



Lhyfe

Europeisk Gasmaknad- HYnder & HYppportunities

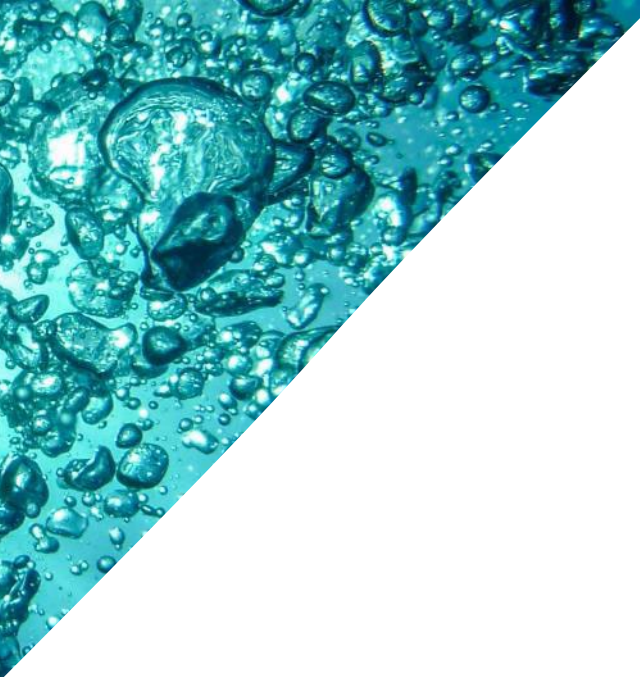
Gasdagarna 2023

- *Sara Wihlborg*
- *Båstad 2023-05-25*



Lhyfe

1. Lhyfe, producer & supplier of renewable hydrogen
2. Market segments and applications for hydrogen.
3. Offshore hydrogen production - What makes it interesting?
4. What policy instruments are needed to get the hydrogen industry to take off? Hynder & HYpportunities



Lhyfe

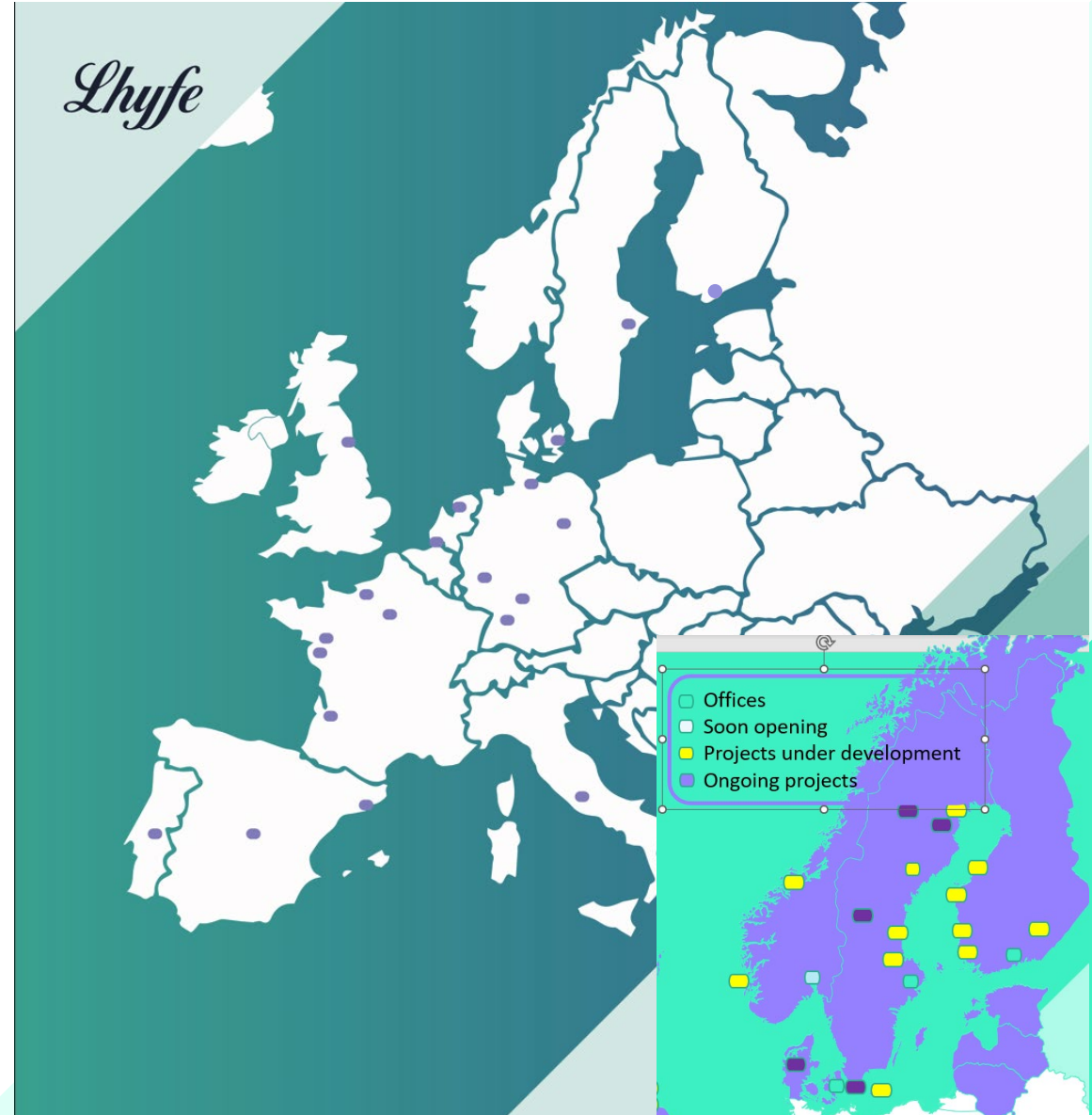
Lhyfe, producer & supplier of renewable hydrogen



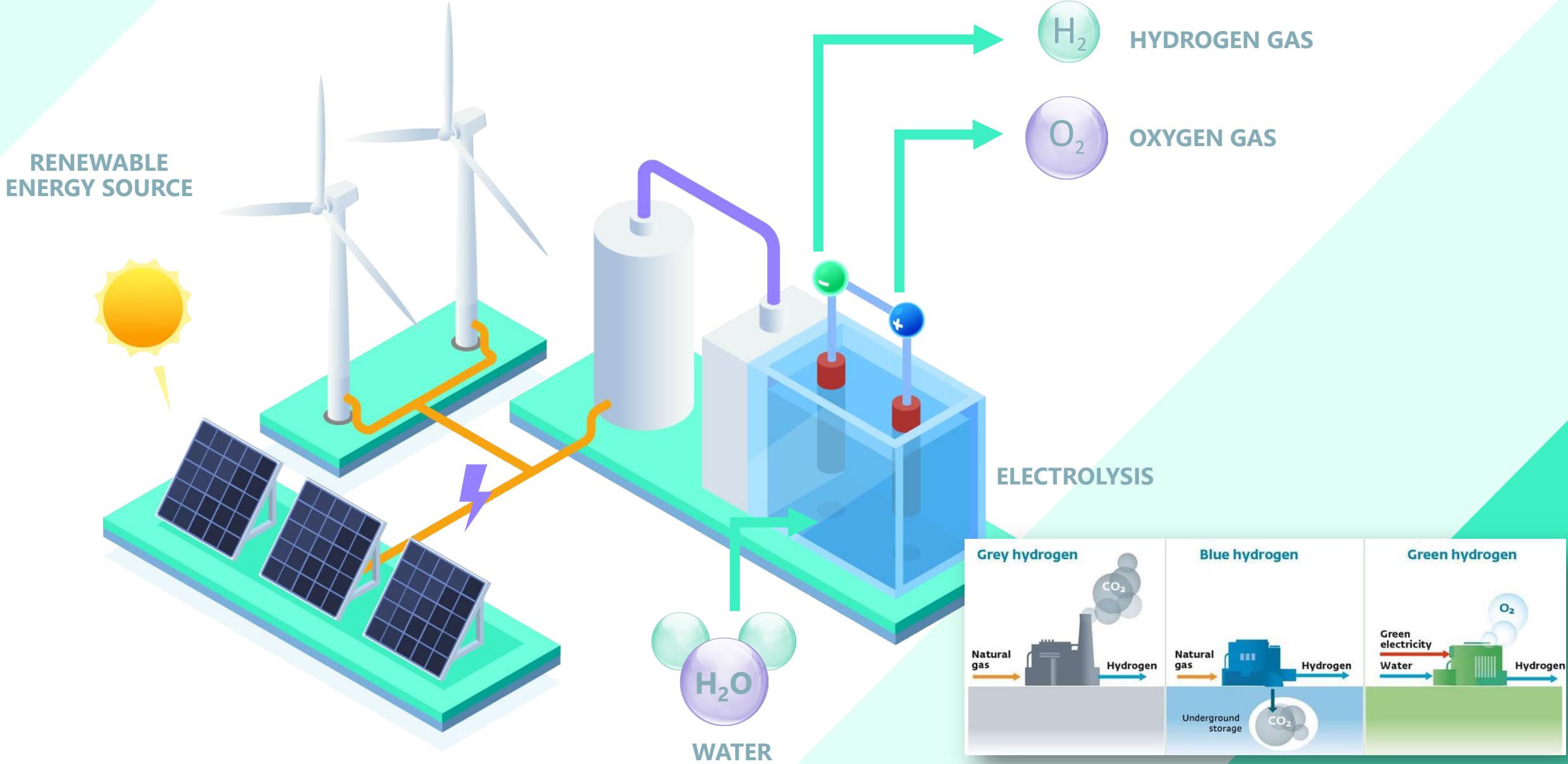
Lhyfe

Lhyfe- Introduction

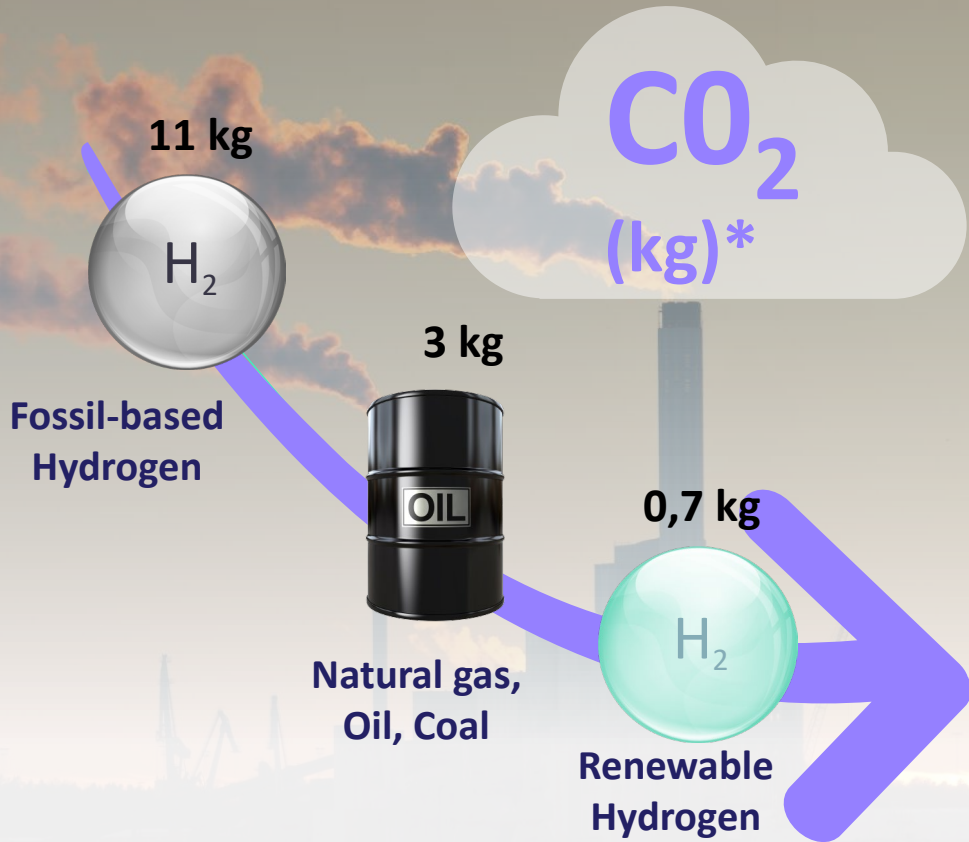
- ▶ Independant company founded in 2017
- ▶ Producer & supplier of renewable hydrogen
- ▶ Headquarter in Nantes, France
- ▶ Located in 12 countries
- ▶ 190+ talented people (2023)



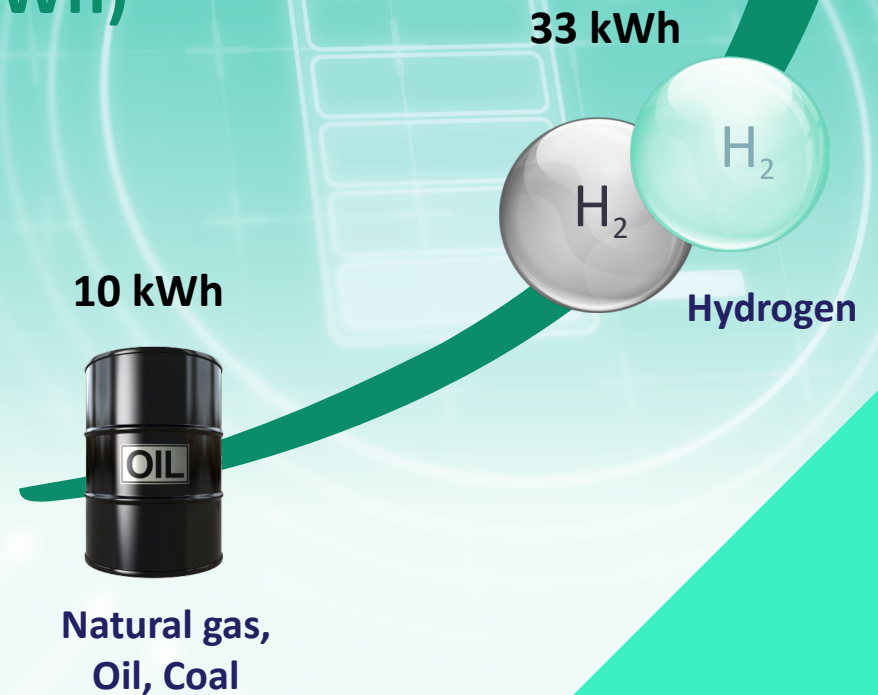
How to Produce Renewable Hydrogen



Renewable Hydrogen: A Decarbonized & Powerful Energy



Energy (kWh)*



*: per kg of feedstock

TRELLEBORG- example of creating local ecosystems



Opening
2025

Capacity
2000 kg of H₂ a day

Energy source
Wind turbine + PV

Water source
Tap water

Uses
Mobility

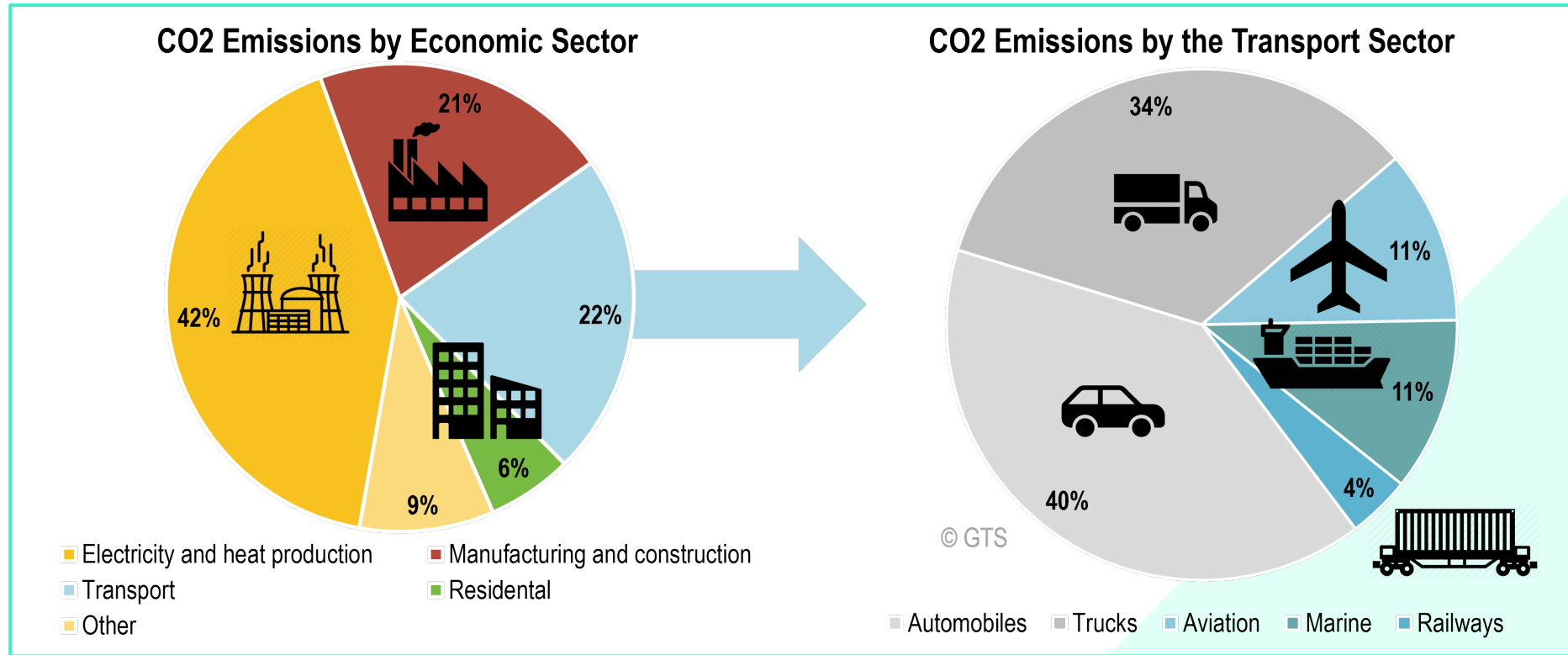


Lhyfe

Market segments and applications for hydrogen.
What does the development look like?



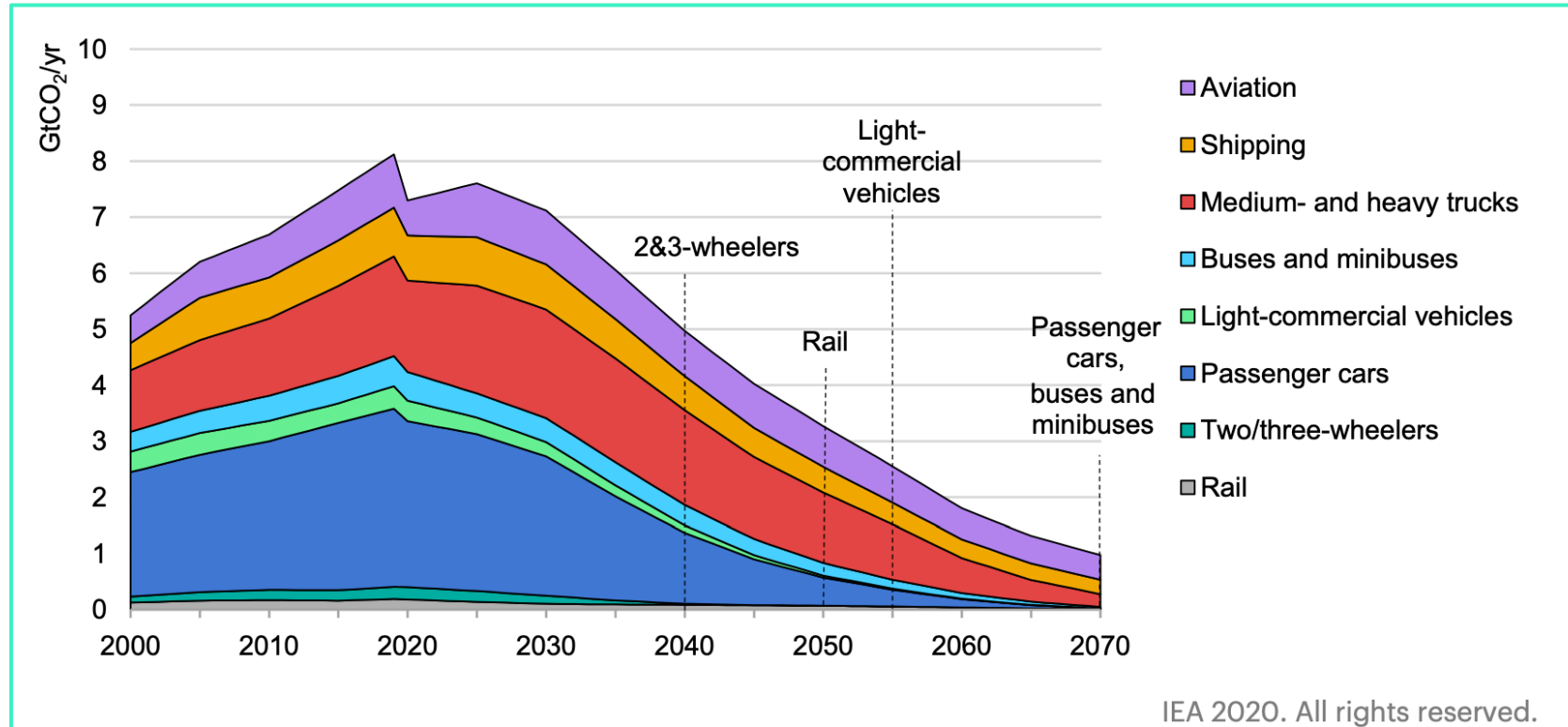
Lhyfe



Source: IEA

► **Mobility represents 22% of the Worldwide CO2 emissions**

Worldwide decarbonation trend for mobility


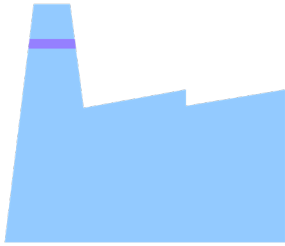



**Decarbonization of the mobility sector where electrification is not the most suitable source of energy
→ Hydrogen would be a good complement.**


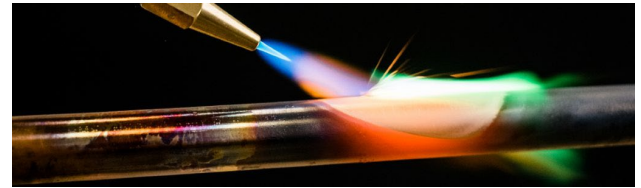
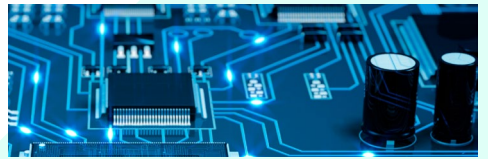
▶ European target

2030 : -55% CO₂ emission (vs 1990) => **FIT FOR 55**

2050 : Carbon neutrality by 2050 => **NET ZERO**

	1	2	3
Segment	Mobility	Industry	Power Generation
			
Needs	Use hydrogen as a fuel to power a vehicle	Use hydrogen in the manufacturing process (product or energy source)	Use Hydrogen as an energy source for power
Applications	Cars, Truck, Buses,...	Chemical, Cement plant, Glass factory...	Generator, Grid injection
Value chain	Gas to Motion	Gas to Process	Gas to Power

End-user applications for H2

	1	2	3
	Feedstock	Combustion	Other Industrial processes
			
	H2 is used to create or transform a component	H2 used as an energy source for combustion	H2 is used in industrial process
Current usage	H2	Fossil	H2
Applications	Example: Ammonia, methanol, hydrogen peroxid	Example: Cement, Asphalt, Ceramics	Example: Electronics as carrier gas, welding, furnace, testing
Co-demanded products	CO,CO2,N2	O2	



E-fuels if biogen carbon source



Lhyfe

Offshore hydrogen production - What makes it interesting?



Lhyfe

WHY GOING OFFSHORE?

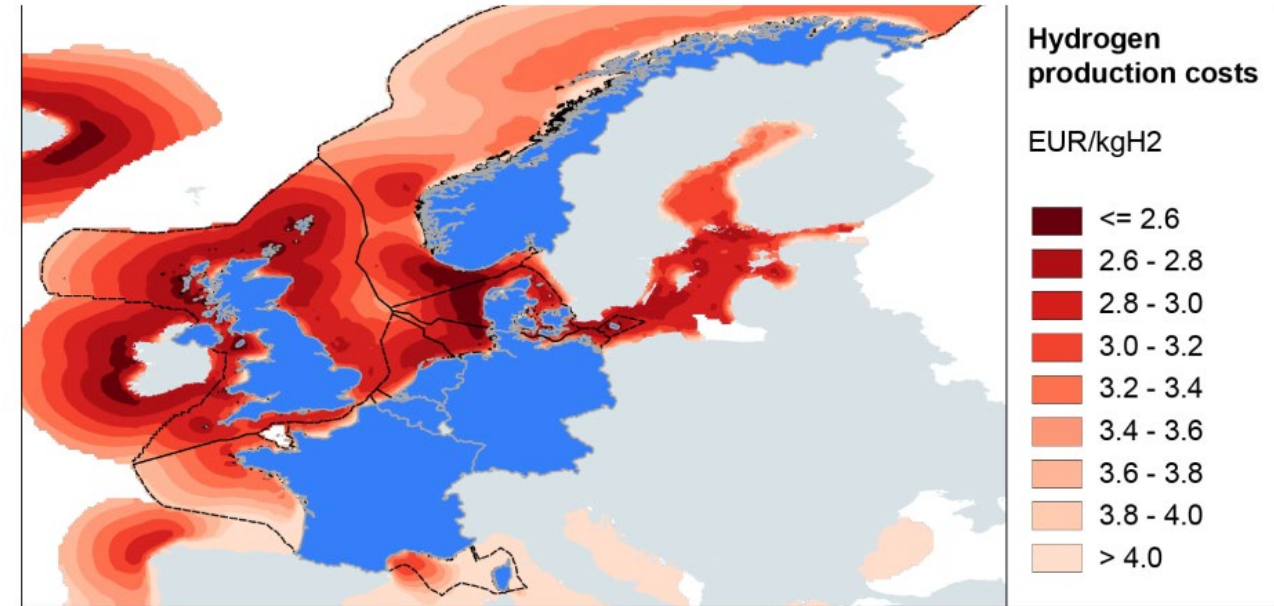
Advantages

- Unlimited resources of water and renewable electricity
- Limited issues in regard to permitting and project acceptance by Stakeholders
- No land usage permit required
- Larger turbines
- Higher Wind Turbine Generator's capacity factor
- Cheaper with pipelines to transport gas compared with cables to transport electricity
- Far shore > 70 km:
 - Facilities invisible from shore
 - Possibility to pack export pipeline to store energy as opposed to electricity

Disadvantages

- Access
- Harsh environment
- High investments and operational costs

Hydrogen production costs from offshore wind in the Accelerated scenario, 2030



IEA. All rights reserved.

Notes: This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. The analysis is based on hourly wind speed data from Copernicus Climate Change Service (2020).⁵⁶

▶ 1st Offshore Pilot : Le Croisic (France)



Opened
2022

Capacity
400 Kg H₂ per day

Source of Energy
Offshore Wind

Water Source
Sea Water



PL 19

Llyfe

Swan & Hill
Greenwich, England

Offshore
Production Facility

LE TEE

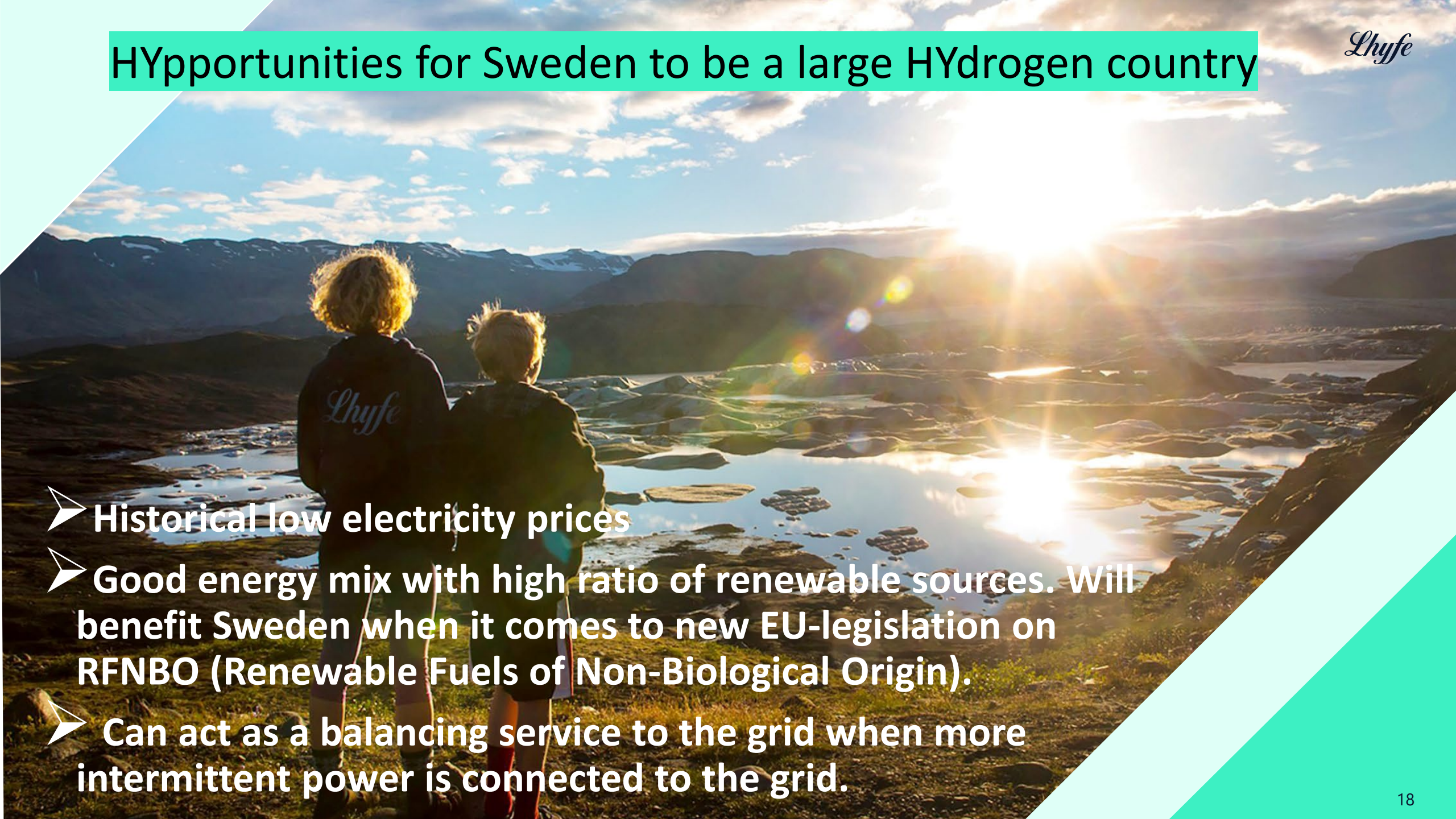


Lhyfe

What policy instruments are needed to get the hydrogen industry
to take off? HYnder & HYpportunities

Lhyfe

HYpportunities for Sweden to be a large HYdrogen country

- 
- A photograph of two people from behind, looking out over a vast, scenic landscape. The person on the left is wearing a dark jacket with the 'Lhyfe' logo on the back. The landscape features a large body of water with many icebergs, surrounded by mountains and a bright sun low on the horizon, creating a lens flare effect. The sky is blue with some clouds.
- **Historical low electricity prices**
 - **Good energy mix with high ratio of renewable sources. Will benefit Sweden when it comes to new EU-legislation on RFNBO (Renewable Fuels of Non-Biological Origin).**
 - **Can act as a balancing service to the grid when more intermittent power is connected to the grid.**

HYnder for Sweden to be a large HYdrogen country

- Subsidies are important to start the market. The criterias, evaluation process and timelines on the subsidies schemes must be transparent, predictable and awarded after lowest cost per CO₂ reduction. Awarded projects must represent all parts in the value/supply chain. Klimatklivet and Industriklivet has sponsored a lot of good projects over the years. What is the future for those programs in the current political environment?
- Grid connection- and permit processes must be faster so parties know where it is possible to get enough capacity, could slow down planning - and investment processes.
- For hydrogen to succeed in the mobility segment a reshape of « Reduktionsplikten » is needed instead of lower the blend-in of renewables in total. By including all lowcarbon fuels in the mandate like hydrogen, biogas and electricity charging it will be more competition among fuels available (to comply with the regulation) and likely also lower prices at pump to the end-customer.
- To succeed with the really big industry projects electrolyzers must bigger, cheaper and more efficient.
- National strategy for hydrogen and collection of biogen CO₂ needed.
- Necessary to get back-bone and underground storage in operation soon to efficient use of off-shorewind and security of supply.

Contact us



Sara WIHLBORG

Country Manager Sales
Business Development
Lhyfe Sweden AB

Name Sara Wihlborg
Country Manager

Phone number +46 73 081 42 79
Mail sara.wihlborg@lhyfe.com