



# Investor Perspectives on Hydrogen Investments

---

**Report number:** C 816

**Author:** Nathalie Fransson and Mirjam Särnbratt

---

**Funded by:** Swedish Energy Agency

**Examiner:** Desirée Grahn

**Approver:** Patrik Isaksson

**ISBN:** 978-91-7883-565-2

**Photo:** Adobe Stock

## Hydrogen in a future energy system

---

The Swedish transport sector targets a 70% greenhouse gas emissions reduction by 2030 compared to 2010 and must reduce emissions to achieve the national goal of climate neutrality by 2045. Hydrogen as an energy carrier in the transport sector can be a complementary fossil-free alternative to other technologies, such as battery vehicles and biofuels. Hydrogen is further expected to be an important energy carrier to transition hard-to-abate industry sectors. For the hydrogen economy to take off, large investments are required that today are associated with high risk given the uncertainties that prevail around the hydrogen market.

This interim report summarizes the results of the final phase of the work in the project *Hydrogen in the future energy system - business models and use in the transport sector*, funded by the Swedish Energy Agency. In this last phase, investor perspectives on hydrogen investments are shared, both in the current setting and with an outlook to 2045. Through interviews with a diverse set of investors active on the Swedish (and/or) hydrogen market, the driving forces, risks, and evaluation criteria that investors see for the hydrogen industry have been compiled, combined with their reflections on the conditions and requirements necessary to attract more capital to the market.

The conclusion of the investor interviews is that hydrogen investments are perceived as high-risk investments, except for a few projects where a particularly successful setup has been achieved. The investors that are able to invest in hydrogen in this nascent phase are more risk tolerant. The investment is made to learn more about the technology and the main driver is the belief that hydrogen could contribute to achieving necessary greenhouse gas emissions. Considerable uncertainty surrounds the hydrogen investments of today, making it difficult for investors to approach the investment case in the same way as they do the more established technologies. The informants therefore requested a more predictable and stable policy landscape to accelerate hydrogen investments.

## Investing in a nascent hydrogen market

---

### Assessment basis for hydrogen investments

As a first principle, the investment needs to represent a promising investment case where investors see that their capital can generate a risk-adjusted return.

*"It is not always the best idea that wins - much depends on the people behind it"*

A strong team behind the company or project with relevant experience and network is highlighted as a key factor. Partnerships with other investors are evaluated in some cases and in all cases, partnerships with potential future customers and specifically anchor off-takers are assessed. Anchor off-takers become a guarantee that at least some volume of future cash flows will be generated. The evaluation is also based on the company's go-to-market model, where investors want to see a clear plan for commercialization and scaling up. The assessment is generally based on a long-term valuation of how the value of the investment will develop along with the company's competitiveness. The exact time horizon varies, depending on the investor's investment model (long-term owners or more short-term owners). Hydrogen investments are evaluated using the same criteria as any other investment, but given the uncertainty of the hydrogen market, investors find it difficult to base the decision on key performance indicators. The most important metric for the interviewed investors is a risk-adjusted rate of return.

*"Hydrogen today has a higher risk than established technologies and that needs to be reflected in the expectation for return."*

For all investors, it is important that the company or project can demonstrate a clear sustainability focus, but the definition of a sustainable investment differs. The focus for investors is mainly climate emissions. Therefore, a key criterion is reduced or avoided greenhouse gas emissions. Investors with a smaller portfolio and company size tend to define sustainability more vaguely, while the larger investors refer, among other things, to the Sustainable Development Goals, requirements under the EU's Corporate Sustainability Reporting Directive and the Disclosure Regulation, or that they evaluate on the basis of Environment, Social and Corporate Governance (ESG) or their own Science-based targets. Other environmental and social sustainability aspects are also mentioned, but are subordinated to the climate impact.

*"Sustainability is a matter of survival."*

## Drivers for investing in hydrogen

The largest driver for investors to invest in hydrogen today is the belief that hydrogen will be one of the keys to solving the green transition of hard-to-abate sectors, such as industry or transport.

*"Hydrogen is one of the keys to enable the transformation of hard-to-abate industries."*

Investors therefore believe that the investment will be profitable in the long term and that green hydrogen investments meet the sustainability targets set for their investment portfolio. Several investors state that their current hydrogen investment is a strategy for learning more about the technology and the market: one investor even described it as a "peephole investment". Two investors stated that they are investing in hydrogen today because of a sense of responsibility, that someone must take the lead and carry the initial risk for the hydrogen economy to take off.

*"Hydrogen investments are seen as a learning process about the market."*

## Risks, risk management and attracting capital

Overall, uncertainty about profitability and expected returns is the biggest risk experienced by investors today. Some believe they will not be able to recoup their investment. Many state that because the hydrogen investment is seen as high-risk, it is only allowed to constitute a small part of the investment portfolio. Others say that because the hydrogen industry is too immature and risky, it does not suit their investment strategy and hence they are unable to invest at this point in the market. It is not possible to know which companies will be winners in the hydrogen market and therefore it must be assumed that some companies will not succeed in the long term. Pre-investment due diligence and regular monitoring of company performance are tools used to manage risk. Some investors are active owners and work with the company to develop it based on their network and experience. Specifically for the transport sector, one investor states that the current vehicle shortage is a challenge for securing off-takers and thus attracting capital. Other specific risks raised by individual investors are the perceived safety risk with hydrogen and the availability of water for production of hydrogen using electrolysis in the future.

The investors were also asked to list factors that could contribute improved bankability for hydrogen investments and what needs to be developed for the market to grow. Factors mentioned were:

- ❖ The prospect of a risk-adjusted rate of return as a prerequisite
- ❖ Long-term regulations and policies (e.g., on sustainability criteria, grid capacity, electricity prices).
- ❖ The possibility to invest in parts of the hydrogen value chain (not the whole system)
- ❖ Increased marketing of the hydrogen industry (with the support of politicians) to the public at large
- ❖ More early adopters and binding commitments from off-takers
- ❖ A more attractive price for produced hydrogen

Explicit support from municipal or state authorities is seen as positive to reduce the risk. This may be, for example, through the project or company taking in grants (soft money), where the EU Innovation Fund and Klimatkivet are mentioned. The arrangement for H2 Green Steel where the Swedish National Debt Office has issued a green credit guarantee for the new plant for production of green steel is mentioned as a positive example of where blended finance is applied to facilitate large green investments.

## Hydrogen investments in 2045

The investors' view of the development of how hydrogen investments will evolve from today to 2045 is unanimous. Under the assumption that the hydrogen market takes off (which everyone believes, although there are uncertainties), by 2045 there will be mature companies to invest in on an established market. This will enable more reliable investment calculations. The risk of the investment will have dropped dramatically, and hydrogen can then assume a larger part of the portfolio. A mature hydrogen market in 2045 will be attractive to other types of investors looking for lower risk and lower returns.

*"The hydrogen market will be mature and thus the risk in hydrogen investments will decrease."*

**INVESTOR PERSPECTIVES ON HYDROGEN INVESTMENTS**

**STOCKHOLM**

Box 21060, 100 31 Stockholm

**GOTHENBURG**

Box 53021, 400 14 Gothenburg

**MALMÖ**

Nordenskiöldsgatan 24  
211 19 Malmö

**KRISTINEBERG**

**(Center for Marine Research  
and Innovation)**

Kristineberg 566  
451 78 Fiskebäckskil

**SKELLEFTEÅ**

Kanalgatan 59  
931 32 Skellefteå

**BEIJING, CHINA**

Room 612A  
InterChina Commercial Building No.33  
Dengshikou Dajie  
Dongcheng District  
Beijing 100006  
China

© IVL SWEDISH ENVIRONMENTAL RESEARCH INSTITUTE LTD. | Phone: 010-788 65 00 | [www.ivl.se](http://www.ivl.se)