

Hydrogen as renewable fuel for zero emission mobility

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Sustainable hydrogen R&D
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SOL Group

Who we are?



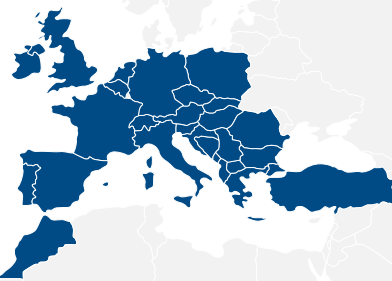
Hydrogen as renewable fuel for zero emission mobility

SOL GROUP

An international reality born in Italy in 1927



Giovanni Annoni and **Aldo Fumagalli** founded the SOL Group with the first oxygen and acetylene production plant in Livorno and (in 1929) in Ancona



1,487 M€ turnover in 2023



6.370 employees



Present in 32 countries



100 branches



Headquarter in Italy



Listed at Milano stock exchange since 1998



SOL GROUP

An international reality born in Italy in 1927



50k

industrial
customers



122

Production
plant



14%

Renewable
energy

Production and distribution of:

- **technical gas for industrial uses**
- **Medicinal gases for hospitals**



650k

Patients
served



18

Country
served



9

Therapeutic
areas

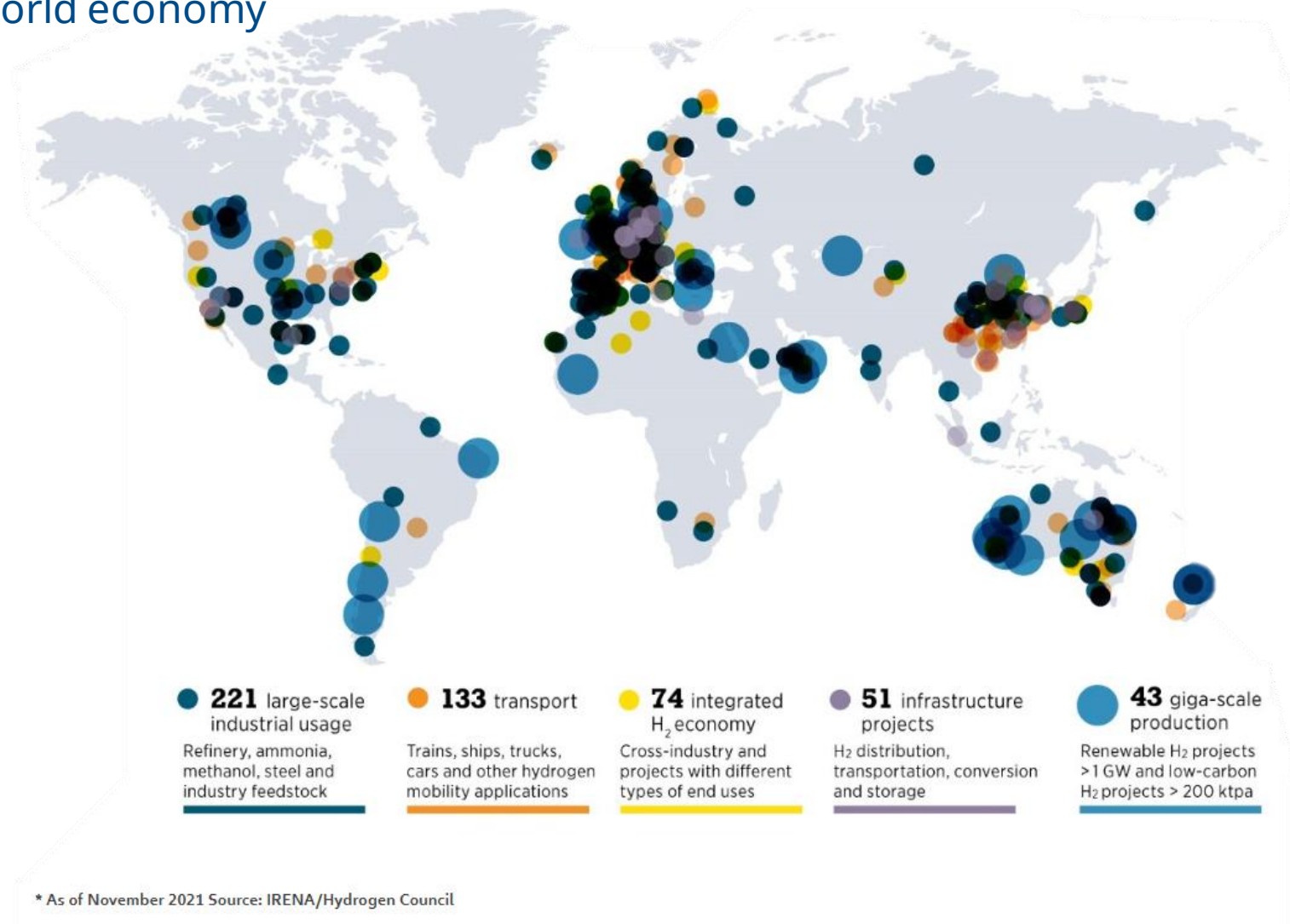
**Medical technical assistance and
care for patient at their home**

Hydrogen economy



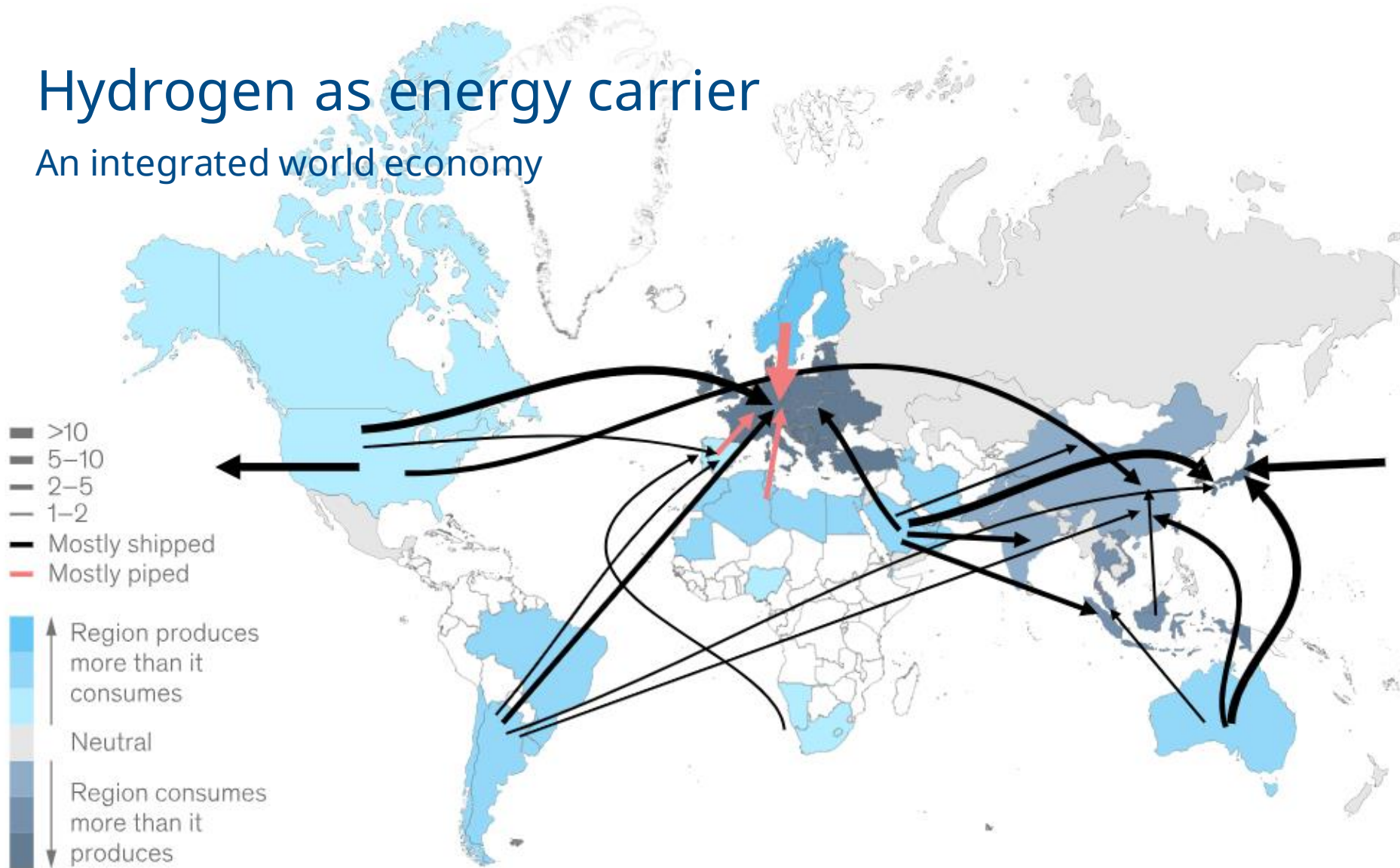
Hydrogen as energy carrier

An integrated world economy



Hydrogen as energy carrier

An integrated world economy



Note: The boundaries shown and the designations used on this map do not imply official endorsement or acceptance by McKinsey & Company.
Source: McKinsey Global Hydrogen Flow Model

Hydrogen technology



Hydrogen production

Our experience



HYSOL E

- Hydrogen generator based on ALK, PEM AEM technology
- From 0,1 to several MWh production capacity



HYSOL R

- Hydrogen generator based Steam Methane Reforming technology
- From 40 to 300 Nmc/h production capacity

HYSOL A

- Hydrogen generator based Auto Thermal Reforming technology
- From 10 to 50 Nmc/h production capacity



Hydrogen refuelling station

Our experience



2006

Hydrogen refuelling station at 200 bar_g
for cars with Internal Combustion engine



2008

Refuelling station of liquid hydrogen for cars with
Internal Combustion engine

2015

Hydrogen refuelling station at 350 bar_g for Fuel
Cell Electric vehicles



Hydrogen as energy storage

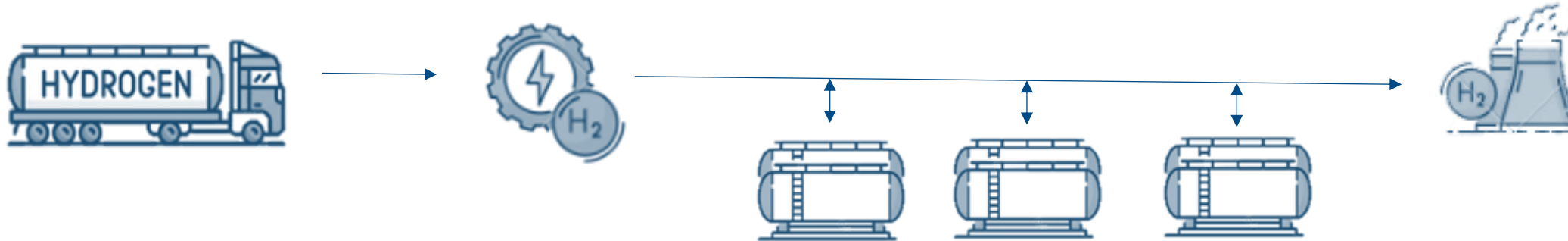
Our project Firenze

2,4 ton/day
as maximum H₂
delivering
capacity

200 kg/h
H₂ compression
capacity

3
H₂ stationary
storage @300
barg – 2.400 kg

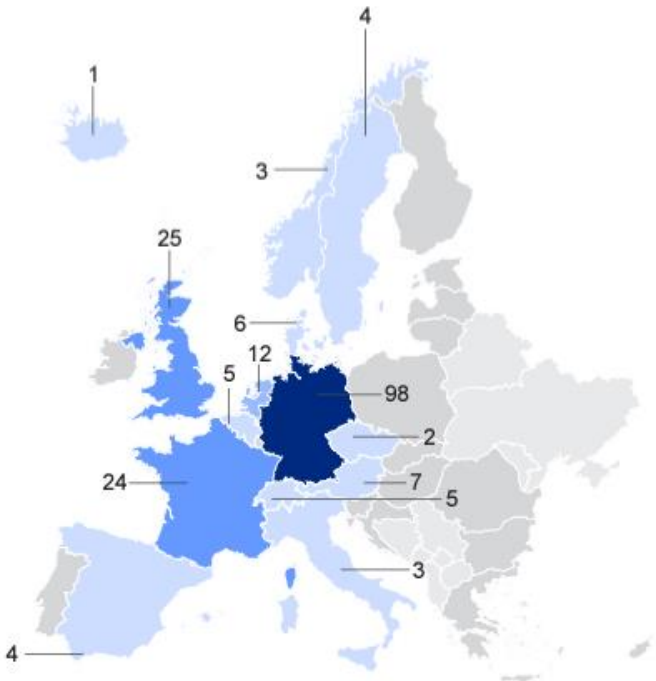
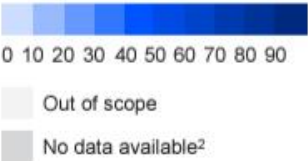
16 MWh
Power
production,
consuming 19.000
Nm³ of H₂



Decarbonize mobility through renewable hydrogen

Italian strategy

FCEV HRS in Europe, 2020
Total number of HRS by country¹



¹ Includes stations dispensing at 700 and 350 bar.
² There may be FCEV HRS in countries marked as no data available. This map reflects IEA and FCH Observatory sources as of Q4 2021 only.

Source: IEA; FCH Observatory



Decarbonize mobility through renewable hydrogen

Our project in Monfalcone



Thank you for your attention

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