



Hydrogen Europe
Research

Policy Working Group

8 September 2023

Agenda

- 1. Ban on PFAS – Hydrogen Europe Research answer to the consultation**
 - Context of the ban and consultation process
 - Hydrogen Europe’s answer and strategy to answer the consultation
 - Comments and suggestions received
 - Proposed way forward

- 2. Hydrogen Valleys Questionnaire**



▶ Ban on PFAS

PFAS Ban - Context

1. January 2023: the environment agencies of five countries – Germany, Sweden, the Netherlands, Denmark, and Norway – proposed an EU-wide ban on over 10,000 hazardous per- and poly-fluoroalkyl substances (PFAS).
2. March – September 2023: public consultation organised by the European Chemicals Agency (ECHA) – They look for information relevant to the risks of the ban, socio-economic aspects, and availability of alternative substances.
3. Two ECHA scientific committees will present their opinions after the consultation – the Risk Assessment Committee (RAC) and the Socio-Economic Assessment Committee (SEAC).
4. Finally, the European Commission will draft a definitive proposal for a Member State vote. The ban is subsequently expected to enter into force in 2025.



PFAS Ban - Context

Derogations to the ban will be based on:

- Availability of alternatives & socio-economic considerations.
- Balancing of trade-offs (cost of restriction vs social costs of continued use). NB: cost-benefit balance is not a determining criterion for a derogation.



In the ban in the proposal published in January, PEM fuel cells are the only (hydrogen) technology mentioned for a derogation (5 years).

PFAS Ban - Hydrogen Europe's position

➔ Request to exempt Fluoropolymer production and use from the U-PFAS restriction.

- **Limited risk:** Fluoropolymers are produced under responsible manufacturing conditions and used in a highly controlled industrial environment, where their **emissions are negligible**. Literature references demonstrating that fluoropolymers meet the OECD criteria to be defined as '**polymers of low concern**'.
Ongoing data gathering on PFAS emissions in the water and surrounding equipment taking place with HE and HER members.
- **Lack of available alternatives** with the same capacities in hydrogen technologies.
- **Technical possibility and economic incentive to recycle:** Due to their high initial price, their reusability and recyclability are actively investigated and inherently encouraged. Recycling of PTFE-based sealing materials for hydrogen compressor systems is already established. Combustion of PTFE under typical waste incineration conditions (municipal level) and using Best Available Techniques (BAT) does not degrade into the identified PFAS of environmental concern.
- Data is provided on **economic, social (jobs), industrial side effects of a PFAS ban** for the hydrogen sector.
- **Projections on the amount of PFAS use by the hydrogen sector in the coming years are shared.**
- **Proposal to set up a framework for exempted use to incentivise:**
 - best practices for the manufacturing, use and end-of-life stages of fluoropolymers
 - research into finding alternative products

Comments / Suggestions received

- **General strategy to request an exemption:**

Proposal to differentiate technologies:

- (1) using PFAS as the core part (the membrane) which is the case for PEMFC and PEM electrolyzers, and for which there is no substitute;
- (2) using PFAS as secondary elements (gaskets for instance), for which other options can be more easily found.

Following discussions with members, HE decided to go for “Plan A without a Plan B”.

- > Issue of timing to have viable options on the market if no exemption (+7 years)
- > Risk of slowing down the entire sector if fluoropolymers are not exempted altogether.
- > Jeopardizes the strategy arguing that fluoropolymers should be considered different from other PFAS as they are not harmful.

Comments / Suggestions received



- **Reference to 140 GW not 100 GW for REPowerEU** – 140 GW refers to the electricity input for electrolysis; 100 GW amount to the hydrogen output.
- **Estimate use of PFAS by hydrogen technologies (Q5):**
 - Based on a scenario taking PEM as the main technology for projections on PFAS use, we could take the share between technologies considered by the IEA (roughly 50% PEM / 50% Alkaline).
 - Ongoing calculation from a member – any update is of interest to HE.

The numbers will be refined for the new submission to integrate projections as suggested. Reference to the study are welcome.

- **Emphasise on PEM electrolyzers not only fuel cells (Q2)**
PEMEL which can arguably be considered as most relevant than FC for 2 reasons: 1) the power installed, which will largely surpass the one of PEMFC, and consequently the quantity of PFAS; and 2) the need of recycling is even larger for electrolyzers since iridium is more critical than platinum and its loading amount higher. **Point taken; on HE's side more insights received from FC so less on EL.**

Comments / Suggestions received

- **Highlight the need to increase research projects** to find solutions to replace F-based membranes for PEM fuel cells and PEM electrolyzers. Need to have regular calls on the topic to maximise the chances of success. **Point taken.**
- **Projections on PFAS use by hydrogen technologies to be shared.** Interest from HE to compare their data with other projections.
- **Insist on climate arguments connected with the EU policy framework and targets for FCH.** Information received that the ECHA it not considering political arguments but demonstrations, literature references, socio-economic impact.
- **New references available in the comments submitted.** Approval to share the insights with HE to be confirmed.

PFAS Ban - Proposed way forward

- **Sharing information with Hydrogen Europe to complement their answer.**
- If support from members with the main messages: Providing a **one pager answer to the « General comments » section**, referring to Hydrogen Europe's position.

Considering:

1. *Limited risk for the environment and human health (from use to end of life)*
2. *Lack of alternatives with equivalent capacities. Fluoropolymer ban would be a showstopper for the sector.*

Fluoropolymers should be exempted from the ban on PFAS.

In parallel the following actions should be implemented:

- *research to find alternatives to PFAS should be continued and increased.*
- *best practices for the manufacturing, use and end-of-life stages of fluoropolymers should be promoted.*



▶ Hydrogen Valleys

Hydrogen Valleys Roadmap



- The European Commission is currently elaborating a **European Roadmap on Hydrogen Valleys**, in order to define the strategic priorities and actions needed to reach the REPowerEU objective of doubling the number of Hydrogen Valleys in the EU by 2025.
 - A series of workshops were organised by DG Research and Innovation, leading to the signature of a Joint Declaration on Hydrogen Valleys on the 1st of March 2023.
- During the Summer, the European Commission launched a Call for Evidence where stakeholders could provide their views on this topic.
- In parallel, Hydrogen Europe Research launched its own internal consultation with its members.
 - The outcomes will be shared bilaterally to DG RTD.



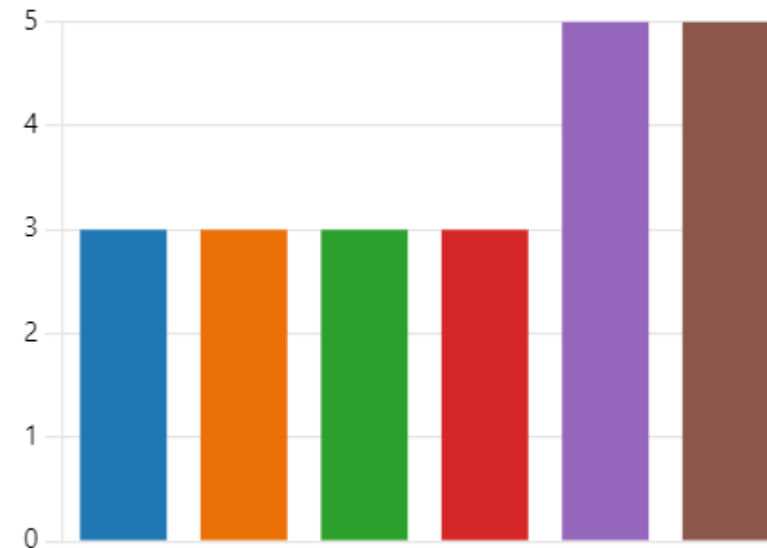
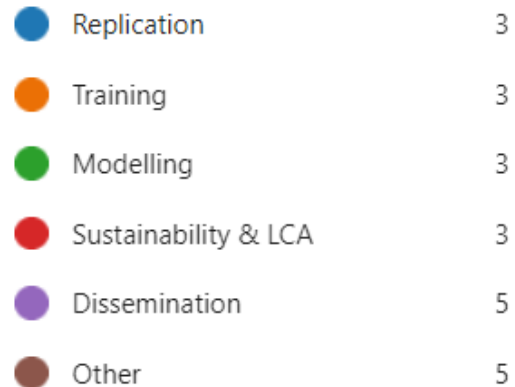
HER - Hydrogen Valleys Roadmap Consultation

Hydrogen Valleys Form Results

- Only 8 responses received, from 7 HER members: RISE, CIRCE, ZSW, University of Bologna, CNH2, ITE and FHA.

4. What type of activities do you currently carry out in Hydrogen Valleys?

[More Details](#)

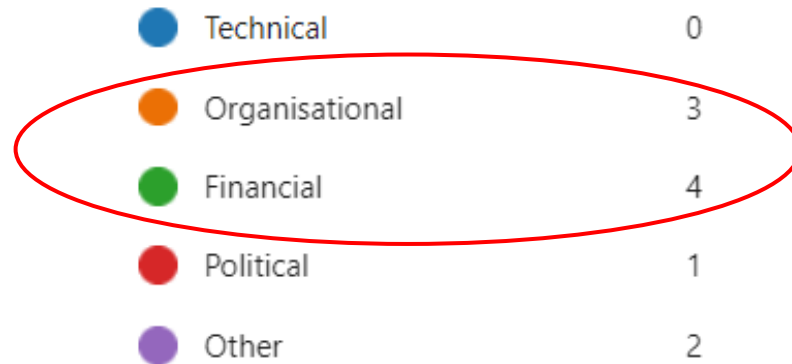


- Activities carried out by respondents are diverse and homogeneous (from raw data received)

Hydrogen Valleys Form Results

5. If any, what type of obstacles did you experience when preparing a Hydrogen Valley project?

More Details



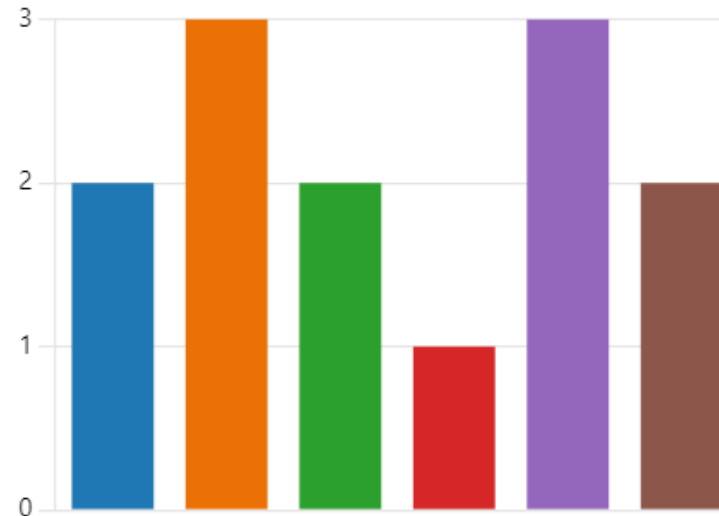
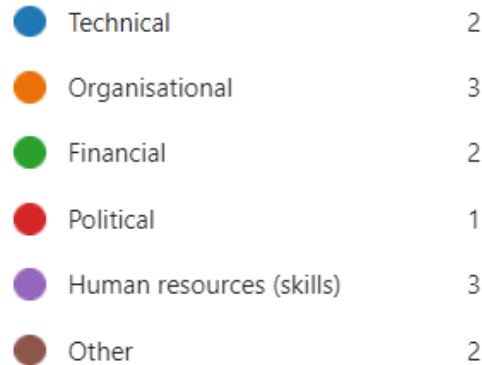
➤ Main issues when preparing a Hydrogen Valley project:

- Short amount of time for the preparation of the proposal;
- Involvement of entities with no or limited experience in hydrogen, leading to organisation obstacles;
- Low funding rate and high financial investment;
- Difficulties in securing co-financing outside of EC support.

Hydrogen Valleys Form Results

7. If any, what type of obstacles did you experience when implementing a Hydrogen Valley project?

[More Details](#)



➤ Main issues when implementing a Hydrogen Valley project:

- Complicated approval process for hydrogen installations and lack of harmonisation (even on country level) & delays in the acquisition of equipment;
- Uncertainty regarding the economic/financial viability of the project;
- Lack of hydrogen expertise.

Hydrogen Valleys Form Results

- Obstacles on business model definition:
 - Difficulty to find off-takers;
 - Unstable and high energy prices - therefore high hydrogen production costs;
 - High costs of equipment.

- Co-funding is not considered as being an obstacle, however national or regional funding programs remain a key element in the development of Hydrogen Valley projects.

- There are no particular challenges for RTOs or universities to be part of Hydrogen Valley projects as they play a role in training or knowledge/technology transfer to the industry, however research organisations and universities are usually limited to low TRLs making their developments difficult to be integrated into Hydrogen Valley projects

Hydrogen Valleys Form Results

- Should low TRL activities be included in Hydrogen Valley projects?
 - This question was the most divisive, with a **50/50 split between yes and no**
 - ❖ Arguments for **yes**:
 - The integration of new technologies can help to study if they are actually feasible in real situations;
 - Basic research found in low TRL is necessary to improve existing and already implemented technology. In the case of Hydrogen Valleys the TRL is high, but they should be accompanied by research and low TRL activities to achieve continuous improvement. Internal knowledge transfer and developments could also be considered;
 - Mutual benefit of integrating low and high TRL activities.
 - ❖ Arguments for **no**:
 - Hydrogen valleys must take advantage of the last research advancements and upscale and deploy them at TRL7-8;
 - Other EU support and funding instruments are more adapted.

Hydrogen Valleys Form Results

- Respondents were unanimous in supporting training activities in Hydrogen Valley projects:
 - Many entities and people involved in the Hydrogen Valley with limited or no experience in hydrogen or in the technologies need to be trained;
 - Training activities should address all the value chain and stakeholders (including public administration) locally involved and engaged in the project;
 - Opportunity to raise awareness among the citizens of the Hydrogen Valley and to promote hydrogen-related careers. Informal dissemination for the local population and specific training focused on attracting and preparing potential workers or stakeholders could be beneficial;
 - Staff training and qualification programme, as well as the existence of training programmes between the different hydrogen-related projects, should be integrated in Hydrogen Valley projects. Cooperation and collaboration are essential for the advancement and development of these technologies.

- Project Development Assistance was considered as beneficial as most industrials or research applicants do have no experience in writing, filing and administrating public projects.

Hydrogen Valleys Form Summary

➤ Main outcome:

- Organisation difficulties and financial uncertainty are the main obstacles when preparing Hydrogen Valley proposals;
 - Difficulties in the implementation of Hydrogen Valleys projects are more diverse;
 - There are not particular challenges regarding the inclusion of universities and RTOs in Hydrogen Valley proposals;
 - Training should be included in Hydrogen Valley projects;
 - PDAs are considered as helpful in the development of proposals.
- Subject of debate whether low TRL activities should be included in Hydrogen Valley projects.

➤ Next steps:

- Sharing of information to DG RTD.
- Possibility for further exploration on what could be improved in terms of the technical aspects of Hydrogen Valley projects - to be potentially considered in the future Roadmap under elaboration.



**Hydrogen Europe
Research**

Thank you!