



# Blue Hydrogen in the UK

Debunking common myths about the cost and risk of producing blue hydrogen in the UK



The UK Government has a target of **up to 5 GW** of blue or “low-carbon” hydrogen to be produced by 2030, announced in 2022 as part of its Energy Security Strategy.

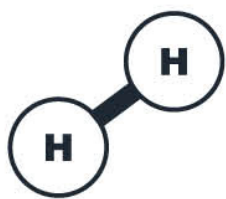


The **cost of producing blue hydrogen in the UK is 36% higher** than the UK Government (BEIS)'s 2021 estimates, due to higher current and expected future gas prices.



Using blue hydrogen for space heating would require the **UK to import 10% more natural gas** at a time of record high fossil fuel prices, disrupted global supply, and security concerns regarding dependency, particularly on Russian imports.

## How is Blue Hydrogen Produced?



**Blue hydrogen is produced by splitting natural gas (methane) into hydrogen and CO<sub>2</sub>**

The two most common processes for the generation of blue hydrogen are either steam methane reforming (SMR) or autothermal reforming (ATR), and both result in CO<sub>2</sub> emissions as a by-product.



**Resulting emissions must be captured and stored, or reused**

The goal is to capture 90-95% of the carbon emitted during production, but typically only the hydrogen process emissions are targeted, not supply chain emissions, such as from upstream methane leaks, venting and flaring, the equipment power source or the CO<sub>2</sub> compression, and transport power source.



**Using natural gas to produce hydrogen results in 25-30% energy loss**

For every unit of heat potential in natural gas at the start of the process, only 70-75% of that energy remains in the hydrogen product. Using hydrogen to heat a building requires about one-third more natural gas than using natural gas directly for heat.

## Why Blue Hydrogen Is Not the ‘Super-Fuel of the Future’



### HIGH RISK

**Blue hydrogen is an extension of the fossil fuel gas value chain and amplifies those risks**

The largest cost component for blue hydrogen is the cost of gas, used as feedstock or fuel for the SMR or ATR processes. The cost of production is linked to current and future price of gas, and highly sensitive to assumptions about price fluctuations.

### POOR PERFORMANCE

**CCS is a technology that has been consistently underperforming**

IEEFA finds that carbon capture and storage (CCS) has failed to meet its emissions reductions targets time and again. Globally, only about 1% of hydrogen production from fossil fuels currently uses CCS.

### A BAD INVESTMENT

**Blue hydrogen is expected to become uncompetitive this decade, making it a bad investment**

The UK Government assumes a 40-year lifetime for blue hydrogen projects. There is a high likelihood that they will become stranded assets early in their life, and investors (including taxpayers) will lose money, or that UK industry and consumers will be tied into expensive hydrogen supply contracts in order to protect investors.

