Equinor's priorities on the upcoming delegated act defining a methodology for the greenhouse gas assessment of low-carbon hydrogen

Background

Equinor has welcomed the Hydrogen and Decarbonised Gas Market Package (Directive and Regulation), soon to enter into force. The package is expected to play a key role in the market ramp-up for hydrogen by, for the first time, providing a clear definition of "low-carbon hydrogen" and therefore complementing the existing framework of the Renewable Energy Directive (RED) on renewable hydrogen.

As one of the prerequisites for hydrogen to be classified as "low-carbon", the new Gas Market Directive stipulates a threshold of at least 70% greenhouse gas (GHG) savings in comparison to the fossil fuel comparator of 94 g CO_2e/MJ. To enable market participants to prove compliance with this requirement, Article 9(5) of the Directive mandates the Commission to adopt a delegated act (DA) on the methodology to assess the greenhouse gas balance of low-carbon hydrogen.

Ahead of this act's adoption, Equinor wishes to provide recommendations on certain design choices. These recommendations build on the assumption that the DA will be closely oriented around the existing DA 2023/1185 on GHG savings of recycled carbon fuels (RCF) and renewable fuels of non-biological origin (RFNBOs).

Low-carbon hydrogen (LCH) could be produced by various technologies, but hydrogen based on natural gas with carbon capture and storage (CCS) or from nuclear energy are expected to represent most of the production. **With regards to LCH production, Equinor focuses on LCH based on natural gas from the Norwegian Continental Shelf (NCS) and CCS with an achievable lifecycle GHG intensity of ca. 0.6 to 1.8 kg CO_2e/kg H_2 (5 to 15 g CO_2e/MJ)[1].**

The carbon intensity of LCH varies considerably depending on the average carbon intensity of the electricity grids in different geographical areas. While the numbers mentioned above exclude onshore natural gas transport from landfall to the hydrogen factory gate and hydrogen distribution, it can still be seen that **the LCH produced by Equinor can fulfill the 70% threshold stipulated by the Directive** (i.e. its carbon footprint is below the maximum value of 28.2g CO_2e/MJ).

The following pages include our detailed recommendations.

[1] The upper bound in this case represents LCH production in the Netherlands with NCS gas and today's Dutch average grid electricity carbon intensity of 321 g CO2e/kWh. All else being left unchanged, the upper bound could be reduced from 1.8 to 1.1 kg CO2e/kg H2 (9.1 g CO2e/MJ) if the Netherlands were to reach the EU average 2030 target of 118g CO2e/kWh. The lower bound represents LCH production in Norway (less emissions from transporting the natural gas and CO2) with its average grid electricity carbon intensity of 17g CO2e/kWh.

Our views and recommendations

I. Natural gas input to LCH production

Main recommendations:

- Allow the use of certified values for natural gas upstream emission intensity.
- Clarify the definitions of 'incorporated process' and 'upstream emissions'.
- Establish a transparent, credible and accurate mechanism, with independent third-party verification, to track the GHG emission intensity of natural gas production and supply to Europe and require transparency on carbon intensity from LCH producers.
- For transport-related GHG emissions, provide realistic default values, while allowing the use of certified data, if available. In the case of LNG, transport emissions should cover both ballast and laden voyages.

Explanations:

[redacted]

[redacted]

[redacted]

II. Electricity input to LCH production

Main recommendations:

- Allow for project-specific carbon intensity of the electricity used in LCH production (via Power Purchase Agreements, PPAs).
- Allow to claim zero-carbon intensity for electricity from renewable sources not fulfilling all the criteria of delegated act 2023/1184 ("additionality delegated act"), and without the limits imposed by the annex, point 6, litra b and c in delegated act 2023/1185 (on the methodology for calculating life cycle GHG emissions for RFNBOs).

Explanations:

[redacted]

[redacted]

[redacted]

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