April 2022

France Hydrogène Position Paper
on the Hydrogen & Gas Package:
Toward a global framework for the renewable and low-carbon hydrogen market

On 15 December 2021, the European Commission introduced its new **Hydrogen and Decarbonized Gas Market Package**, a recast of the 715/2009 Regulation and 2009/73 Directive on the gas market. This Package comes as a complement to the Fit for 55 Package introduced on 14 July 2021, which offers a framework for the production and consumption of renewable hydrogen and derived synthetics fuels[1]. With these two packages, the European Commission's ambition is to provide **a global EU framework for the production, storage, transport, and uses of both renewable and low-carbon hydrogen to decarbonize hard-to-abate sectors** (mainly industry and transports), and to build the foundations of **a future European market for hydrogen** where this energy vector would be exchanged as **a commodity**. To this end, the Package includes measures to (1) define and certify **low-carbon hydrogen**, (2) establish **common rules for an internal hydrogen market and its infrastructures**, (3) regulate the **blending of hydrogen** into the gas network, and (4) ensure **the planification of hydrogen networks**.

KEY RECOMMENDATIONS

1. **Completing the legal definition of low-carbon hydrogen**: France Hydrogène supports the introduction of a legal definition of low-carbon hydrogen meeting a reduction threshold of 70%, and asks for the definition of a baseline in analogy to the definition of renewable hydrogen (RFNBO). The review clause set for 2031 should be removed as it will create a significant regulatory risk for the projects.
2. **Appropriate carbon methodology for electricity-based low-carbon hydrogen**: France Hydrogène calls for a methodology based on the hourly average carbon content of the electricity supplying the electrolyzer ($gCO2_{eq}$/kWh), from the electricity mix where electrolyzers are located (location-based method).
3. **Quick implementation of the Delegated Act from art. 8 of the Directive:** expected by the end of 2024, this Delegated Act will be essential to complete the definitions of hydrogen and its carbon methodology, and should therefore be adopted by the end of 2022 to provide certainty to investors and industrials.
4. **Promoting low-carbon hydrogen to decarbonize hard-to-abate sectors.** To help strengthening the EU's energy independency and resilience, and achieve climate goals, Member States should be allowed to make low-carbon hydrogen eligible to the industry and transport targets for renewable hydrogen.
5. **Ambitious requirements for the certification of hydrogen imports:** equivalent rules and requirements should be imposed on imports of renewable and low-carbon hydrogen to be certified as EU compliant, in terms of GHG emission savings, with a robust assessment of the carbon footprint in LCA.
6. **Flexible rules for vertical unbundling:** based on the rules for the common gas market, the Independent Transmission Operator (ITO) model should also be in use for the hydrogen market without a 2030-time limitation.
7. **Derogations for local private networks**: the development of an EU-wide hydrogen market will start from and within local hydrogen hubs, where economic operators should be free to invest in hydrogen production assets and local distribution pipelines without a 2030-time limitation. A negotiated third-party access should however be granted to local competing producers.
8. **Tariffs on cross-border flows of hydrogen:** France Hydrogène considers that tariffs on cross-border points should be cost reflective. Zero tariffs at cross-border points are neither necessary nor sufficient to develop the hydrogen market.
9. **A limited approach for hydrogen blending with gas**: France Hydrogène supports a maximum of 5% level cap of blended hydrogen at the interconnections of the EU gas network. Injection of hydrogen into the gas network should always be a last resort choice for hydrogen producers, offering a complementary outlet for renewable and low-carbon hydrogen consumed by natural gas users, after more direct relevant uses in industries and transports are supplied.
10. **A governance for hydrogen networks**: the temporary platform the European Commission intends to install before the launch of a European Network of Network Operators for Hydrogen (ENNOH) should include hydrogen European and national associations.

[1] See France Hydrogène's Position Paper on the Fit for 55 Package, September 2021

1. A LEGAL FRAMEWORK TO SUPPORT LOW-CARBON HYDROGEN

a. Completing the definition of low-carbon hydrogen

The 2020 EU Hydrogen Strategy show **a support for both renewable and low-carbon hydrogen**, at least for a transitional period for the latest. The Strategy defines low-carbon hydrogen as "*fossil-based hydrogen with carbon capture and electricity-based hydrogen, with significantly reduced full life-cycle greenhouse gas emissions compared to existing hydrogen production*"[2]. Within the Fit for 55 Package and the revision of the Renewable Energy Directive (RED III), a comprehensive definition of renewable hydrogen has been introduced with the category of "*renewable fuel of non-biological origin*" (RFNBO)[3]. However, **no definition of low-carbon hydrogen had been proposed**, even though low-carbon hydrogen is targeted by several reforms: the Energy Taxation Directive, the EU ETS Directive, or the Fuel Maritime Regulation.

Within the Hydrogen & Gas Package, **France Hydrogène is pleased to observe the introduction of a legal definition for low-carbon hydrogen with a GHG reduction threshold**. The European Commission fully **acknowledges here the role that low-carbon hydrogen should *"play (…) in the energy transition,*** *particularly in the short and medium term to rapidly reduce emissions of existing fuels, and support the uptake of renewable fuels such as renewable hydrogen*" (recital 9 of the Directive).

The Package introduces **a definition of low-carbon hydrogen as "*hydrogen the energy content of which is derived from non-renewable sources which meets a greenhouse gas emission reduction threshold of 70%*"** (art. 2 of the Directive). But this definition remains incomplete without any explicit mention of the baseline used for computing the reduction. **France Hydrogène asks for the definition of a baseline compatible with the Renewable Energy Directive and the EU Taxonomy for Sustainable Activities.**[4]. Such a level would **harmonize the definitions of renewable and low-carbon hydrogen**, **both subject to the same requirements in terms of GHG abatements.**

There is however no reason to introduce a distinction in terms of GHG abatements between renewable hydrogen and low-carbon hydrogen. **The review clause set for low-carbon hydrogen's threshold planned for 2031 should be removed as it will deprive the UE from much needed emissions reductions and will create a significant regulatory risk for the projects under development** (recital 9 of the Directive). Any review should at least not affect facilities which secured construction permits before the review date.

b. Adopting an adequate carbon methodology for low-carbon hydrogen

The definition of low-carbon hydrogen is followed by the creation of **a certification system extended to both renewable and low-carbon gases and fuels**, in addition to the certification already applicable to renewable hydrogen under RED. The certification system will ensure economic operators use renewable and low-carbon hydrogen compliant with the threshold and the GHG saving requirements (art. 8 of the Directive), whether they are domestically produced in the EU or imported from third countries. **This certification system should be implemented as fast as possible** to ensure correct quantities of clean hydrogen are exchanged. **Same requirements should be applied to hydrogen imports.**

---

[2] Fossil-based hydrogen with carbon capture is often referred as blue hydrogen, while hydrogen produced with electrolysis and nuclear electricity or low-carbon grid-electricity are referred as pink and yellow hydrogen.

[3] The Directive defines RFNBO as "*liquid or gaseous fuels the energy content of which is derived from renewable sources other than biomass*", which excludes relevant renewable hydrogen production pathways from biomass.

[4] The EU Taxonomy for Sustainable Activities sets a threshold of at least 3.0 $kgCO2_e$/kgH2 resulting from a reduction of 73.4 % of GHG emission compared to a fossil fuel comparator of 94 $gCO2_e$/MJ, whereas RED II yields a level of at least 3.38 $kgCO2_{eq}$/kgH2 resulting from a reduction of at least 70% of GHG emission compared to the same comparator (equivalent to the carbon intensity of the most conventional fossil-based hydrogen, hydrogen produced from steam methane reforming, at 11 kgCO2eq/kgH2).

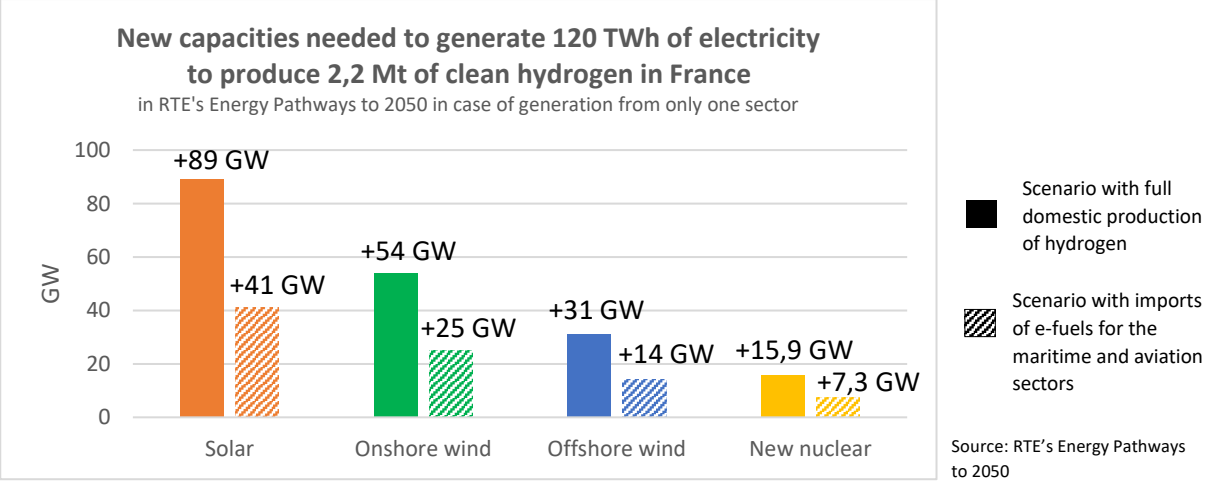
A common methodology to assess GHG reductions from renewable hydrogen and low-carbon hydrogen production pathways is still another missing piece of the puzzle, as both the Fit for 55 Package and the Hydrogen & Gas Package postpone this issue to a later date. Under the Hydrogen & Gas Package, **the Commission is empowered to adopt a Delegated Act by December 31st, 2024, to specify the methodology for assessing GHG emissions savings from low-carbon fuels** (art. 8 of the Directive).

The Delegated Act should be adopted as soon as possible by the European Commission, ideally by the end of 2022 or beginning of 2023 at the latest, right after the adoption of the Directive, to stabilize the legislation and provide certainty to investors and industrials still confused by an unclear and unprecise legal framework. Key principles of the methodology should be included in the Directive.

France Hydrogène expects different production pathways to be covered by this carbon methodology and its perimeter to be defined as a life-cycle assessment from well-to-gate, including upstream emissions. For electricity-based low-carbon hydrogen, **the future methodology to be defined by the Delegated Act should use the average hourly carbon content** (gCO2eq/kWh) **of the electricity mix where the electrolyser is located (location-based method). This key principle should be already stated in the Directive to give a clear direction to the future Delegated Act.** This method acknowledges the real carbon content of the electricity used to power electrolysers and the real level of decarbonisation of the electricity mixes, rewarding countries with an already decarbonised electricity mix[5].

c. Promoting low-carbon hydrogen as a substitute to fossil fuels

Investing in the deployment of electrolysers is a no-regret scenario to help decarbonize hard-to-abate sectors in the industry (refineries, fertilizers, steel…) and the transport sector (road, railway, maritime, aviation). Large volumes of renewable and low-carbon hydrogen will be needed to substitute fossil energies in those sectors (gas, petrol, coal). The production of 10 million tons of clean hydrogen targeted by the EU by 2030 requires 550 TWh of electricity and hundreds of GW of new dedicated renewable capacities. **With a risk of a lack of additional renewable electricity, low-carbon electrolytic hydrogen can contribute as a complement to the ramp-up of the electrolysis market and help match the EU demand for clean hydrogen**. A mix of renewable and low-carbon electricity (from onshore and offshore wind, solar, hydro, and nuclear power) should be used to produce domestic hydrogen, toward **EU's energy independency and resilience**.



Source: RTE's Energy Pathways to 2050

The World Energy Council's recent study on the demand and offer of hydrogen in the EU shows that countries such as France using all renewable and nuclear power generation sources to produce clean

[5] According to Ember, in 2030, countries such as Austria, Portugal, Slovakia, Finland, France, Sweden, Denmark will all have electricity production with carbon intensity below 59 $gCO2_{eq}$/kWh compatible with a 3.24 $kgCO2_{eq}$/kgH2 for low-carbon hydrogen (link)

hydrogen can match their hydrogen demand by 2030 and 2050, while other **EU countries relying exclusively on renewable energies will have to resort to about 50% of imports of hydrogen to feed their demand**[6].

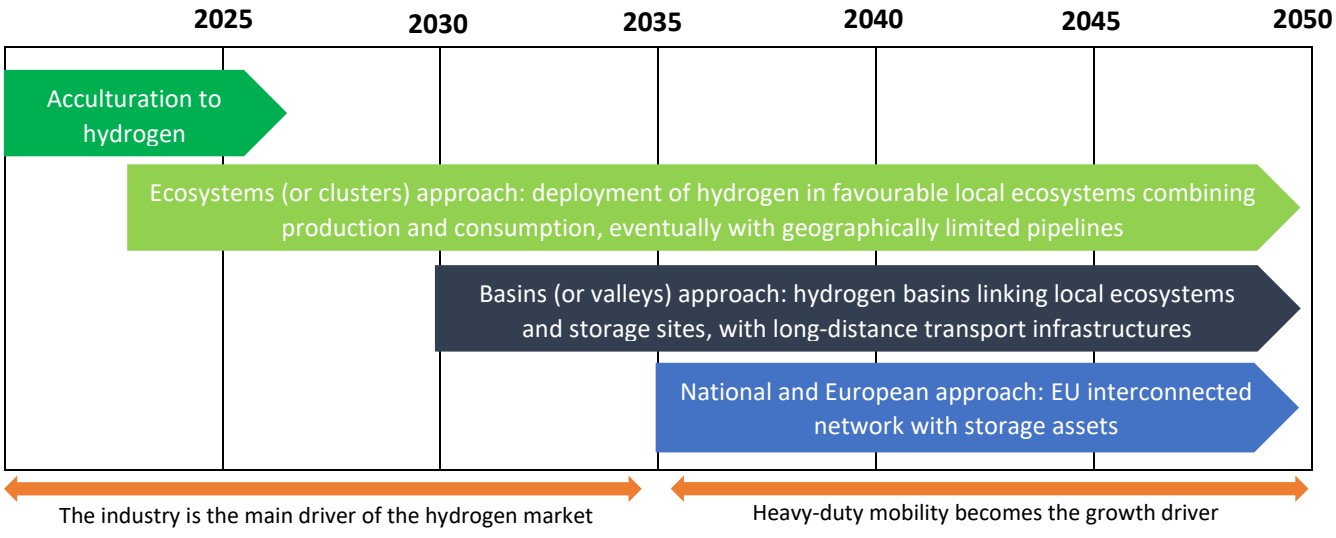
The RED III targets to support the demand for renewable hydrogen in the industry and the transport sectors should be opened to integrate all types of low-carbon hydrogen. **Member States should be free to decide whether to account low-carbon hydrogen to the objective of 50% of renewable hydrogen within their industrial consumption and the 2.6% of renewable hydrogen and derivates** in the final energy consumption of the transport sector by 2030. This measure would take into account national circumstances and Member States' choices in terms of their energy mix.

2. A FLEXIBLE AND PROGRESSIVE FRAMEWORK FOR THE FUTURE HYDROGEN MARKET

a. The nascent clean hydrogen market will follow progressive steps of development

With the Hydrogen & Gas Package, the Commission aims at defining the rules to regulate a future hydrogen market in the EU, inspired by the market design for electricity and gas. **France Hydrogène considers that the rules to define a market design for hydrogen should be rather flexible and progressive**, as too many constraints and regulations would risk impeding an emerging renewable and low-carbon hydrogen market to develop fast enough in an international race for the leadership on hydrogen technologies[7]. If abuse of market power should be avoided and competition guaranteed, these concerns should not impede the massive investments the sector currently needs to achieve the EU targets of 40 GW of electrolysis capacities and 10 million tons of clean hydrogen by 2030 from the 2020 EU Hydrogen Strategy.

Development of the hydrogen sector in France by 2050



Source: GRTgaz & Térega

Regulators should have in mind the history of development of capital-intensive industries such as the electricity, gas or railway markets in the 19th and 20th centuries. Just like them, **the development of hydrogen will start from local hubs – industrial, harbour, airport, freight terminal areas** – associating different bricks of the hydrogen value chain, from production to uses, including transport and storage of hydrogen.

[6] World Energy Council, *Decarbonised hydrogen imports into the European Union: challenges and opportunities*, October 2021
[7] As examples, the Biden Administration has adopted in November 2021 its Infrastructure Investment and Jobs Acts with 9.5 billion dollars targeted to ambitious clean hydrogen programs, while China is reflecting on setting a 100 GW national target for electrolysis.

Then, national markets will emerge from the progressive connexions of these hubs with each other's, thank to longue-distance transport networks mainly built from the repurposing of existing gas infrastructures[8]. To prevent undue delay, **France Hydrogène supports the grandfathering of authorisations** (licences, permissions, concessions, or approvals) granted under national law for the construction and operation of existing gas pipelines and other network assets once the transported gaseous energy carrier in a gas pipeline changes from gas to pure hydrogen (art. 7 of the Directive). At a later stage, **cross-border interconnections will finalize the emergence of an EU-wide common hydrogen market** where hydrogen would be a tradeable commodity between producers and consumers, both within the EU and with third countries.

b. The hydrogen market needs more flexible rules for vertical unbundling

Considering the hydrogen sector is still in a start-up phase, **a progressive and flexible approach should be favoured** before regulating the future common hydrogen market with the current rules in use for the gas and electricity markets: third party access, cost-reflective tariffs, unbundling principles, or free choice of suppliers.

The Package imposes a principle of vertical unbundling of hydrogen networks from energy production and supply activities to avoid the risk of conflicts of interest (art. 62 of the Directive), meaning hydrogen network operators cannot be part of a company group that is also engaged in gas, hydrogen or electricity production or supply activities.

France Hydrogène is of the opinion that the provisions enforcing a too strict ownership unbundling should be avoided. The current unbundling rules for natural gas should be extended to hydrogen. Legal unbundling should certainly be applied (separation of network operation activities in a distinct legal entity). In other words, **current T/DSOs should be allowed to develop hydrogen activities under the same unbundling rules as for methane in the future, with the model of Independent Transmission Operator (ITO) beyond 2030. The 2030 time-limitation applicable to the ITO model should be removed** (art. 62 (4) of Directive) **to allow it as an option for hydrogen activity even after 2030.**

c. Derogations for existing and future local private networks

A first network of 1.200 km of hydrogen pipelines is already in operation in the north-western part of Europe, between France, Belgium, the Netherlands, and Germany, including 303 km of private pipelines in France directly connecting hydrogen producers to industrial consumers.

France Hydrogène is pleased to see that the European Commission considers these "*localised hydrogen clusters*" as "*an important building block of the European hydrogen economy*". That is why **France Hydrogène shares the idea that "*such clusters could benefit from simplified regulatory requirements during the ramp-up phase of the hydrogen market*"** (recital 75 of the Directive).

Member States should therefore **exempt or grant derogations to private operators from the obligations of the regulated regime** such as unbundling rules, third-party access, transparency requirements, or network codes. Existing private networks (at the entry into force of the Directive) and "***geographically confined hydrogen networks***" (art. 47-48 of the Directive) **should be exempted not only during a transitional period up to 2030. but as long as no competing renewable or low-carbon hydrogen producer has expressed its will to get access to the network,** to ensure a level playing field between competing local

[8] With its Hydrogen European Backbone, the Gas for Climate coalition estimates that 70% of a future EU-wide hydrogen network (about 40.000 km in 2040) could be obtained from the reconversion of existing gas infrastructures, while the 30% left would require new built assets.

producers. In such a case, a negotiated third-party access should be guaranteed between operator and network user**.**

d. Toward an integrated EU market with international dimensions

Each hydrogen network operator will have to build sufficient cross-border capacities for the integration of a European hydrogen infrastructure (art. 46 of the directive). For an integrated market, the Commission proposes that hydrogen network access tariffs will also be fully exempted at the level of cross-border interconnections (art. 6 of the Regulation). **France Hydrogène considers that tariffs on cross-border points should be cost reflective. Zero tariffs at cross-border points are neither necessary nor sufficient to develop the hydrogen market**:

- In the mature EU gas market, the existence of cross-border transmission tariffs did not hamper the functioning of this interconnected market.
- Setting zero cross-border tariffs will not be enough to develop an interconnected hydrogen market.
- It could also raise questions on the remuneration of hydrogen network operators for "transit" or "cross-border" flows. In any case, massive investments in the production and usage of hydrogen are probably required in first instance, before considering cross-border exchanges.

The European Commission also orientates the future EU market toward international trade. The Package covers the case of hydrogen interconnections with third countries (art. 49 of the Directive). International agreements between the EU and a third country will have to specify the expectations in terms of third-party access to the network, separation, and **certification of renewable and low-carbon hydrogen**. France Hydrogène insists **it will be essential to develop international norms and standards to enable the development of an international market of hydrogen with equivalent rules to the EU framework for renewable and low-carbon hydrogen. Imports of renewable and low-carbon hydrogen should be subject to the exact same requirements in terms of GHG emission savings, as well as subject to a robust assessment of the carbon footprint** in life-cycle analysis using location-based method for electricity emissions to avoid any environmental dumping and greenwashing practices.

3. BLENDING OF HYDROGEN WITH GAS AS A COMPLEMENTARY OPPORTUNITY FOR HYDROGEN PRODUCERS

The Package aims at the integration of growing volumes of renewable and low-carbon gases in the European gas system to **decarbonize the current uses of gases (building, industry, transports)**. Together with biomethane and synthetic methane[9], hydrogen is targeted as one of these renewable and low-carbon gases the European Commission intends to stimulate.

However, **the blending of hydrogen into the gas system offers relatively moderate relevance, both in terms of cost-effectiveness and decarbonisation**. A 20 % share of hydrogen blending by volume would raise the price of wholesale gas by around 33 % but reduce emissions only by 7 % given the different physical properties of hydrogen and methane[10]. Moreover, as ACER points out, most EU countries cannot even accept a blending level beyond 6% today[11], meaning only 2 % of GHG emissions reductions. Finally, blending can affect the operation of gas infrastructure, end-user applications, and the interoperability of cross-border systems.

Therefore, **renewable and low-carbon hydrogen should rather be strategically used to decarbonise hard-to-abate sectors consuming pure hydrogen**. Blending of hydrogen with gas should not be forbidden for as much, but **the utilisation of hydrogen for natural gas consumers should be evaluated in a merit order as**

[9] Produced by combining hydrogen with CO2 such as biogenic CO2 from methanisation units
[10] Agora Energiewende, *12 Insights on Hydrogen*, November 2021
[11] ACER, *NRA Survey on Hydrogen, Biomethane, and Related Network Adaptations*, July 2020

a third complementary transport outlet for hydrogen producers, after more relevant direct uses of renewable and low-carbon hydrogen for the decarbonisation of industries and heavy-duty transports.

As a result, **France Hydrogène is pleased with the European Commission's proposal to not impose any blending mandate for hydrogen in the national gas systems**, but only to introduce an EU-wide maximum blended hydrogen level cap of 5% that TSO will have to accept at cross-border interconnection points, starting from October 2025 (art. 20 of the Regulation). This measure would limit the risks of market segmentation, while letting Member States free to choose to integrate their own level of blended hydrogen up until 5% or even adjacent Member States to agree for higher levels.

4. TOWARD A FUTURE GOVERNANCE AND PLANIFICATION OF HYDROGEN NETWORKS

In order to ensure the management and transparency regarding the development of the hydrogen network in the EU, the Package includes **the creation of a European Network of Network Operators for Hydrogen (ENNOH)**, composed of certified hydrogen system operators. In parallel to ENTSOG and ENTSOE, the ENNOH will have a mandate to establish, publish and regularly update a non-binding Union-wide ten-year network development plan (TYNDP) for hydrogen infrastructures by 2026 (art. 40-43 of the Regulation). The ENNOH will assess the needs of the developing hydrogen markets. It will participate in the development of the energy system with cost-benefit analysis, including electricity, gas and hydrogen transport infrastructure as well as storage, LNG terminals and electrolysers, in liaison with the ENTSOG and the ENTSOE.

Until the ENNOH is established, **a temporary platform should be set up under the lead of the European Commission with the involvement of all relevant market participants** (art. 41 of the Regulation). This platform should support early work on scoping and developing issues relevant for the building up of the hydrogen network and markets without formal decision-making powers. **France Hydrogène asks for the integration of relevant professional associations, including Hydrogen Europe and national hydrogen associations**, as they gather the whole hydrogen value chains (producers, transporters, consumers) and can provide their expertise to assess national offer and demand for clean hydrogen.