

REASONS WHY "HYDROGEN-READY" IS A MYTH

1. Not all gas is created equal and hydrogen is particularly difficult to handle safely



Hydrogen molecules have very different characteristics compared to methane molecules. They are smaller, lighter and more flammable. Handling such an explosive gas with the tendency to cause embrittlement makes it more **complicated to develop suitable materials and equipment**. Even though retrofitting gas pipelines or gas boilers for home heating might be technically feasible, there is **no practical experience with handling hydrogen across large scale infrastructure**.

2. Energy realities pose unbending constraints



Hydrogen is less energy intensive per unit of volume than methane. This means that, overall, one would have to build much larger infrastructure or settle for transporting and storing less energy via hydrogen. **"Hydrogen-readiness", however, often insinuates the possibility of a full functional substitution of fossil fuels with hydrogen. Even if we had enough hydrogen, using it would be an unjustifiable waste of energy in most cases.** For example, a gas-fired power plant running on 100 % renewable hydrogen would consume 2.8 times the electricity it could generate due to energy efficiency losses in producing electrolytic hydrogen and combusting it again to generate electricity.

3. Hydrogen is and will continue to be a scarce resource



There will most likely never be enough hydrogen to completely replace fossil gas. Even if we used all the electricity generated in the EU to produce hydrogen, we would still only be able to substitute around 45 % of the energy currently supplied by fossil gas¹. **The narrative that eventually all "hydrogen-ready" applications will be fueled with hydrogen is misleading.**

4. Retrofitting is associated with great uncertainties



In the case of LNG terminals, **retrofitting for the import of liquid hydrogen or ammonia is feasible if considered at the planning stage. Subsequent conversion is subject to considerable uncertainties** related to technical challenges concerning the steel used for storage tanks or thermal insulation, among others. Uncertainties also arise from a general lack of experience with and knowledge of technical requirements. While the German government celebrates the commissioning of "hydrogen-ready" LNG terminals, the cost of retrofitting the partially state-owned terminal in Brunsbüttel is apparently unknown. **Conversion plans, including a timeline and cost estimates, should be fleshed out before any investments are made.**

5. Fossil fuels are locked in and stranded assets are created



Betting on "hydrogen-ready" applications risks lock-in of unabated fossil fuel use, and undermines far more energy-efficient solutions, in particular direct electrification. Compared to powering "hydrogen-ready" gas heating with hydrogen, alternatives such as heat pumps are by and large more energy efficient, environmentally friendly, less resource intensive and far more likely to phase out the use of fossil gas. **Conceding to the "hydrogen-ready" narrative means that gas heating would continue to run on unabated natural gas, therefore seriously jeopardising the energy transition.**

6. Consumers are lured into the trap of the more expensive option



Wherever hydrogen competes with the much more energy-efficient direct use of electricity, **hydrogen will always be the more expensive solution.** The wholesale price of clean hydrogen is not expected to drop to a level where it could compete with the direct use of electricity in applications such as home heating or passenger cars. **Few off-takers are willing to buy hydrogen at almost any price** – and private households do not belong to this group.

7. Climate action is put on the back burner with this narrative



"Hydrogen-ready" is an empty catchphrase that does not currently impose any obligation for climate action, but rather places an uncomfortably high level of trust in future decision-makers to eventually implement measures. In the best case, the transition from fossil gas use to hydrogen will take place once the latter is available economically and at scale. **In the meantime, fossil fuels will remain the default energy source with no immediate benefits for the climate or the energy transition.**