



Green Hydrogen Project Development: Navigating the Road Ahead



Juriaan van Tilburg
Manager - The Netherlands
Hinicio S.A



2021 was a tipping point for clean hydrogen markets filled with big announcements of large-scale clean hydrogen production across the globe.

Over the past few years, Hinicio has witnessed a gradual shift of focus from early technology deployment and long-term market strategies to more concrete questions around project development, engineering and market development. What's more, these projects are no longer focused solely on water electrolysis as developers seek further integration with more complex molecules, in particular ammonia, methanol and e-kerosene.

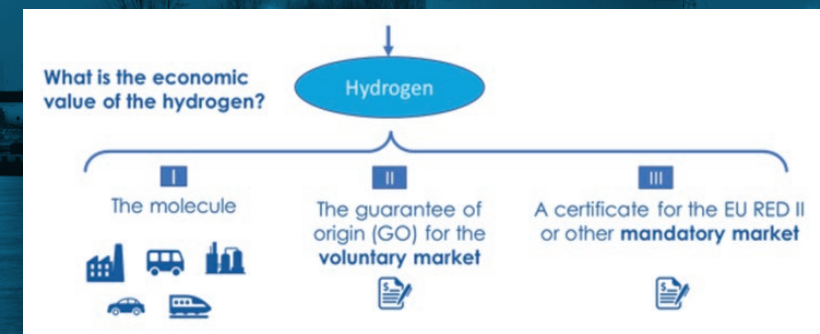
With so many large projects seeking bankability, the key question our clients face today is:

“ How can we valorise the cleanness of our green hydrogen-based product? ”

To us, this is a clear indication that the clean hydrogen market is maturing very rapidly.

Markets assign value to hydrogen based on its environmental attributes

Whatever the end use, the hydrogen molecule is always the same. When it comes to valorising green hydrogen, it will be the environmental attributes of the molecule that will determine a market's willingness to pay. Hinicio already sees an initial market interest for clean hydrogen driven by consumer marketing and Corporate Social Responsibility (CSR) objectives. These voluntary markets attribute value to a low carbon footprint and clean production technologies.



The EU is creating mandatory markets for hydrogen

The main driver for clean hydrogen will however come from mandatory markets that are being introduced by European Union's (EU) climate policies. In the *Fit For 55* policy package proposed in June 2021, the EU defines specific targets for renewable hydrogen with defined environmental attributes and carbon footprints.

Hinicio supported multiple clients to develop product and asset compliance strategies for these emerging markets:

01

Project development assistance:

Leveraging our state-of-the-art green hydrogen technical and project development capabilities with our Hinicio Chile team for the development of pre-feasibility and feasibility studies for large scale clean hydrogen and derivatives projects around the world.

02

Plant setup assessments:

Review of plants and contractual setups to ensure the output product will meet identified eligibility criteria and to optimise the product's potential to capture price premiums from voluntary and mandatory markets.

03

Asset optimisation:

Optimisation of plants' operational setups, balancing multiple product streams to meet demands in various compliance markets.

The EU is creating mandatory markets for hydrogen

Certification will allow products to be traded in these voluntary and mandatory markets. Both the voluntary and mandatory markets will require evidence to validate claims on the clean character of the hydrogen. Typically such evidence is provided through certification.

Certification allows both seller and buyer to identify and proof a product's attributes.

Certificates that demonstrate compliance with mandatory markets or added value in voluntary markets will allow clean hydrogen-based products to be traded at premium prices compared to fossil energy-based alternatives. The relevance of certification is growing with key EU initiatives such as the H2Global import programme and the EU CBAM policy proposal defining eligibility criteria for the import of hydrogen-based products into Europe. Other import-oriented geographies are closely monitoring European developments and may very well adopt similar criteria.

Hinicio has been pioneering and leading hydrogen certification efforts for over half a decade

Since 2014, Hinicio along with other public and private organisations in Europe has been initiating and leading the EU CertifHy® programme on the certification of hydrogen. CertifHy introduced the terms green, blue and grey hydrogen to facilitate early discussions on environmental attributes. Under CertifHy®, a guarantees of origin scheme has been established to allow the production of hydrogen and many of its environmental attributes to be identified. Such guarantees of origin can be traded on the market, furthering the development of voluntary markets.



As part of its third phase, CertifHy® is working with the Association of Issuing Bodies (AIB) to set up a certification body for EU Member States who currently lack one. In parallel, CertifHy® is developing a scheme for a large EU market for hydrogen as transport fuel as mandated through the EU Renewable Energy Directive. We have active engagement with EU member states and countries outside the EU on how to set-up and implement certification schemes, including both future hydrogen importing and exporting countries. In addition, we are involved in the development of a guarantees of origin scheme in the Netherlands and have been working for institutions like the World Bank and Inter- American Development Bank to support the definition of standards and new schemes.

Furthermore, Hincio is supporting the creation of the first hydrogen exchange in the world: HyXchange. As a first step, we will initiate a multi-party pilot involving industries in the Netherlands, in which participants will be able to issue and trade hydrogen guarantees of origin.

Based on our experiences in hydrogen project development and improving project bankability, our recommendations moving into 2022 are:

01 Understand what will be your off taker markets and what mandatory or voluntary eligibility criteria are important to them. In many projects we notice that project developers are convinced they produce green hydrogen-based products. Policy makers or end-consumers may however have a completely different perspective and in some cases use very specific eligibility criteria.

02 Review not only your production process, but also your process input specifications and sourcing contracts to meet eligibility criteria. Some eligibility criteria, especially in mandatory EU markets, go beyond the specifications of the production process and focus on the sources of electricity, gas and hydrogen used. As a result, sourcing contracts will need to be aligned to these criteria. Ensuring compliance can be quite impactful, demanding specific electricity procurement contracts or flexible operation of the production plants. It can be complex or costly to change the design of a plant after it has been designed or constructed. Not being compliant will lose you a large part of the market potential.





How Hinicio can help you:



Project development assistance (PDA):

Development of feasibility and pre-feasibility studies for large scale hydrogen & e-fuel projects, development of business cases and market entry strategies



Pre-certification: Assessing the impact of (upcoming) eligibility criteria in your target voluntary or mandatory compliance markets and proposing compliance measures to prepare you for certification and audits.




Asset optimisation: Techno-economic optimisation of your production processes against market eligibility criteria to allow you to supply various voluntary and mandatory markets with existing assets



Voluntary label development: Development of product labels or certification targeting voluntary markets for which no labels exist yet






Hi-Regulate: Tailored workshops to help you structure and assess the impact of the European policies and regulation regarding (renewable) fuels and chemicals, including the Fit for 55 package and RED II delegated acts.



YOUR KNOWLEDGE PARTNERS
FOR SUSTAINABLE ENERGY AND
TRANSPORTATION PROJECTS
AND STRATEGIES

Juriaan van Tilburg juriaan.van.tilburg@hinicio.com +31 6 38214642	Thomas Winkel thomas.winkel@hinicio.com +31 6 14537204
---	---

 www.hinicio.com [HinicioSA](https://twitter.com/HinicioSA) [/company/hinicio](https://www.linkedin.com/company/hinicio)