

Why maintaining a Institutional Private-Public Partnership (IPPP) on hydrogen and implementing it in the post-2020 framework ?

Establishing an new iPPP, preferentially a Joint undertaking (JU), would allow :

- **to keep the momentum given** by the FCH JU created in 2008 – setting up a European Hydrogen community – then the FCH2 JU in 2014 – towards the deployment of Hydrogen technologies - : this momentum allowed the establishment of a European ecosystem gathering private companies, research and the European Commission (EC). A new JU could extend these achievements and work on the mass deployment of Hydrogen technologies while preparing the next generations of technologies. The current networks created by the FCH 1 and 2 are a strength and a major asset.
- **to support a strong, innovative and competitive sectorial ecosystem** promoting the emergence of SMEs and of a European industrial value chain in a technology where Europe is still in good position in the global competition. FCH JU meets the need to tackle « market failure » where **public support is needed to create a European innovative and industrial field creating jobs and growth** : Hydrogen technologies deployment is still too risky to be set-up only by private sector.
- **to avoid dispersion of the Hydrogen ecosystem** in different FP9 programmes/clusters or in the project of FP9 big missions. The structured Hydrogen ecosystem of the new JU will be able to integrate itself easily in the different thematic areas and missions.
- **to foster industrial involvements and investments** through the « private in-kinds » of the FCH JU projects and the « private in kind additional activities ». Indeed the mid-term evaluation of the FCH2 JU shows that the JU generates a 0,98 of operational leverage thanks to the « private in-kinds » of participants in the projects and an additional 0,65 of leverage due to their « private in kind additional activities ».
- **to develop a long-term European strategy** shared by industry, research and the EC. This strategy could be implemented by programmes and projects with strong impact and yearly assessed via shared KPIs (key performance indicators).
- **To extend the scope of application of the Hydrogen industrial field.**

What actions could be implemented by a new FCH JU ?

A new JU could :

- target more specifically **the « green » Hydrogen production** in order to meet the overall needs of transport, energy and industry.
- focus on the development of **critical generic components and sub-systems** of the value chain in particular via pilot lines supplying different products for different markets.
- contribute –without excluding research on lower TRLs- to face **the following technological challenges** for achieving the global deployment of Hydrogen technologies :
 - Increasing compacity and density of system elements ;
 - Decreasing the use of rare raw materials including Platinum and Iridium ;
 - Developing use compliance ;
 - Eco-designing and recycling of equipments and materials ;
 - Working on **different Hydrogen storage technologies** including the critical stage of compression and of the existing facilities ;

- Working on **the future disseminated Hydrogen production pathways** including biological ones ;
 - Ensuring **high safety level** including storage in closed environment, large volume storage, deployment and maintenance of vehicles and infrastructures ;
 - Developing **harmonized tests protocols** accelerating the integration of new materials/components into the Hydrogen systems.
- **Following-up funding of demonstrations** while remaining open on technologies with a “market pull” approach : a demonstration project and chosen technologies should be relevant for the users, an identified market and competing solutions. Some calls of the current FCH2 JU were strongly “techno push” and prescriptive on the expected technical solutions for implementation. For example, in the transport area, actions aimed firstly private vehicles and buses forgetting other land transport or other transport applications (boat, train, airplane) for other possible markets. **Call for proposals writing process and call specifications should take into account stakeholders (companies and academics) proposals but should be less directly commanded by their immediate needs or their intended projects.**
 - **Keeping a European top-level research** for preparing the next generation of products through lower TRLs research and grant fundings.
 - Coordinating R&I actions and demonstration projects with initiatives for deployment. As such, the FCH JU can’t implement the technologies deployment. **However the FCH JU can create the conditions for mobilizing other funding sources closer to the market and less grants consuming : Connecting Europe Facility (CEF), European Fund for Strategic investment (EFSI), European Investment Bank (EIB), InnovFin-EDP European demonstration projects, European structural and investment funds (ESIF)...** A new FCH JU should ensure the complementarity of funding tools on the whole Hydrogen value chain.
 - Participating in the development of the following topics :
 - Développement of **education tools for skilled and highly qualified workforce** for R&D, industry but also other different professions like firemen for example. This entails collaborative work with different professional areas : architects, inspectors of classified installations, urban planners, heating installers...
 - Accompanying **economic analyses** for indentifying short term markets (before 2030) allowing economic reality of Hydrogen technologies (ie autonomous vehicles) ; fostering a systemic approach ;
 - Participating in **pre-normative activities** for the setting-up of ISO, IEC and regulations allowing the deployment of Hydrogen activities ;
 - Intensificaying **communication** outside of the Hydrogen ecosystem especially the general public and young people from the age of 10.
 - Caring about societal challenges related to the Hydrogen technologies deployment.

To address these objectives, France expects several evolutions for a future JU compared to the current FCH2 JU

1) An improvement¹ of the governance compared to the current FCH2 JU :

- Keeping **private sector representatives** coming from different application areas of Hydrogen - such as transport, buildings, energy networks...- in the Governing board (GB) ;
- Opening the GB to **regulators** –health, safety, deployment...- ;
- One of the FCH2 JU mid-term evaluation conclusions is that relationship of the JU with Member States is weak and as such has not delivered the expected results. As a consequence, this relationship should be revised for reinforcing strategic exchanges and synergies leading to an optimal use of the available funding. Stronger involvement of the Member states is therefore necessary for sharing quantified targets, risks, funding and regulation alignment. It could be therefore efficient to **reserve one of the GB seats to a representative from the State representatives group (SRG) having the right to vote** ;
- The involvement of local authorities which are local organizing authorities with funding capabilities, is necessary for the concrete implementation of demonstration and deployment projects. Furthermore local authorities are able to use a strong but under-used development lever so far : innovative public procurements. It could be therefore efficient to **reserve one of the GB seats to a representative of local authorities.**;

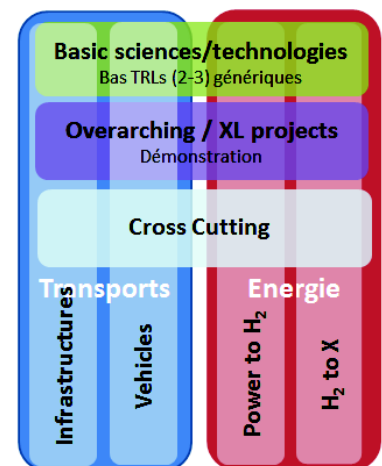
2) A better coordination between the new JU activities and national public programmes :

A stronger involvement of Member states in the JU governance and implementation is necessary. Simultaneously a new FCH JU will need to reinforce its commitment in the SET-Plan activities which aims at coordinating European/National/private R&I actions : as such a new FCH JU should participate in the current work on delivering and executing Implementation Plans especially those on “Energy systems” (SET-Plan action N°4) and on “alternative fuels” (SET-Plan action N°8).

3) A new structure of the new JU integrating two new crosscutting pillars : “Basic sciences and technologies” and “overarching activities”

▪ **The “Basic sciences and technologies” pillar :**

It is necessary to **keep a European top-level research** for preparing the next generations² of products through lower TRLs research and grant fundings. This overarching pillar could reduce “time-to-market” by funding incremental and breakthrough innovations (low TRLs) through cooperations between short and mid term expectations of companies and innovative ideas of researchers –academics and RTO-. Lower TRLs



¹ Currently 10 people representing Industry grouping, Research grouping and the European commission seat at the FCH2 JU Governing board : the EC holds indivisible 50% of the voting rights ; the industry grouping holds 43% of the voting rights and the research grouping 7% of the voting rights.

² Potential topics for lower TRLs research actions : Reduce/suppress the use of critical raw materials (CRM), especially noble metals ; High performances Fuel Cells (>6kW/L et 4 kW/kg) ; Electrolyzers with a high energetical efficiency (Energy < 4kWh/Nm³, corresponding to a yield > 75%) ; New materials for reversible and high mass density Hydrogen storage (>10 mass%H₂) ; Fibers with high mechanical strength ; High performance Hydrogen compressor.

can't be funded only by the Excellence pillar of the post-2020 framework programme (ie ERC or FET) because of the weak link of these programmes with private companies : transfer to industry and market of innovations coming from this excellence pillar are more difficult. A new JU would cover TRLs from 2 up to 7, always ensuring a strong link between its activities and industry.

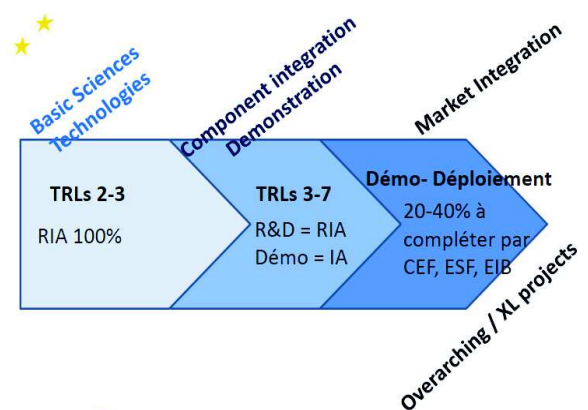
▪ **a pillar focused on « Overarching activities »**

Mid-term evaluation of the FCH2 JU underlines the lack of common vision of the DG MOVE and the DG ENER. The commitment of the two DGs is still necessary regarding the future development of more interdependent energy and transport sectors and the role that hydrogen and fuel cells can play in that. Therefore France proposes to add **an other cross-cutting pillar “overarching activities”**. This pillar would allow the implementation of large demonstration or pre-deployment with systemic approach. **A such these projects would involve transport and energy Hydrogen applications on a territory – urban, sub-urban, port, airport, logistic centers...- and would aim at reaching faster the economical profitability.**

These projects could focus on **modelling/simulations** helping **sizing, energy management and validation**. Through **the development of pilot lines**, these overarching projects could also help for the rizing of an European Hydrogen supply chain on critical generic components.

4) **A new JU coordinating and facilitating for applicants the access to European funds for R&D, demonstration and deployment projects :**

JU activities funded under the pillar « Overarching activities » could be evaluated, ranked and selected by a committee grouping different funding authorities dealing with the different funding tools already described previously : CEF, EFSI, EIB, InnovFin-EDP, ESIF... As such, a new JU could gather or at least coordinate access to finance at each step of a project, from the idea (lower TRLs) up to the market (highest TRLs) :



- « **Basic sciences/technologies** » : development for lower TRLs topics (typically TRL 2-3) addressing different applications possibly together Energy and Transport pillars : funded by 100% grants by a new JU ;
- « **Component Integration / Demonstration** » : R&D topics dedicated to a market or an application : transport, P2H, H2X, storage... These topics can integrate innovations aiming at reaching validation through demonstration projects (TRL 3/4-6/7) either for Energy application (Energy pillar) or Transport application (Transport pillar) : funded by 100% grants for public stakeholders and 70% grants for private for profit stakeholders by a new JU ;
- « **Market integration** » : projects for deployment (IA) of Hydrogen technologies benefiting of lower funding rates (possibly 20-40%) to be completed and co-funded by other programmes : CEF, ESF, EIB, Member states...
- « **Overarching / XL projects** » : 1) projects facilitating local demonstration and deployment of common technical solutions for Energy and Transport applications (« H2 valleys ») ; 2) projects putting in place a European industrial value chain through pilot lines for critical generic component or sub-systems.