



Beyond the hype.

**A reality check
on hydrogen**

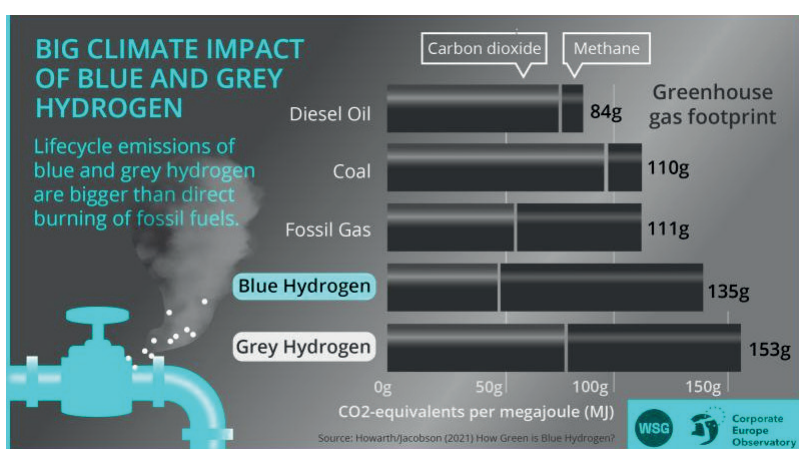
Executive summary

Summary of the report **Beyond the hype. A reality check on hydrogen**, available in Dutch.

The promise of replacing fossil fuels with hydrogen-based fuels is not credible. The physical characteristics of hydrogen simply do not allow it. A hydrogen vision in 2023 which is based on producing, transporting and consuming as much hydrogen as possible, would increase greenhouse gas emissions, raise the cost of the energy system, and increase geopolitical risks. **The environmental movement therefore calls for the Belgian Hydrogen Vision to be revised in order to take the limits of hydrogen into account.**

Our insights on hydrogen production and consumption

- **Fossil hydrogen with carbon capture has no role to play in a climate-neutral economy, even as a "transitional vector".** The greenhouse gas emissions associated with this production (in particular the non-captured carbon and upstream methane emissions) are higher than those resulting from the direct use of fossil fuels. Plans to build new fossil hydrogen plants with carbon capture are de facto counterproductive from an environmental point of view, as are plans to inject hydrogen into the fossil gas network to artificially support demand.

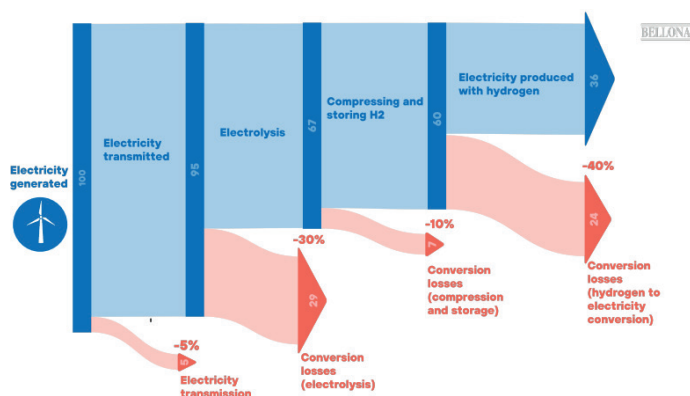


Source: CEO, 2023. [The dirty truth about the EU's hydrogen push](#)

Nor is carbon capture a solution for existing fossil hydrogen production. The high investment costs lead to extending the life of fossil fuel infrastructures, thus creating a lock-in effect. The climate emergency means that we cannot afford such dependence on fossil fuels.

Current demand for fossil hydrogen (mainly for refining and fertilisers) is set to fall, notably as a result of changes in agricultural techniques and a reduction in demand for fossil fuels (following climate policies for transport and heating). The remaining demand and new applications will gradually have to be met by renewable hydrogen.

- **Renewable hydrogen - if used correctly - can play a long-term role in tackling the climate crisis.** Produced by electrolysis using renewable electricity, renewable hydrogen does not emit CO₂ or methane, but it remains an inefficient energy carrier that is complex to use, not least because of the energy losses associated with its production, transport and conversion. Its use should therefore be limited to the hardest-to-abate applications with no available alternatives.



A power plant using 100% renewable hydrogen would consume almost 3 times the electricity it produces.

Source: Bellona, 2022. [Hydrogen's place in an energy-efficient EU](#)

Direct electrification remains the most efficient use of renewable energy, particularly in Belgium where we do not have sufficient renewable electricity potential to meet all our long-term energy demand or to produce renewable hydrogen from surplus renewable electricity. In addition, diverting renewable electricity too quickly from direct use to hydrogen production will de facto prolong the use of fossil fuels and therefore increase greenhouse gas emissions.

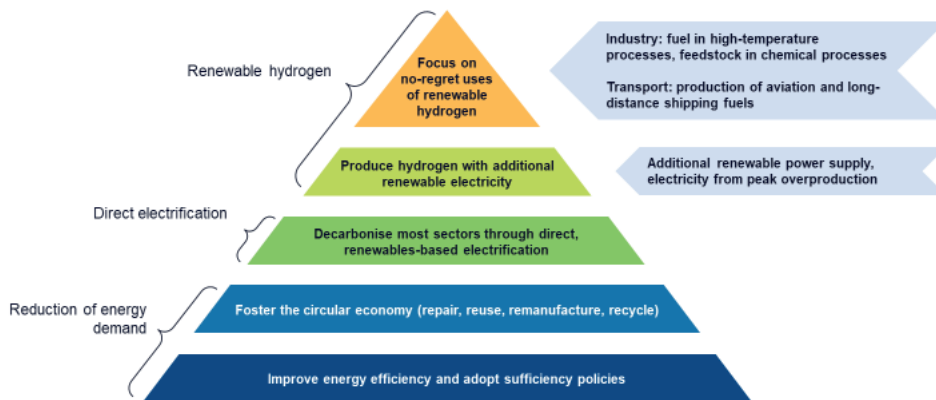
► **Hydrogen imported into Belgium should be in gaseous form via pipelines from Europe.**

The physical and chemical characteristics of hydrogen make it technically difficult, dangerous and costly to transport. Transport by ship over long distances - even in the form of derived molecules - is not a solution. Transport by pipeline involves issues that need to be credibly assessed, but will certainly be a more economical option. The distance between production and use is therefore a crucial factor. This is already the case in the current hydrogen industry and will remain the rule in the future.

Several European countries or neighbouring countries will have a surplus of renewable electricity and therefore a potential for exportable renewable hydrogen, both in the south (Spain/France) and in the north (Scandinavia). It is also necessary to avoid developing a new energy dependency with countries in the Global South, with the associated geopolitical risks and harmful effects on the population and the environment. Once again, this means limiting demand for hydrogen to only the unavoidable applications.

► **Above all, the hydrogen hype is a way of avoiding a necessary rethink of our industrial fabric.**

Is there a place for energy-intensive production processes in regions where renewable energy production is neither abundant nor cheap? Betting today on massive imports of hydrogen - including by ship - heavily subsidised to bring prices down, is not a viable economic strategy. Instead, we need to have a fundamental discussion. What is the role of our industry in a climate-neutral Europe and world? Which sectors need to be developed or transformed? And how much hydrogen and hydrogen derivatives are unavoidable? We must avoid dragging our industry into a model dependent on massive imports of hydrogen, which is economically and ecologically unfeasible in the long term.



Source: EEB, 2023.
[Policy brief: A sustainable hydrogen strategy for the EU](#)

7 principles for a sustainable hydrogen policy

- 1. Give absolute priority to demand reduction, circular processes, and direct electrification** using renewable sources to make our energy system more sustainable.
- 2. Reduce the hydrogen hype to realistic proportions.** Recognise that the gas industry is facing an existential transformation due to the necessary and inevitable decline in European and Belgian gas demand. Critically examine the 'energy scenarios' promoted by the sector. Do not use public funds to artificially develop an unsustainable hydrogen market, but favour targeted investments in research and innovation. Collaborate constructively with other European countries rather than developing a competitive rationale to become a European hydrogen centre at any (financial or ecological) cost.
- 3. Reserve renewable hydrogen for applications that are the most difficult to decarbonise and for which there are no other solutions.** Given its environmental and economic inefficiency, ban the blending of hydrogen in the gas network. Exclude the use of hydrogen as an energy carrier for applications such as road transport and space heating, where efficient alternatives exist, and focus instead on demand reduction and management, and renewable energies. Support research and development into solutions that are not viable or competitive today, such as short-term electricity storage.
- 4. Consider only sustainably produced renewable hydrogen** as an energy carrier, and only in very limited quantities until the 2030s. Phase out fossil hydrogen, even with carbon capture, and avoid creating new infrastructure for this. Reject nuclear hydrogen as a way of extending a lifeline to an unsustainable and risky industry (waste, nuclear risk, proliferation, etc.).
- 5. Minimise plans to import renewable hydrogen and favour gaseous imports by pipeline from Europe.** As far as possible, avoid inefficient transport of hydrogen and its derivatives by ship, and use imported ammonia as a raw material only. Imports of hydrogen and derivatives from third countries must be accompanied by strict safeguards: only consider equitable partnerships with democratic regimes which include local populations, do not jeopardise the acceleration of the local energy transition, and carefully assess local impacts, particularly water stress and land use.
- 6. Size hydrogen infrastructure on the basis of an assessment of sustainable demand.** Do not blindly build infrastructure based on hypothetical hydrogen consumption that is heavily subsidised and unsustainable. Avoid unwanted infrastructure such as refuelling stations for road transport or distribution networks for use in heating. Coordinate - not compete - with neighbouring countries.
- 7. Ensure strong governance.** Separate the production and transport of hydrogen and its derivatives (vertical unbundling) and keep the role of hydrogen TSO separate from the one for fossil gas (horizontal unbundling) in order to avoid conflicts of interest and monopoly situations. Give a decisive role in decisions on infrastructure needs to an independent regulator.



[Download Beyond the hype. A reality check on hydrogen \(Dutch\)](#)

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