permitting hydrogen (demonstration) projects, but the availability of personnel is limited and the workload is heavy. Therefore we propose additional resources for permitting authorities. Where new technology is applied or new concepts are demonstrated, permitting authorities need to navigate complex regulatory issues and wish to move projects along in a responsible manner.

- In alignment with the Green Deal Industrial Plan, we call for a simplified regulatory framework for production capacity of products that are key to meet our climate neutrality goals, such as batteries, wind turbines, solar, electrolyzers and storage technologies.

Building a Dedicated Projects Pipeline and Financial Incentives

- The roadmap should also focus on accompanying the development and scaling up of hydrogen valleys with EU-funded research and development (R&D). This should also extend to ecological and socio-economic effects in order to address the comprehensive transformation of hydrogen valleys from all aspects.
- Dedicated Hydrogen Valley facilities such as the Project Development Assistance (PDA) of the Clean Hydrogen Partnership (for early stages of project development) have proven to be useful instruments for bringing projects to a high level of readiness. These services aim at assisting regional and municipal authorities to develop project concepts in full and bring them to the point of implementation, prior to the point of requesting funding/financing from various sources. More detailed technical assistance facilities like the ELENA – European Local ENergy Assistance could also assist regions in the preparation of investment-ready projects, but should be made more accessible to develop these kind of projects where final investment decisions have not yet been taken. It is recommended that the Roadmap pays attention to how these instruments could help to build a project pipeline of Hydrogen Valleys.
- Hydrogen Valley projects need to be de-risked and need public financial support to be viable and develop scaling potential. **State aid incentives should, thus, be made possible For H2V. This could either be achieved by giving an IPCEI-type of status to Hydrogen Valleys where up to 100% support for the remaining funding gap is possible, or with a specific state aid category for Hydrogen Valleys.** This is necessary because it would be too cumbersome and cause unnecessary delays if for every subproject/dedicated value chain of a Hydrogen Valley, state aid exemptions must be requested. Instead we need a comprehensive funding/aid solution for Hydrogen Valleys. Within the framework of Hydrogen Valleys, business models for regions and companies should be developed through targeted funding in order to establish a functioning and profitable hydrogen economy. The Commission needs to put in place schemes to support new investments in production facilities in defined, strategic net-zero sectors, including via tax benefits
- **Facilitating synergies between European, national and regional funds is crucial to support all the aspects of a Hydrogen Valley project**, for instance CEF for refueling infrastructure combined with Clean Hydrogen Partnership (Horizon Europe) funding for industrial or integrated projects and/or ERDF to support local projects. Furthermore, the development of Hydrogen Valleys should go hand in hand with existing and yet to be developed energy and transport infrastructure corridors such as TEN-E and TEN-T. Full coverage of the TEN-T networks with charging and refueling infrastructure (AFIR-readiness), and development of a European hydrogen backbone and strengthening of smart electricity grids to accommodate large quantities of renewables on the TEN-E network, require large investments. In that sense, **Hydrogen Valleys can ‘fuel’ these corridors.** Moreover Hydrogen Valleys could be the ideal test-bed for launching the Hydrogen Bank initiative.
- Additionally, funds such as the DG CLIMA Innovation Fund should mirror the regional specificities, and offer comparable conditions for large-scale and small-scale projects. Concretely, **OPEX support for hydrogen projects must be made available not only in the large-scale but also specifically in the small-scale calls for proposals**, e.g. by becoming available as co-funding of regional and local subsidies with no additional constraints. The strength of a Hydrogen Valley is precisely that it integrates several value chains and (sub-)projects – small and big. Smaller projects show concrete results faster while bigger projects are being developed in parallel to achieve scale. **Therefore, support for both scales of projects are needed.**
- **Dedicated funds should be directed towards connecting Hydrogen Valleys: Cross-regional (even beyond borders) Hydrogen Valleys are instrumental in detecting regulatory barriers across regions and borders, facing different regulatory obstacles in different Member States.** Cross-Border Hydrogen Valleys can detect these differences at regulatory levels and work jointly towards solutions, providing best practices to Hydrogen Valleys to be developed.
- To enhance the development of Hydrogen Valleys, a Hydrogen Valley Investment Fund is needed, combining public and private efforts to expedite the development of Hydrogen Valleys.

R&I, Skills and Public Acceptance

- The emphasis of Hydrogen Valleys is not on the technology development of an application, but on system integration of hydrogen production, its distribution and storage, and its subsequent valorisation as an energy vector in transport, as industrial feedstock for the production/upgrading of chemicals/fuels and/or in the electricity/gas grid. To this end it is important to keep supporting R&I activities aiming to optimise the ways in which hydrogen technologies work in synergy and are integrated with other elements: renewable production, gas infrastructure, electricity grids, batteries, etc.
- The deployment of Hydrogen Valleys will foster the development of new skills and jobs that are required for the energy transition. To support these developments, local and regional authorities are enhancing the access to new curricula and life-long learning, in cooperation with universities, vocational schools and training providers as well as industry leaders. One good example of such an initiative is the Erasmus+-funded project ‘Green Skills for Hydrogen’* which identifies skills gaps in the hydrogen sector and develops urgent reskilling and longer-term training programmes. We recommend to build on the insights gained in such projects to identify further potential for EU support. Labour shortage is a big concern for many sectors, certainly in the energy field, including hydrogen as a comparatively new technology/nascent market.
- Moreover, Hydrogen Valleys will enable the public to experience and interact with hydrogen technologies, which will raise the acceptance of the transformation. Public dialogue events and school projects will bring a better understanding and also interest young people in hydrogen careers.
- Consequently, Hydrogen Valleys offer the possibility to inform and reskill people and make the clean hydrogen economy a reality for European citizens and businesses. Therefore, **the Hydrogen Valley Roadmap should include tools to foster the development of these new skills both for public authorities and private stakeholders, to make sure the new training modules and standards meet the needs of the green hydrogen ecosystem and to gain credence and interest within the public sphere.** This will be of immense importance to additionally enhance necessary knowledge of public authorities, which in return would support a faster permitting process and ultimately technology off-take and roll-out.

Cooperation between Hydrogen Valleys at the EU level

Hydrogen Valleys across Europe have different scales, ambitions and levels of maturity. The Roadmap should take account of these different regional potentials. To foster the development of more Hydrogen Valleys, cooperation at EU level among Hydrogen Valleys and between more mature and less advanced valleys is crucial to exchange best practices, disseminate results and solve potential problems which might arise. This will accelerate the development of new Hydrogen Valleys and facilitate their cooperation in future joint investment projects.

This is particularly important when it comes to the deployment of hydrogen distribution and refueling infrastructure as well as transport infrastructures, as Hydrogen Valleys are not stand-alone projects and need to be connected. The European Hydrogen Valleys S3 Partnership plays a key role to foster such exchanges but, without its own full-time team, it currently lacks the means to fully cater to its members’ needs.

This is why the Hydrogen Valleys Roadmap should make dedicated resources available to strengthen the S3 European Hydrogen Valleys Partnership, which would facilitate networking and consortium building among valleys but also the dissemination of the results of H2 Valleys projects, so that more valleys can emerge all over Europe.

*<https://greenskillsforhydrogen.eu>

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