Consultation from the EU commission on draft methodology for low- carbon hydrogen

Position from Sfen (October 25, 2024)

1. On the impact of time restrictions on the efficiency of electrolysers

The European Commission mentioned in its draft Annex to the Commission delegated regulation that *"State aid does not unduly distort competition.".* It is noted that *"Such safeguards may by way of example include time limitations to the use of electricity in certain production processes."* **Such a provision may undermine France, and the European Union (EU) in general, in the development of competitive clean hydrogen production.**

As a reminder, one of the key recommendations of the Draghi report is for the EU to "*Secure a minimum share of EU autonomy in the supply of selected clean technologies and their components across the different steps of the value chain in an integrated way".* Future regulation should facilitate **competitive production of clean hydrogen in the EU**.

The objective of State Aid is to make the clean hydrogen produced in the EU competitive vs. fossil hydrogen. This is all the more challenging that major studies (IEA, 2019; RTE, 2020; CRE, 2021) converge towards a range between €1.5 and €2 per kgH_2 for fossil hydrogen.

In France, most studies (CRE, 2021; RTE, 2020; CEA, 2022) converge on the conclusion that a continuous electricity supply (over 7000 hours per year) is the optimal operating mode to make clean hydrogen to be more competitive (amortization of the cost of electrolysers), and prevents degradation related to load variations.

One might argue that, for the hydrogen produced to qualify as clean in France, electrolysers should only operate during periods when clean electricity sources (renewable energies and nuclear power) are marginal. However, even if peak demand may require thermal fossil plants in the short term, electricity from fossil sources have only represented 4,2% of the electricity mix in France in the first half of 2024 (RTE). In the longer term, the country's plan is to increase clean electricity production to 580-640TWh by 2035 (DGEC) from 445TWh in 2023. Focusing on the short term may hinder the development of new infrastructure which is necessary for the longer term.

2. On the impact of the European Commission's postponement of its assessment of alterative pathways

The European Commission has postponed its assessment until July 1, 2028, regarding the impact of introducing alternative pathways, notably to source low-carbon electricity from nuclear power plants.

The European industrial alliance on small modular reactors (SMRs) was established in February 2024 by the EU Commission to facilitate and accelerate the development, demonstration, and deployment of SMRs in Europe by the early 2030s. **The postponement of the delegated act to 2028 regarding the application of electrolysers via alternative pathways, which includes nuclear, may create uncertainty for investors who need a long-term vision on future applications of SMRs, and associated revenues.** Such a decision would go against the objectives pursued by the SMR alliance.

3. On the overestimation of lifecycle emissions for nuclear

Considering a yield of 33%, in its annex the European Commission obtains a **nuclear emission factor of 13.09 gCO2eq/kWh**. This number appears to be overestimated compared to some recent papers. Also, continuous progress in uranium extraction and the increased use of decarbonised electricity in enrichment processes (main factors of emissions) are expected to contribute in reducing again CO2 emissions from nuclear.

On a global scale, in its full report 'Green Energy Choices: the Benefits, Risks and Trade-Offs of Low-Carbon Technologies for Electricity Production', UNECE states that the life-cycle greenhouse **gas emission factor for nuclear power is between 4.6 and 6.3 gCO2 equivalent per kWh.**

On a European scale (Poinssot and al. Elsevier, 2014) nuclear power emissions would be within the range of **6 to 10 gCO2eq/kWh.**

For France, EDF (2020) indicates that CO2 emissions from nuclear energy amount to **3.1 gCO2 equivalent per kWh.**

Sources

Avis de la SFEN, Contribution du nucléaire dans la nouvelle stratégie hydrogène française – février 2024

The future of European competitiveness – In-depth analysis and recommendations 2024

Assessment of the environmental footprint of nuclear energy systems. Comparison between closed and open fuel cycles, Poinssot & al Elsevier 2014

Green Energy Choices: the Benefits, Risks and Trade-Offs of Low-Carbon Technologies for Electricity Production UNECE 2016