European Commission draft delegated regulation and annex: Methodology to determine the greenhouse gas (GHG) emission savings of low-carbon fuels

Feedback submitted by the Hydrogen Science Coalition (HSC)

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Feedback

The Hydrogen Science Coalition (HSC) is an independent expert group of academics, scientists and engineers working to deliver an evidence-based viewpoint on hydrogen's role in the energy transition for policymakers, free of vested interest.

We applaud the European Commission's work to create robust twin definitions for renewable and low-carbon hydrogen. Both are vital to enabling the implementation of a targeted and science-backed role for hydrogen in the energy transition that effectively contributes to achieving net-zero emissions by 2050.

This methodology to determine the greenhouse gas (GHG) emission savings of low-carbon fuels represents an important final policy step in completing these standards and ensuring hydrogen emissions are reduced in practice.

This will allow the European Union to build a future-proof hydrogen supply system that ensures the competitiveness of European industry: preventing future stranded assets, wasted investment of public funds, and continued reliance on fossil fuel energy imports.

It will also ensure a level playing field in the hydrogen industry: giving confidence that any hydrogen used in the EU meets the same standard of clean, simplifying hydrogen trade, and ensuring subsidies for hydrogen manufacture do not favour one sector over another.

Please find below our feedback on this draft methodology.

Maximum emissions threshold: The HSC suggests that the 70% emissions reduction threshold for renewable and low-carbon hydrogen compared to fossil fuel comparators, equivalent to 3.38 kg of CO2e per kg of hydrogen in lifecycle emissions, be progressively lowered to 1 kg of CO2e per kg of hydrogen (HSC, 2023). This represents an achievable emission savings of more than 90% that is consistent with the EU's 2050 GHG emission goals, and will incentivise investment in best available technologies for hydrogen production.

Upstream methane emissions: The HSC advises that project-specific values be used for the carbon intensity of upstream gas. Proper accounting of upstream methane emissions requires knowledge of the source of the gas, and it is not appropriate to use a single default value for upstream GHG emissions for gas produced locally in the EU and for gas produced outside the EU and transported to the EU as a liquid. The latter, in particular, has a considerable and known GHG emissions premium associated with it (Howarth, 2024). The GHG emissions, including upstream methane emissions, of any energy used to capture, compress, dry and transport CO2 for subsurface disposal must also be accounted for. It appears that Annex paragraph 17 takes this latter factor into account, which is a positive development.

Global warming potential of hydrogen: The HSC advises that sufficient research has been conducted to establish reliable global warming potential (GWP) figures for hydrogen (Sun *et al.*, 2024; Sand *et al.*, 2023). In the unlikely event that these figures are revised lower in subsequent research, the Annex can be amended accordingly at that time.

Grid-based production: The HSC advises that electricity inputs for hydrogen production must be additional to the grid, temporally matched (on an hourly rather than annual basis as is currently proposed in the Regulation), and physically proximate such that the operation of electrolysers will not materially increase the GHG emissions of the local grid. These three conditions are necessary to ensure genuine emissions reductions and alignment with existing requirements for renewable hydrogen.

Electricity inputs: The HSC advises that lifecycle assessment values of actual GHG emissions for all energy sources, including renewable electricity, be used. Electricity counted as "fully renewable" per Article 27(6), second subparagraph, of Directive (EU) 2018 is considered to have zero GHG emissions, but all renewable electricity is associated with some level of GHG emissions, and the subsequent use of even truly renewable electricity in low-efficiency conversions to fuels can result in a multiplication of these emissions. The net result can be considerable GHG emissions in lifecycle terms, which will be underestimated by this Regulation if the electricity component used in making these fuels is arbitrarily assigned a GHG emission value of zero (De Kleijne *et al.*, 2024).

Transparent third-party audit: The HSC advises that all data be independently verified by approved auditors, ensuring that reported information corresponds to real-world data rather than averages, and that at no stage is the emissions reduction threshold exceeded.