

Hydrogen with LRQA

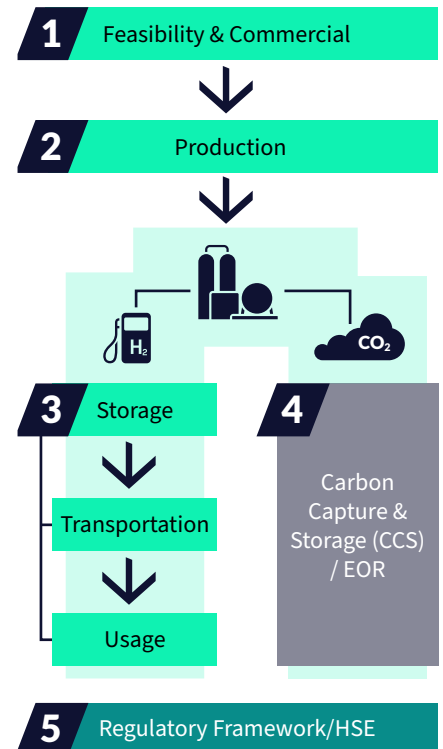
With many years of direct renewable energy experience – LRQA help solve the demanding technical, regulatory and commercial challenges, improving the safety and reliability of assets and the people, systems and processes involved. *Know more. Risk less.*

Our expertise covers the hydrogen, solar, waste to energy, wind and hydro power generation industries, their supply chains and the full life cycle of facilities, from initial concept and detailed design through to construction, commissioning, operation, life extension and decommissioning.

LRQA works with developers, operators, manufacturers and investors around the globe to tackle the key challenges facing the industry including:

1 Building technological readiness through standards, independent assurance and vendor assessments	4 Meeting investor requirements through emissions verification
2 Future-proofing existing schemes and standards for the hydrogen revolution	5 Accelerating global best practice and regulatory alignment
3 Technological-economic assessments	6 Supporting policy-makers to build public confidence

LRQA Provides services across all stages of a Hydrogen project value chain as illustrated in the diagram below:



Stage	Assets	Services
1 Feasibility and Commercial	All projects All technologies Company / regional assessments / plans	Risk assessment studies Life Cycle Assessment Modeling Technology qualification Techno / economic assessment - MSRL framework assessment Project assurance planning and owners engineer Commercial, environmental and technical Due Diligence Consultancy Approval In Principle
2 Production	Electrolyser Steam Methane Reforming, Autothermal Reforming etc. Gasifier Ammonia Production Pressure Equipment	Technology readiness review Global supply chain growth and assurance Certification of pressure vessel Gas source quality certification Domestic appliances certification Gas connection certification – competency assurance Gas infrastructure re-purposing studies / assessment Due diligence – i.e. in relation of second hand plant relocation Onsite inspection Vendor assessment Design verification
3. Storage Transportation Usage	Pipelines Cavity storage Refuelling stations Pressure Equipment Fuel cells Compression Containers	
4. Carbon Capture and Storage (CCS) / EOR	Pipelines Compression Pressure Containment Cavity storage	
5. Regulatory Framework		GHG verification Advise of global regulations and standards Thought leadership Regulation and standards peer review Standards training Origin of Hydrogen certification Responsible / Green Steel Certification

Adaption of Standards for H2 storage use and saving cost

A German consortium (Emano, Fraunhofer-Institute and the LeibnizInstitute) developed bespoke hydrogen storage, manufactured from plastic, this took into account the unique benefits of Hydrogen and provided:

- Weight and price advantages
- Improved risk performance in terms of brittle fracture.

The issue was that this material and use case did not have a prescribed certification route. LRQA stepped in to support, we certified design and manufacture, taking knowledge of global standards to find the most appropriate way to certify using mix of current guidelines. LRQA utilised our working knowledge of PED Module B and Module F and ASME Class I, Section 10, which specifically focuses on fibre reinforced pressure vessels to certify the vessels.

The vessel is now being exported globally.



Why LRQA?

Experience and expertise – with experts on international committees around the world, LRQA is highly experienced in the development of standards and regulations that protect safety and quality, build confidence in the market and inspire investment. Since 2003 LRQA has been active in a number of international hydrogen initiatives including the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) Regulations, Codes, Standards & Safety (RCSS), the Mission Innovation Challenge on Clean Hydrogen, and the International Energy Agency Safety Task.

- 1. Expediting locally** – working with local regulators and vendors, and with an understanding of the supply/demand risks, LRQA staff help to ensure delivery of the right products at the right time.
- 2. Expertise** – LRQA subject matter experts understand hydrogen, and the unique requirements of hydrogen infrastructure, so they are able to help with design reviews and specifications to ensure the procurement of fit-for-purpose products.

3. Global vendor assurance – building trust and confidence in the supply chain

4. Complete range of assurance services – with no pre-existing global or regional standards for measuring the carbon credentials of hydrogen, LRQA can validate and verify everything from product design through to emissions. Typical services include due diligence, onsite inspection, vendor assessment, design verification, product certification, carbon footprint and GHG emissions verification.

As the market develops, LRQA's customers are telling us that they need a reputable third-party with the experience and expertise to point the way forward; helping regulators to establish practical, workable rules and procedures that protect safety, lower risks and ensure that the vitally important potential of green hydrogen is exploited for everyone's benefit.

For more information on our range of assurance and inspection services, visit [lrqa.com](https://www.lrqa.com)

Summary

The hydrogen economy is evolving rapidly with an enormous number of new projects being created globally. Many pilot plants are now in operation and with global energy prices increasing, the prospects for reducing the difference between natural gas and green hydrogen are promising. However, it will take a few years for the market to develop so we have time to establish standards and best practices that are fit for purpose.

LRQAについて :

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その伝統は誇るべきものですが、クライアントとの今後のパートナー関係を構築する上で、本当に重要なのは現在の当社の姿です。揺るぎない価値、リスクマネジメントとリスク軽減における数十年の経験、未来への的確なフォーカスを組み合わせることで、より安心・安全かつ持続可能なビジネスの構築に向けてクライアントをいつでも支援します。

独立した第三者機関として検証、立証を検査、審査、認証、教育、コンサルタントの各種サービス、また、リアルタイムに品質保証を行う技術、詳細にデータ化されたサプライチェーンを導入する作業にいたるまで、当社のエンドツーエンドの各種課題解決のためのソリューションが、ダイナミックに変化するリスク環境に積極的に対処できるよう顧客を支援いたします。いわば、将来の状況に流されるのではなく、顧客自らが構築することが可能となるのです。

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