

Decken Sie mit uns die 4 größten Wasserstoff-Mythen auf

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What we'll be covering today

- As the economy for hydrogen fueling continues to grow, one of the inhibiting factors is persistent misinformation regarding its



Safety



Viability as a mobility fuel



Cost (in both real and relative terms)



Environmental impact

- So, today we'll be addressing each of these topics, and set the record straight on why we believe the hydrogen is the right, best path forward for the global economy as well as the worldwide focus on achieving a greener and more sustainable future for the planet.

Myth #1: “Hydrogen gas is hazardous to store or use.”

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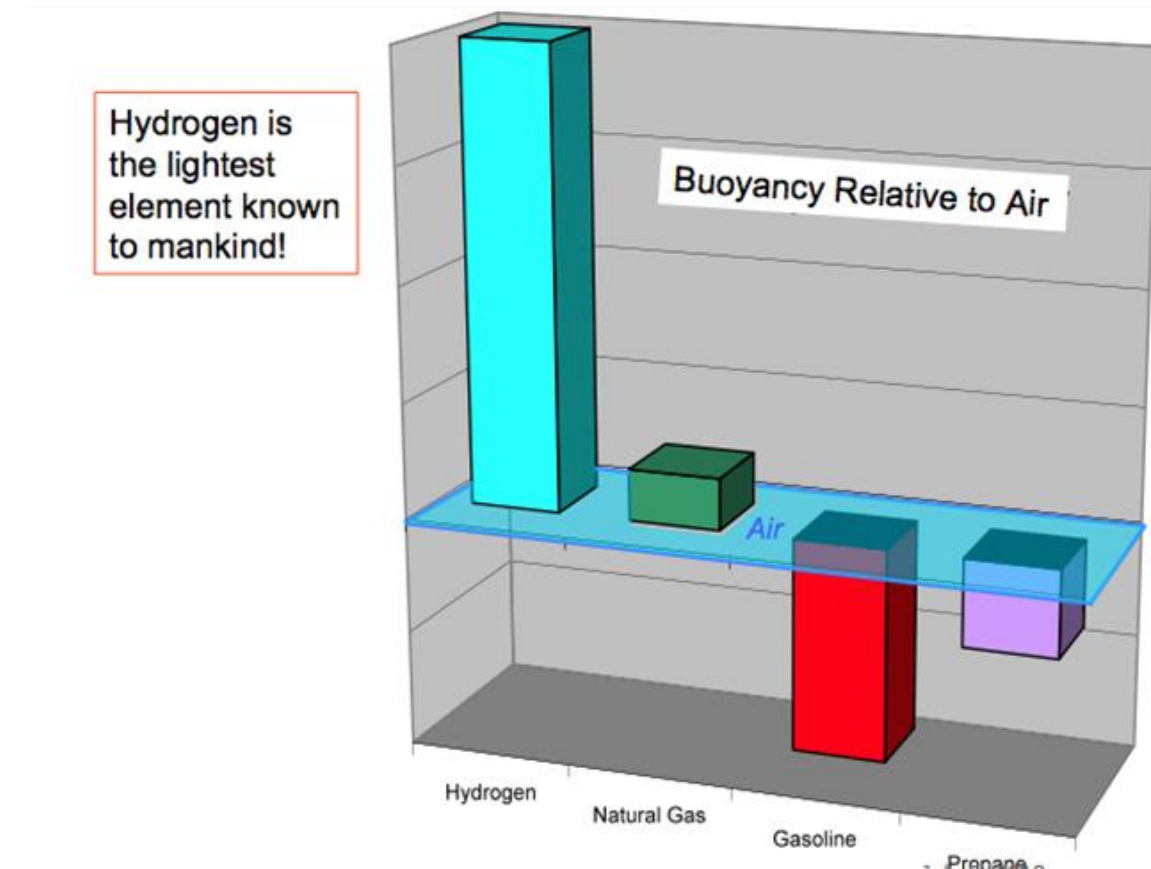
Myth #1: “Hydrogen gas is hazardous to store or use.”

Fact: Hydrogen is no more dangerous than other flammable fuels or the batteries used in electric cars.



Myth #1: “Hydrogen gas is hazardous to store or use.”

Fact: Hydrogen is 14 times lighter than air and 57 times lighter than gasoline vapor. It will typically rise and disperse rapidly when leaked, greatly reducing the risk of ignition at ground level.



Myth #1: “Hydrogen gas is hazardous to store or use.”

Fact: It is non-toxic, unlike conventional fuels. A hydrogen leak or spill will not contaminate the environment or threaten the health of humans or wildlife, unlike fossil fuels.



Myth #1: “Hydrogen gas is hazardous to store or use.”

Fact: Vehicles with pressurized gas storage tanks are not new. There is an existing global multi-billion industry that has been transporting and making hydrogen for many decades.



[Analysis of Supply Chain Opportunities for Fuel Cell Buses Using Industrial Classifications \(csuohio.edu\)](#)

Myth #1: “Hydrogen gas is hazardous to store or use.”

Fact: Hydrogen fueling dispensers are designed to run multiple safety checks throughout the fueling process (start, mid-point, end).



Myth #1: “Hydrogen gas is hazardous to store or use.”

Facts:

- Hydrogen presents the same, if not less, dangers than other fuels due to its non-toxic and low-hazard characteristics
- An array of safety procedures and protocols must be implemented throughout each design stage of a product to ensure the safe performance of hydrogen technology
- Hydrogen technology promises an efficient and economical solution when handled safely and appropriately



Myth #2: “H2 is not a practical long-range solution.”

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Myth #2: “H2 is not a practical long-range solution.”

Fact: H2 has high energy density and so can deliver a comparable range, and under pressure, can be stored and distributed as efficiently as carbon-based fuels.



Refueling



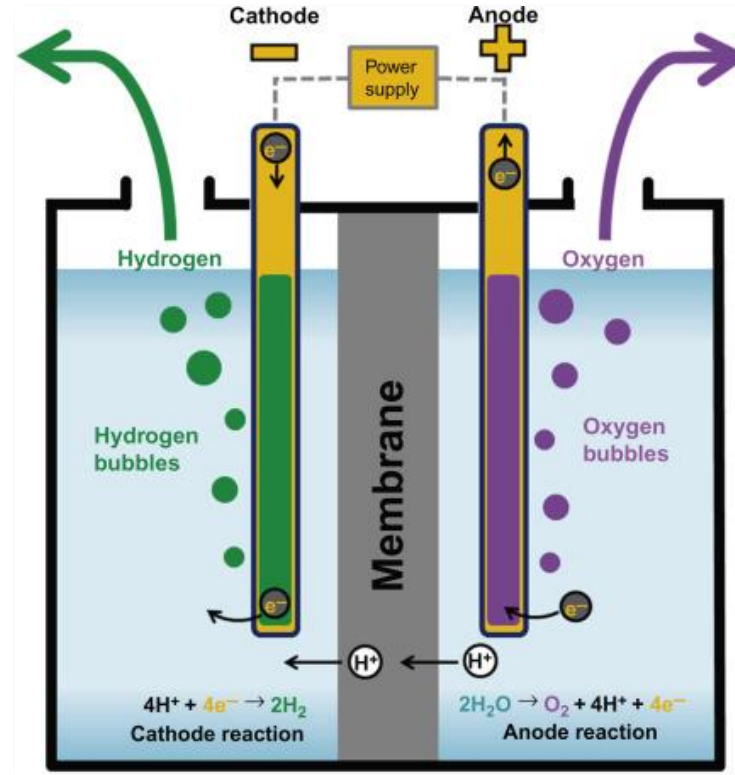
Range



Efficiency

Myth #2: “H₂ is not a practical long-range solution.”

Fact: It is the most abundant element in the universe but needs to be extracted from water or organic compounds, but this is no different from fuel for diesel and gasoline used in combustion engines which require refining and cleaning crude oil (a process that may use hydrogen, BTW).



Myth #2: “H₂ is not a practical long-range solution.”

Fact: The major source of hydrogen today is the extraction from natural gas (which is already a multi-billion-dollar global industry).



<https://www.engineering-airliquide.com/steam-methane-reforming-hydrogen-production>

Myth #2: “H2 is not a practical long-range solution.”

Fact: Infrastructure can be added to existing fueling infrastructure and deliver comparable refueling times to gas and diesel.



<https://advanzh2.ca/h2-for-vehicles-in-canada/>

Myth #2: “H₂ is not a practical long-range solution.”

Fact: A hydrogen economy can eventually touch many parts of everyday life.



Myth #2: “H2 is not a practical long-range solution.” (recap)

Facts:

- H2’s high energy density is particularly well-suited to heavy-duty vehicle applications.
- Its lighter weight can help to maximize a heavy-duty truck’s payload while increasing its range.
- High-speed refueling of hydrogen-powered vehicles is also possible which would help to reduce the downtimes of vehicle fleets and equipment without needing redundancy of battery storage, as is common for many warehouses utilizing battery-powered forklift trucks.
- Even though green H2 depends on wind, solar, and water for generation—improved storage technologies keep the energy flowing regardless of the weather.



Myth #3: “Hydrogen is too expensive.”

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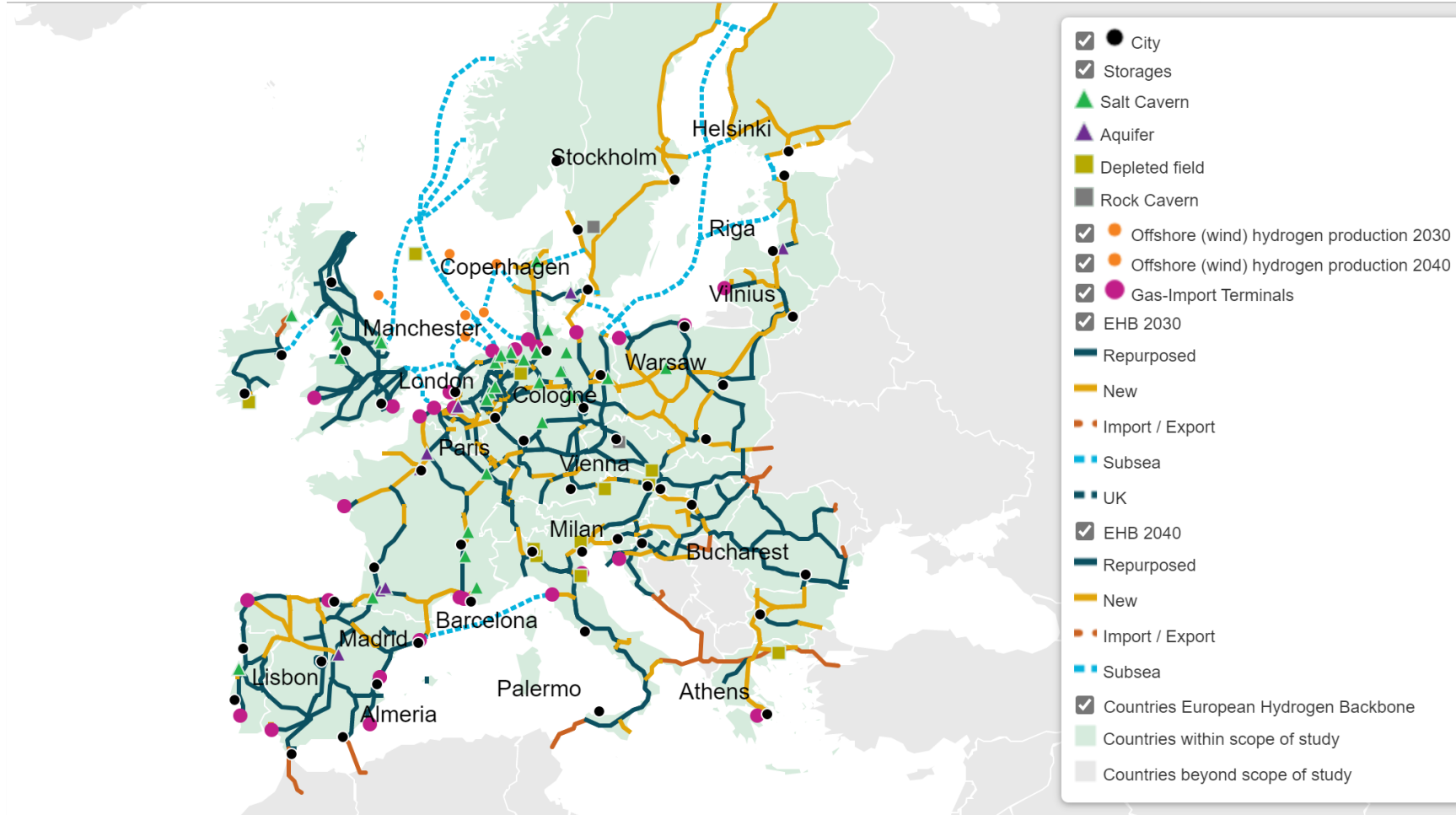
Myth #3: “Hydrogen is too expensive.”

Fact: The price of green hydrogen continues to fall, and this reduction is projected to accelerate over the next decade and make it truly comparable to other mobility fuels (it is projected to be cheaper than natural gas by 2050).



Myth #3: “Hydrogen is too expensive.”

Fact: Major government initiatives will help spur hydrogen development and bring down costs.



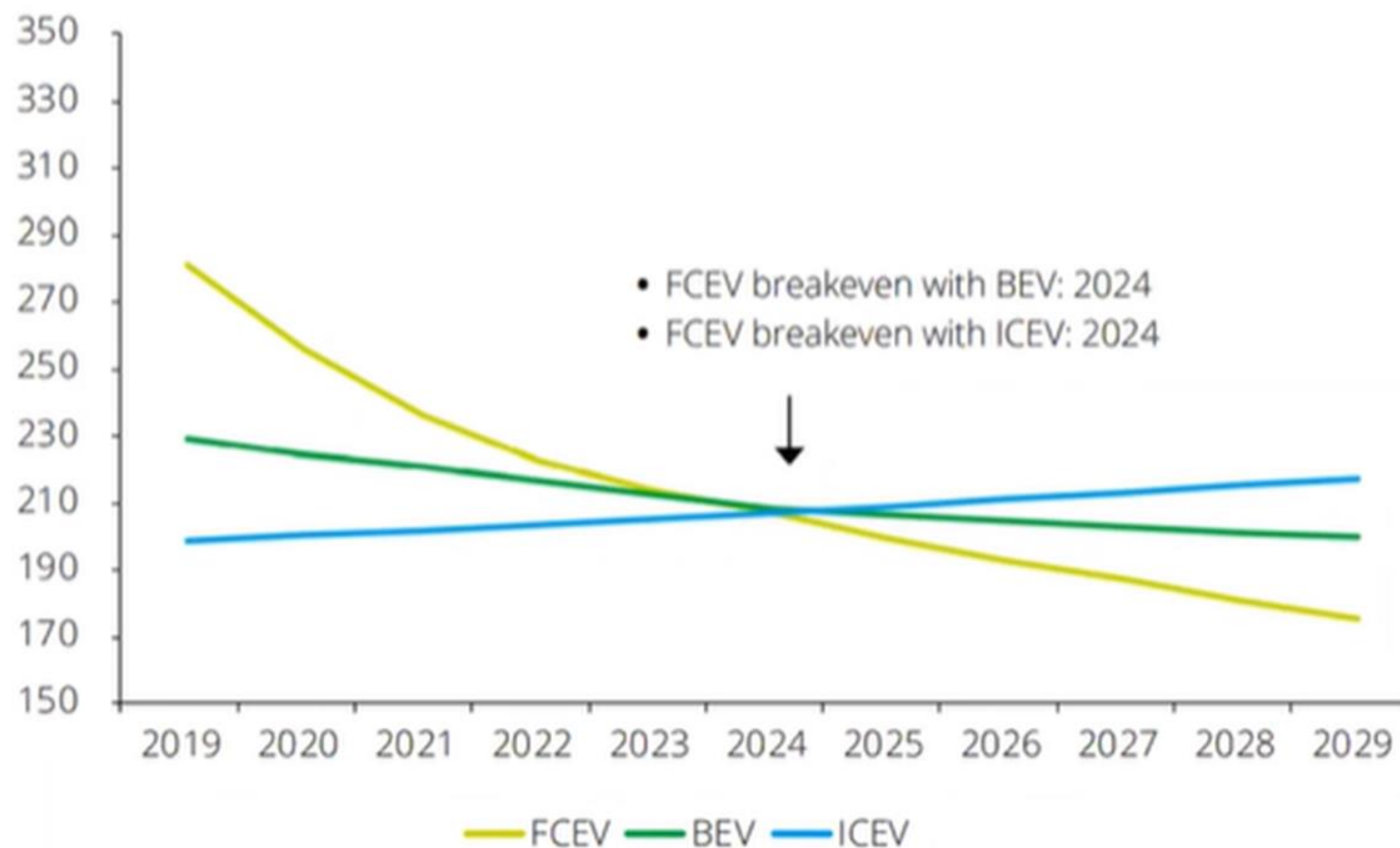
Myth #3: “Hydrogen is too expensive.”

Fact: As the cost and efficiency of renewable (solar, wind, water, etc.) energy resources continue to improve, this will carry H₂ fuel costs with it.



Myth #3: “Hydrogen is too expensive.”

Example: Total cost of ownership of transit buses in London UK / USD per 100km.



Deloitte predicts that based on total cost of ownership, fuel cell buses will become cheaper than both electric and internal combustion engine buses by 2024.

FCEV = fuel cell electric vehicle
BEV = battery electric vehicle
ICEV = internal combustion engine vehicle

Myth #3: “Hydrogen is too expensive.”

Facts:

- Government support will accelerate the growth of hydrogen at scale.
- The price of green hydrogen continues to fall and this reduction is projected to accelerate over the next decade and make it truly comparable to other mobility fuels (it is projected to be cheaper than natural gas by 2050).
- As the cost and efficiency of renewable (solar, wind, water, etc.) energy resources continue to improve, this will carry H₂ fuel costs with it.



Myth #4: “H2 is not environmentally friendly or sustainable.” 

Myth #4: “H₂ is not environmentally friendly or sustainable.”

Fact: Using hydrogen in a fuel cell creates no smoke, and no waste and the only outputs are energy and pure water.



Myth #4: “H₂ is not environmentally friendly or sustainable.”

Fact: There are several processes by which H₂ is produced, and these processes range widely for CO₂ emission output and sustainability

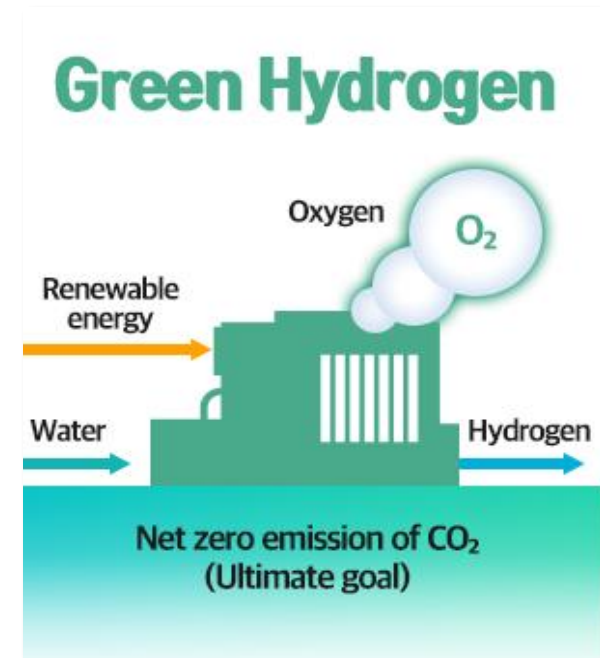
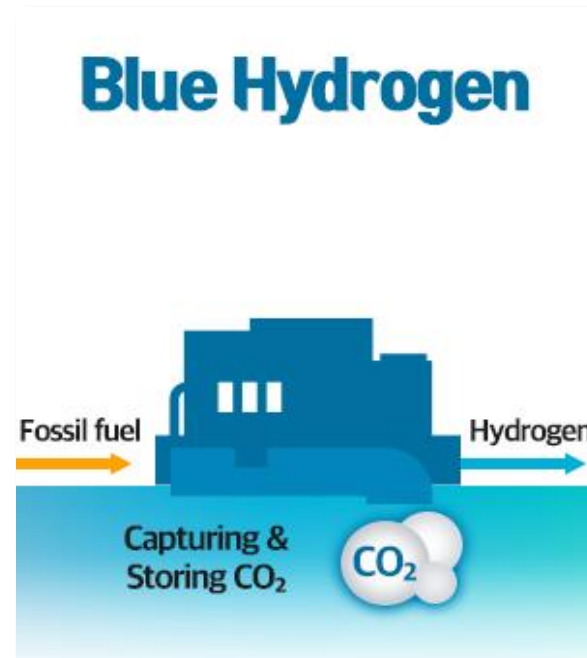
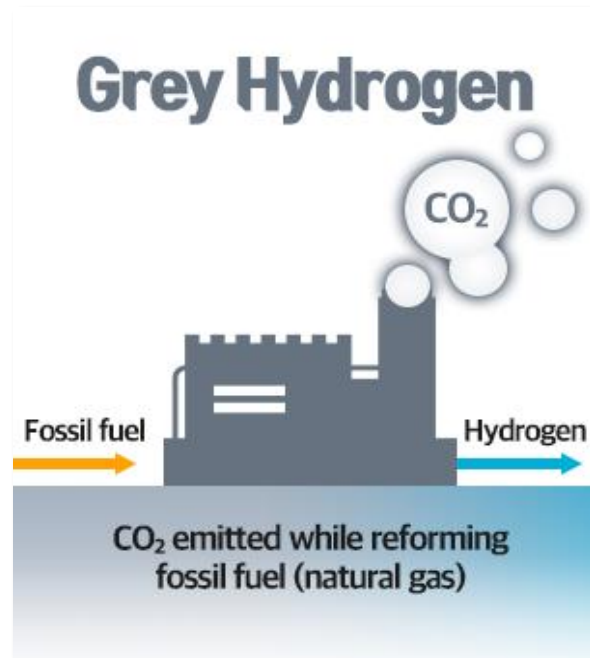
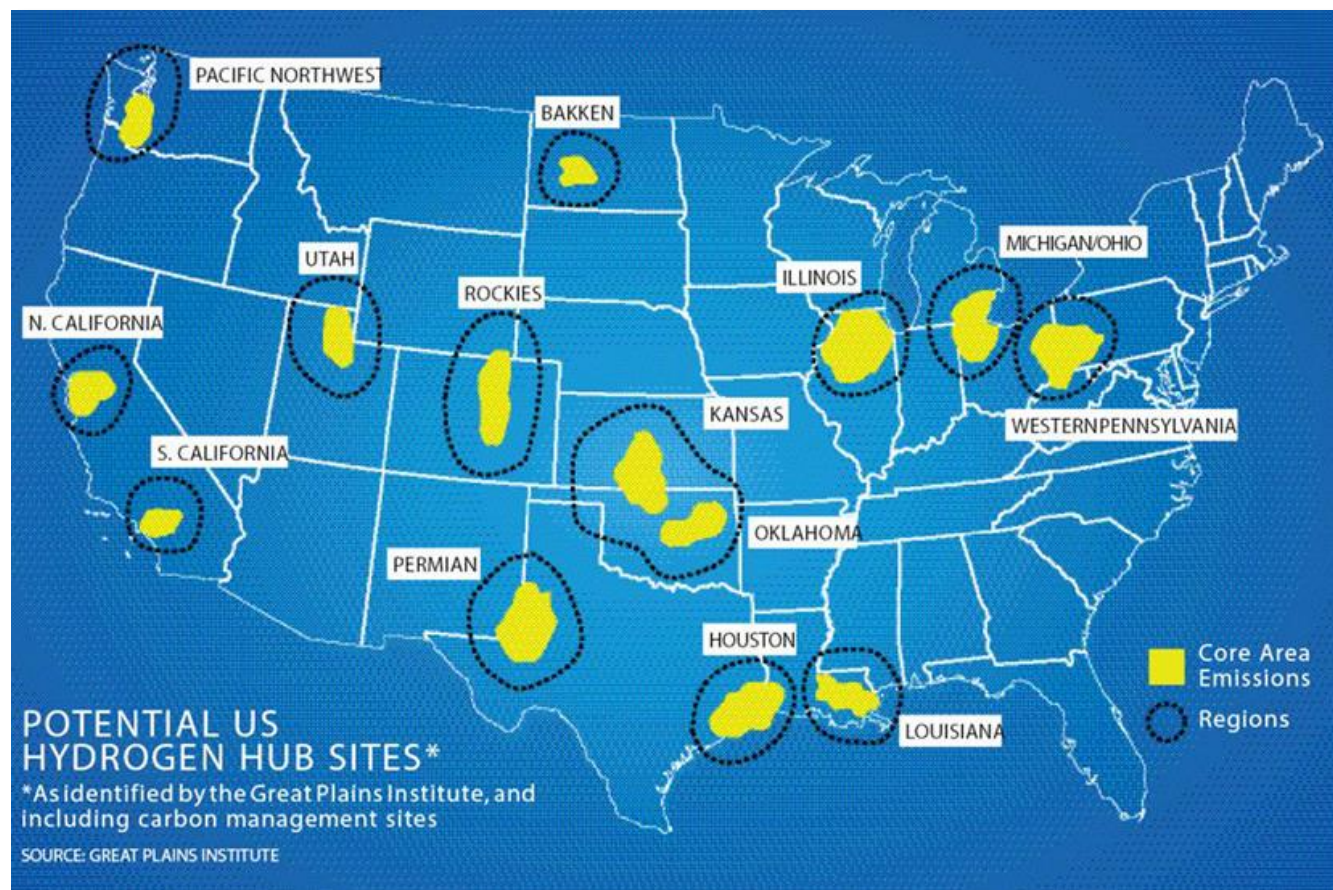


Illustration via POSCO

Myth #4: “H2 is not environmentally friendly or sustainable.”

Fact: Carbon capture technology offers a way to sequester carbon and permanently store (or use it) for industrial purposes.



Myth #4: “Hydrogen is not environmentally friendly or sustainable.” (recap)

Facts:

- Using hydrogen in a fuel cell creates no smoke, and no waste, and the only outputs are energy and pure water.
- There are several processes by which H₂ is produced, and these processes range widely for CO₂ emission output and sustainability
- Governmental efforts such as the US DOE Earth Shots program support long-term growth



Swagelok and Clean Energy

- Swagelok has **75 years of experience and expertise in the containment and management of small-molecule gases under pressure.**
- We have 30 years of experience supporting **customers pursuing clean energy solutions** that require high-integrity components that effectively contain high-pressure, small-molecule gases like hydrogen.
- Our stainless-steel components are designed to deliver **leak-tight systems and long-service life.**
- And, with our **global network of authorized sales and service centers**, we can deploy this expertise whenever and wherever you need it.
- As a result, we are uniquely qualified to **help our customers meet and overcome the fluid system challenges unique to the emerging Clean Energy industry.**

Questions?

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