Terms of Reference - Testing of Green Hydrogen Projects in accordance with the Green Hydrogen Standard

The response to the launch of the Green Hydrogen Standard in May 2022 has been outstanding.[1] [2] There is a growing appreciation of the need for global standards and strong support for GH2's approach. GH2 is now collaborating with several leading green hydrogen producers on a collaborative project to further test and refine the procedures for green hydrogen accreditation and certification.

The participating companies will nominate a green hydrogen project (or several projects) to be independently evaluated in accordance with the Green Hydrogen Standard. Testing at an early stage of project development will identify any issues or concerns that may constitute a barrier to GH2 accreditation and certification. Participating companies will receive a confidential report summarizing the findings.

Participating companies will also be invited to join a working group that will oversee the design and execution of the project. Parallel to the project evaluations, the working group will further refine the methods and procedures to be adopted in GH2 accreditation and certification. This test phase will help identify any gaps or ambiguities in the Standard, and opportunities to further align the Standard with industry best practices. The review will give priority to issues of particular interest to project developers, including:

- The protocols for verifying greenhouse gas emissions of <1kg CO_2 / kg H_2 in accordance with the agreed system boundaries;
- Developing an agreed procedure for quantifying the greenhouse gas emissions associated with the storage, conversion and delivery of H_2 and its derivatives, particularly ammonia;
- Reviewing and applying emerging best practice relating to embodied emissions;
- Elaborating the procedures for verifying that project developers have considered "technically feasible and cost-effective measures to support the deployment of additional renewable energy capacity" in accordance with requirement 5a. Optionally, the project will independently assess whether the green hydrogen projects are "RFNBO ready", i.e., whether the project meets the European Commission's proposed definition of "renewable hydrogen" as per the 2018 Renewable Energy Directive, which would apply to hydrogen produced and imported into Europe. [3]
- Evaluating the provisions related to the utilisation of water (including desalination) and wastewater treatment;
- Elaborating the "exceptional circumstances", in accordance with §1.1, whereby GH2 may consider projects involving other renewable non-fossil sources, where these projects meet the same emissions and sustainability standards.

This approach has a number of benefits for participating companies:

- Participating companies will have an opportunity to shape the procedures and evidentiary requirements that will be applied in accreditation and certification under the Green Hydrogen Standard.
- GH2 will acknowledge and promote the role that participating companies are playing in participating in the test phase. Participating companies will be able to identify themselves as front-runners in adoption of the Green Hydrogen Standard.

The project will be administered by the GH2 Secretariat, who will engage an independent assurance specialist (or several specialists, as needed) to conduct project evaluations and work to support the development of assessment templates and guidance notes.

[1] https://gh2.org/article/industry-leaders-welcome-launch-global-green-hydrogen-standard

[2] https://gh2.org/our-initiatives/gh2-green-hydrogen-standard

[3] The European Commission's approach to defining renewable hydrogen has not yet been finalised. Two draft proposals were presented in May 2022. The first proposal, covering Renewable Fuels of Non-Biological Origin (RFNBO) establishes the criteria for products that fall into the "renewable hydrogen" category. The second proposal on the methodology for GHG savings puts forward a detailed scheme to calculate the life-cycle emissions of renewable hydrogen as well as recycled carbon fuels to meet the greenhouse gas emission reduction threshold set in the Renewable Energy Directive. The project will test green hydrogen projects against the "final" proposals expected in September 2022. The European Parliament and the Council will then exercise a two-month scrutiny period over the proposals before their final adoption by the Commission.

Participating companies would be expected to:

- Nominate a contact point for each project who can liaise with GH2 and the consultants regarding the project concept and design. These consultations will be undertaken virtually.
- Nominate a contact point for media and communication activities.
- Optionally, nominate a contact point to join a working group that will oversee the project.

GH2 will ensure that appropriate safeguards are in place to address competition and anti-trust obligations and to safeguard proprietary information including non-disclosure agreements and data rooms. Any disclosure of information relating to individual projects will be confirmed with the project proponent in advance.

Timing

Project testing is expected to commence in September 2022 with a view to presenting the initial findings at a workshop with participating companies in London or Geneva in Q4 2022. Following the workshop, GH2 will prepare a synthesis report, including recommendations to the GH2 Board on opportunities to clarify and strengthen the Green Hydrogen Standard, including the adoption of policy notes addressing priority topics. Subject to the demand from project developers, the project may be extended into 2023.

Cost

GH2 is a non-profit foundation under Swiss law. The fee structure for the project aims to cover the cost of engaging a specialist assurance provider and GH2's coordination and administration costs relating to the project:

Companies interested in participating in the project are invited to contact Sam Bartlett, Director for the Green Hydrogen Standard at sam.bartlett@gh2.org or on +47 9026 7530.

Background

The Green Hydrogen Organisation (GH2) is a non-profit foundation under Swiss law. In addition to its office in Geneva it is present in London, Perth, and Sydney. The mission of GH2 is to dramatically accelerate the production and utilisation of green hydrogen across a range of sectors globally. It will push to rapidly decarbonise industries like steel, cement, fertilisers, shipping and aviation that have so far made limited progress reducing their emissions.

A central objective of GH2 is to establish a global standard for green hydrogen. A clear global standard will support policy and project development, lower costs for producers and consumers, and help build support and confidence in the market for green hydrogen. Our approach emphasizes collaboration between government, industry and civil society.

The GH2 Board launched the Green Hydrogen Standard in May 2022. Green Hydrogen projects that meet the Green Hydrogen Standard ("the standard") will be licensed to use the label "GH2 Green Hydrogen" and will be eligible to obtain and trade GH2 certificates of origin for green hydrogen and derivatives such as green ammonia. GH2's definition of Green Hydrogen is:

> *Green hydrogen is hydrogen produced through the electrolysis of water with 100% or near 100% renewable energy with close to zero greenhouse gas emissions (<=1 kg CO_2e per kg H_2 taken as an average over a 12-month period).*

GH2's definition is based on the technologies that are the leading candidates for scaling up green hydrogen production: hydropower, wind, solar, geothermal, tidal, wave and other ocean energy sources.[4] The Standard refers to "near 100% renewable energy". There is some flexibility (e.g., for backup systems) so long as the maximum greenhouse gas emissions threshold is not exceeded.

[4] GH2 notes that some countries have determined that there is a role for nuclear energy and biomass to accelerate the shift from more polluting activities, such as coal generation. However, nuclear power and biomass raise some specific environmental and safety related issues which this Standard is not designed to address. GH2 welcomes if the Green Hydrogen Standard inspires further rules and standards also for nuclear and other forms of energy production with close to zero emissions.

The Standard includes “scope 1” emissions from production, including water treatment and desalination and “scope 2” emissions from on-site or purchased renewable electricity. The Standard builds on the methodology proposed by the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE). The Standard requires that projects operate at <=1 kg CO_2e per kg H_2 (taken as an average over a 12-month period). The <=1 kg CO_2e per kg H_2 threshold is considerably lower than the thresholds proposed by other so-called “clean hydrogen” or “low carbon hydrogen” standards, which have significantly higher emissions threshold to accommodate hydrogen production based on fossil fuels.

The GH2 Board has committed to review the performance of GH2 accredited projects “with the expectation that the boundaries of the emissions assessment framework can be widened and that the emissions thresholds will be lowered”. Accordingly, a priority for the current study is to refine the procedures for verifying greenhouse gas emissions of <1kg CO_2 / kg H_2, including quantifying the greenhouse gas emissions associated with the storage, conversion and delivery of H_2 and its derivatives and embodied emissions in accordance with requirement 5e.

The Standard also requires that the environmental, social and governance consequences of green hydrogen production are addressed and requires that the development opportunities and impacts of green hydrogen production are considered. A priority for the current study is to refine the procedures for verifying “technically feasible and cost-effective measures to support the deployment of additional renewable energy capacity” (requirement 5a) and the procedures for evaluating the utilisation of water (requirement 5b).

Project participants will, through the working group, be invited to suggest other areas for more detailed investigation, including issues that are not currently addressed in the Green Hydrogen Standard.

Further reading

The Green Hydrogen Standard: https://gh2.org/our-initiatives/gh2-green-hydrogen-standard

A fact sheet for green hydrogen project developers: https://gh2.org/sites/default/files/2022-05/GH2_Standard_Fact%20Sheet_.pdf

A FAQ document: https://gh2.org/sites/default/files/2022-05/Green%20Hydrogen%20Standard%20FAQ.pdf