AMMONIA ENERGY ASSOCIATION

Sustainable, Equitable Development of Ammonia Projects

Presented By

JONATHAN COCKER
jcocker@blg.com
ENVIRONMENTAL MARKETS
Borden Ladner Gervais LLP

July 27th, 2022

BLG
Borden Ladner Gervais

Social Licence for Ammonia Energy Projects

Challenges:

- Community knowledge gap on technology and demonstrable areas of concern;
- Lack of differentiation with industrial ammonia usage;
- No clear legally accepted parameters around licence terms;
- Ambitious government/stakeholder expectations for hydrogen end markets

Source

Hydrogen End-Markets Strategies – What are regulators expecting?

- Politically high-profile;
- Central to governments' plans for:
  - Compliance with NDCs;
  - Transition from fossil fuels;
  - Air pollution / environmental impacts;
  - Energy independence; and
  - Economic growth.

Canada's Hydrogen Plan:

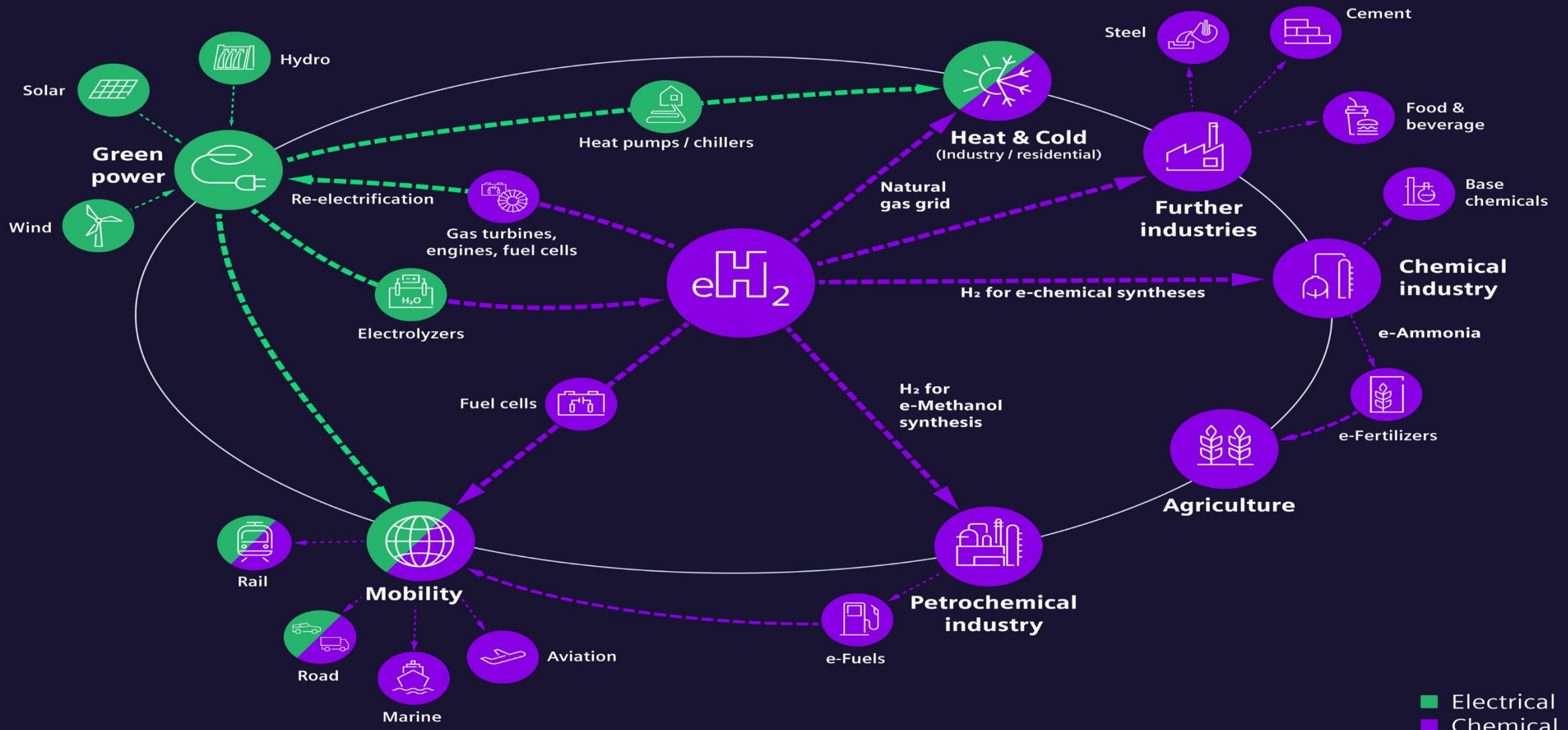
"inclusive, equitable, affordable, reliable, sustainable, etc."

To right all the accumulated wrongs of the energy sector?

Source

Source

Hydrogen End Markets – Does the Licence Change Based Upon Deployment?



Licence Variability?

- Generation v. Usage
- Greenfield projects v. repurposed assets
- Nature of governmental / industry support
- Domestic v. export
- On-shore v. off-shore projects
- Industrial v. transportation
- Auxiliary benefits
- Proximity to local / indigenous communities

Source

Example – Denmark's Power-to-X Strategy

- Denmark's *Government Strategy for Power-to-X,* which mandates:

  - **1) Power-to-X must be able to contribute to the realisation of the objectives in the Danish Climate Act.**
  - **2) The regulatory framework and infrastructure must be in place to allow Denmark's strengths to be utilised and for the Power-to-X industry to operate on market terms in the long run.**
  - **3) The integration between Power-to-X and the Danish energy system must be improved.**
  - **4) Denmark must be able to export Power-to-X products and technologies**

- These support a robust renewable energy sector, coming grid challenges and a desire to find markets for high value hydrogen-related exports

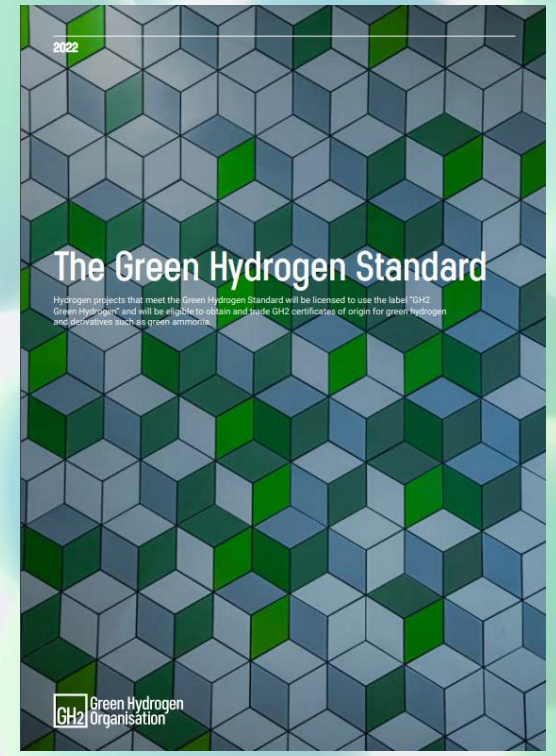
Thank You

For more information, contact:

Jonathan Cocker
Partner
416.367.7283
JCocker@blg.com

Borden Ladner Gervais

Introduction to the Green Hydrogen Standard



27 July 2022

GH2 Green Hydrogen Organisation

gh2.org | @gh2org

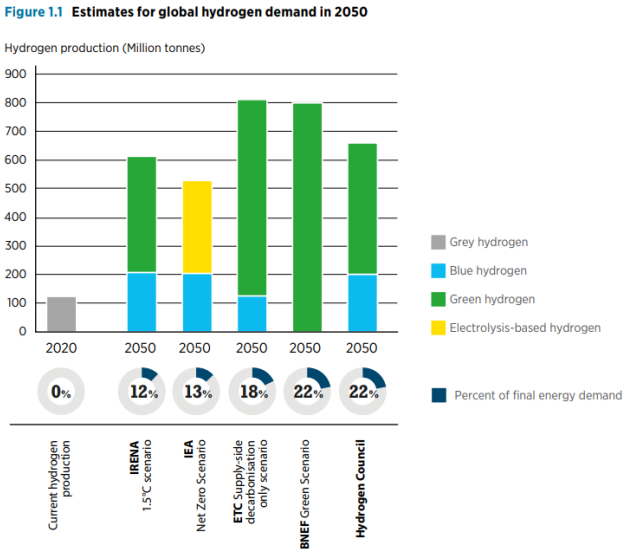
The Green Hydrogen Standard

Green Hydrogen projects that meet the **Green Hydrogen 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.

The Standard can also be applied in early-stage design and pre-feasibility studies. Testing at an early stage will identify any issues or concerns and highlight opportunities to align project design with global best practice.

Why hydrogen standards are important

- Globally, definitions are ambiguous. Governments and industry often refer to “clean hydrogen” and “low carbon hydrogen”. These often involve fossil fuels, and emissions up to ten times greater than green hydrogen.
- Green hydrogen **producers and customers need clarity** and consistency in order to plan for the long term (including to secure government approvals, debt and equity financing, and offtake agreements).
- Clear definitions are needed to underpin government policy/ incentives/subsidies.
- Adherence to emissions and sustainability standards will strongly influence export opportunities and pricing.
- End-use consumers want transparency and accountability throughout the supply chain. They want hydrogen that has close to zero-emissions and projects that contribute to sustainable development.



“Renewable hydrogen is the only option strictly aligned with a reliably 1.5-degree energy sector pathway.”

UN Climate Champions third guiding principle for climate-aligned hydrogen

Key Features

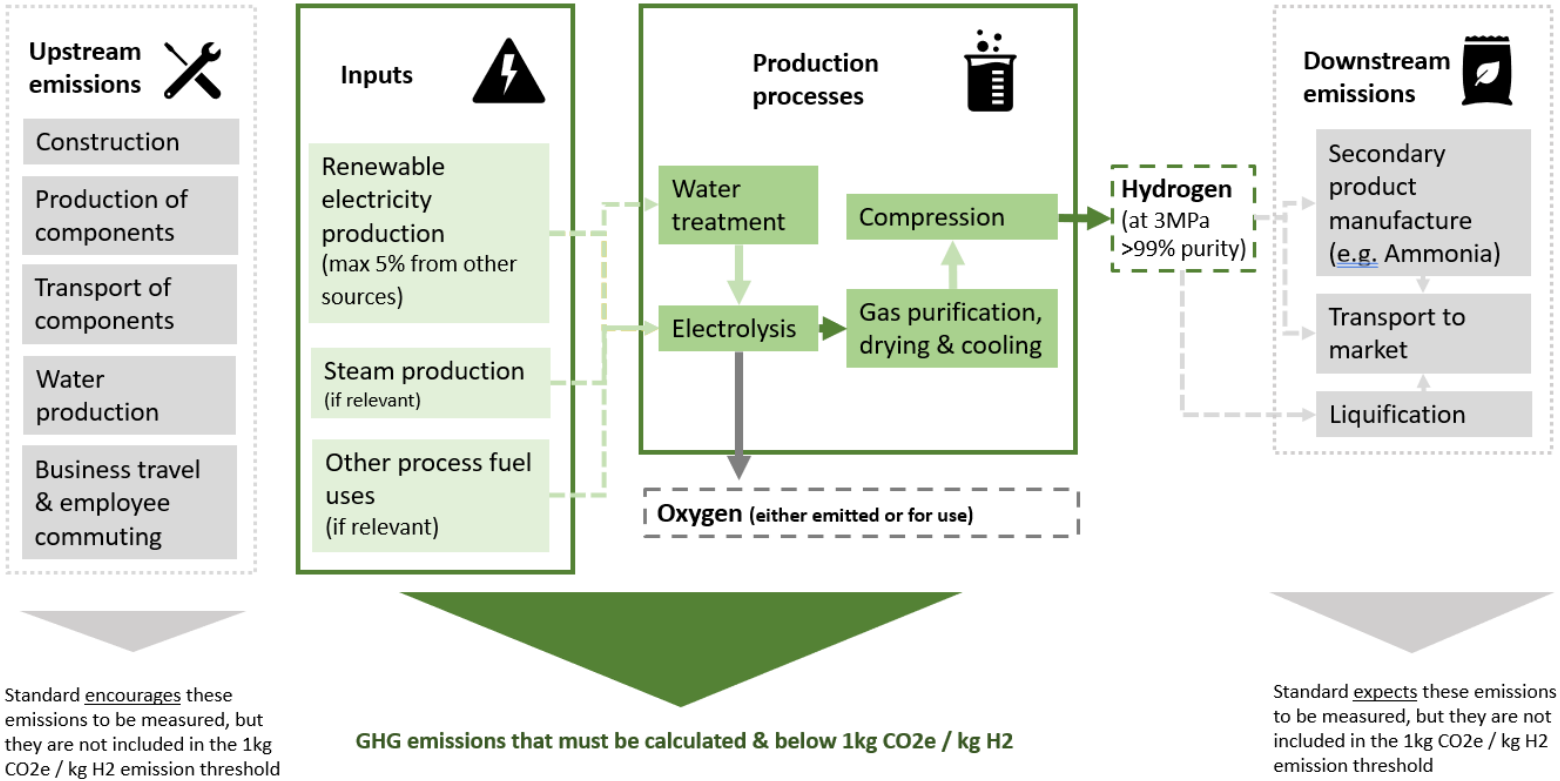
1. **Establishes a global definition of green hydrogen**: “Green hydrogen is hydrogen produced through the electrolysis of water with 100% or near 100% renewable energy with close to zero greenhouse gas emissions”.

    - “100% or near 100% renewable energy”. Includes energy sourced from hydropower, wind, solar, geothermal, tide, wave and other ocean energy sources. Excludes nuclear. Excludes waste to energy, biomass*.

    - “Close to zero emissions” threshold of **< 1kg CO2e/Kg H2**. The Standard builds on the IPHE methodology. Includes “scope 1” emissions from production (including desalination), and “scope 2” emissions from on site or purchased renewable electricity.

* The focus is on the renewable energy technologies that are the leading candidates for scaling up green hydrogen production. In exceptional circumstances, and in consultation with stakeholders, GH2 will consider opportunities to engage with project operators that are planning to produce hydrogen with other renewable non-fossil sources, but only where these projects meet the same emissions and sustainability standards.

The Green Hydrogen Standard



Key Features

2. **The Standard requires that the environmental, social and governance consequences of green hydrogen production are addressed**. General principles to ensure a focus on the most significant impacts and avoid duplication with national standards.

    - Alignment with international best practices, including the IFC safeguard policies.

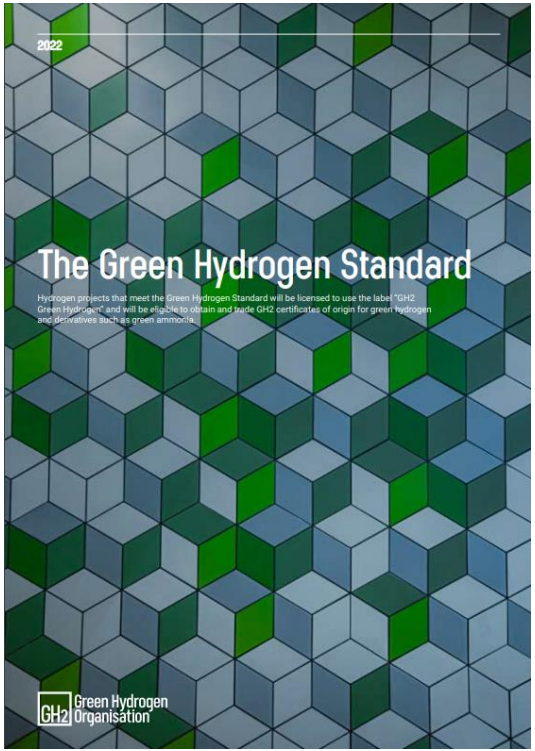
    - Green hydrogen producers may count electricity taken from the grid as fully renewable if they have concluded one or more power purchase agreements (PPAs) and make use of credible guarantee of origin certification schemes (or similar proofs) where available.

    - No “additionality” requirement for grid connected projects (unless this is a national requirement), but a requirement for a broader assessment of the impact of grid-connected projects on the grid + the identification of technically feasible and cost-effective measures.

3. **The Standard requires that the development opportunities and impacts of green hydrogen production and use are fully considered**.

Overview of Requirements

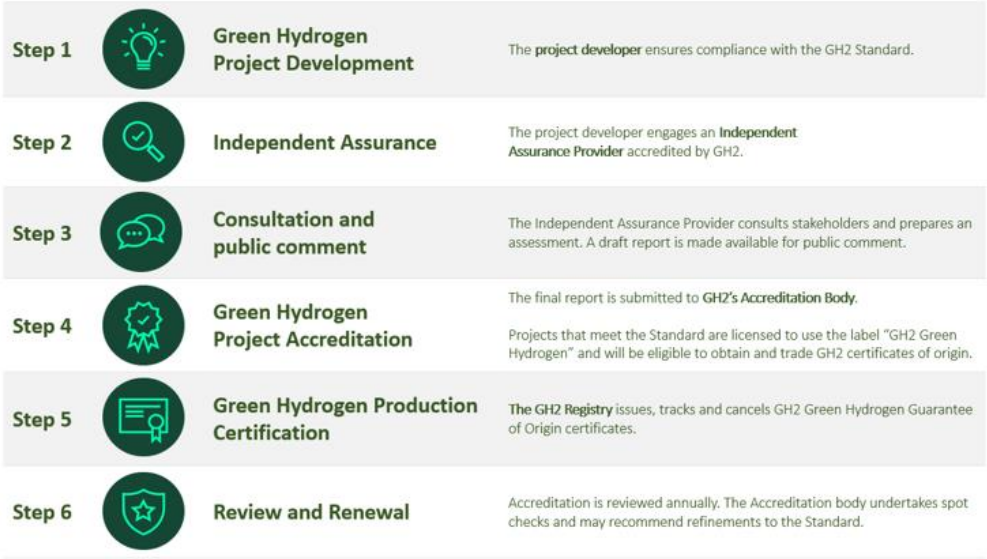
- Requirement 1 - Project overview and outlook
- Requirement 2 - Stakeholder engagement
- Requirement 3 - Project location and design
- Requirement 4 - Social impact
  - Requirement 4A – Affected communities and livelihoods
  - Requirement 4B – Resettlement
  - Requirement 4C – Indigenous Peoples
  - Requirement 4D – Labour and working conditions
  - Requirement 4E – Modern slavery, child and forced labour
- Requirement 5 - Environmental impact
  - Requirement 5A – Renewable energy sources
  - Requirement 5B – Water use and quality
  - Requirement 5C – Waste, Noise and Air Quality
  - Requirement 5D – Biodiversity
  - Requirement 5E – Climate change impact and mitigation
- Requirement 6 - Health and Safety
- Requirement 7 - Government, transparency and accountability



gh2.org | @gh2org

The Green Hydrogen Standard

1. Early stage / pre-feasibility scoping (confidential)
2. GH2 Accreditation and Certification. (Following government approval / FID).



Next steps

1. **Green Hydrogen Project Developers** are invited to utilise the Green Hydrogen Standard from an early stage in project development and seek GH2 accreditation and certification.
    - Project developers are invited to join a testing project in Q3 2022 (10-12 project developers)
    - You are welcome to contact GH2 for a presentation of the Standard and/or additional guidance materials

2. **Harmonisation with global, national and regional standards**
    - GH2 welcomes further dialogue with national and regional bodies to align standards and reduce red tape
    - GH2 continues to align its work with global best practices in the renewable electricity sector (solar, wind and hydropower).
    - GH2 working to align certification procedures with requirements in key export markets (e.g., EU RFNBOs)

3. **Green Hydrogen Standard Development**
    - Q3 - Formalisation of a multi-stakeholder advisory committee to advise on emerging issues and refinements to the Standard
    - Q3 - Establishment of the Independent Accreditation Body
    - Q4 - Accreditation of Independent Assurance Providers

Contacts

Jonas.moberg@gh2.org	
Sam.bartlett@gh2.org	The Green Hydrogen Standard
Ines.marques@gh2.org	Governments, Charter and DFIs
Joe.Willams@gh2.org	Strategy, civil society and communications

Green Hydrogen Organisation

General Principles

1. **Sovereignty and subsidiarity**. GH2 acknowledges that the development of natural resources and energy markets is in the domain of sovereign governments to be exercised in the interest of their citizens and national development. To avoid duplication, demonstrating adherence to credible and comprehensive national requirements shall be deemed sufficient to meet GH2's accreditation and certification requirements.

2. **Proportionality (materiality)**. The process emphasises the most significant issues and impacts and allow for minor gaps/deviations in meeting the requirements where the broader objective of the requirement is met.

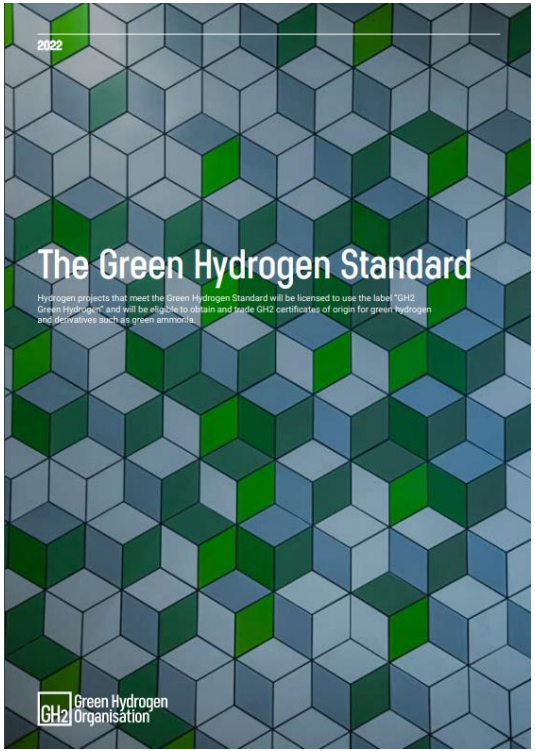
3. **Harmonisation**. GH2 encourages alignment with international best practice and works with organisations that are pursuing similar objectives.

4. **Consultation**. GH2 accreditation and certification requires proactive and broad-based stakeholder consultation.

5. **Transparency**. GH2 expects disclosures from project operators to be proactive, comprehensive, and publicly accessible.

6. **Independent verification, concerns and appeals**.

7. **Further development of the Standard**. The Standard seeks to balance predictability and flexibility in a new and rapidly growing industry. GH2 will review the lessons learned from the accreditation and certification process in consultation with all stakeholders. Any subsequent refinements or modifications to the Standard will include transitional arrangements that will allow project operators to make the necessary adjustments within a reasonable timeframe before coming into force.



GH2 Membership

FORTESCUE FUTURE INDUSTRIES

Envision

HYUNDAI

thyssenkrupp

TES

AKER HORIZONS

snam

Korea Zinc

ARK ENERGY CORPORATION

gh2.org | @gh2org

“The inextricable march of green hydrogen has been further strengthened by the global acceptance of the Green Hydrogen Standard which will ensure people get what they think they are paying for - a fuel which does not harm the planet.”

Dr Andrew Forrest
Founder of Fortescue Future Industries
Founding member of the GH2 Board

“This standard sets a clear benchmark for green hydrogen as the world's 'new oil', along with net zero industrial parks as the 'new infrastructure'. Taken together they will accelerate the drive towards green industrialisation, increase market confidence and support the global energy transition.”

Lei Zhang
Founder and CEO of Envision

gh2.org | @gh2org

“The launch of GH2’s Green Hydrogen Standard is great news for the industry. It will enable countries like Chile to trade its competitive products together with providing certainty to consumers about the compliance of strong sustainability criteria”.

Maria Paz de la Cruz
CEO of H2 Chile

“Establishing a standard and certification methods will help build confidence in the market for buyers of green hydrogen. As a global hydrogen producer, we view this as an important step towards accelerating the deployment of green hydrogen, which will be critical to reaching net zero.”

Kristian Røkke
CEO of Aker Horizons

GH2 Board

- **Hon. Malcolm Turnbull,** Inaugural chair of GH2, Australia
- **Mr. Marco Alvera,** CEO of Snam, Italy
- **Mr. Yun Choi,** CEO of Korea Zinc Company, Ltd., South Korea
- **Ms. Maria Paz de la Cruz,** CEO of H2 Chile, Chile
- **Dr Andrew Forrest,** Chairman of Fortescue Metals Group & the Minderoo Foundation, Australia
- **Mr. Yu Gan,** Co-Chairman, Board of Trustees, Daxing International Hydrogen Energy Demonstration Zone, China
- **Ms. Nienke Homan,** Sustainable Hydrogen Club, the Netherlands
- **Mr. James Josling,** Independent, Switzerland
- **Dr. Frannie Léautier,** CEO of Southbridge Investments, Rwanda
- **Dr. Tae Won Lim,** Executive VP & Head of the Hydrogen and Fuel Cell Business Centre of Hyundai Motor Group, South Korea
- **Ms. Martina Merz,** CEO of ThyssenKrupp, Germany
- **Mr Kristian Røkke,** CEO of Aker Horizons, Norway
- **Lord Adair Turner,** Former Chair of the UK Financial Services Authority and Chair of the Energy Transitions Commission, United Kingdom

GH2 Staff

- **Jonas Moberg** - CEO
- **Sam Bartlett** – Director of the Green Hydrogen Standard
- **Inês Schjølberg Marques** – Director of the Green Hydrogen Development Plan
- **Joe Williams** - Director of Strategy and Communications
- **Melannie Lai**, Graphic Designer
- **Simran Sinha**, Analyst
- **Benedicte de Caro,** Senior Finance and Operations Manager (from 1 October)
- **Joyce Kabui,** Green Hydrogen Africa Manager (from 21 August)

Senior advisor and chair of the Green Hydrogen Development Plan: **Erik Solheim**