



SPACE FOR GREEN GROWTH AND CLEAN ENERGY

How Space can contribute
to a sustainable green economy ?

14/09/2020

Air Liquide with Airgas, a world leader in gases, technologies and services for...

INDUSTRY

- wide range of industrial processes for customers:
 - energy, metals, food, chemicals, automotive, pharmaceuticals...



HEALTH

- hospitals
- patients at home
- hygiene and specialty ingredients



~67,000
EMPLOYEES



PRESENT IN
80 COUNTRIES



MORE THAN
3.7 MILLION
CUSTOMERS &
PATIENTS



REVENUE
€21.9bn



NET PROFIT
(GROUP SHARE)
€2.24bn

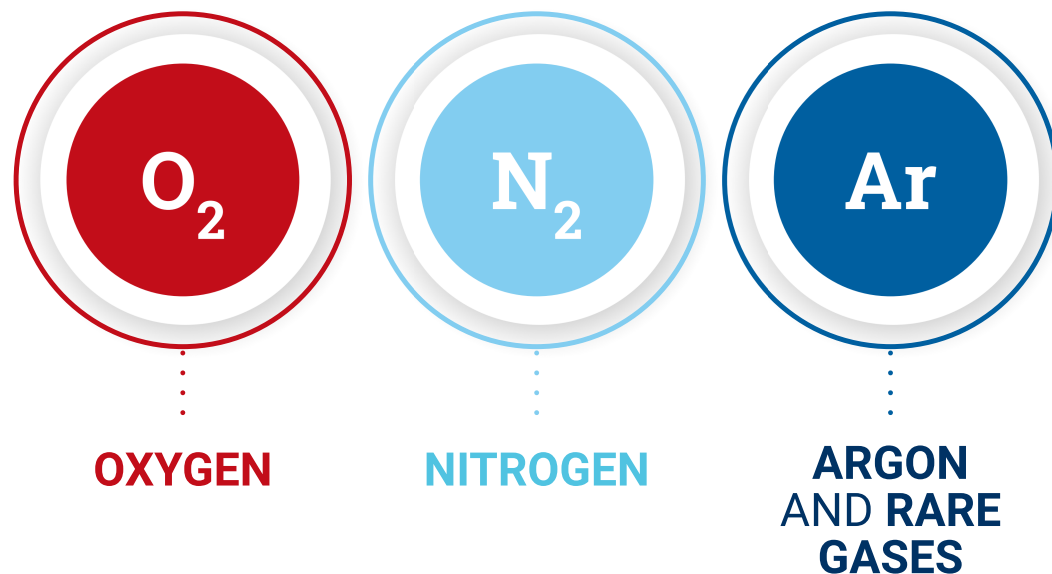


INVESTMENT
DECISIONS
€3.7bn

Our scientific territory: essential small molecules

Oxygen, nitrogen and hydrogen are essential small molecules. They embody Air Liquide's scientific territory and have been at the core of the company's activities since its creation in 1902.

Separating the **air** components
to take advantage of their properties



Producing molecules from
natural resources of the planet



CLIMATE OBJECTIVES

A global
approach



ASSETS

Reduce our carbon
intensity in 2025 vs. 2015 by **-30%**



CUSTOMERS

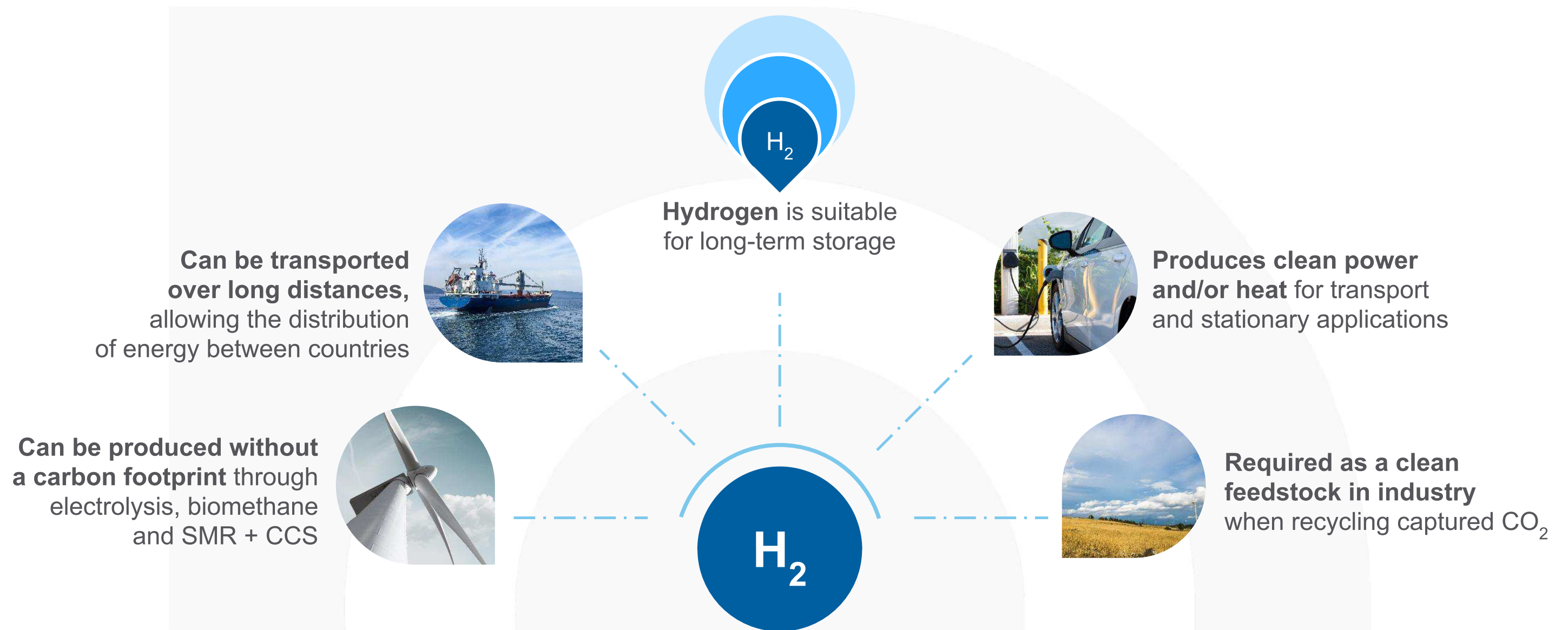
Act for clean industry by
developing low-carbon solutions



ECOSYSTEMS

Contribute to a new low-carbon society

Hydrogen is a clean, safe and diversified energy carrier



1kg of LH2 ~ 3kg kerosene avoided ~ 12 kg of CO₂ saved

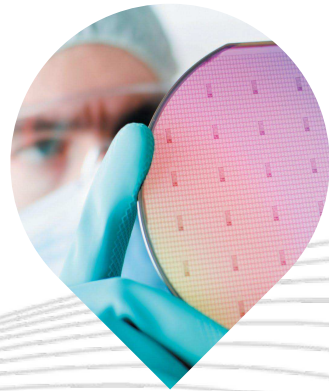
Hydrogen, many existing applications...



Heat Treatment



Glass



H₂ Ultra pure <1 ppb



Chemicals &
Petroleum refining

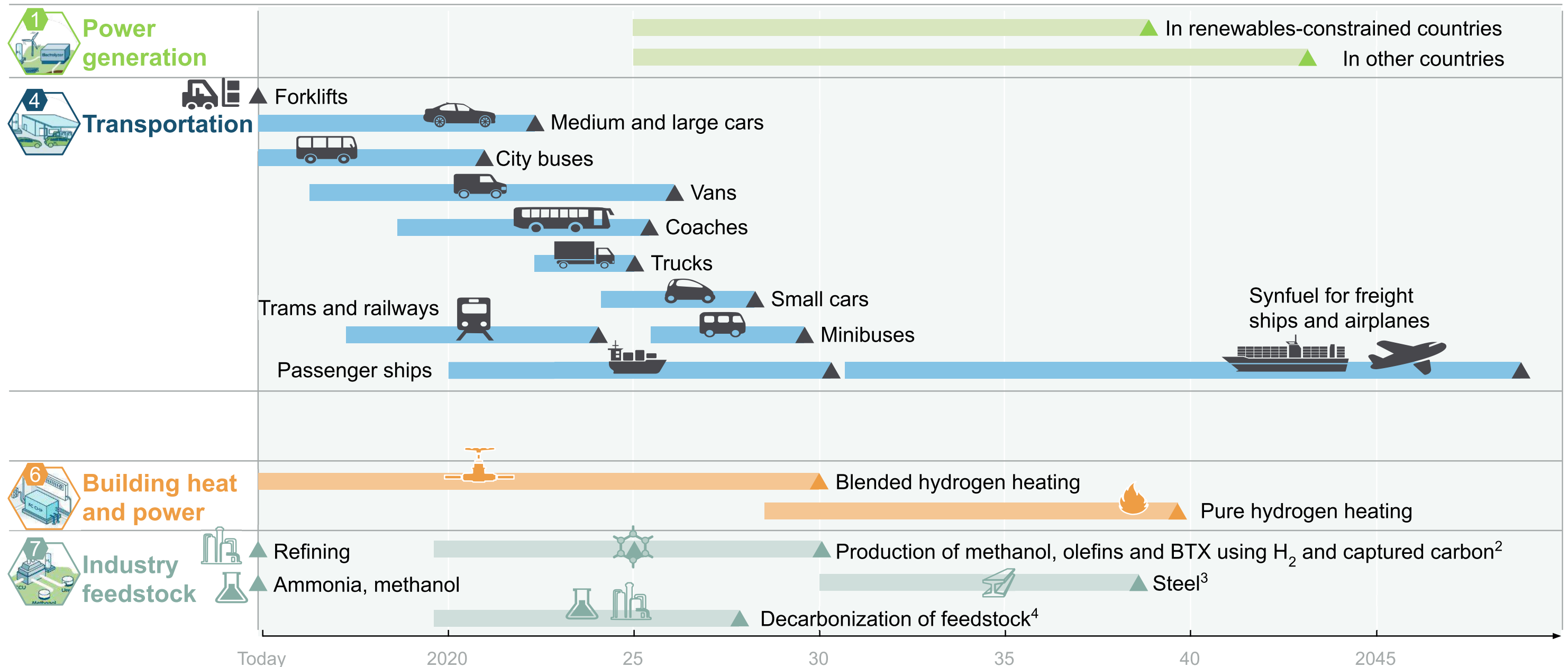


Rockets



Fuel cell vehicle

H2 technologies exist and are ready to be scaled up, to help in decarbonizing many end uses



1 Mass market acceptability defined as sales >1% within segment in priority markets

2 Market share refers to the amount of production that uses hydrogen and captured carbon to replace feedstock

3 DRI with green H₂, iron reduction in blast furnaces and other low-carbon steel making processes using H₂

4 Market share refers to the amount of feedstock that is produced from low-carbon sources

Source: McKinsey & Hydrogen Council 2017

Hydrogen by 2050: a quantified vision of its key role in the energy transition

18%
of final
energy demand



30 million
jobs created



6 Gt
annual CO₂
abatement

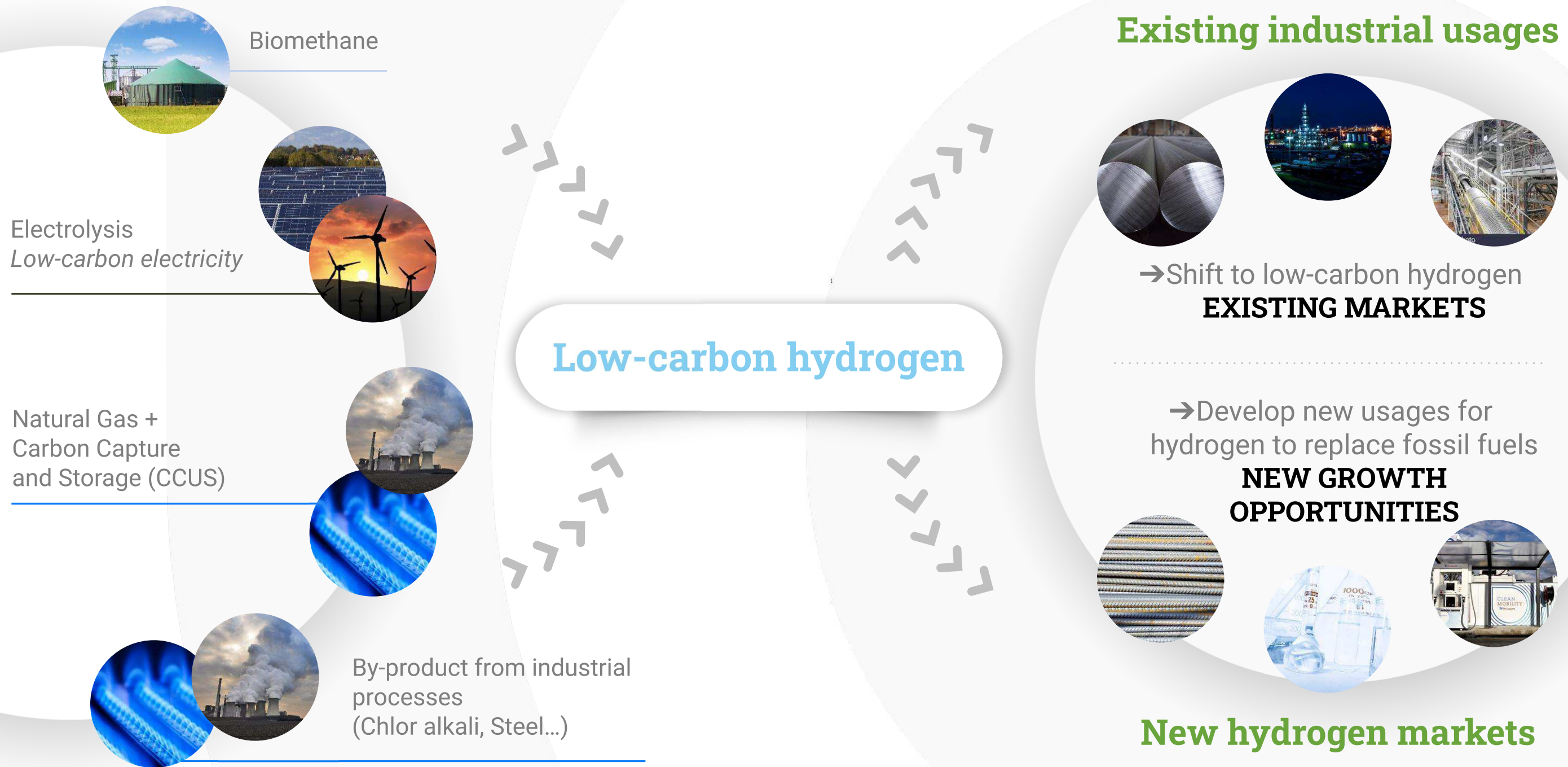


\$2 500 Bn
annual sales
(hydrogen & equipment)

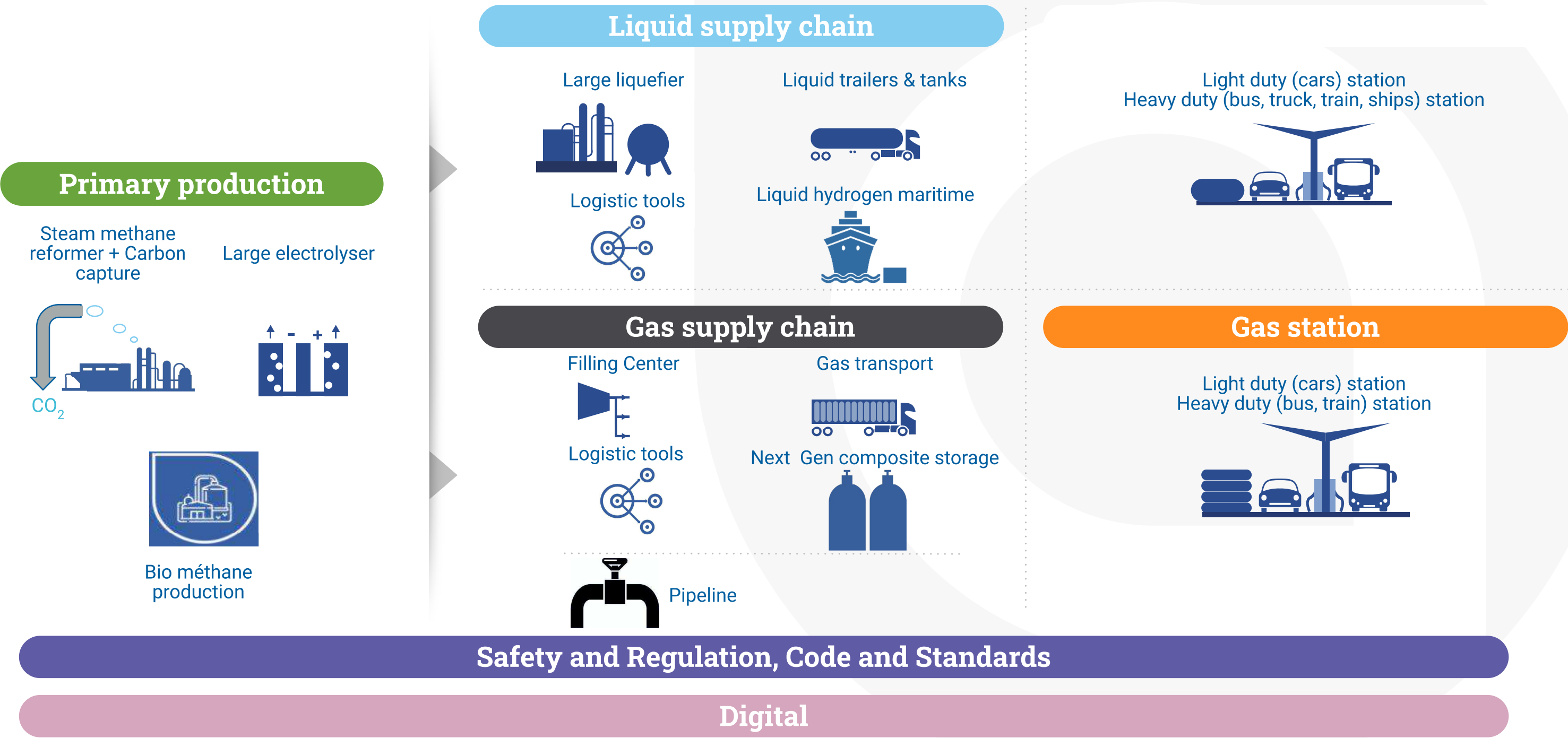


Source: McKinsey & Hydrogen Council 2017

The need for low-carbon hydrogen



Hydrogen technology roadmaps



Energy transition key figures



80+ bio-NGV filling stations
in Europe



19 biomethane production units
worldwide (**1.1 terawatt-hour**
/year)



More than 100 years of experience in gas separation (cryogenics, adsorption, membranes, absorption)



50 Turbo-Brayton for CH₄ re liquefaction on LNG boats



More than 120 hydrogen stations designed and installed in the world

Worldwide H₂ assets :
Production Capacity :
1. 8 BNm³/hr
Pipeline 2000 km



50+ years of expertise in Liquid HYDROGEN technologies