



Towards an EU Roadmap for Hydrogen Valley Workshop

Summary report

Background

Hydrogen Valleys contribute to the REPowerEU objectives by scaling up green hydrogen production, supply and consequently to meet the growing demand from industry, transport, and other sectors. The European Commission allocated to the Clean Hydrogen Partnership an additional €200 million through REPowerEU, to double the number of Hydrogen Valleys in Europe by 2025.

The Clean Hydrogen Partnership, the European Hydrogen Valleys S3 Partnership and the Northern Netherlands region organised the workshop "Towards an EU Roadmap for Hydrogen Valleys – Regional actors and their role: double the number of valleys by 2025 and build-up skills", on 28 February and 1 March 2023 in Brussels.

The purpose of this two-day workshop was for the regional and local actors to talk about current opportunities and challenges in rolling-out and scaling-up Hydrogen Valleys in Europe. More than 150 people attended in person the workshop on each day, showing the increasing interest towards the topic.

The workshop was organized around two-half-days session - see [agenda and presentations](#).

This document provides a summary of the main messages and outcomes of the sessions included in the workshop and, where possible and relevant, it suggests possible actions looking ahead.

Policy context and State of play of Hydrogen Valleys

Bart Biebuyck, Executive Director of the Clean Hydrogen Partnership, opened the workshop and introduced the work that the partnership – and its predecessor, the FCH2 JU – started with regions back in 2017, which led to the establishment of the Hydrogen Valley S3 Partnership, and the launch of initiatives such as the Project Development Assistance for the regions (PDA), as well as the inclusion of Hydrogen Valleys as topics of the last calls for Proposals (starting with Call 2019).

Melissa van Hoorn, Regional Minister of Energy, Groningen Province, welcomed everyone on behalf of the Northern Netherlands and provided a background on the policy framework that

provides support for hydrogen within the ambition of the region to shift from a natural gas to a hydrogen-based economy.

Rosalinde van der Vlies, Director of the Clean Planet Directorate in DG Research and Innovation, emphasised the big momentum that has been created at EU level for hydrogen, that was backed-up by the strong political messages in the REPowerEU communication, including the additional €200 million for the Clean Hydrogen JU to support doubling the number of hydrogen valleys by 2025.

Session 0: State of play Hydrogen Valleys.

Markus Kaufmann, Principal Consultant at Roland Berger, provided a preliminary update of the state of hydrogen valleys (with a focus in Europe) using the updated data that will be included in the soon to be relaunched Hydrogen Valley Platform¹. The Hydrogen Valley platform was launched in 2021 with 21 Hydrogen Valleys in Europe and is expected to increase this number significantly by the time it is relaunched on the 8th of May 2023.

Zoé Buyle-Bodin (Normandy Region, France) and Mara Bubberman (Northern Netherlands Region) provided an overview of the Hydrogen Valleys S3 Partnership. The Partnership was created in 2019, as a result of the initiative of a few pioneer regions which were already working on hydrogen projects. Currently the partnership includes more than 60 regions in 13 Countries. The Hydrogen Valleys S3 Partnership brings to Brussels the voice of European regions working on hydrogen and it also opens a platform to develop joint projects. The objectives of the Partnership are: to share information, to bring perspective on regional projects, to increase the visibility and influence of regions as important actors in the field and to facilitate joint investments. The Partnership is open to receiving new members especially from Central and Eastern Europe to have a broader geographical coverage. In 2023, the Partnership intends, with the help of DG Regio of the European Commission, map the regional needs of the members and refine its scope of activities.

Session 1: Collaboration of Hydrogen Valleys. Successful engagement of public and private stakeholders.

Objective:

- Illustrate the importance and to provide examples of successful collaboration between the public and private stakeholders that are necessary to deploy Hydrogen Valleys.

Outcomes:

- Regional declaration of a Hydrogen Valley as a Project of Regional Interest can accelerate the process of licensing and permitting, reducing the needed time by more than half.
- Collaboration between stakeholders, both private and public, is key for a successful development of Hydrogen Valleys. All necessary stakeholders should be engaged along the

¹ The Hydrogen Valley platform is a joint initiative by the Clean Hydrogen Joint Undertaking and Mission Innovation (www.h2v.eu).

process. The role of public institutions is seen as crucial as they are usually closer and can facilitate the liaison between industry, knowledge/ research institutions as well as citizens. Regions as off-takers of hydrogen could play an important role in de-risking Hydrogen Valleys projects.

- Scale-up of Hydrogen Valleys requires an adequate and predictable regulatory framework to support the investment decisions that are needed. To this end, adequate legislation is needed to support the de-risking of this type of projects in order to attract the necessary private finance.
- It is important to encourage cooperation and knowledge transfer between regions, especially in research and investments. This could support the replication and/or initiation of similar projects in other regions.
- European industry is ready to scale-up and deliver all what is necessary for the implementation of Hydrogen Valleys. But we are still missing a regulatory framework that is clear and predictable. This is a pre-requisite in order access to the required financing and skills. Europe's industry still needs to develop the necessary manufacturing capacities.
- The role of the research community is key at European, national and regional levels. Important roles include (but not limited to) data gathering and analysis to build on lessons learnt (feedback to industry), support incremental development of hydrogen technologies and support to start-ups by providing them with access to research infrastructure.
- The concept of digitalisation (e.g., Digital twins) can help to approach Hydrogen Valleys from a multi-objective perspective (both in the design but also to offer optimised ways to operate the Hydrogen Valleys).
- Hydrogen Valleys could be linked to TEN-T corridors locations as a means to become green hydrogen suppliers to refuelling infrastructure.
- As the number of Hydrogen Valleys increases, it will become important to think the best manner to go about linking all the different Hydrogen Valleys via hydrogen corridors.
- There should be an ambition to accelerate technology development building on lessons learn from early R&I projects, in order to inform the development of future projects.

Session 2: Create and manage a project consortium. Coalition building and management of a large project.

Objective:

- Illustrate how to successfully create and manage a Hydrogen Valley project (consortium) and provide best practices and challenges encountered when building-up the coalitions that are needed to organise and implement Hydrogen Valley projects.

Outcomes:

- The process for assembling a good consortium starts long before the submission of the proposal. The process has to start taking into account local initiatives for which the involvement of local governments is necessary.
- When setting-up a project consortium, it is key to, early in the process, identify the local needs and accordingly bring all necessary actors together from small SMEs to larger organisations.

Each of them has a role within the consortium, even though it might not be immediately visible to the public.

- Before building the consortium the strategic dimension needs to be mapped; this defines the common objectives in terms of impact that a Hydrogen Valley can have.
- Developing a Hydrogen Valley requires a clear structure for the project, which facilitates the allocation of responsibilities within the consortium. It is also important to ensure that the partners share a common vision in order to move forward as efficiently as possible.
- Lessons learned from consortia can enable the collection of technical and economic values on performance of a Hydrogen Valley.
- Building and managing the type of consortium that are necessary to develop and deploy a Hydrogen Valley, especially for cross-border projects, is not an easy task. It requires flexibility in order to reach mutual understandings and adapting to the different ways of working, different languages, and also strict monitoring for ensuring timing execution of the tasks.
- A number of Hydrogen Valleys of a cross-border nature were presented in the workshop. In particular, the “North Adriatic Valley” (Croatia, Slovenia and north of Italy) and the “Grande Region Hydrogen” (initiative composed of interconnected projects across France, Germany and Luxemburg). Both of these projects are very ambitious and results will only be visible within 3 to 5 years.
- Cross-border projects are difficult to implement but can be seen as an intermediate step between distributed smaller-scale Hydrogen Valleys limited in a single region and the wider European Hydrogen backbone². One issue (not only for cross border projects but more prominent for these) has to do with the timing of the availability of funds for different parts of the value chain of a Hydrogen Valley; in fact, there could be hydrogen production plants in one country, end-uses in a different one with the distribution infrastructure deployed across borders. Still, all these activities should be funded within a similar timeframe.
- Example from Occitania Region: they want to set up a zero-emission transport corridor, going from Spain to Luxembourg/Germany. Their financial structure is as follows: funding from the region, the European Investment Bank, the regional energy agency and private funds. The funds go to the region, which then redistributes them.

Session 3: Securing public financial support / public commitment/ state-aid and regulatory issues

Objective:

- Illustrate with concrete examples how a number of Hydrogen Valleys (Spain, Ireland, Germany, Greece) have structured and, in some cases, secured the funding/financing required to deploy their projects.
- Identify best practices and challenges when it comes to the combination of funding (EU/national and regional).
- Share experiences on permitting.

² <https://ehb.eu/>

Outcomes:

- Projects are using / looking at a diverse range of funding sources including European (e.g. CEF-T, Innovation fund), national mechanisms (e.g. on the back of the EU Recovery and Resilience Facility) and regional funds (e.g. ERDF /Cohesion Funds/Just Transition Fund). In some cases, projects are looking at a combination of public funding (using no-reimbursable grants) together with loans from banks or other facilities and, finally, own-funding. One project mentioned they are keen to pilot the use contract for differences to be launched by the European Hydrogen Bank.
- The biggest funding gap today concerns infrastructure. Regions are waiting for the rollout of hydrogen refuelling infrastructure. This should help to find a sustainable business model.
- Usually, Hydrogen Valleys require financing from more than one sources. This is challenging as:
 - o It is a very time-consuming process (each funding sources has its own requirements).
 - o Makes it difficult to align the timing of the availability of the different funding streams.
 - o When own-fundings are significant an upfront grant appears to be the most effective mechanism to secure a financial investment decision.
 - o On many occasions the use of national and EU funds to support the same equipment/infrastructure (for R&I projects) is not compatible (even if no-profit is being made). Limiting factors includes both the rules and conditions for participation of programmes directly managed by the European union and those of the programmes administered by national (including regional) authorities.
- Workshop participants agreed in the need to simplify the process for the implementation of synergies between different funding sources.
- State-aid rules (despite the General Block Exemption Regulation) appears to significantly slow down the speed with which designated managing authorities in Member States can effectively allocate and disbursed their funding to co-fund hydrogen R&I projects, including Hydrogen Valleys, already supported by EU R&I programmes such as H2020
- Even if limited compared to the total costs of a Hydrogen Valley there was an agreement that the support provided by e.g., the Clean Hydrogen JU is key to kick-start the projects. Furthermore, some projects mentioned that putting a proposal together was already a merit of its own that helped advancing things further.
- There was an agreement among the presenters on the need of having future Hydrogen Valley calls that provide enough flexibility for applicants to ensure that the projects can be designed according to the local needs (which sometimes may not be aligned with the requirements included in the calls for proposals for this type of projects)
- Permitting and regulation is a big challenge of its own: lead times for permitting varying excessively from Country to Country and, in some cases, also within regions in the same Country. This makes it very difficult to transfer the lessons learnt. One project promoter mentioned that the smooth permitting process in one region was not mirrored with a similar project they had in a different region in the same country.
- About the recent delegated acts on Renewable Hydrogen, there were concerns that they may result in an increase of the levelized cost of hydrogen, due to the criteria proposed to

demonstrate the “renewable” character of the electricity used for hydrogen production (electrolysis).

Session 4: Knowledge transfer, citizens Empowerment and building the skills.

Objectives:

- Sharing best practices for effective knowledge transfer.
- Provide an overview and lesson learnt of ongoing projects and initiatives on skills for hydrogen.

Outcomes:

- There is an urgent need to prepare the workforce that will be needed to deliver Hydrogen Valleys at the scale and speed that is required. All levels need to be addressed (both white- and blue-collar workers) including the workforce needed for maintenance of the hydrogen related technologies/infrastructure.
- Human capital should be linked to knowledge capital.
- According to the above, Universities and Vocational Educational Training providers need to adapt their offers already now (in order to be ready by the time when hydrogen ecosystems become more widespread).
- Skills development and training should already start at a young age in order to make the sector attractive to the new workforce.
- Different initiatives are ongoing (regionally but also at EU level).
- The Province of northern Netherlands is creating different knowledge hubs (covering technical, legal, financial, etc expertise) that can be used by project developers at any point in time to support the implementation of Hydrogen Valleys in the region (these activities may receive support from the EU Just Transition Fund and will address one of the challenges in the region which has to do with the expected loss of jobs in the years to come).
- In the Rhone-Alpes region a partnership between manufacturers and training institutes is working together in the development of a training program for job seekers that would also cover the hydrogen sector.
- At EU level the GreenSkillsforH2 ERASMUS+ project is working on the development of a EU Hydrogen Skills Strategy (planned for June 2023) which will be informed by a skill gap analysis that is expected to be ready in first half of 2023:
 - o This project includes 33 partners in 15 countries bringing together industry, higher education and research organisation, VET providers, regional actors, and skills expertise.
 - o Once the Hydrogen Skill Strategy is ready, curriculum for different competences and jobs will be created and trainings across Europe will be implemented.
 - o There is a dedicated work package on knowledge exchange. Lessons learned from this work are expected to show that, through collaboration, long lasting knowledge partnerships can be formed; shared challenges are best identified in partnerships

- A suggestion provided by one of the speakers to foster the development of skills is to ensure that any investments related to the deployment of Hydrogen Valleys (and this could apply to EU funding programmes), should allocate a fraction of the value of the investments to human capital (trainings/skills). This would appear a relevant aspect for Hydrogen Valleys as a means to create regional value.
- Education should be embedded in the EU internal market. The EU could support the costs required for reskilling. Educational programmes should be developed in a 'triangle' between public authorities, the industry and knowledge institutions.
- New jobs should adjust to new technologies. A possible (and sustainable) way forward should cover the following:
 - o mapping skills and needs
 - o gap analysis and identification of needs for additional training
 - o development of a hydrogen skills strategy underpin with dedicated hydrogen curriculum should be created. Train the trainers should be included.
 - o hydrogen skills alliances are needed; that go beyond the project
- There is a need to harmonise hydrogen training modules and to better understand what industry needs in terms of skills. Hydrogen Valleys are testbeds that could provide an answer to this (current and future skills needs).

Session 5: Capacity Building in CEE countries.

Objectives:

- Provide successful examples of Hydrogen Valleys building strategies in CEE Countries (Slovenia, Poland, Czech Republic, Bulgaria).
- Demonstrate the capability of these valleys to make efficient use of funding mechanisms in order to convert a CO2 intensive energy region into a Hydrogen Valley.

Outcomes:

- The regions showed the importance of the long lead-time needed in order to build their Hydrogen Valleys. In some case, the activities started in 2016 through the Project Development Assistance (PDA) supported by the FCH2JU.
- The Hydrogen Valleys presented showed the importance to connect with local actors, especially for mobility end-uses, which, for some of these valleys, will be a key end-use case.
- Another key stakeholder for the Valleys in these countries are the local governments and authorities. The regions acknowledge the importance of having politicians on-board as part of the engagement with stakeholders, in order to have a quicker development.
- One of the common trigger points of Hydrogen Valleys projects, is that they have been sparked by the need of decarbonisation of the region, for example:
 - o the Usti region in Czech Republic is a "Transitionary Coal Region", meaning that it is shifting from coal to renewables through the Just Transition Mechanism and the Modernisation funds and it can rely on these funds for their developments.

- The Hydrogen Valley in Stara Zagora (Bulgaria) has been selected for funding under the Clean Hydrogen JU Call for Proposal (Project Zahyr). The Stara Zagora region faces the urgent need for decarbonisation as it heavily relies on coal. This region has excellent geographical and logistics conditions suitable for ports, railways, gas network and machineries and has vast expertise in Photovoltaic energy, all favourable elements to build a Hydrogen Valley.
- One of the key elements of success of the Hydrogen Valleys presented is, in fact, the ability to use EU funds to cover part of the capex and utilise the existing available expertise and opportunities (such as knowledge in Photovoltaic production in Bulgaria or Ammonia production in Czech Republic) to exploit the available renewable resources and to transport them efficiently.
- Similarly, for these Valleys it is evident that building such a complex project requires time, negotiations and ability to interact with local and international stakeholders from policy and industry.
- It is also clear that these regions have clear intentions to expand beyond their own Valleys and will be able to train and educate other regions willing to do the same.