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Big energy storage system, future for challenges

HUAWEI FUSIONSOLAR PARTNER for CEE, Scandinavia, Baltics and Eurasia

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FOREIGN OFFICES

SALES OFFICES EUROPE AND ASIA

- **České Budějovice** ▶ Czechia
- **Prague** ▶ Czechia + Slovakia
- **Kyiv, Lviv** ▶ Ukraine
- **Warsaw** ▶ Poland
- **Budapest** ▶ Hungary
- **Sønderborg** ▶ Denmark
- **Stockholm** ▶ Sweden
- **Tallinn** ▶ Baltics
- **Bucharest** ▶ Romania
- **Plovdiv, Sofia** ▶ Bulgaria
- **Tbilisi** ▶ Georgia
- **Tashkent** ▶ Uzbekistan
- **Almaty** ▶ Kazakhstan

HUAWEI

BASIC FACTS

HUAWEI

INVERTER BUSINESS **SINCE 2008**

ACTIVE IN **23 COUNTRIES**

15 FOREIGN **OFFICES**

1

5.800+ MW IN 2022
11.500+ MW SINCE 2016
HUAWEI INVERTERS

400+ MWH BESS

490 M USD* 2022

2

150 EMPLOYESS

40 TECHNICAL SUPPORT

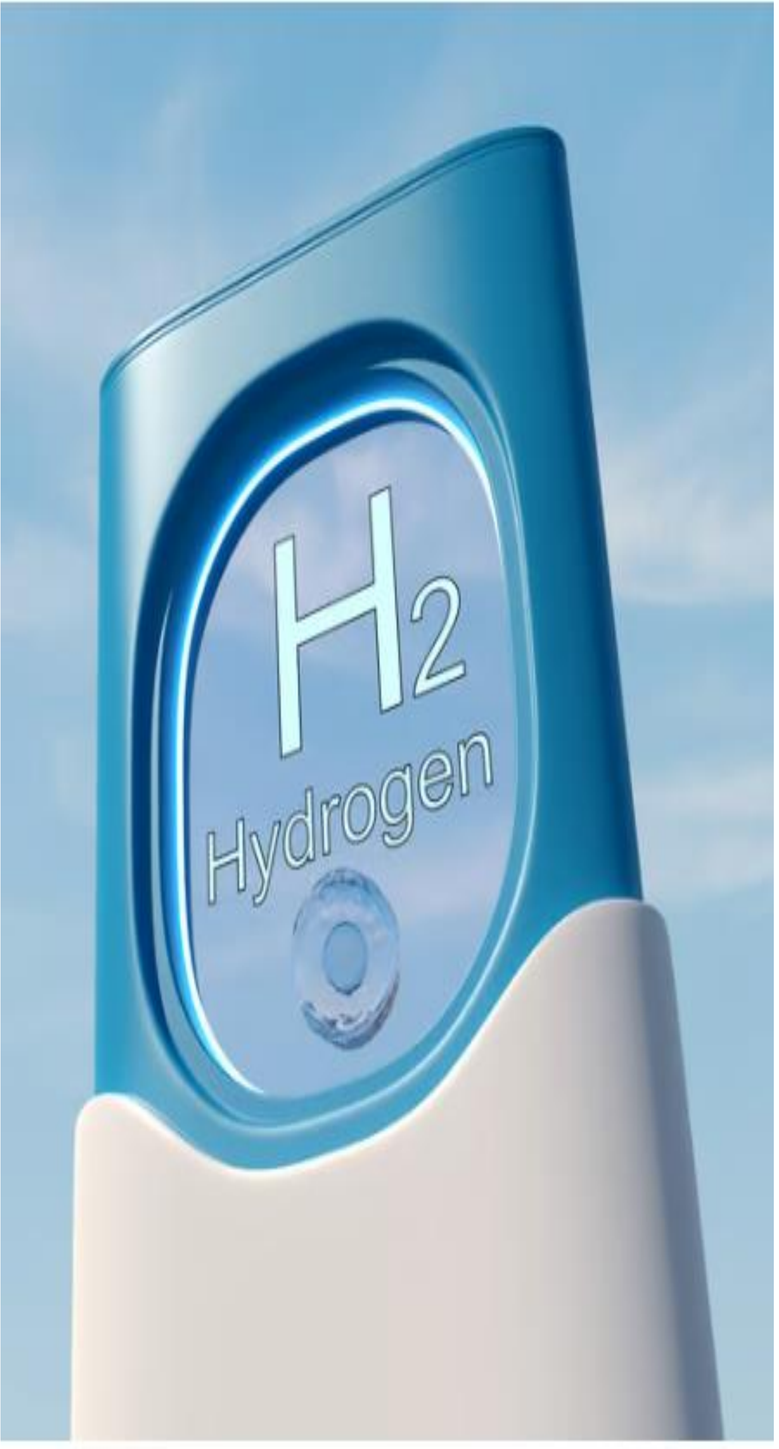
220+M INHABITANS MARKET

3

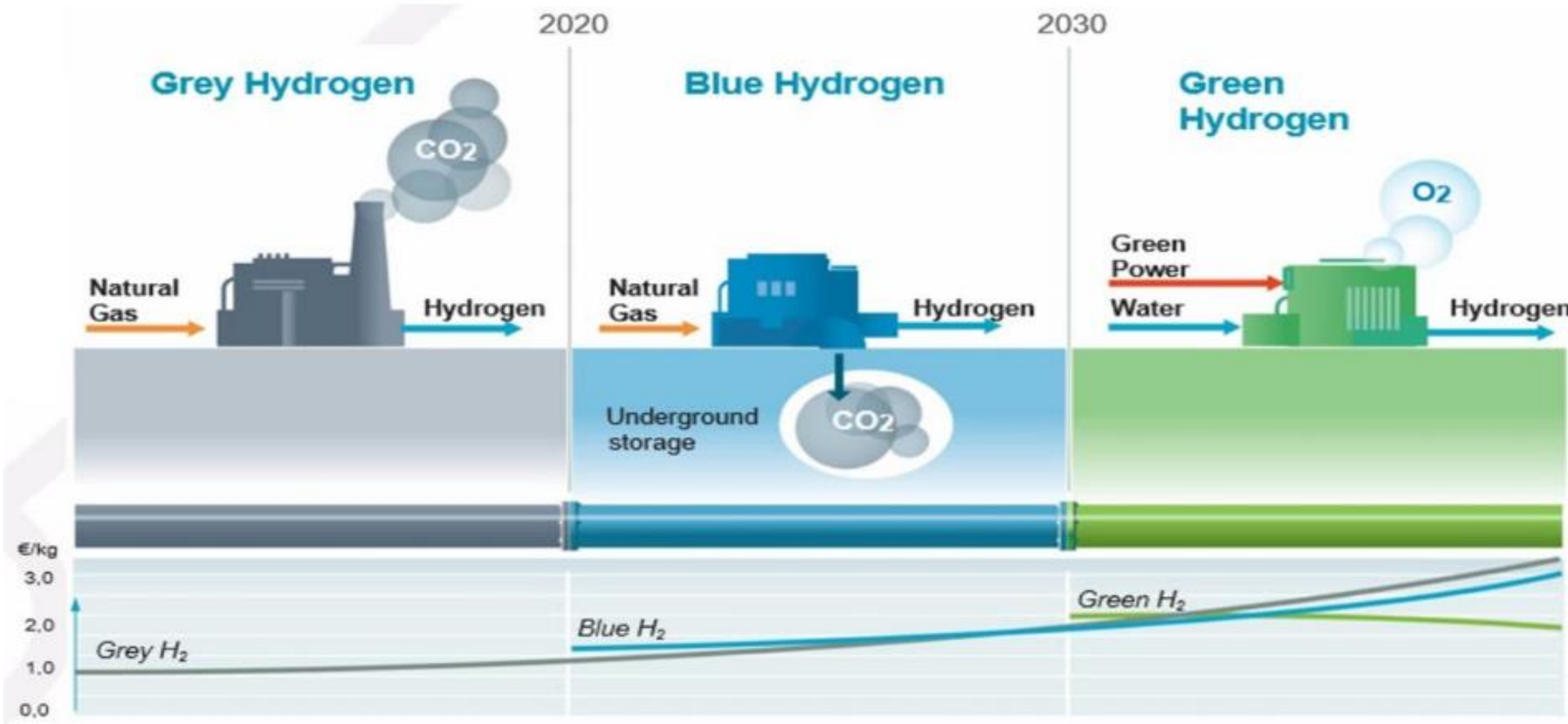
165 IN 2022 TRAININGS

5000+ IN 2022 TRAINED INSTALLERS

4



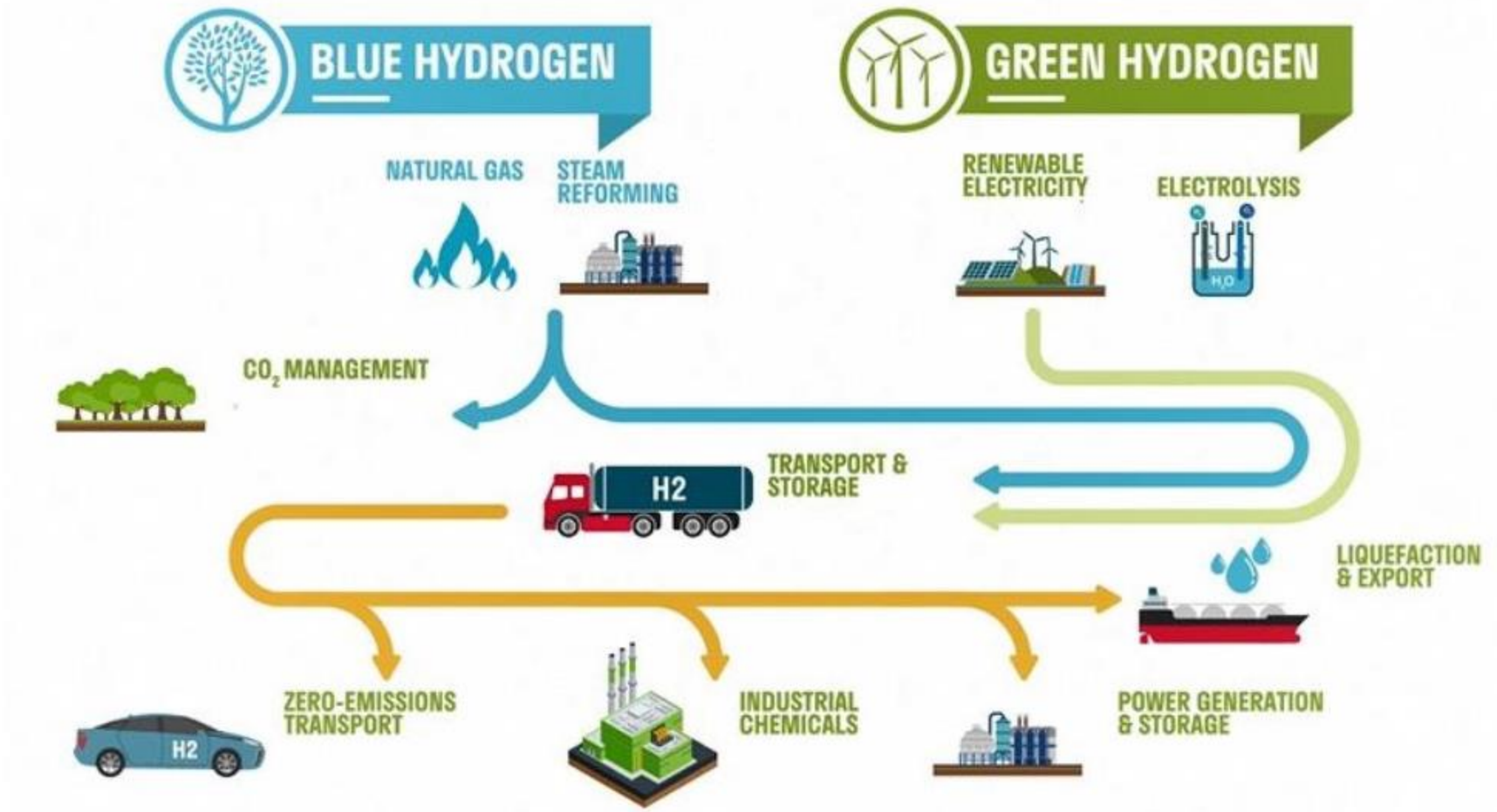
“TYPES” OF HYDROGEN



Grey hydrogen - steam methane reforming and coal gasification
Blue hydrogen - grey hydrogen + storage of CO_2
Green hydrogen – electrolysis of H_2O

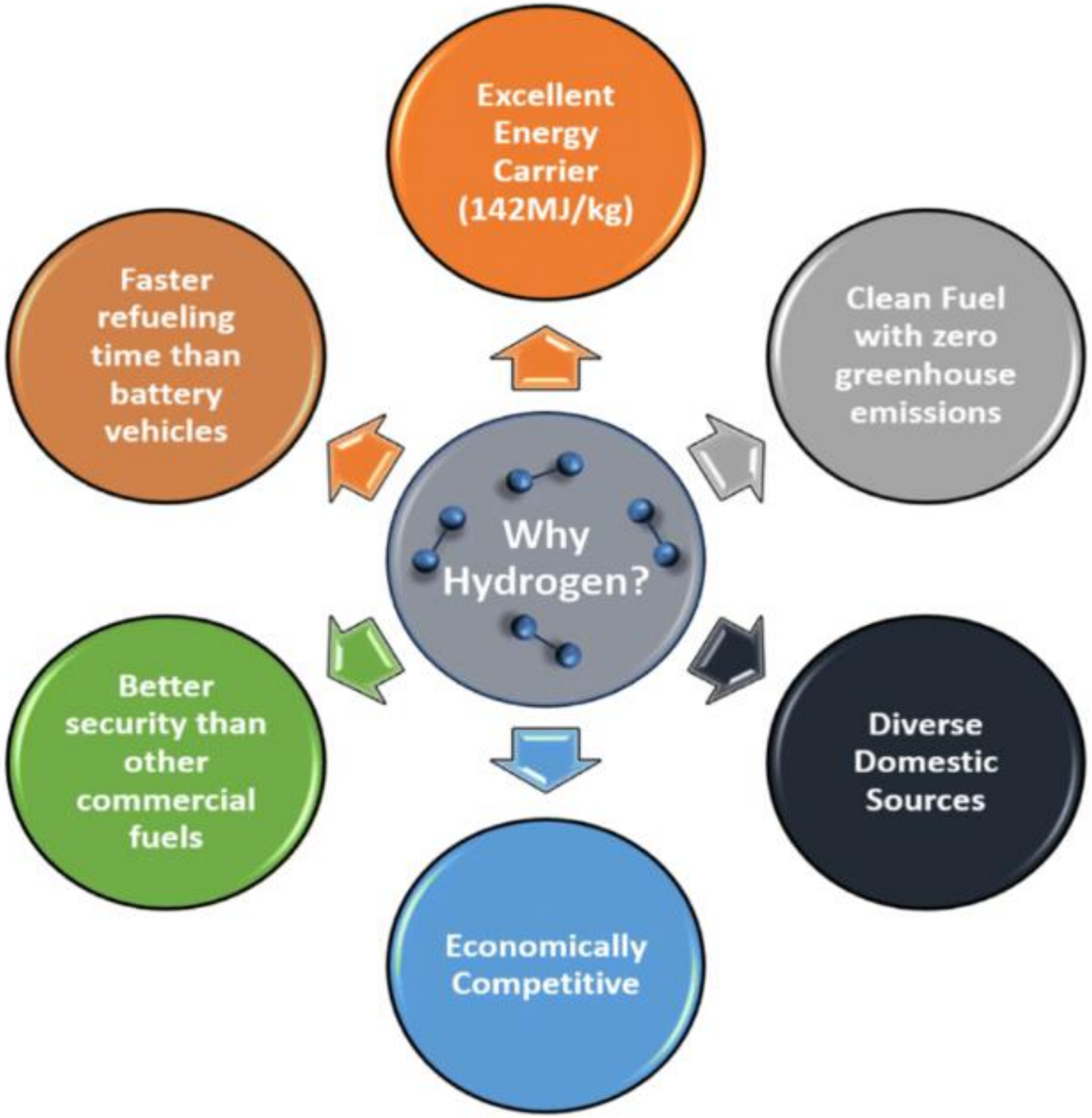
Source: https://energyeducation.ca/encyclopedia/Types_of_hydrogen_fuel

HYDROGEN USAGE

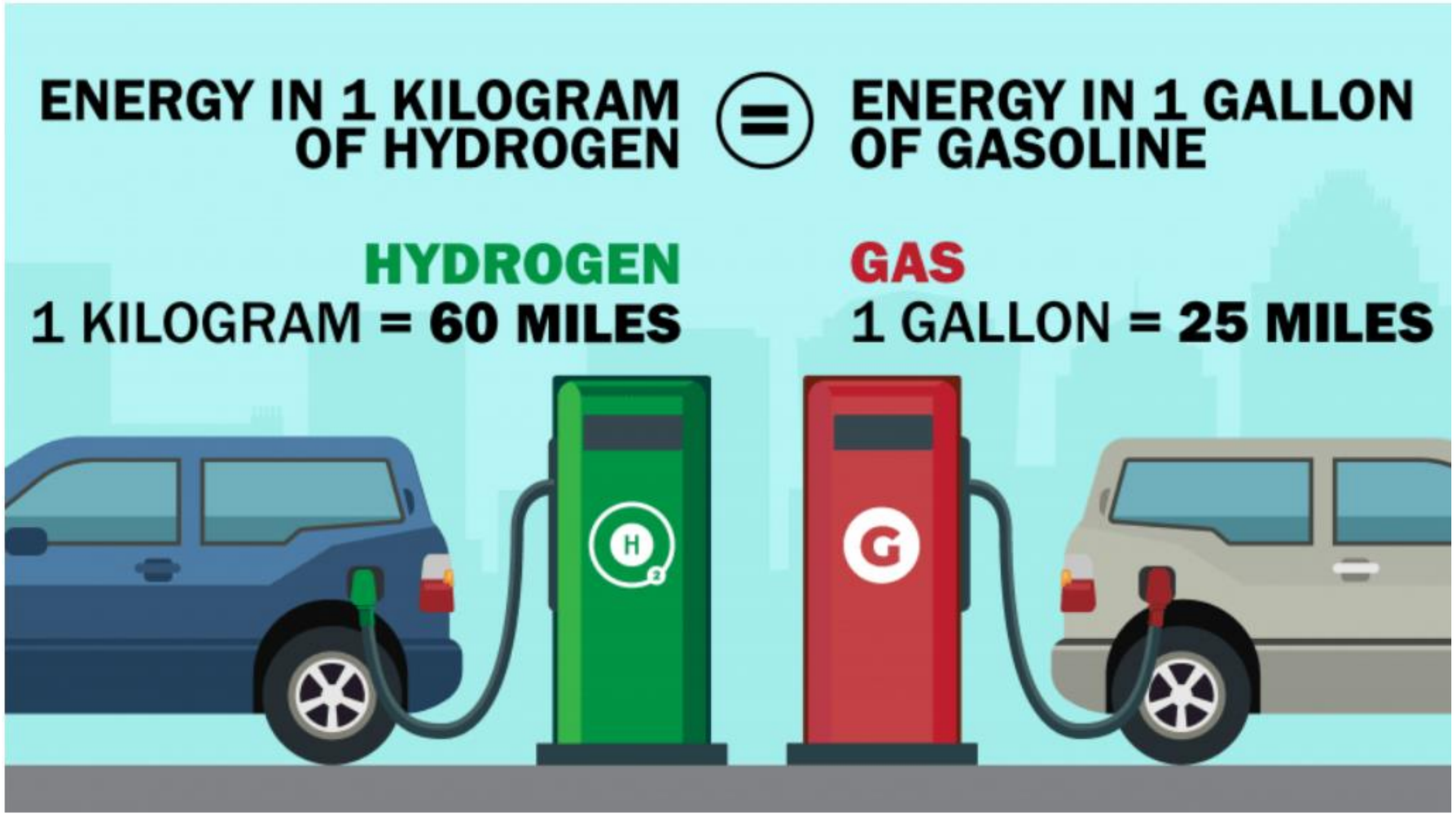


Source: Australian Broadcasting Corporation (ABC)

WHY HYDROGEN?



Filling Up with Hydrogen



Source: https://www.energy.gov/eere/vehicles/articles/hydrogens-role-transportation

European Clean Hydrogen Alliance

Criteria for inclusion of projects in Alliance project pipeline:

- Scope: submission of project by an Alliance member (cut-off date = closure of collection period on 7 May 2021)
- Project maturity: planned project deployment by 31 December 2030
- Project location: project is located within the geographic scope of the Alliance or has the potential to be closely linked to and contribute to an integrated value chain with a strong focus within its geographic scope
- Emission reduction: compliance of all hydrogen production projects with the life-cycle GHG emissions savings requirement of 73.4% for hydrogen (resulting in 3tCO2eq/tH2) and 70% for hydrogen-based synthetic fuels relative to a fossil fuel comparator of 94g CO2e/MJ (in line with EU Taxonomy Climate Delegated Act)
- Impact: industrial application projects with minimum size of 100 tH2/a; mobility applications with minimum size of 70 tH2/a

HYDROGEN

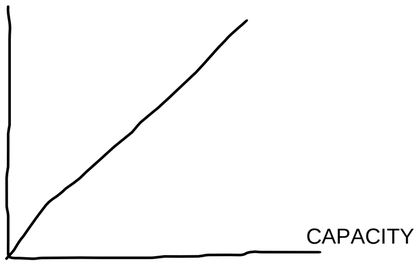
Electrolyser + HESS

Investment cost 200.000 USD / kg +
20.000 USD / 10 kg
100.000 USD / 1 t

EXAMPLE
▼
30 kg PEM + storage → 400.000 + 60.000 USD
▼
▼
30 t PEM + storage → 2.000.000 + 3.000.000 USD
☺

BESS

Investment cost 300-350 USD / kWh

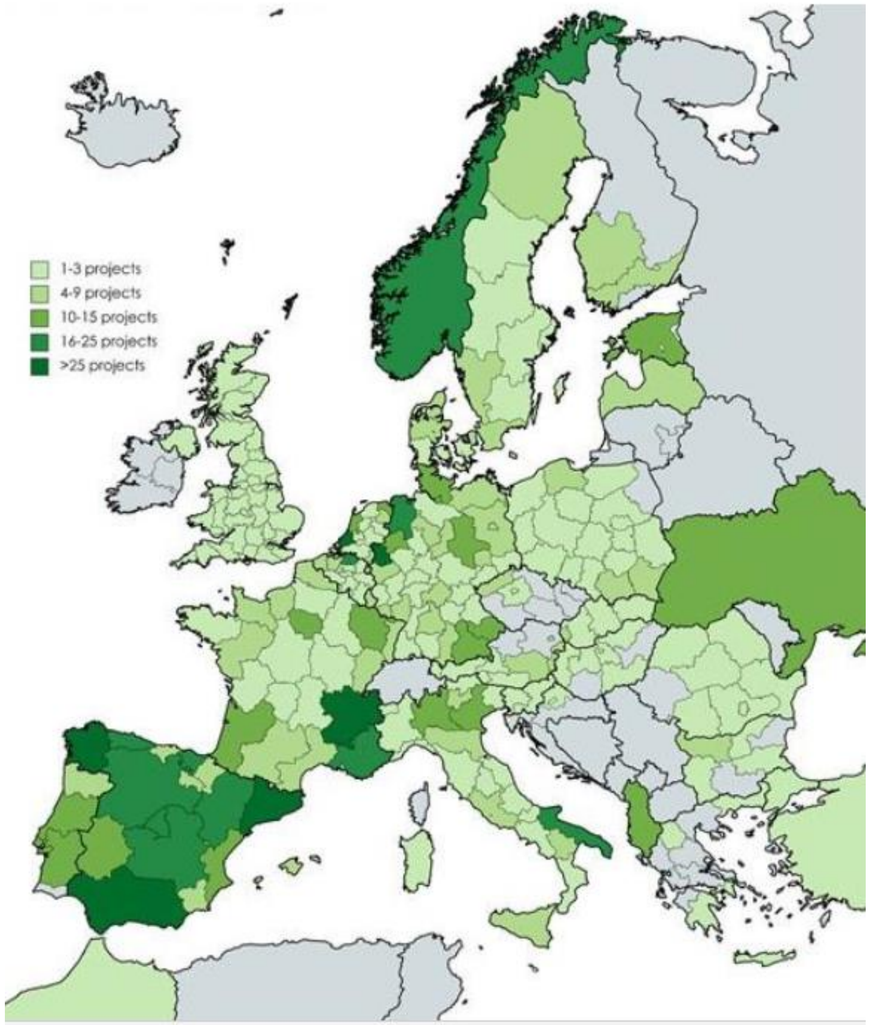


EXAMPLE
▼
1 MWh storage → 350.000 USD
▼
▼
1 GWh storage → 350.000.000 USD
☹

Project pipeline of the European Clean Hydrogen Alliance

European Clean Hydrogen Alliance

Kick-starting the EU Hydrogen Industry to achieve the EU climate goals



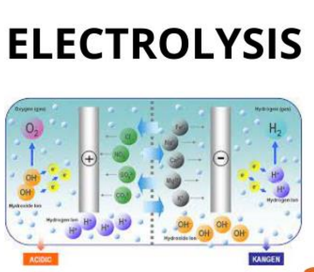
Source: https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance/project-pipeline_en

HYDROGEN PROJECTS IN ROMANIA

Project	Company	Archetype	Location	Size	Maturity
Green Hydrogen from Abandoned Oil Wells	ILF CONSULTING ENGINEERS AUSTRIA GMBH	A.A Hydrogen production	RO11 - Nord-Vest RO12 - Centru RO31 - Sud-Muntenia RO41 - Sud-Vest Oltenia	10 MW	
ZEVA - Zero Emissions Versatile Aircraft	ELSA Industry	D.G Aviation applications	RO32 - București-Ilfov		2030
Green Complex	Chimcomplex S.A Borzesti	A.A Hydrogen production	RO21 - Nord-Est RO41 - Sud-Vest Oltenia		
Green Complex	Chimcomplex S.A Borzesti	C.C Hydrogen as feedstock for the chemical industry (with carbon from various sources)	RO21 - Nord-Est RO41 - Sud-Vest Oltenia		
Green Complex	Chimcomplex S.A Borzesti	F.C CHP projects	RO21 - Nord-Est RO41 - Sud-Vest Oltenia		

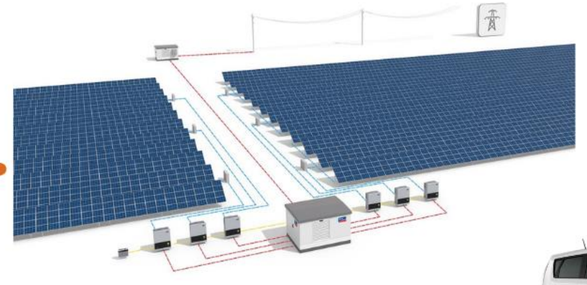
Source: https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance/project-pipeline_en

Green Hydrogen – from production to user



H2 FILLING STATION

H2 MOBILITY



INVERTOR

PV PLANT

E-MOBILITY

BESS

FAST EV CHARGER

HYDROGEN DELIVERY

Hydrogen Comes in a Variety of Ways

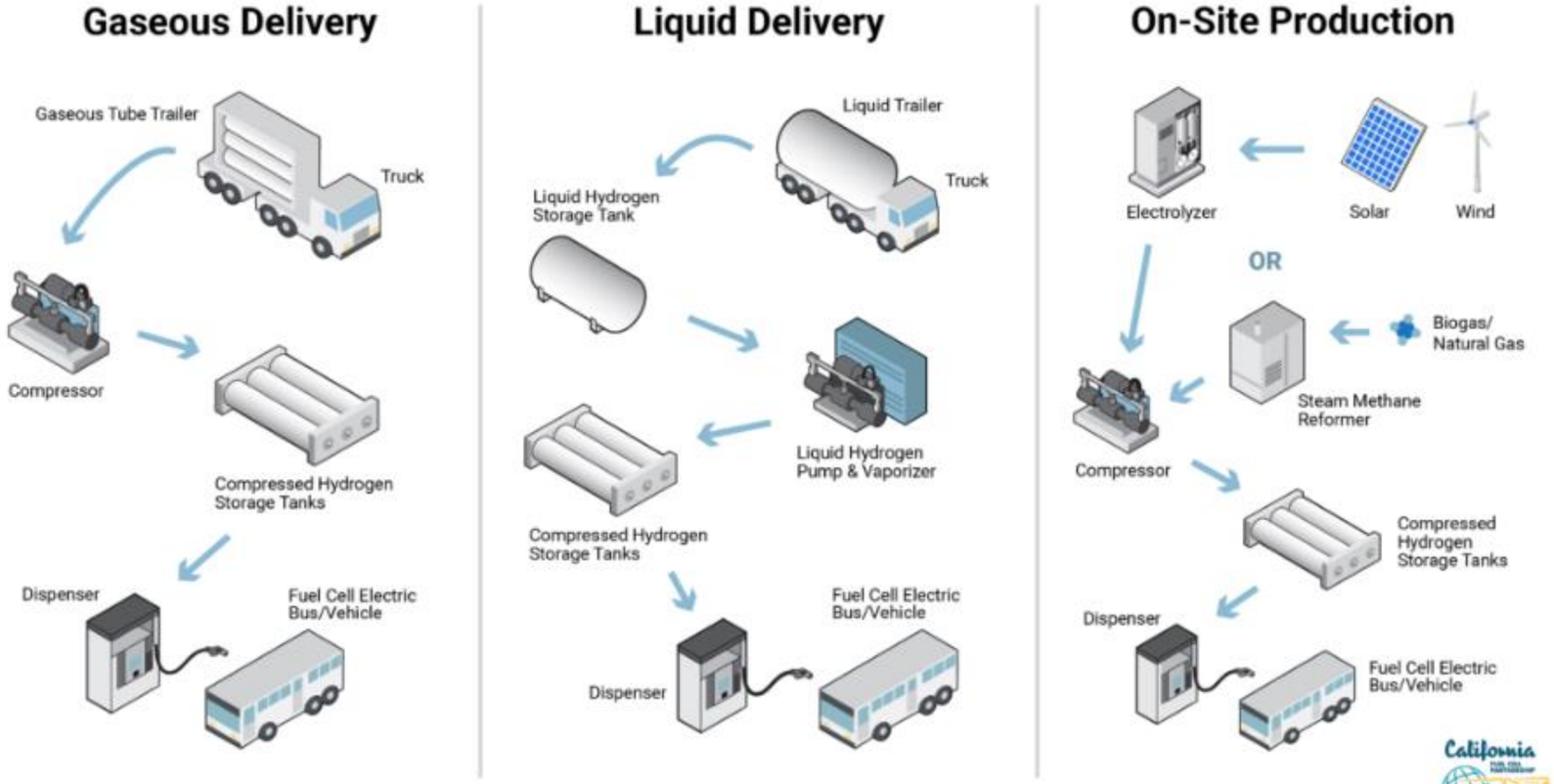
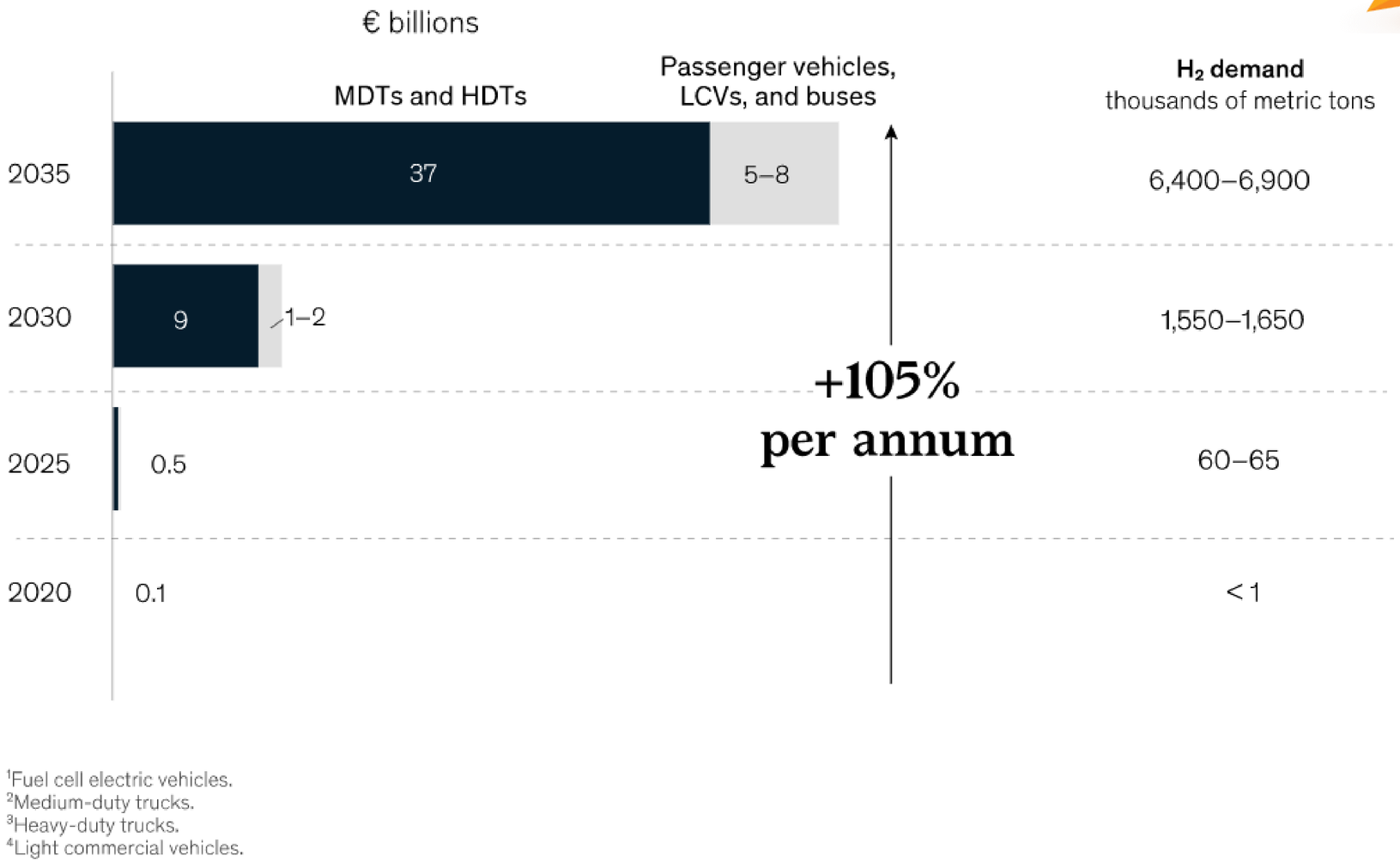


Figure 1: Summary of hydrogen fueling station delivery options (Image source: California Fuel Cell Partnership)

https://californiahydrogen.org/resources/the-other-electric-bus-hydrogen-fuel-cell-bus-info-page/

Hydrogen's refueling market in EU



[1]Fuel cell electric vehicles.
[2]Medium-duty trucks.
[3]Heavy-duty trucks.
[4]Light commercial vehicles.

Sourcehttps://www.mckinsey.com/capabilities/operations/our-insights/global-infrastructure-initiative/voices/unlocking-hydrogens-power-for-long-haul-freight-transport

HYDROGEN THROUGH PNRR

European Commission approved 149 million euro through PNRR to support renewable hydrogen production

Deadline: 31 December 2023

The scheme is aimed at supporting the construction of new installations to produce renewable hydrogen, in order to achieve by 31 December 2025 renewable hydrogen production capacities of at least 100 MW in electrolysis installations producing at least 10,000 tones of hydrogen per year.

The scheme is open to:
(i) companies of all sizes that are active in the production of hydrogen or electricity,
(ii) administrative-territorial units, or
(iii) national institutes for research and development in the field of energy, including associations or partnerships formed by those actors.
Under the scheme, the support will take the form of direct grants.
The maximum amount of aid that can be granted per project will not exceed €50 million.

Source: https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4865

THANK YOU

FOR YOUR ATTENTION

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