

Draft Background Note ERCST hydrogen work stream Needs and Reality webinar June 16th

The European Green Deal is entering a crucial phase where there is an evident change from exploration and preparation to delivery in which the substantial issues of the various legislative and non-legislative developments are being exposed. In this context, hydrogen is not an exception. However, there is a considerable level of uncertainty when it comes to the implementation of the objectives foreseen in the European Commission strategy and the regulatory framework which will enable the achievement of these objectives. This background note summarizes key issues identified during ERCST inception meeting on Hydrogen held on May 4th, which need further discussion and clarification.

1. Background of the discussions

European Commission Strategy: On 8 July 2020 the European Commission adopted its hydrogen strategy which originally was supposed to be part of the Energy System Integration Strategy and subsequently individualized due to the tremendous momentum hydrogen was gaining. The aim of the strategy is to create an enabling framework to scale up renewable hydrogen supply and demand in line with the EU climate neutrality objective, recognizing a role for low-carbon hydrogen in the short and medium term. The strategy foresees a gradual development for this technology, with three phases of development of the hydrogen economy, at different speed across different industry sectors.

European Council Conclusions: Heated discussion took place in the Council about the role of low-carbon hydrogen, where east European countries and France were pushing, respectively, to produce hydrogen through the reforming of natural gas with carbon capture and hydrogen produced from nuclear. Finally, the Council adopted conclusions in December 2020, with a focus on renewable hydrogen for decarbonization, recovery and competitiveness recognizing again a role for low-carbon hydrogen limited to the transition.

Own Initiative Report in Parliament: ITRE, the leading committee in charge of the parliamentary Own Initiative on hydrogen approved its Report in March, which was subsequently passed in plenary on May 19th. The report highlights the need to timely foster the deployment of Hydrogen relaying on low-carbon hydrogen for its production during a transition phase until enough additional renewable capacity is ready allowing the switch to renewable hydrogen. It also points out that hydrogen is not the silver bullet for decarbonization, but it is a solution to decarbonize the hard to abate sectors having a huge potential to reduce emissions in the industry. It also recognizes that there is a bottle neck when it comes to infrastructure and pointed out that when public resources are invested in new pipelines, the risk of stranded assets should be avoided.

2. The Hydrogen Economy, needs and reality

Among the conclusions drawn from ERCST inception meeting on Hydrogen:

- We have seen how key stakeholders in the production, transportation and the demand side of the market see hydrogen differently. While in the production side, discussions are mainly driven around the implications of a technology neutral approach to hydrogen, the demand side in some of the hard to abate sectors, such as chemicals or steel, see hydrogen more as a low carbon commodity, being decarbonization, costs and incentives the key enablers.
- In the center of both, views on hydrogen transportation vary between the different market players such as, electricity utilities, the fossil fuel industry, gas TSOs, and potential consumers. Some of them share the view that there is a timely need to start building a hydrogen transportation infrastructure to stimulate hydrogen production and demand, while others argue that the deployment of a hydrogen infrastructure prior to a certain degree of demand growth, risks the creation of stranded assets and put pressure on the deployment of this technology.

Some of the key issues identified during ERCST previous meetings on hydrogen can be summarized as follows:

2.1. Supply:

- **Classification of the different production processes:**
 - So far, there is not a binding or legal classification for the different hydrogen production processes. The European Commission mentions some of them based on the range of emissions, technologies, and energy sources, while some industries prefer to use a color-based/carbon footprint classification.
 - The question here is, do we need a binding classification for production processes, why? And based on what?
- **Technology neutrality principle:**
 - There is an unresolved debate between the application of the technology neutrality principle and the promotion of renewable hydrogen, reflected in the discussions about the role of low-carbon hydrogen in the transition.
 - This debate reaches greater relevance when talking about incentives. It is still not clear, which sorts of hydrogen production processes will be incentivized, how, and where (in which pieces of legislation) these incentives will be enshrined.
 - In this context the question that arises is: what is the role of the technology neutrality principle in the deployment of a hydrogen economy?
- **EU hydrogen Imports vs. EU own production:**

- Once decided that the EU will rely partly on hydrogen to meet its decarbonization objectives, there are two main scenarios:
 - one where the EU produce all the hydrogen needed and;
 - another one where the EU relies to a greater or lesser extent on imports.
- In this sense, one could argue what is more desirable at an EU level, whether to import renewable and low carbon hydrogen from third countries or to incentivize the production at home.
- **Hydrogen production scarcity:**
 - The hydrogen production in the future will be inevitably linked to the demand and today, it is not clear what the future hydrogen demand will be. Demand forecasts vary considerably.
 - In this sense, the question that arises is the following: will there be a hydrogen scarcity or there will only be a scarcity of hydrogen with certain characteristics and produced by certain sources?
- **Pieces of legislation/policy at stake:** RED and EED revision, Gas Directive and Gas Regulation revision, National Hydrogen strategies, ETS, Innovation fund, Delegated Act on Additionality, State Aid, EU Taxonomy, Recovery and Resilience Facility, Horizon Europe.

2.2. Demand:

- **Hydrogen Demand Forecasts:**
 - Considering the different forecasts for hydrogen demand for 2050 which range from 270 Twh¹ to 2080 Twh², the uncertainty regarding what the hydrogen demand will be is considerable.
 - This is mainly because of three factors:
 1. The use of hydrogen in certain subsectors of the economy is still controversial, such as heating, road transport and high temperature industrial heat.
 2. Although several studies have been carried out, we don't know neither how prices for the different production processes will evolve and;
 3. Nor where incentives will be placed and when the new business models will be profitable/sustainable.
 - Taking this into account, it is possible to forecast the hydrogen demand for the future? Is the no-regret approach a good option to size up the market?
- **Demand, The Market Economy vs. Regulation:**

¹ Agora Energiewende, No-regret hydrogen, 2021, <https://www.agora-energiewende.de/en/publications/no-regret-hydrogen/>

² Bruegel, Navigating through hydrogen 2021, <https://www.bruegel.org/2021/04/navigating-through-hydrogen/>

- We have just mentioned during our introduction that actors in the production, transportation and demand side of the market see hydrogen differently.
 - In this sense, the demand side of the market sees hydrogen more as a low-carbon commodity, and therefore investment decisions on the demand side will be fundamentally based on a costs / incentives approach.
 - Under the current regulatory framework green and low carbon hydrogen are not cost competitive with fossil fuel-based hydrogen, and incentives are very limited, the current ETS carbon price does not guarantee neither an automatic switch to green and low carbon hydrogen.
 - In his context, is regulation going to shape market forces, meaning that the hydrogen economy will end up being a EU/MS controlled economy or, the other way around, are market forces going to shape the regulatory framework?
- **Pieces of legislation/policy at stake:** RED and EED revision, Gas Directive and Gas Regulation revision, National Hydrogen strategies, ETS, Innovation fund , State Aid, EU Taxonomy, Recovery and Resilience Facility, Horizon Europe.

2.3. Different sorts of demand incentives:

- Different sorts of incentives are currently being discussed such as, EIB guarantees, sustainable finance support, ETS innovation fund financing, Hydrogen IPCEIs and relaxation of state aid rules, quotas or certain sectors or CCfD.
 - What are the best ones to rump-up hydrogen demand?
 - Should these incentives be placed in the supply or in the demand side of the market?

2.4. Transportation Infrastructure development

- **Transportation infrastructure development pace:**
 - Market players, along the entire hydrogen value chain see things different.
 - Some of them, sustain that rushing into the development of a hydrogen transportation infrastructure without certainty on the production and demand side, risks the creation of stranded assets.
 - Others think that the development of infrastructure is needed to rump-up both, demand and supply.
 - What is the right approach?
- **Pieces of legislation/policy at stake:** Gas Directive and Gas Regulation revision, National Hydrogen strategies, ETS, Innovation fund, State Aid, EU Taxonomy, Recovery and Resilience Facility, TEN-E, TEN-T.

2.5. Link between hydrogen and other legislative acts.

- The current hydrogen regulation and policy is scattered over gas, electricity, fuels, emissions, industry, transport, heating, sustainable finance taxonomy etc. with reduced coordination, which increases the risk of misalignment.
- For now, it is not clear how the European Commission plan to make use of the different legislative instruments for the regulation and development of a Hydrogen economy.
- **Revision of the Renewable Energy Directive:** There are two main issues around the Renewable Energy Directive revision and hydrogen:
 - **Scope:** Is the scope of the renewable energy directive going to be extended beyond renewable hydrogen and cover other forms of low-carbon hydrogen?
 - **Incentives:** What production processes and in which sectors are going to be incentivized? Just hydrogen produced by new-additionally built renewable electricity, hydrogen produced by renewable electricity or also low-carbon hydrogen? In which sectors?
- **Revision of the Gas Directive and the Gas Regulation:** The review and revision of the Gas Directive 2009/73/EC and Gas Regulation (EC) No 715/2009 is referred to by the EC as the hydrogen and decarbonized gas market package.
 - There is currently a public consultation opened on this topic, which will close on June 18th. This piece of revised legislation will address, among others, issues related with the construction of a regulatory framework ready to address the hydrogen market needs, mainly its transportation. Some of the key issues are:
 - If the hydrogen regulatory elements are going to be addressed in the previously mentioned pieces of legislation or in a separate one.
 - How barriers to repurposing are going to be addressed.
 - If blending is going to be promoted.
 - If electroliers are going to be regulated or market assets.
- **The EU Taxonomy:** The EU taxonomy will contribute driving investment towards sustainable activities.
 - In the Taxonomy DA, producing hydrogen is sustainable as long as emissions are under 3 tons of CO₂ per ton of hydrogen and complies with the DNSH principle.
 - These requirements make production processes other than from renewables hardly compliant.
 - For example, the compliance of low-carbon hydrogen, will depend on the development of the CCS technology and nuclear electricity eligibility
 - Conversion/repurposing of existing natural gas networks to hydrogen 100% substantially contributes to climate change mitigation.

- Is the EU taxonomy the closest we have in EU legislation right now to a Hydrogen definition when it comes to incentivizing the different production pathways?
- Is blending going to be considered sustainable?
- **Others:** State Aid, TEN-E Revidion, ETS.

Questions to inspire the discussions:

- Do we need a binding classification for hydrogen production processes, why and based on what?
- What is the role of the technology neutrality principle in the deployment of a Hydrogen economy?
- What are the best ways to incentivize hydrogen demand with a special focus on the hard-to-abate sectors? Should incentives be placed on the demand or the supply side of the market?