

Hydrogen Europe's contribution to the Roadmap on the Revision of the Communication on important projects of common European interest (IPCEIs)

Summary

Introduction:

- ✓ *The European Green Deal, the European Recovery Plan and the European Hydrogen Strategy, all give a very strong political signal to kick-starting a clean hydrogen economy in Europe by 2030.*
- ✓ *To achieve the Hydrogen Strategy vision of 6 GW by 2024 and 2x40 GW by 2030, the total investments needed are of 430Bn Euro, with an estimated necessary support of €145Bn.*
- ✓ *Hydrogen needs strong economic incentives along with carbon price/carbon tax/regulatory framework.*
- ✓ *Economic incentives for hydrogen should aim at compensating the higher cost of renewable and low carbon hydrogen production, as well as end-users' higher costs due to the change to renewable hydrogen and to transforming industrial technologies and processes to hydrogen.*
- ✓ *The current State aid regime is not fit to support the ramping up of the production, the transmission and distribution and the deployment of clean and low carbon hydrogen in hard to abate sectors. These needs should be addressed in a dedicated State aid framework for hydrogen technologies (outside or within the EEAG) and the revision of the IPCEI Communication.*

IPCEIs Communication:

- ✓ *IPCEIs is a very relevant tool to support the integrated development of the hydrogen ecosystem across Member states and the H2 value chain.*
- ✓ *An ambitious approach to hydrogen IPCEIs is needed already in 2021 to use all the flexibilities that the 2014 Communication offers in terms of support to transport and energy projects, coverage of 100% of the funding gap and also in terms of Opex eligibility.*
- ✓ *The 2014 Communication needs to be further clarified and enhanced on :*
 - *the interpretation of Point 23 (environmental, energy and transport projects of great importance) and the possibility to cover large scale demonstration and ramp up projects*
 - *the eligibility of additional Opex in the above-mentioned and FID projects*
- ✓ *Provisional measures could be analysed to provide extra incentive to first hydrogen IPCEIs during the transition period.*
- ✓ *Guidelines on a structured IPCEI building process would be very valuable to ensure the swift organisation of the involved stakeholders and approval by the European Commission.*
- ✓ *Clearer and more favorable rules on cumulation with EU funds, and coherency with the other specific and relevant State aid regimes are an important complement.*
- ✓ *The European Clean Hydrogen Alliance is an opportunity to finetune the needed State aid framework for hydrogen, including IPCEIs as flagships of the Hydrogen Strategy and the Alliance pipeline of investment projects.*

Hydrogen Europe is the leading European Hydrogen and Fuel Cell association which promotes clean and low carbon hydrogen as the enabler of a zero-emission society. It currently represents 200 industry companies, 90 research organisations as well as 25 national Associations. Its member companies are of all sizes and represent the entire hydrogen value chain, from production to transport, distribution and final end-use of hydrogen. The association partners with the European Commission in the innovation program Fuel Cells and Hydrogen Joint Undertaking (FCH JU).

Introduction : Hydrogen a key enabler of the European Green Deal and the European Recovery Plan

The European Green Deal, the Recovery Plan and the first European Hydrogen Strategy adopted on the 8th of July, all give a very strong political signal to kick-starting a clean and low carbon hydrogen economy in Europe by 2030. The European climate strategy and the transition to a decarbonised economy will indeed imply a deep transformation of the production, storage and consumption of energy in Europe, with carbon-free power generation, increased energy efficiency, and the deep decarbonization of transport, buildings and industry. **This transition will require hydrogen at large scale, at internationally competitive prices, and in particular clean hydrogen.**

Hydrogen is an essential lever among other technologies, that offers a versatile, clean and flexible energy vector. It makes the large-scale integration of renewables possible with the conversion and storage of energy as a renewable gas. It can be used for energy distribution across sectors and regions, and it also provides a way to decarbonise segments in hard-to-abate sectors of the economy.

At the same time hydrogen opens up business opportunities for EU industry to lead the transition towards a carbon neutral future, based on EU leadership in a number of key hydrogen related technologies. However, full-scale industrial deployment implies the need for systemic change and also requires systemic action along the whole value chain, from hydrogen production and transport to the industrial use as feedstock for energy-intensive industries or as fuel for transport or balancing the renewable electricity output.

Hydrogen Europe has estimated⁽ⁱ⁾ that **in order to achieve the Hydrogen Strategy vision of 6 GW by 2024 and 2x40 GW by 2030, the total investments needed are of €430Bn, with a necessary support of €145Bn.**

Economic operators are ready to launch ambitious scale up projects and investments. The high level of engagement of the hydrogen industry representing the whole value chain in the European Clean Hydrogen Alliance attests to this.

But they will not solve the equation alone. The EU political signals need now to be translated into concrete measures that support the creation of a European competitive hydrogen economy, able to face growing international competition.

In order to create the adequate market conditions for the new decarbonised technologies, and, in particular, for clean hydrogen, the essential rise of the carbon price and the adjustment border tax, will need to be accompanied by a supportive regulatory framework as well as strong economic incentives.

In the coming years, EU and national sustainable funding will be key in supporting the production of affordable clean hydrogen, securing the needed infrastructure, and covering the higher operating costs of clean hydrogen in the end use sectors. At a moment where Member states are finalising their Resilience and Recovery Plans, and that the EU has confirmed higher CO2 reduction target for 2030, **State aid rules should play an essential role in the acceleration of the European hydrogen industry adaptation efforts until the market develops and costs become competitive.**

I. Need for a shift in the State aid approach in relation with hydrogen

Hydrogen Europe welcomes the upcoming review of the State aid rules and the opportunity provided for public funds to further contribute to the European Green Deal objectives.

Hydrogen Europe acknowledges the global results of the recent EC evaluation of the State aid rules which concludes that, if the State aid control system and rules are to be fit for purpose, individual rules will need some adaptation, also in the light of the Green Deal and the EU's Industrial and Digital Strategies.

Business as usual will not be enough. State aid rules need indeed to be tailored to support the deployment of the new Recovery and Resilience facility and its objective to dedicate more than one third to green projects.

Hydrogen Europe is convinced that a **real shift will be needed to unlock the potential of the National Resilience and Recovery plans in the light of the European Green Deal. This is particularly important for the development of the clean hydrogen sector while a European supportive regulatory framework is not yet in place.**

An enhanced regime is therefore needed -and is essential in an early stage- to allow State aid into renewable hydrogen projects -individually or through dedicated Member state schemes- relating to the production, transmission and use of clean and low carbon hydrogen.

The enhanced investment support should namely aim at:

- **compensating the higher cost of renewable and low carbon hydrogen production and transport in comparison with existing hydrogen and other fuel prices**

Example:

Currently, the production of green hydrogen is +/-6 €/kg compared to existing hydrogen (1 €/kg). In order to reduce the costs to 1'5€/kg in Southern Europe and 3€/kg in Northern Europe volumes need to be increased to Gigawatt scale.

Scaling up and creating large scale electrolyser manufacturing plants, green hydrogen production sites and renewable generation projects to supply electrolysers should therefore be, as an example, adequately supported.

- **compensating end users for the higher costs due to the change to renewable and low carbon hydrogen -compared to existing hydrogen and other fuels prices- and for transforming industrial technologies and processes to hydrogen, creating thereby an additional demand**

Examples :

1.The development of clean and low carbon hydrogen in the industry, mobility and building sectors generates additional operational expenditures due to the higher cost of fuel, that are not always eligible to State aid. For instance, only around 20% of levelised costs of renewable hydrogen production is made up by initial Capex. As a result even subsidising 100% of initial investment will not provide sufficient incentive for industry to result in a fuel switch.

- **Industry:**
Decarbonising energy-intensive industries requires massive investments, but the current aid intensities (often only around 20-30 %) are too low to trigger these high-volume investments. Considerable funding gaps remain uncovered, which inhibits the required decarbonisation projects necessary to enable the Green Deal. Decarbonising processes and products often requires more expensive input materials and/or energy mixes. Therefore it is crucial to allow funding for additional operation costs beyond the investment, until a working market for ‘green products’ is in place.
Next to the review of State aid, it will therefore be necessary to adopt supportive legal measures (eg. obligatory quotas for green-products; enhancing green public procurement...) to establish a “lead market for green products”.
 - **Mobility:**
The inclusion of additional operational expenditures is especially important for rolling out alternative fuels fleets, where the sustainable fuel is usually more expensive than its fossil competitor. For example for long haul, only 21% of the TCO is made up by the initial Capex and often haulers have access to competitive diesel prices at their depots thanks to special agreements.
Besides, a combined approach in support of both fleets (eg: vehicles/vessels) and infrastructure could significantly help accelerate the market uptake, including on corridors (eg: road, inland shipping...). An option would be to designate technologies/types of projects that qualify for state aid and base the assessment on strong business cases that include externalities.
 - **Buildings:**
There is also a clear gap between renewable hydrogen and natural gas that is used for heating in buildings, and that State aids need to address.
2. *The transformation of industrial technologies and processes to clean and low carbon hydrogen though promising in the steel, chemicals, cement and glass sectors, is still in an exploration phase.*
- **Steel:**
In relation with the switch from coal based blast furnace route steel production to hydrogen based direct reduction steel making, the production cost of the GHG lean route for a site in middle Europe (Capex and Opex) amounts to roughly 170% of the conventional production (ii). The support to pilot tests, demonstration plants and then ramp up needs to be accelerated so as to allow these energy intensive sectors to rapidly decrease CO2 emissions. When technology is already largely available, State aid should no longer consider the degree of innovation, but rather the far-reaching reduction in greenhouse gases. Compatibility of Carbon Contracts for Difference (CCfD) can also clearly play a role in promoting the uptake of low-carbon production processes.

Infrastructure is another key element that the state aid framework needs to further consider to ensure the transmission, distribution and storage of H₂, including the import of H₂, and connect offer and demand.

In view of the presented challenges it is clear that limiting support for hydrogen technologies just to Capex will not create a big enough incentive to result in deployments on a big enough scale needed to reach the EU Hydrogen Strategy targets. **The eligible costs should therefore be defined as the funding gap, calculated based on a counterfactual scenario, presumed to be the situation in which the project would not take place. The funding gap should be calculated as the difference between the positive and negative cash flows over the entire lifetime of the investment (i.e. covering both Capex as well as Opex and revenues), discounted to their current value.**

II. Main levers for the hydrogen sector in the revision of the current State aid framework

Considering the challenges the hydrogen sector is confronted with in the context of the European Green Deal and the Hydrogen Strategy, and, as a newly recognised European strategic value chain, it is important to underline that **the current State aid framework is not fit for the purpose of hydrogen technologies and the development that the hydrogen market will undergo in the coming years. Promoting the hydrogen economy envisaged in the EU's Hydrogen Strategy implies systemic change and requires certain derogations from legislation and regulatory sandboxes.**

As an example, the current Energy and Environmental State Aid framework and the IPCEIs Communication are too limited in scope and have too restrictive cost rules, to efficiently address the market failures of hydrogen deployment.

In the light of the above, Hydrogen Europe supports:

- a) The adoption of dedicated guidelines on State aid or a dedicated chapter within the EEAG for hydrogen technologies, including transport and storage, that provide more tailored and flexible eligibility conditions, more favorable maximum aid intensities and higher aid amounts.
- b) The revision of the IPCEI Communication to adequately address operating costs in hydrogen scale up projects.

III. The revision of the 2014 IPCEI Communication

i. Suitability of IPCEIs for hydrogen deployment and status

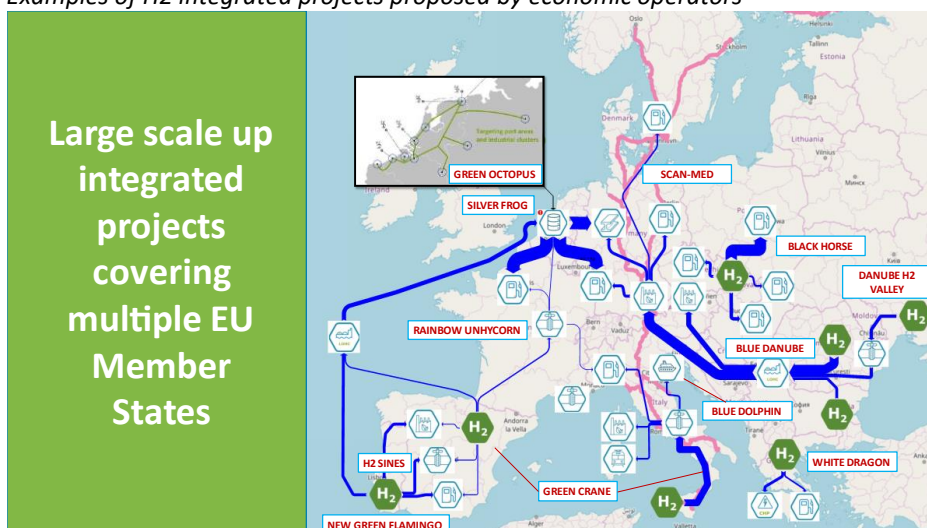
The very nature of IPCEIs as integrated projects along the value chain and across Member states, makes them particularly suitable to accelerate the deployment of the European hydrogen ecosystem at a larger scale.

No hydrogen IPCEI has yet been adopted, but for more than one year many interested companies have been involved in designing major disruptive concept projects, and have submitted substantial proposals to the eleven calls for expression of interest for hydrogen IPCEIs that Member states have launched so far.

Following the High Level Conference that the German Presidency organised on the 17 of December '*IPCEI now and tomorrow*', and the signature by 23 Member states of the "*Manifesto for the development of a European 'Hydrogen technologies and Systems' value chain*" this process is expected to enter beginning 2021 a more structured and concretisation stage aiming at submitting a first hydrogen IPCEI notification during the year.

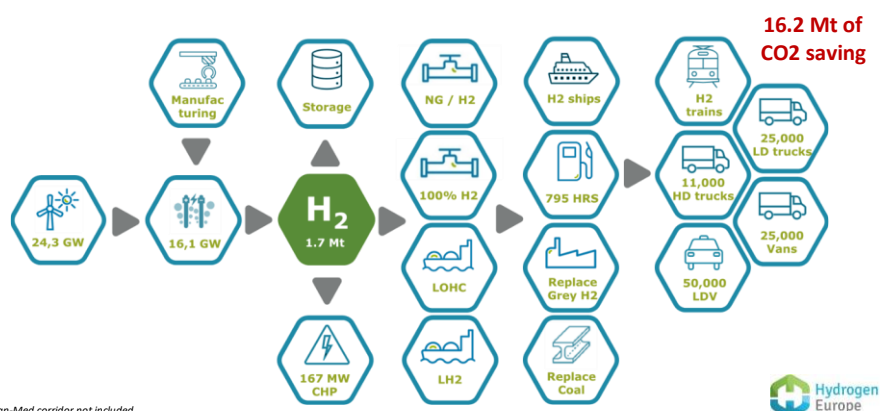
Hydrogen Europe fully supports the hydrogen IPCEIS building process and has been instrumental, from an early stage, in setting bridges between all the stakeholders involved. Hydrogen Europe firmly believes that H2 IPCEIs can become the flagship of the European Hydrogen Strategy and showcase the added value of hydrogen on European competitiveness, technology sovereignty and job creation through an integrated value chain.

Examples of H2 integrated projects proposed by economic operators



Aggregated data of H2 integrated projects proposed by economic operators

Large scale up integrated projects* covering the entire value chain



However, if IPCEIs are to play a decisive industrial policy role in relation with the emergence of the hydrogen economy, specially in the absence of a fit-for-purpose dedicated State aid framework for hydrogen projects in the EEAG, two aspects need to be taken into account :

- a) the potential of the current IPCEI framework, and in particular the provisions related to the projects of great importance, should be be fully deployed in relation with hydrogen IPCEIs;
- b) the revision of 2021 should take the opportunity to better address, amongst others, some of the concerns relating to eligibility of projects and costs of the 2014 Communication.

ii. Priorities in relation with the hydrogen IPCEIs under construction

Since the adoption of the 2014 IPCEI Communication a few IPCEIs have been adopted, but the experience relating to the environmental, energy and transport projects of great importance remains very limited.

It is important that the lack of reference in the application of Point 23 of the Communication doesn't limit the opportunities of ramp up integrated hydrogen projects to receive adequate support in a

context of a well-known market failure where the mere production and use of clean and low carbon hydrogen is already a disruption in itself.

Until the IPCEIs framework is finetuned, Hydrogen Europe supports an ambitious and forward-looking interpretation of the current rules to deploy IPCEIs full effects in the roll out integrated hydrogen projects across the EU. There is a clear potential for hydrogen IPCEIs to go beyond the practice and **use all the flexibilities that the 2014 Communication offers in terms of:**

- a) support to transport and energy projects of great importance, in addition to RDI and FID,
- b) coverage of 100% of the funding gap,
- c) Opex eligibility,
- d) accelerated assessment after notification of the IPCEI.

The ambitious approach should apply in relation with other aspects identified by existing IPCEIs (eg : possibility of earlier project starts, better efficiency on the reporting and project controlling...) in order to underline the incentivising effect of IPCEIs on hydrogen deployments.

iii. Revision of the IPCEIs Communication

As a facilitator of the IPCEI process, Hydrogen Europe understands that the scope of the IPCEI 2014 Communication urgently needs to be clarified and reinforced in relation with two issues extremely relevant for the development of the hydrogen sector:

- a) **the interpretation of Point 23 on environmental, energy and transport projects of great importance, and the possibility to cover large scale demonstration and ramp up projects,**
- b) **the eligibility of additional Opex** in the above-mentioned and FID projects, so as to compensate the higher cost of renewable and low carbon hydrogen production, as well as end-users' higher costs due to the change to renewable hydrogen and to transforming industrial technologies and processes to hydrogen.

Until the new frameworks applies, additional **provisional measures** could be analysed to provide extra incentive to first hydrogen IPCEIs, especially considering the current absence of a suitable State aid framework for hydrogen projects.

In the future framework, the continuity between IPCEIs rules and the other main State aid instruments must be ensured for hydrogen projects that, even outside IPCEIs, are part of the same ecosystem. Clearer rules on the cumulation of aid, namely with EU funding, and a coherent approach of the available tools with higher funding and larger eligibility costs on Opex (eg: ETS Innovation Fund, Invest EU, CEF, Horizon Europe...) will be equally important.

Finally, to have more visibility on the complex building process of IPCEIs between economic operators, Members States and the European Commission, Hydrogen Europe would also welcome the adoption by the European Commission of a **non-paper proposing a structured working process** for interested stakeholders or at least best practices that could be used as a reference.

iv. Cooperation among companies in view of developing a hydrogen IPCEI:

Alongside enhanced IPCEI rules, Hydrogen Europe would like to stir the attention on the need to clarify the scope of antitrust rules that apply to companies willing to participate in an IPCEI.

This might have an impact on the preparation and future roll-out of the project. In practice, parties are reluctant to cooperate with other companies, and when they do, they mostly settle a ‘competition meeting protocol’ just in case, which involves the presence of lawyers in all meetings and is extremely costly. This may discourage companies from cooperating.

This was the case in some IPCEI pre-application processes, for direct competitors and for vertical collaboration through the value chain.

Hydrogen Europe asks therefore the European Commission **to provide guidelines on the exchange of information in the context of the development of hydrogen IPCEIs** and clarify what is allowed and not in terms of collaborative and confidential data, including the tools that could be used (eg: standardised agreements, intermediary organisations that bring parties together on an ‘open access’ basis and receive the sensitive information, etc...).

IV. Final remarks

The EU’s objective of achieving 6GW renewable hydrogen production in 2024 and 40GW in 2030 is already at risk. **The period between now and 2024 is crucial in scaling up volumes that can lead to the development of a sustainable and competitive hydrogen market. Before considering the use of market incentive tools (e.g. tariffs, quotas for hydrogen production – both on supply and demand side) for hydrogen uptake, the use of state aid will be crucial in getting these projects of the ground at lowest possible cost and impact for the tax payer and the consumer.**

Hydrogen Europe is very much **concerned by the current legal vacuum and its negative impact on hydrogen investments until the new State aid framework applies.** Despite the current available EU funding tools, hydrogen projects adopted before the reviewed framework will be in a fragile position. If the retroactive application of State aid rules can be a solution, this option remains too uncertain for businesses. Hydrogen Europe proposes therefore the European Commission **to immediately consider an ambitious approach to IPCEIs and provide additional provisional measures for hydrogen projects.**

Finally, as an active member of the European Clean Hydrogen Alliance, Hydrogen Europe expects the Alliance to properly address the funding and financing support to the pipeline projects and other enabling conditions. In this context, Hydrogen Europe supports a thorough discussion on the State aid rules needed to further enhance the investments in scale up projects.

(i) ‘Hydrogen 2030 : The Blueprint’

https://hydrogeneurope.eu/sites/default/files/Hydrogen%202030_The%20Blueprint.pdf

(ii) “Macroeconomic implications of switching to process-emission-free iron and steel production in Europe”; Mayer et al., Department of Economics at the University of Graz; November 2017