LEADING THE ENERGY TRANSITION

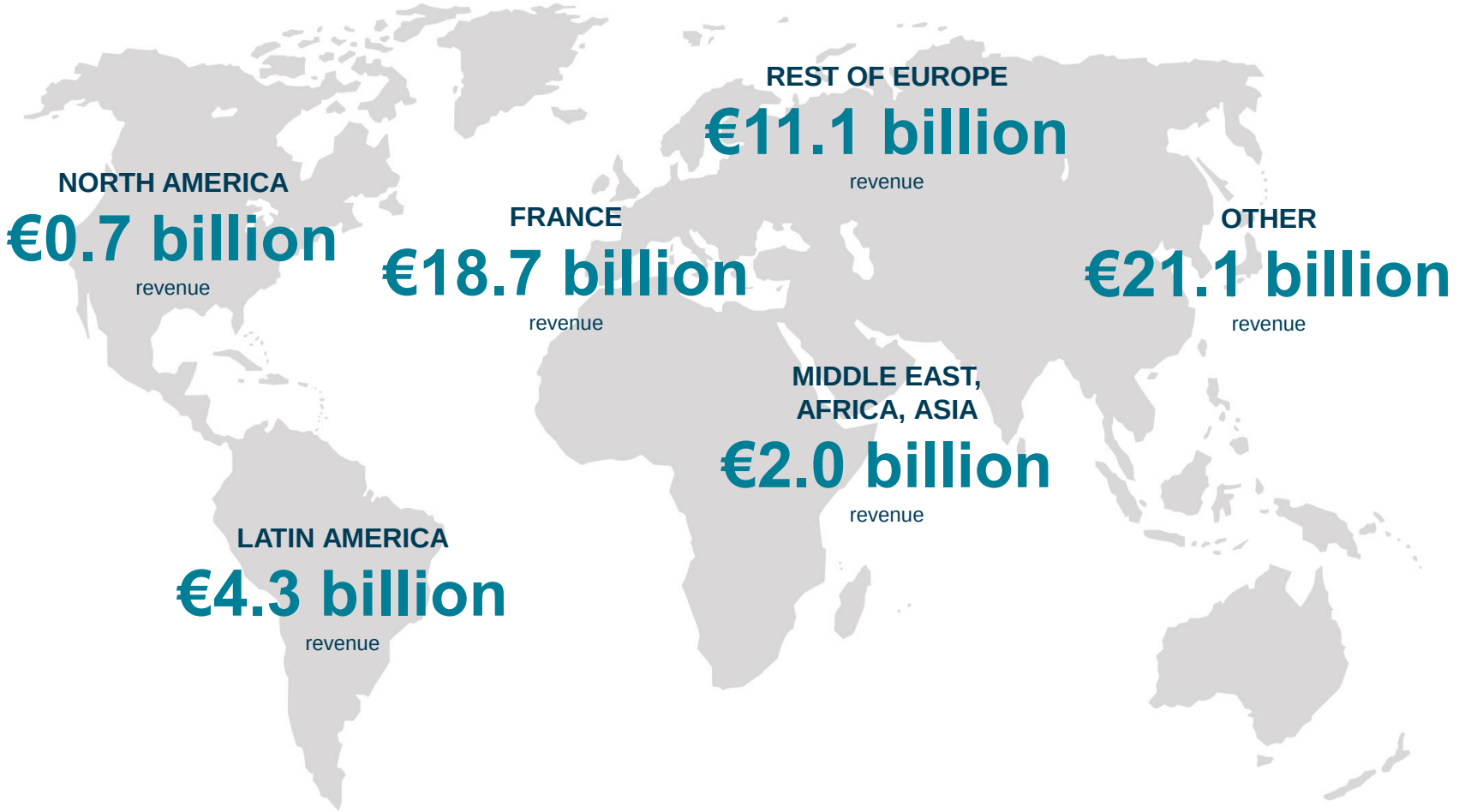
Energy Mission - 17/11/2022
Bob Van Schoor

Today we are building the low-carbon energy system of tomorrow

We are an international player

In 2021

- **101,504** employees
- **€57.9 billion** revenue
- **€138 million** spent on R&D
- **3GW** extra installed renewables capacity
- **€4.3 billion** growth investment
- **100,3 GW** installed power generation capacity



Annual figures on 31/12/2021 (excl.Equans)

By focusing on our 4 core activities

Renewables

- **No. 1** wind and solar producer in France
- **No. 2** of the power purchase agreement (PPA) in the world
- Acquisition of **Eolia** in spain, 0.9GW in operations and 1.2GW of renewable projects
- **34 GW** of installed capacities @100%
- **4 900** employees worldwide

Networks

- **No. 1** natural gas transmission network in France and Brazil
- **No. 1** underground gas storage in Europe
- **No. 1** natural gas distribution network in Europe
- **No. 2** terminal operator in Europe
- **351 biomethane production sites** connected globally to GRDF and GRTgaz network, for **6.1 TWh/year** of production capacity
- **+250 000 km** of gas distribution network worldwide
- **~ 5 600 km** of electricity transmission network
- **22 500** employees worldwide

Energy Solutions

- **No. 1** urban cooling network in the world
- **No. 3** urban heating network in the world
- **More than 65.000** energy assets operated within buildings worldwide
- **No. 4** in H2 fueling stations in Europe
- **23 GW** of installed capacities in decentralized energy
- **47 500** employees worldwide

Thermal production & energy supply

- **60 GW** of power generation capacity @100%
- **22,3 M of** BtoC contracts in the world
- **No. 2** seawater desalination operator
- Coordination of hydrogen expertise and development in the world
- **17 100** employees worldwide

Annual figures on 31/12/2021 (excl. Equans)
* UHCN: Urban Heating and Cooling Network

To achieve the Net Zero Carbon target by 2045

We take action throughout the value chain: our business activities, our suppliers, and our clients

Renewables

- By adding **+4 GW per year** on average by 2025, and +6 GW on average per year from 2026
- **To achieve 50 GW by 2025** of installed renewable capacity and 80 GW by 2030
- By targeting **5 to 7 GW of offshore wind** in operation or construction by 2025
- **58%** of renewable electricity generation capacity by 2030

Networks

- By producing **4 TWh/year of Biomethane** by 2030 in France
- By deploying **700 km of hydrogen** transmission network by 2030
- By developing **1 TWh of hydrogen storage** capacity by 2030
- **100% of renewable gas** by 2050
- Connecting wind, solar and renewable gas projects to networks

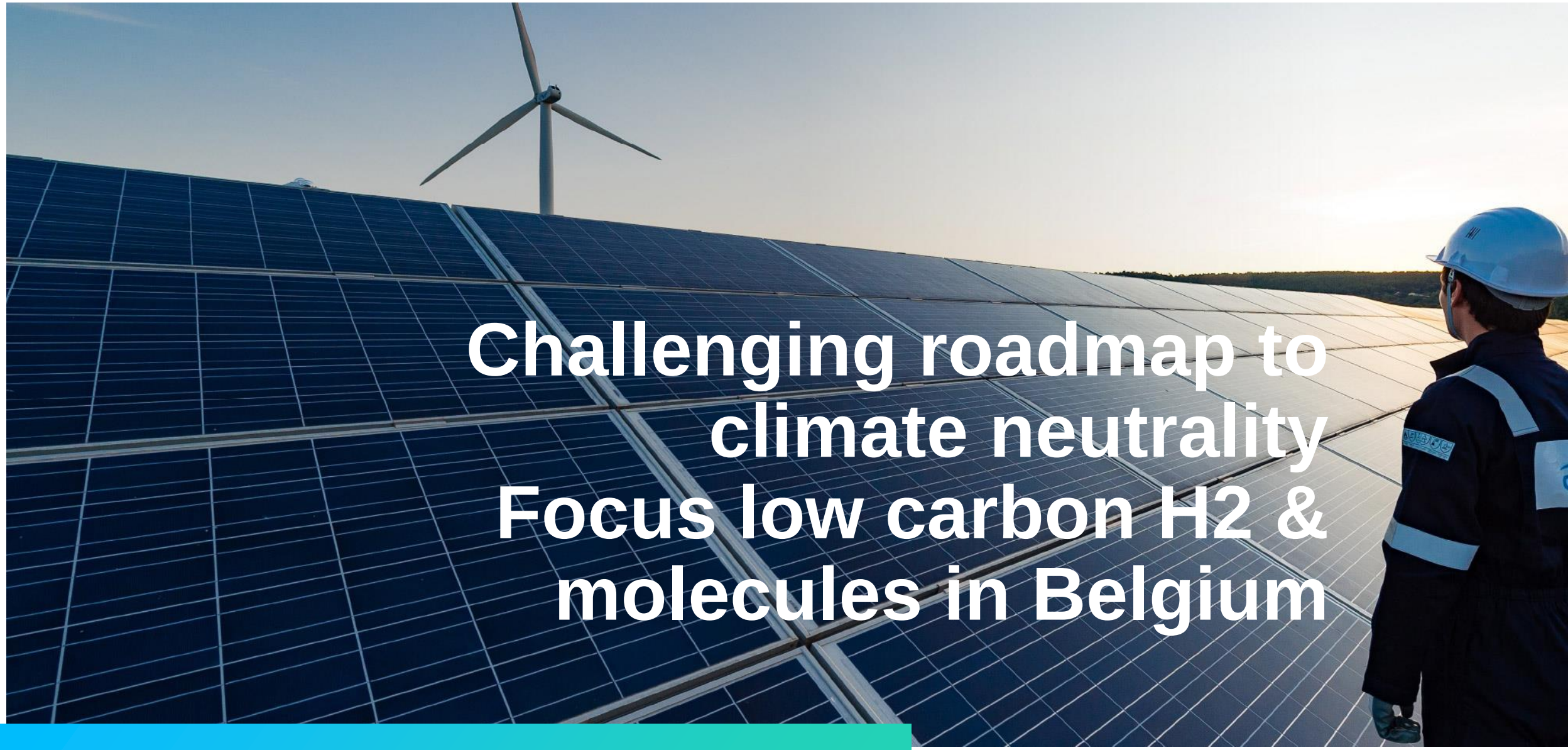
Energy Solutions

- By decarbonizing our customers' energy infrastructure with **+8 GW added by 2025 @100%**
- **+ 100** hydrogen charging stations by 2030

Thermal production & energy supply

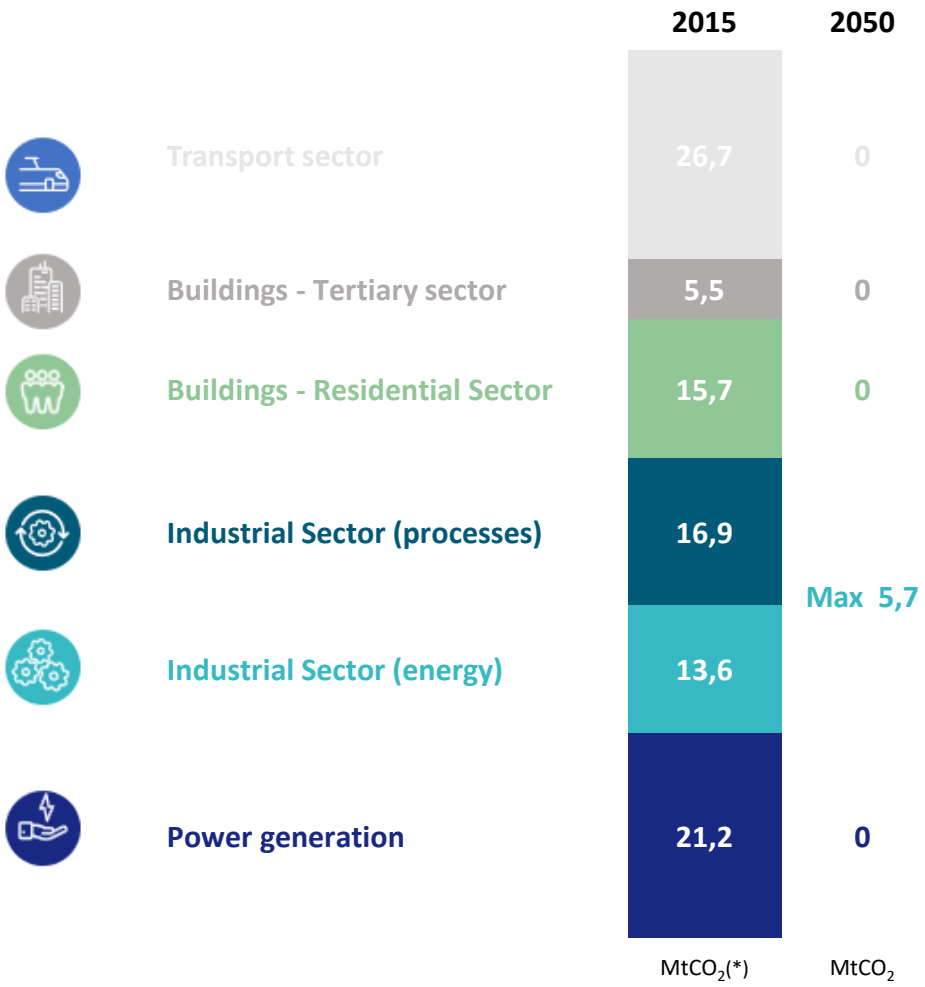
- By greening the thermal energy production, including **the phasing-out of our coal activities by 2027**
- By developing a production capacity of **4 GW of renewable hydrogen** by 2030
- By reducing CO_2 emissions from BtoC customers: **-34% between 2017 and 2030**

45 Mt of CO_2 emissions avoided by 2030 for our customers thanks to our products and services



Challenging roadmap to climate neutrality Focus low carbon H2 & molecules in Belgium

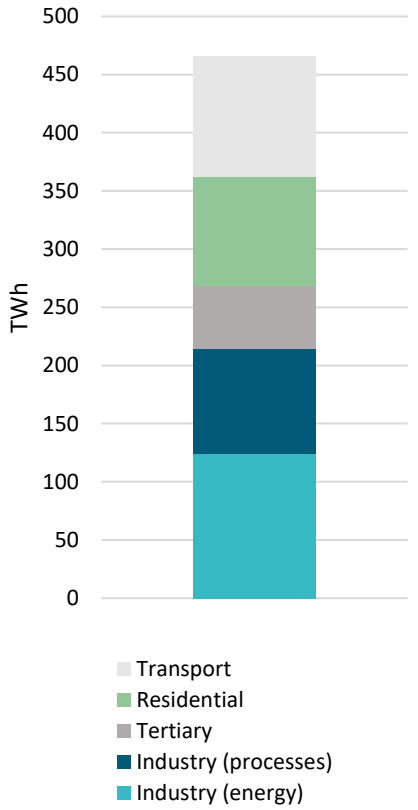
Challenges for Belgium to move from present situation to climate neutrality by 2050



- Road transport requires a significant **phase out of oil consumption**
- Currently limited **renovation rate** of buildings
- Currently little **RES heating** in buildings
- **Little behavioral change and demand response management**
- Need of more ambitious **feedstock greening, energy efficiency, circular economy** measures in the industrial processes
- Need of more ambitious **fuel greening and circular economy (e.g. emissions capture)** measures for industrial heat
- RES **constrained by weather conditions and availability of sites** and requires **large scale storage** in the system
- **Nuclear phase out** requires alternative to produce low-carbon power
- Energy **dependencies** towards other countries

Aiming at climate neutrality with complementary solutions

Belgium final energy & non energy fuel consumption per sector (2019) (**)



How low-carbon solutions could meet the demand

- **Energy efficiency**
- **Electrification based on Renewable Electricity**
- **Renewable Heat**

Focus

- **Green hydrogen and E-molecules (produced with carbon captured from industries or air, CCU)**
- **Natural gas with carbon capture and storage : Post-combustion capture or pre-combustion capture as the main stream for low-carbon Hydrogen production**

Belgium

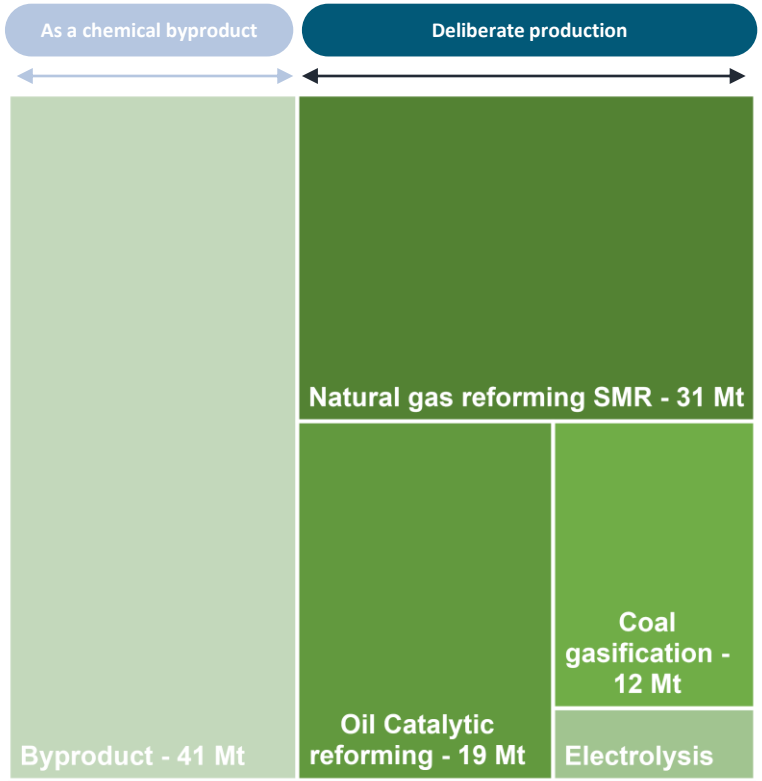
Import & export

(*) E-molecules produced with hydrogen through electrolysis and captured carbon (CCU)

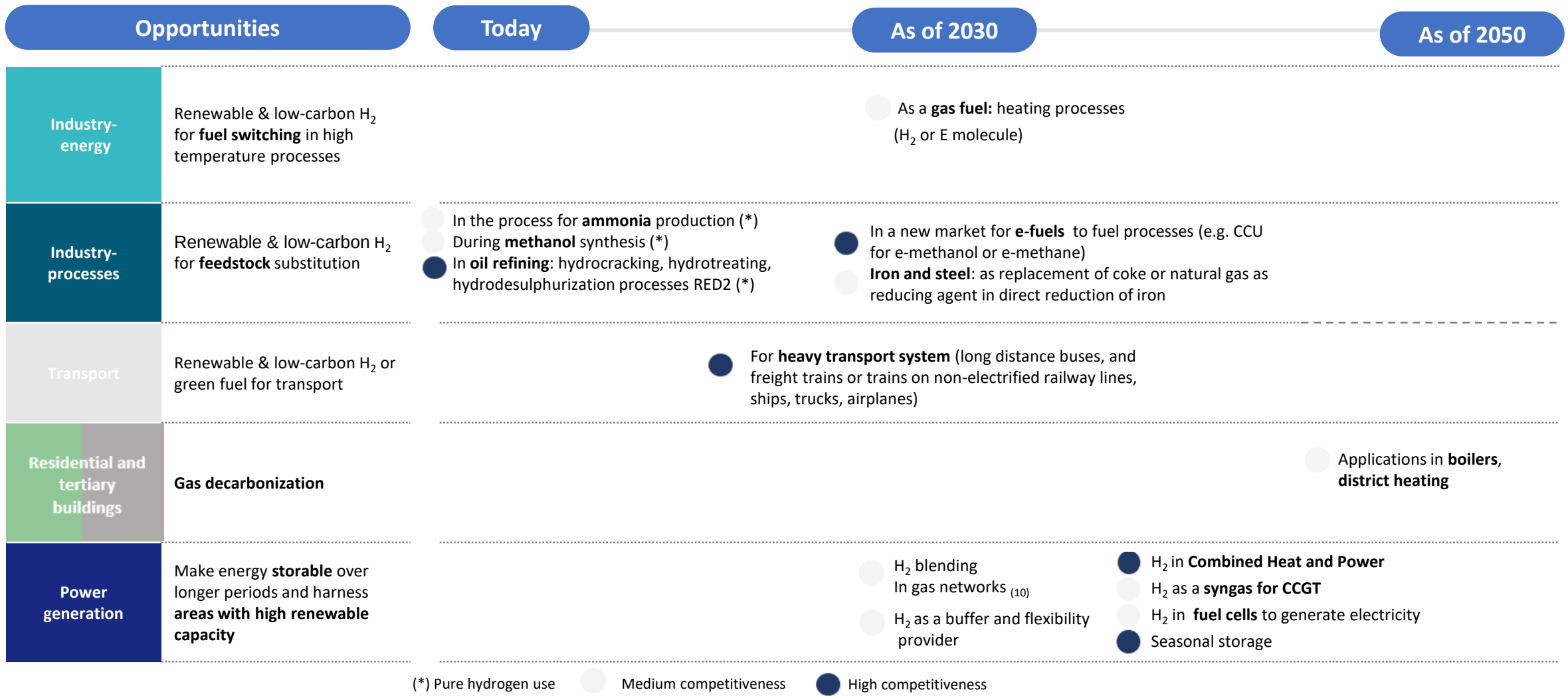
(**) Source: Statbel. Agriculture and others were removed. Electricity use included in each sector. 300 TWh/y transit of natural gas not taken into account

Grey H2 is currently the prominent H2 production method

Only 5% of deliberate production H_2 is currently produced via electrolysis

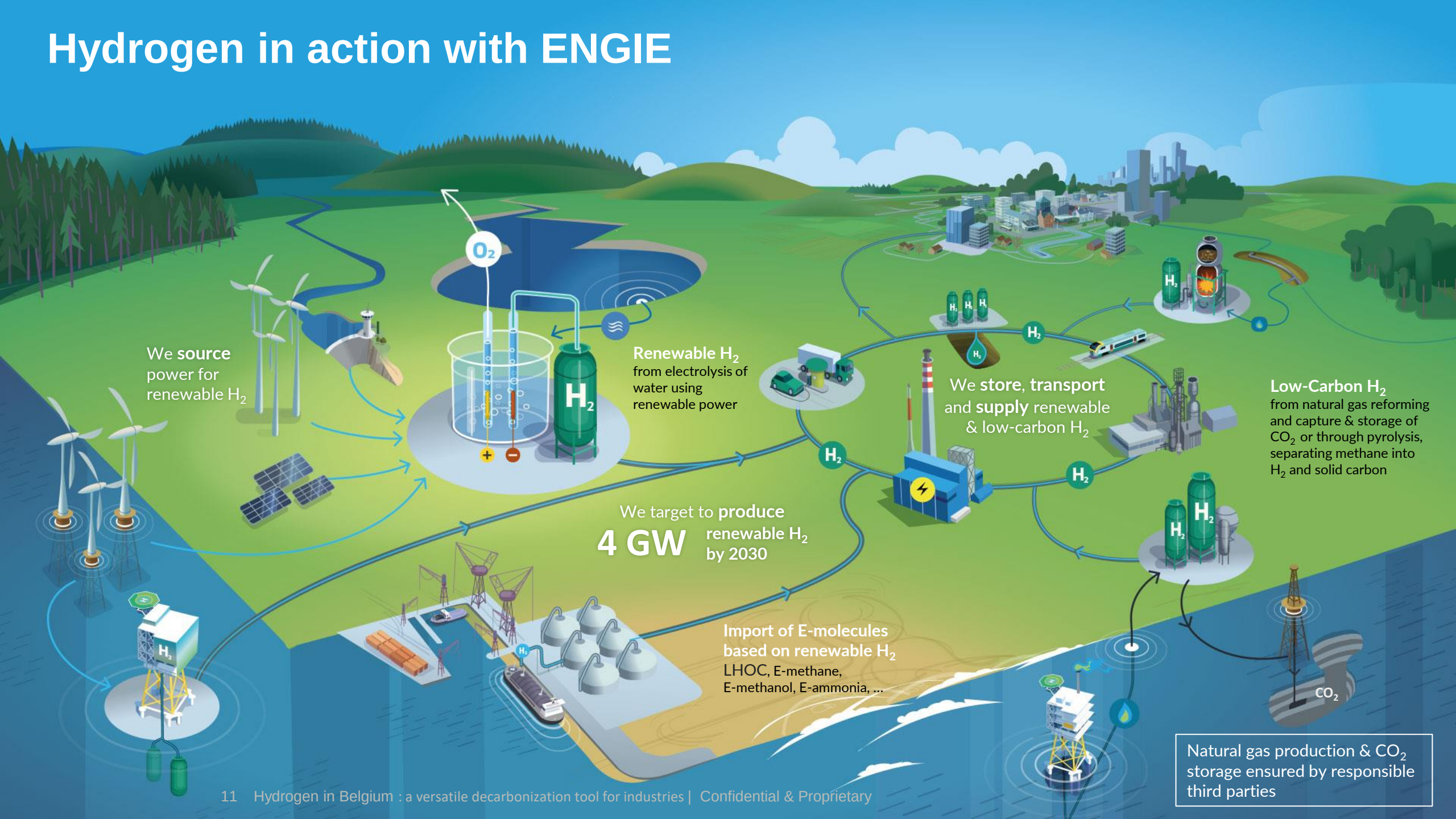


H2 & E-molecules to meet the hard-to-abate emissions and flexibility needs



The initial focus is on these sectors that are hard to abate: heavy-duty transport and industry

Hydrogen in action with ENGIE



First ENGIE H2 developments @ nearby locations, within first mover consortia and pushed by premium markets and/or regulation

H2/CCU PROJECTS

POWER-TO-METHANOL ANTWERP

Inovyn site, Port of Antwerp | BELGIUM

Consortium : Engie, Fluxys, Inovyn, Indaver, Oiltanking, PMV, PoA

METHANOL

- **E-methanol** (8 kton/yr) as feedstock
- **EZ :** 5 MW
- **FID :** 2022
- **COD :** 2023

COLUMBUS

Amercoeur | BELGIUM

Consortium : Carmeuse, Engie, John Cockerill

INDUSTRY

- **E-methane** (370 GWh/y) as fuel
- **EZ :** 100 MW
- **FID :** 2023
- **COD :** 2026
- Up to 162 kt/y of CO2 emissions avoided

ReuZe

Dunkerque | FRANCE

Consortium : ArcelorMittal, Engie, Infinium

REFINERY

- **E-naphta** (feedstock) & **E-fuels** (SAF) upto 100 kton/yr
- **EZ :** 400 MW
- **FID :** 2024
- **COD :** 2027
- Up to 570 kton/yr CO2 emissions avoided

GREEN/BLUE H_2 SUPPLY TO BACKBONE

HyNetherlands

Groningen | THE NETHERLANDS

Consortium : Engie, OW, OCI

CHEMICAL

- **Green H2** (15 kton/yr) as feedstock
- **Phase 1** : 100 MW electrolyser
- **FID** : 2023
- **COD** : 2025
- **Phase 2** : 1 GW electrolyser

NORTH-C-HYDROGEN

North Sea Port, Gent | BELGIUM

INDUSTRY

- **Green H2** (10 kton/yr) as feedstock and/or fuel
- **EZ :** 67 MW
- **FID :** 2023
- **COD :** 2026

H2BE

North Sea Port, Gent | BELGIUM

Consortium : Engie, Equinor

ATR + CCS

- **Low carbon H2** (200 kton/yr) as feedstock and/or fuel
- **1 GW ATR** with CO2 capture > 95%
- **FID :** 2027
- **COD :** 2030

ENGIE's purpose is to act to accelerate the transition towards a carbon-neutral economy, through reduced energy consumption and more environmentally-friendly solutions.

The purpose brings together the company, its employees, its clients and its shareholders, and reconciles economic performance with a positive impact on people and the planet.