

The Global Hydrogen Trade: Comparing Developments in the EU, the U.S., and Globally



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The
Deciding
Factor

The IRA drives up to USD 175 billion investment in hydrogen production



Tax credits for hydrogen production can be as high as USD 3/kg

CO ₂ intensity (kg CO ₂ equiv./kg H ₂)*	Maximum tax credit (USD/kg H ₂)	Minimum tax credit (USD/kg H ₂)
2.5–4	0.60	0.12
1.5–2.5	0.75	0.15
0.45–1.5	1.00	0.20
0–0.45	3.00	0.60

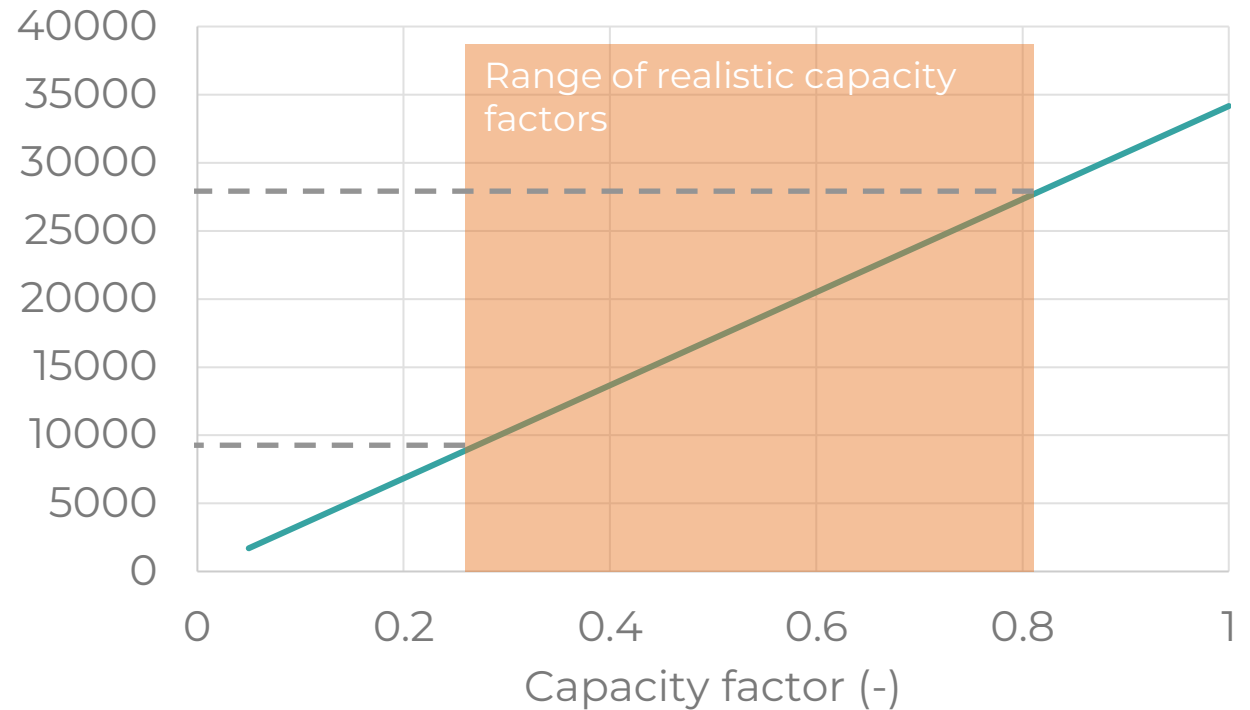
A factor 5 higher tax credit depends on conforming to prevailing wage conditions.

The IRA drives up to 28 Mtonne/y of hydrogen production



Hydrogen production capacity depends on the electricity source

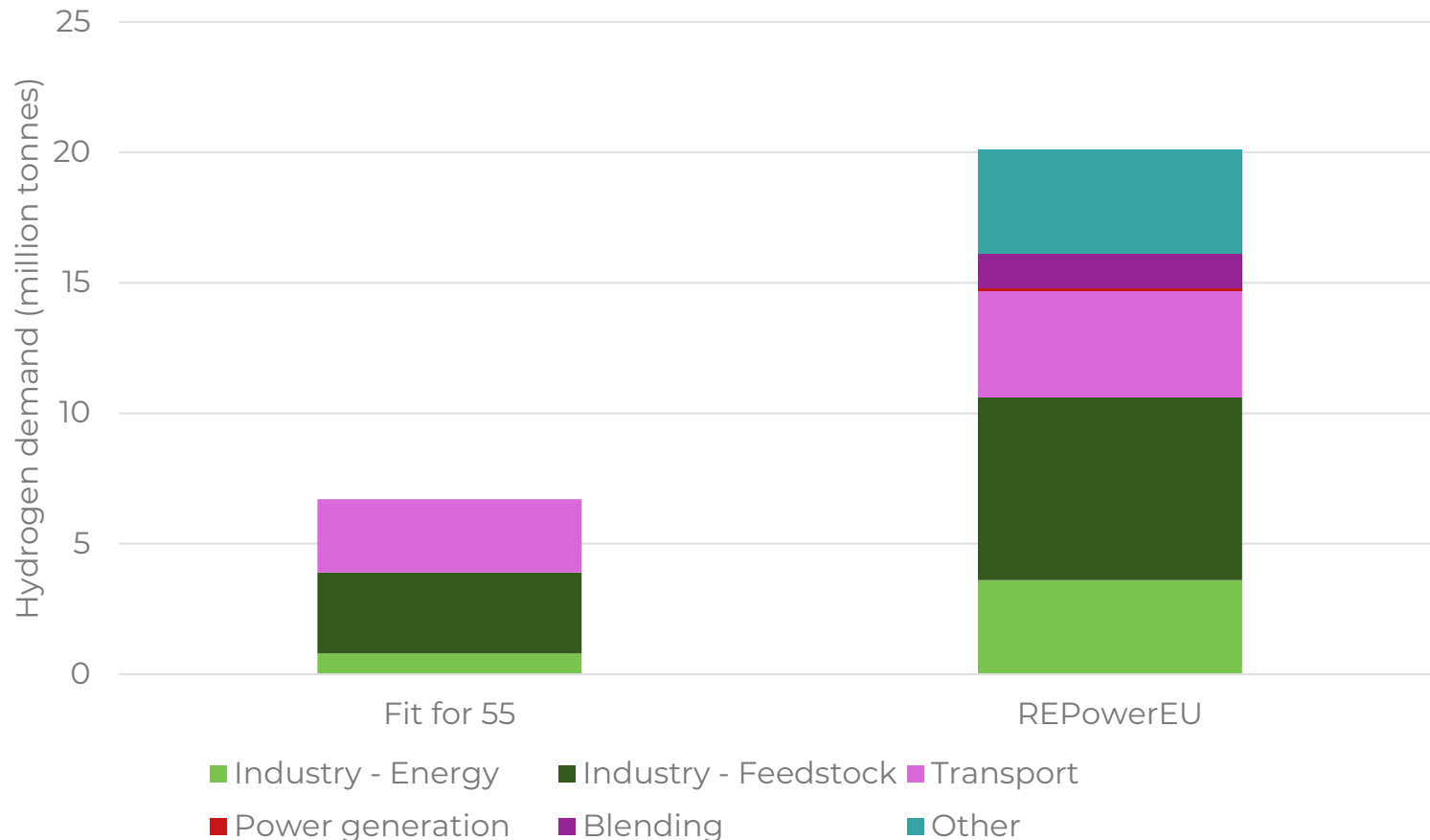
Hydrogen production capacity
(ktonne/y)



Calculated based on electrolyzer investment data by Lux Research.
Image source: [Chemical Engineering](#)

In 2022, the EU revised its demand to 20 Mtonne of hydrogen by 2030

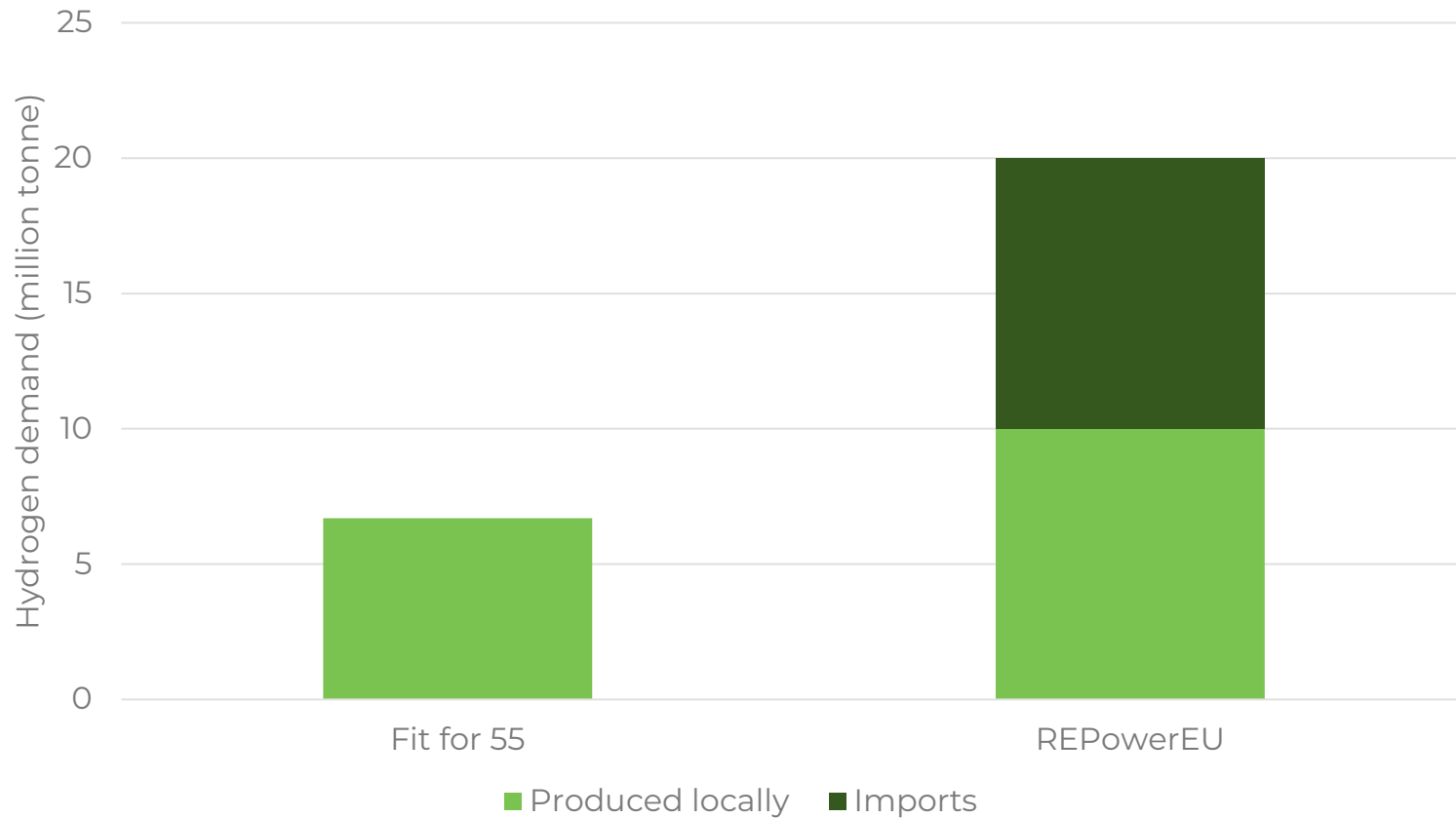
Projected hydrogen demand in the EU by 2030



REPowerEU is a plan to rapidly reduce reliance on Russian fossil fuels and accelerate the EU's transition to carbon neutrality.

The EU will produce half its hydrogen locally and import the rest

Projected hydrogen demand in the EU by 2030

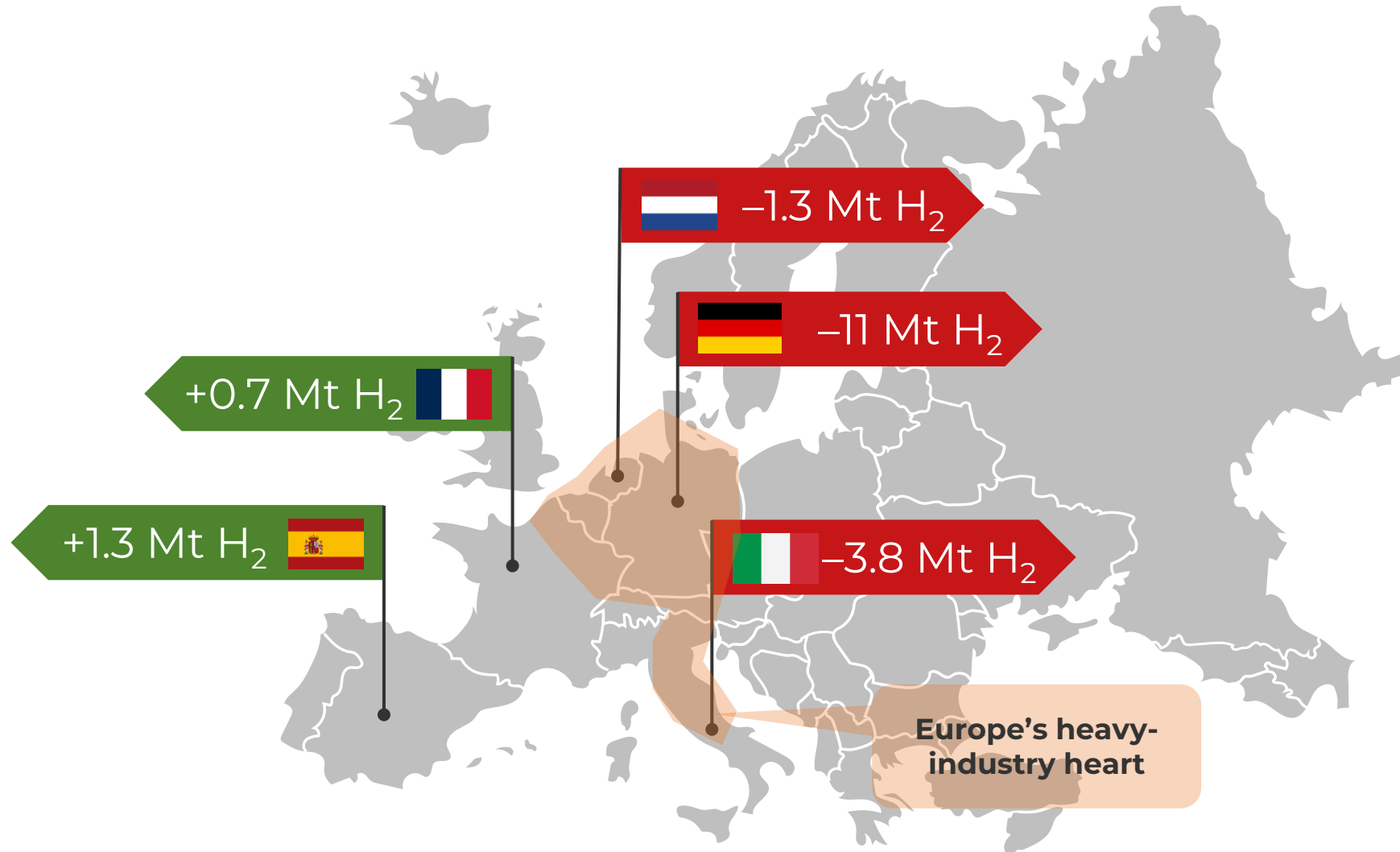


Up to 17.5 GW of electrolyzer manufacturing capacity is needed by 2025, at a cost of EUR 2 billion.

In addition, the EU will import up to 10 Mtonne of hydrogen by 2030.

The heavy-industry band will be net importing

2050

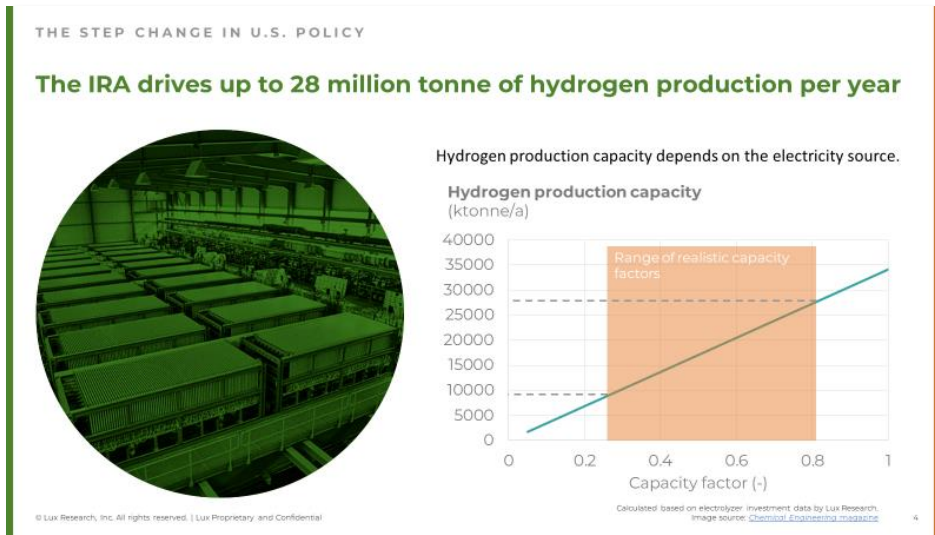


The EUR 3 billion **H2MED** project consists of two pipelines with a combined length of 700 km.

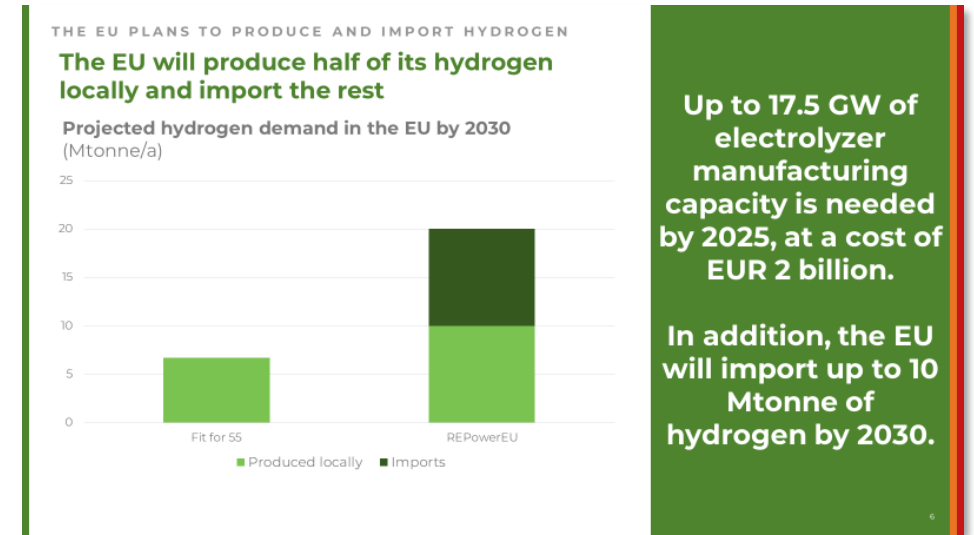
Approximately 2 Mtonne of hydrogen will be transported through the pipeline, which will connect Portugal, Spain, France, and Germany.



The EU and the U.S. are on very similar tracks to scale hydrogen

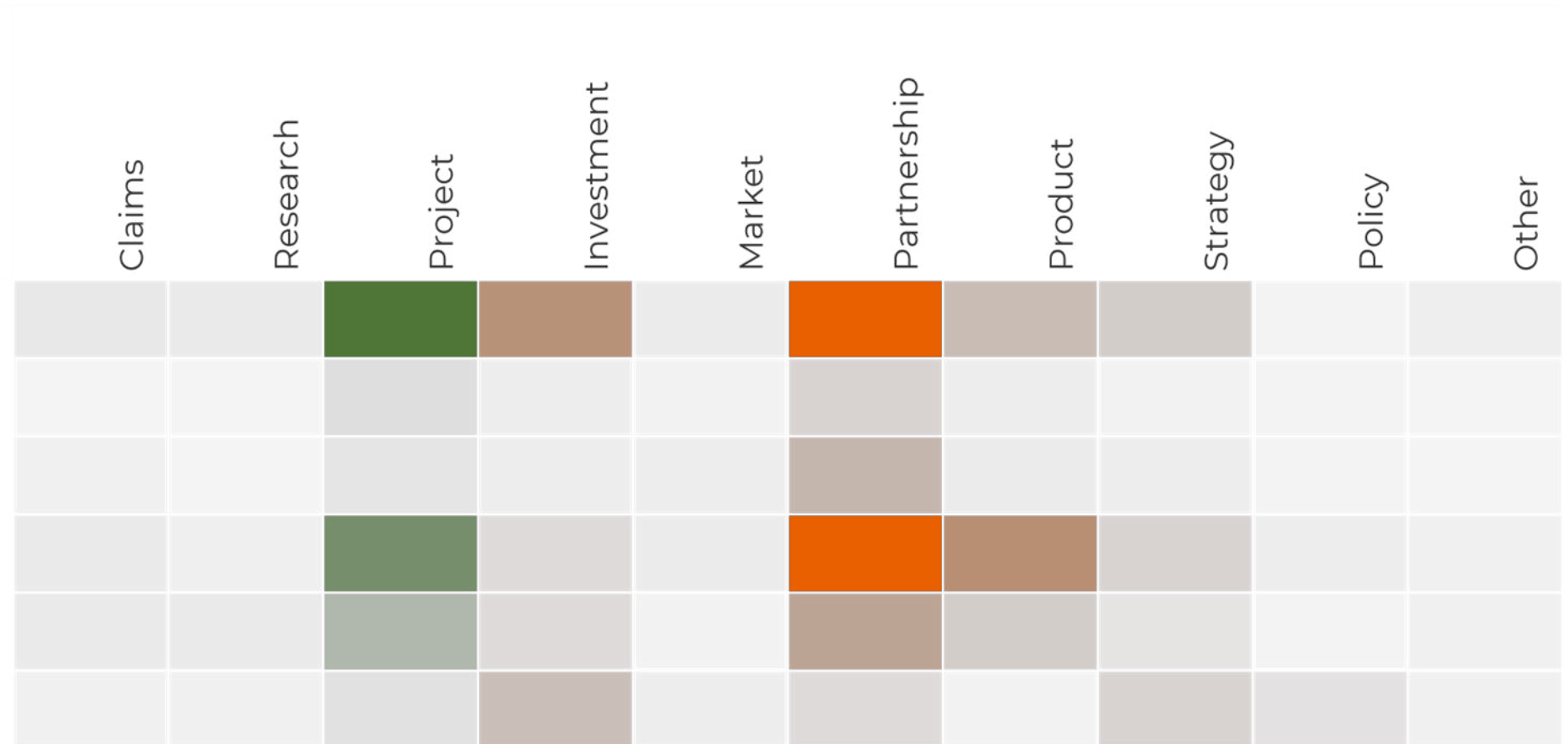


- Approximately 20 Mtonne/y production by 2035
- Up to USD 175 billion total investment by 2035



- Approximately 20 Mtonne/y demand by 2030
- Domestic electrolyzer production supports at least EUR 150 billion investment between 2025 and 2030

The world focuses on building and partnering for hydrogen today



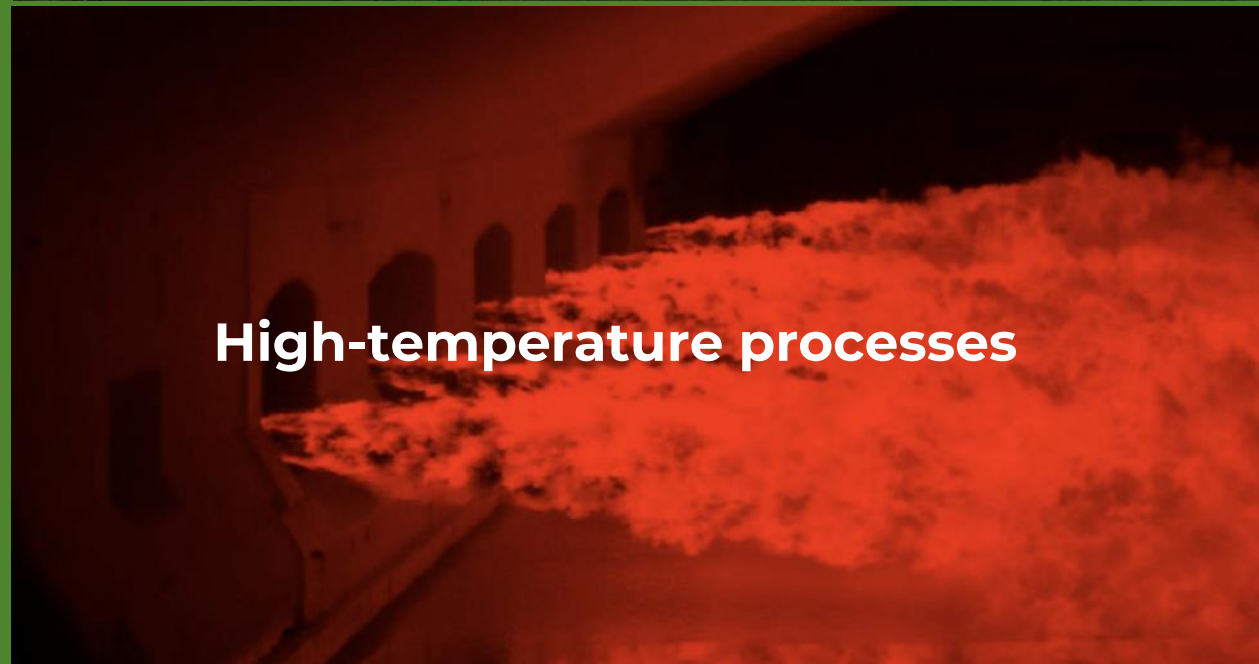
Hydrogen economy activity in Q2 2023, as tracked through Lux Research's news commentaries



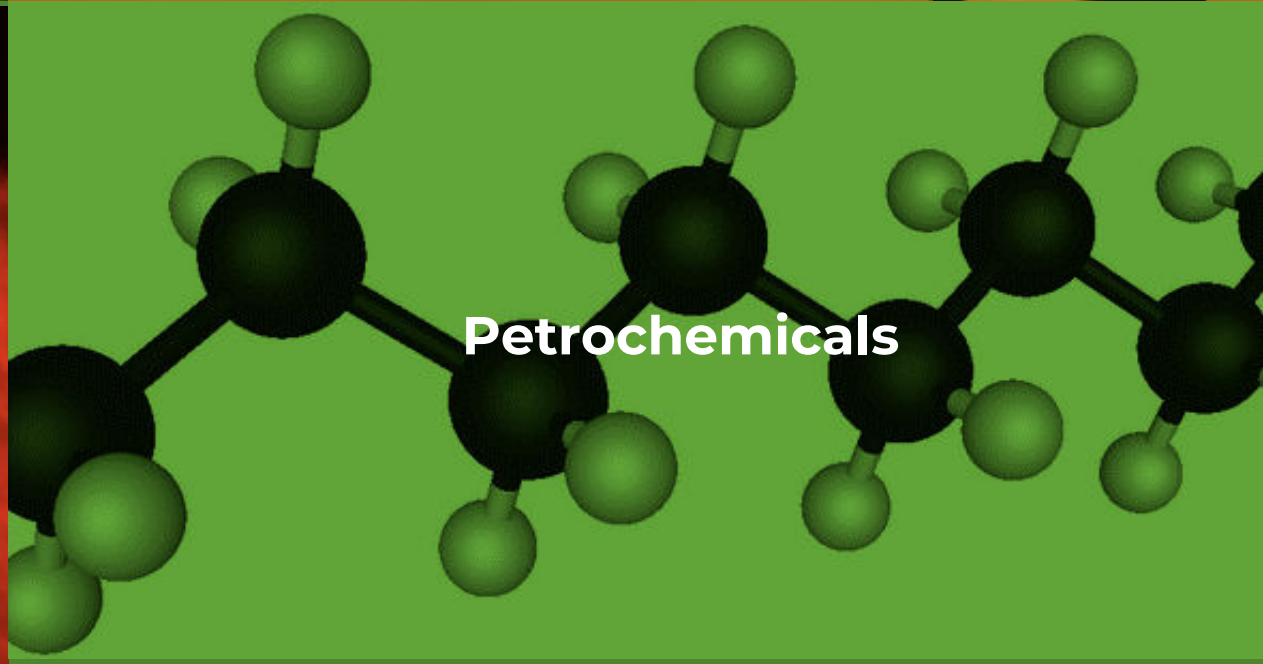
Energy transmission



Transportation fuel

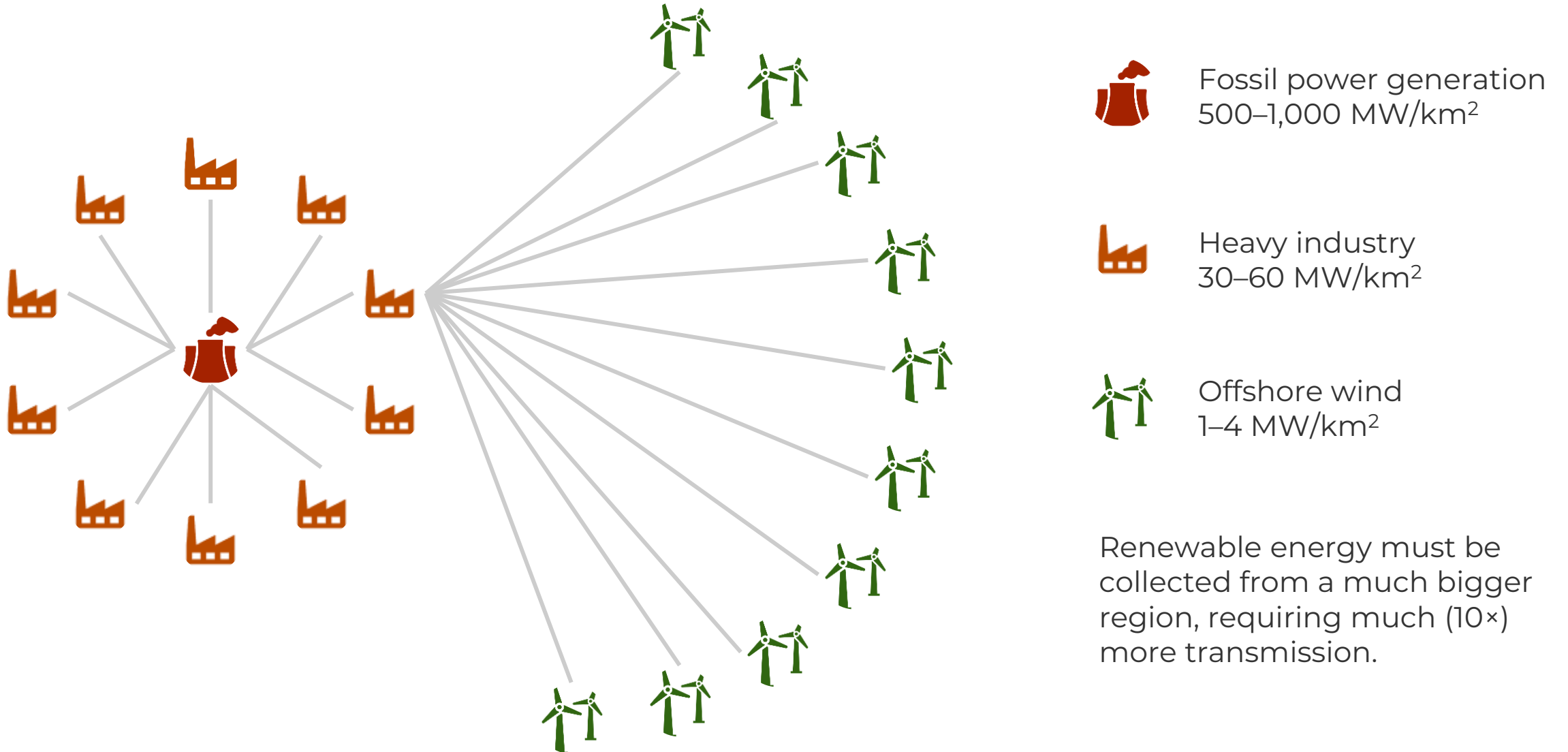


High-temperature processes



Petrochemicals

Power densities change by 3 orders of magnitude



Land-dependent process industry is smaller (a factor of 3–5 times)



Ethylene

Cracker capacity on one site	1,825 ktonne/y
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Carbon content	85%
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Carbon processed	1,564 ktonne/y
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Paper

Largest mill capacity	250 ktonne/y pulp
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Carbon content	48%
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Carbon processed	122 ktonne/y
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Potato starch

Starch production	600 ktonne/y
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Carbon content	44%
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Carbon processed	267 ktonne/y
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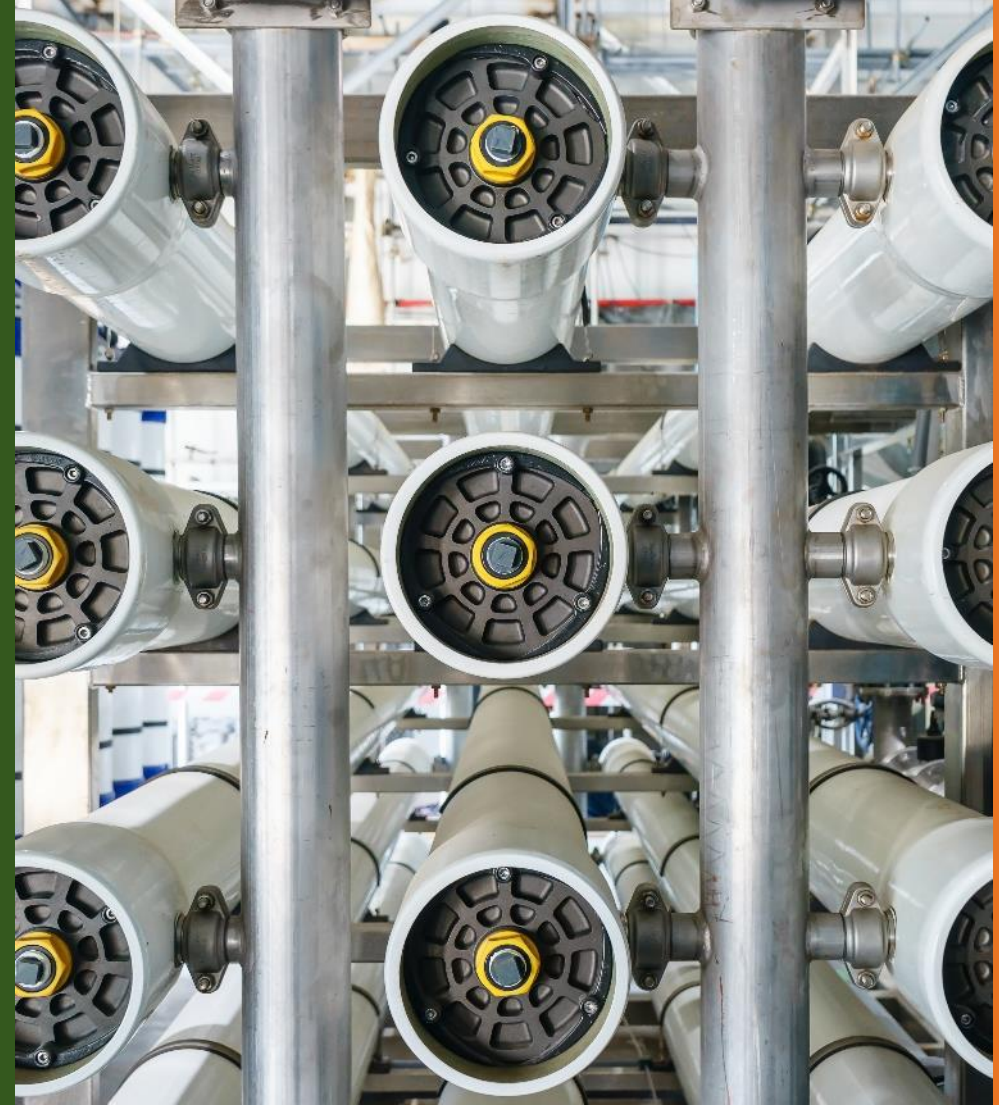
DiviGas

Novel membrane manufacturer

- Hollow-fiber membranes to improve gas separation performance.
- Can handle H₂ concentrations **as low as 35%** today; lower concentrations are possible in the future.

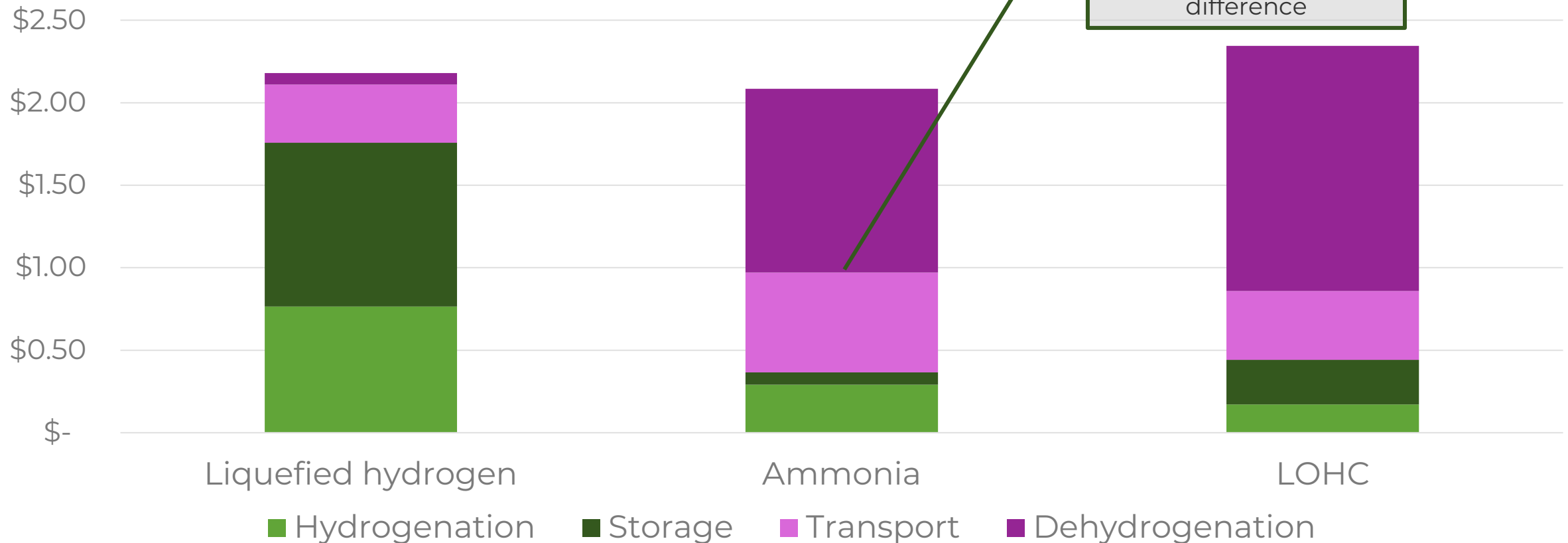


While the company is still at the pre-commercial stage, **its solution offers clear performance advantages.**



Hydrogen can be exported to places where renewable energy is USD 60/MWh more expensive

Cost of transporting hydrogen via liquid & chemical carriers (USD/kg)



1 ENGINE

From top to bottom: corporates, SMEs, research institutes








2 TURBINE

From top to bottom: corporates, SMEs, research institutes

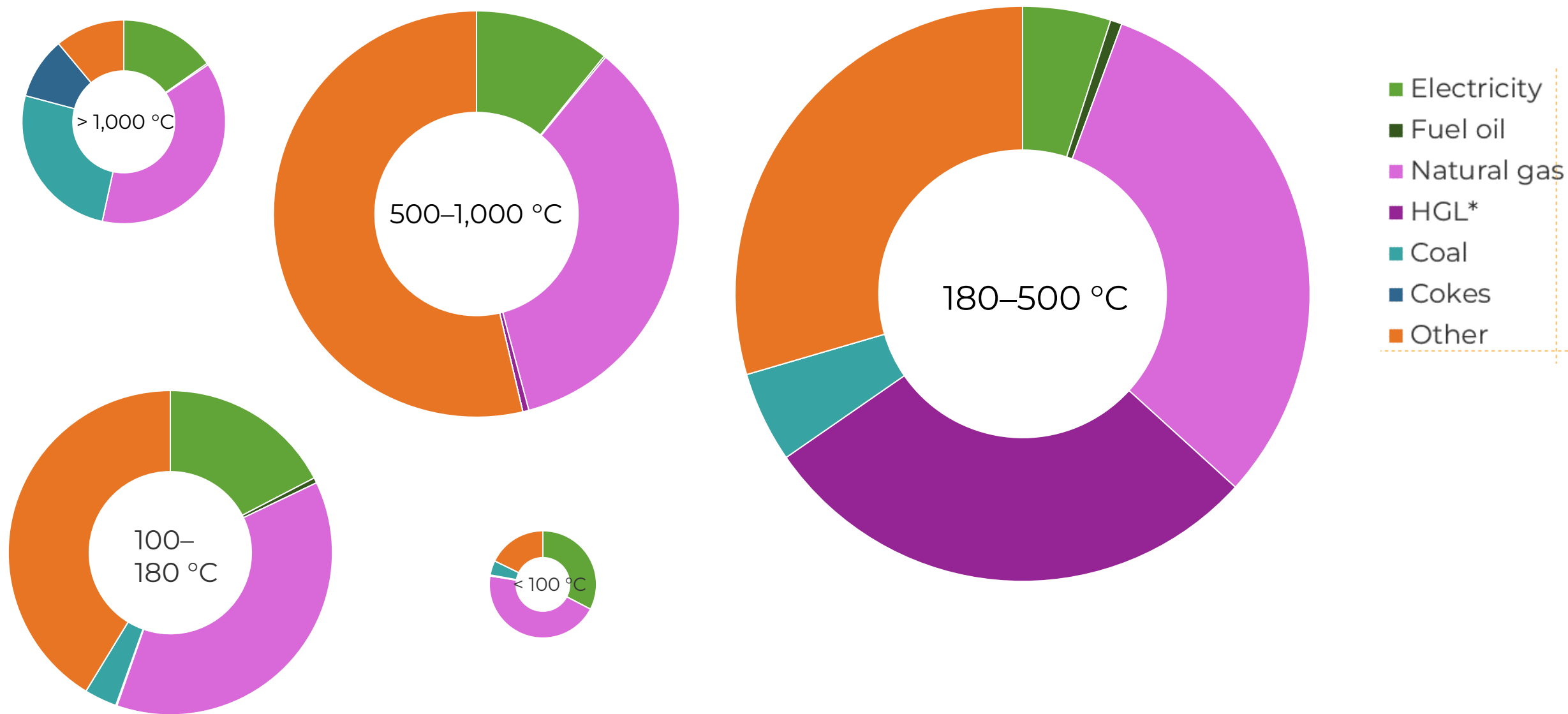
				
				

3 DIRECT AMMONIA FUEL CELL

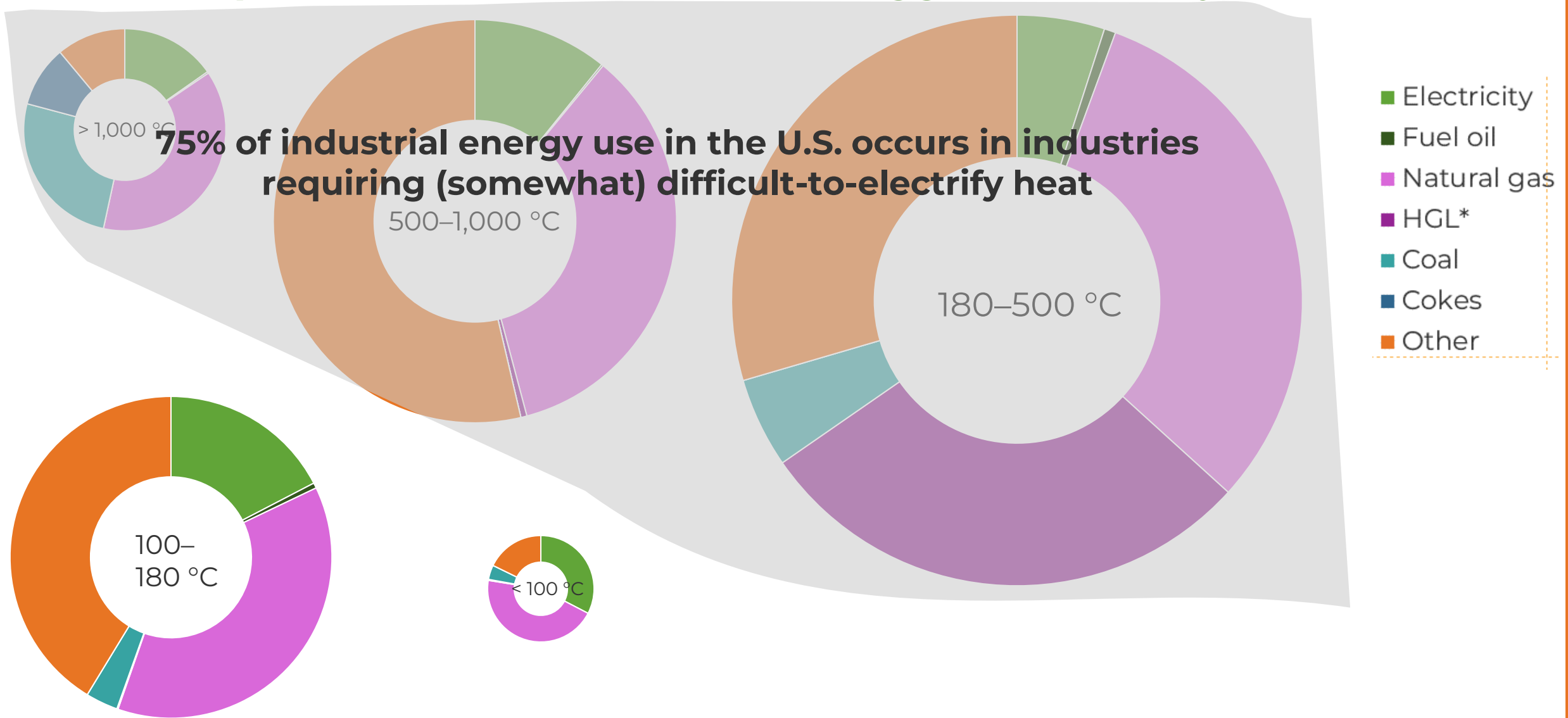
From top to bottom: corporates, SMEs, research institutes

Industrial processes over 500 °C will struggle to electrify



Industrial processes over 500 °C will struggle to electrify



The Renault Master van allows a like-for-like comparison

Master E-tech

100% battery electric

Consumer sales price: > USD 58,000

Range: up to 126 miles

Charge time: 2 hrs. (for 80% range)



Master H2-tech

Hydrogen fuel cell vehicle with Hyvia fuel cell

Consumer sales price: > USD 85,000*

Range: up to 250 miles

Charge time: 5 min. (for 100% range)



The Renault Master van allows a like-for-like comparison

Master E-tech

100% battery electric

Consumer sales price: \$45,000*

Range: 100 miles

Charging: 2 hours

For delivery in cities: average speed about 25 mph
That's 2 hours charging for 4 hours' driving.
Maximum utilization: 65%



Master H2-tech

Hydrogen fuel cell vehicle with Hyvia fuel cell

Consumer sales price: \$55,000*

Range: 300 miles

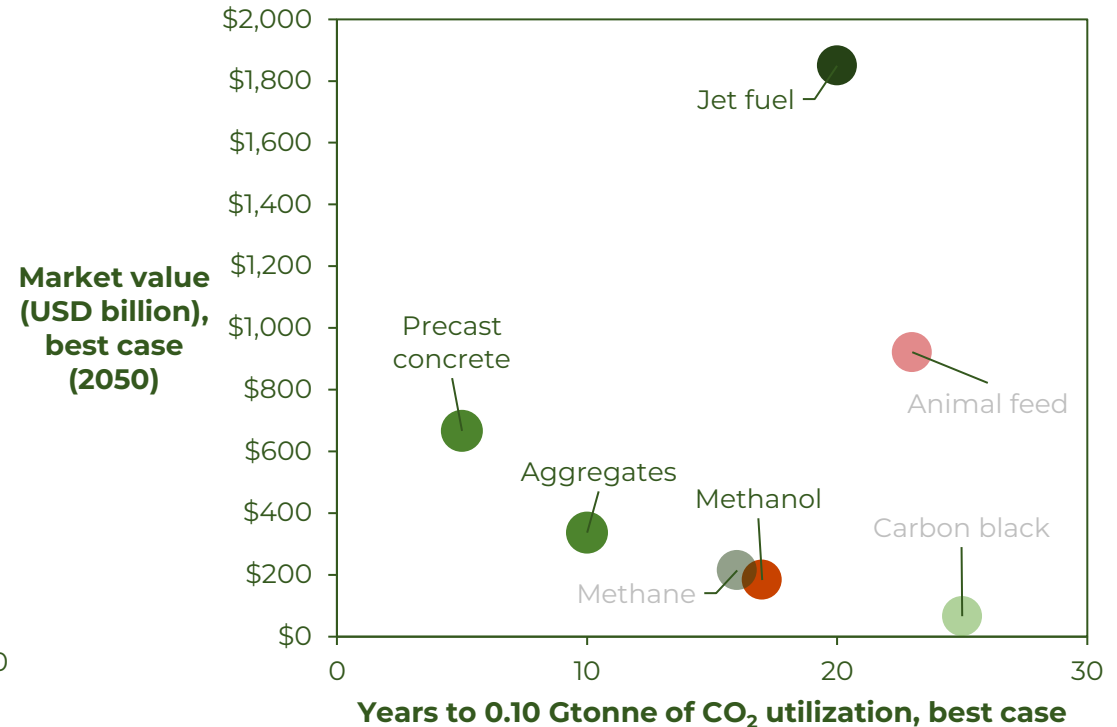
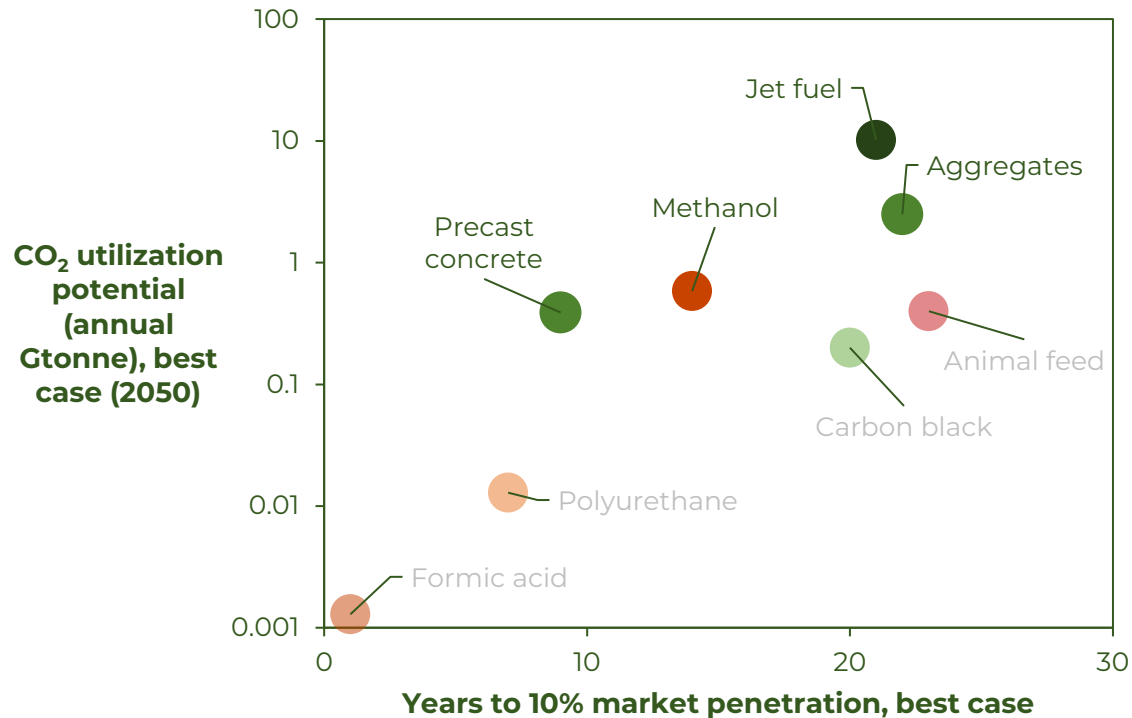
Charging: 5 minutes

For delivery in cities: average speed about 25 mph
That's 5 minutes charging for 10 hours' driving.
Maximum utilization: 99%

Two H2-techs can do the job of three E-techs



Production of chemicals and fuels won't drive short-term hydrogen demand but may be the largest future market



Note: CCU end-products not present in the above figures failed to reach 10% market penetration or utilize 0.1 Gtonne of CO₂ in the best case.

Key Takeaways

1 Hydrogen is primarily a good way to move renewable energy, abroad and in the U.S.

2 The case for hydrogen mobility is precarious and hinges on vehicles requiring high utilization.

3 Industrial use is initially driven by the need to decarbonize heat; chemicals and fuels will follow in 10 years.

Thank you

A link of the webinar recording will be emailed within 24–48 hours.

UPCOMING WEBINARS

OCTOBER 17

[How Robotics Will Fuel the Future of Agriculture](#)

NOVEMBER 21

[Unpacking the UN's Plan on Plastic Pollution](#)

NOVEMBER 28

[Decarbonization Policy Global Outlook](#)



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