



Hydrogen Business Strategy



The Repsol Commitment
Net Zero Emissions
by 2050



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01.

Repsol company overview



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Repsol today

+24,000 employees

Presence in
+20 countries

We sell our products in
+90 countries

24 million customers
1.35 electricity and gas customers

CO₂ emissions reduced by **6.1** million metric tons between 2006 and 2021



Upstream

572,000 boe/d
average production

Projects in **15** countries
in key geographic areas

Industrial

7 industrial complexes
in Spain, Portugal and Peru
+1 million bbl/d
refining capacity

Renewables

Projects in Spain,
Chile and USA
1.5 GW
in operation in Spain
and Chile

Innovation and technology

+370 digital
transformation
initiatives

+270 circular
economy initiatives

Repsol Tech Lab

+200 research
alliances globally

+4,600
service stations
in Spain, Portugal,
Peru and Mexico



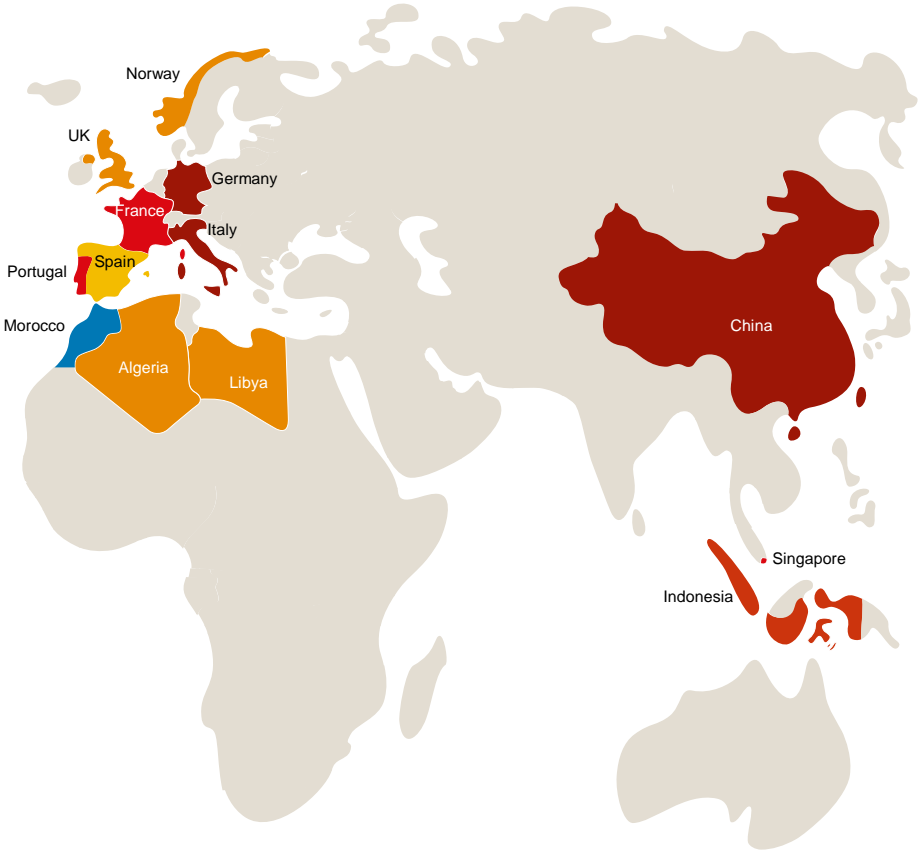
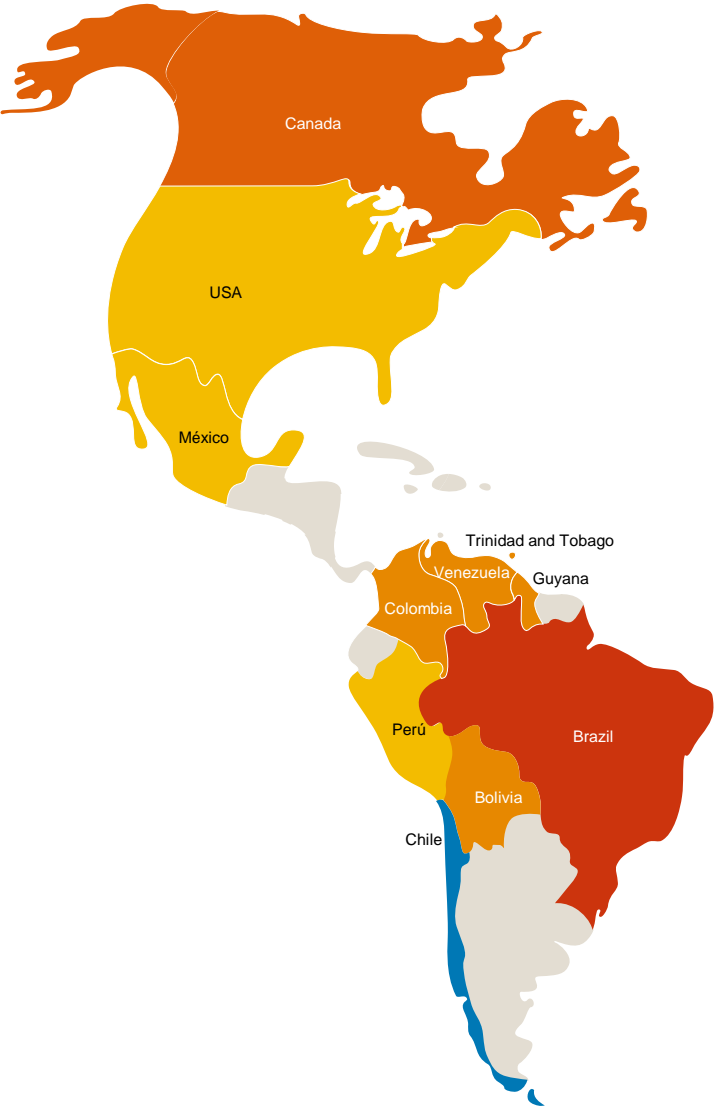
AutoGas
+400
supply points
at service stations

+500
public electric
charging points



Leaders in LPG
in Spain with **4 million**
customers

01. Company overview



Repsol is a vertically integrated energy company present in 36 countries



| All | Industrial |
|---|--|
| SPAIN Refining Chemicals Trading Wholesale and gas trading LAAS* Mobility LPG Retail Electricity and Gas Low-carbon generation Geothermal (Upstream) | GERMANY Chemicals LAAS CHINA Chemicals ITALY Chemicals LAAS |
| USA Upstream Chemicals Trading Wholesale and gas trading Low carbon generation | Upstream + Commercial and Renewables BRAZIL Upstream LAAS INDONESIA Upstream LAAS |
| MÉXICO Upstream Chemicals LAAS Mobility | Commercial and Renewables CHILE Low-carbon generation MOROCCO LAAS |
| PERÚ Upstream Refining Trading LAAS Mobility | Industrial + Commercial and Renewables FRANCE Chemicals LAAS LPG PORTUGAL Chemicals LAAS Mobility LPG SINGAPORE Trading LAAS |
| Upstream ALGERIA BOLIVIA COLOMBIA GUYANA LIBYA NORWAY UK TRINIDAD AND TOBAGO VENEZUELA | |
| Upstream + Industrial CANADA Upstream Trading Wholesale and Gas trading | |

Data included in this map show Repsol's presence in the world on 31st january 2022

* LAAS: Lubricants, aviation, asphalts and specialized products

01. Company overview

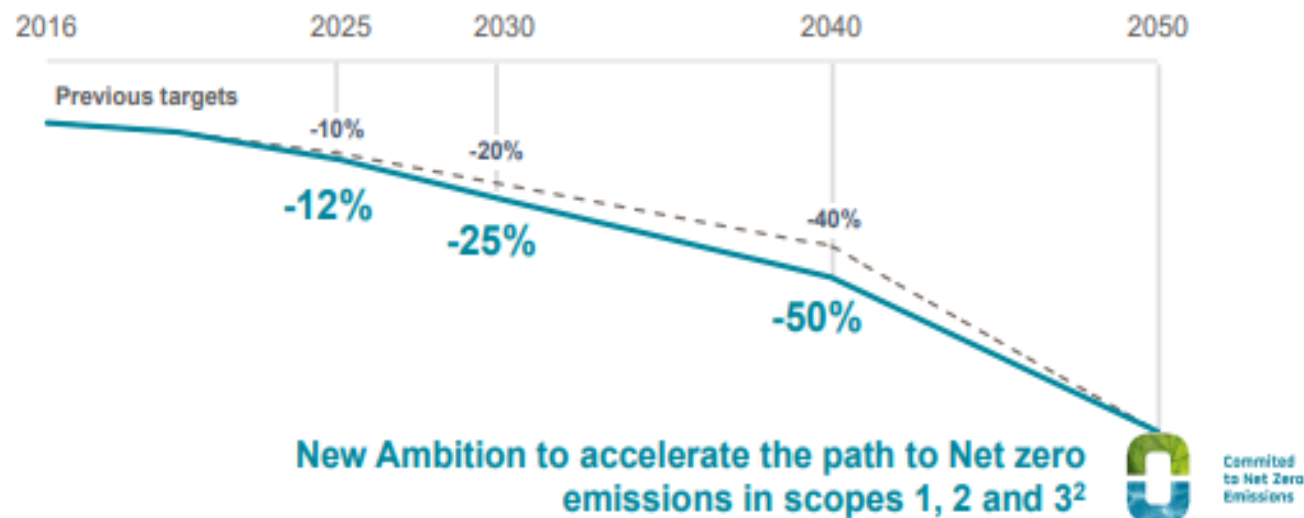


Repsol: Pioneering commitment with decarbonization goals

First O&G to target Net Zero emissions

Committed in December 2019, now increasing our ambition

Carbon Intensity Indicator¹ reduction target [gCO₂/MJ]



Leading the energy transition in line with the objective of the **Paris agreement** to limit global temperature increase to well below 2°C

Leading ESG company



Top grade 2020



Top grade 2019



1st quintile 2020

32% Repsol's institutional shares managed by **ESG investors...**

15% ...more than doubling the Global oil and gas average

1. 2016 baseline. 2. Scope 3 emissions based on the use of the products from our upstream production
Note: TPI: Level 4 "Strategic Assessment"; CDP: Within Oil & Gas: A-; MSCI: In Integrated Oil and Gas: AA
Source: Leaders Arena research August 2020 & Repsol SID List Feb 2020.

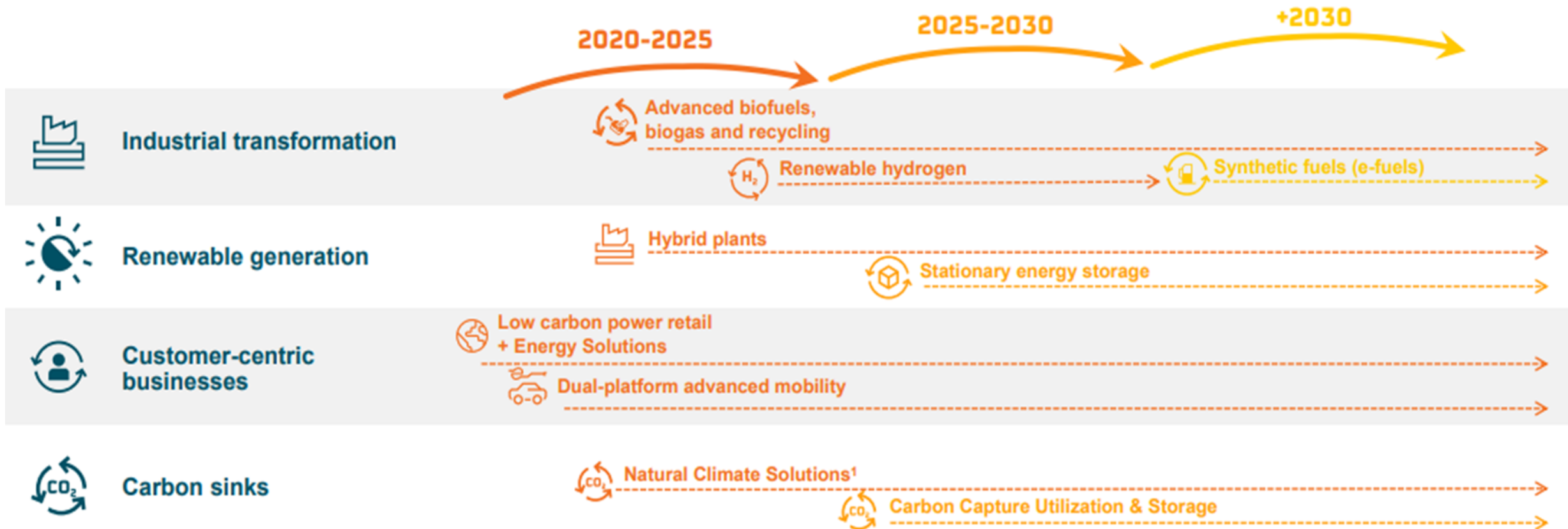


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01. Company overview



Decarbonization is an opportunity to build business platforms as technology evolves



1. Forestry JV



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02.

Repsol position



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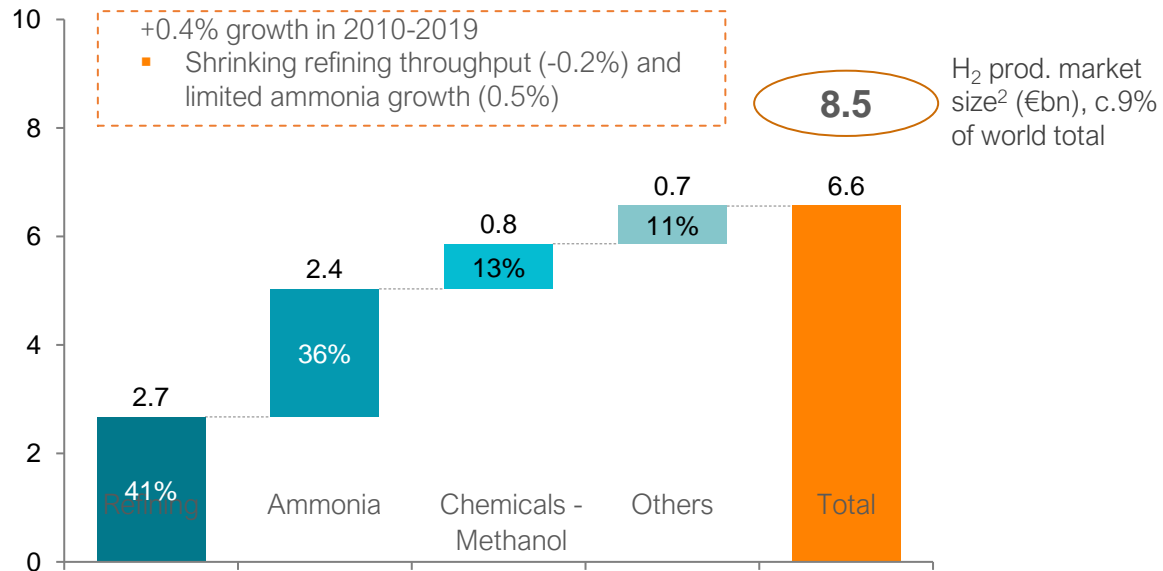
02. Repsol Position

Hydrogen consumption in Europe & Spain



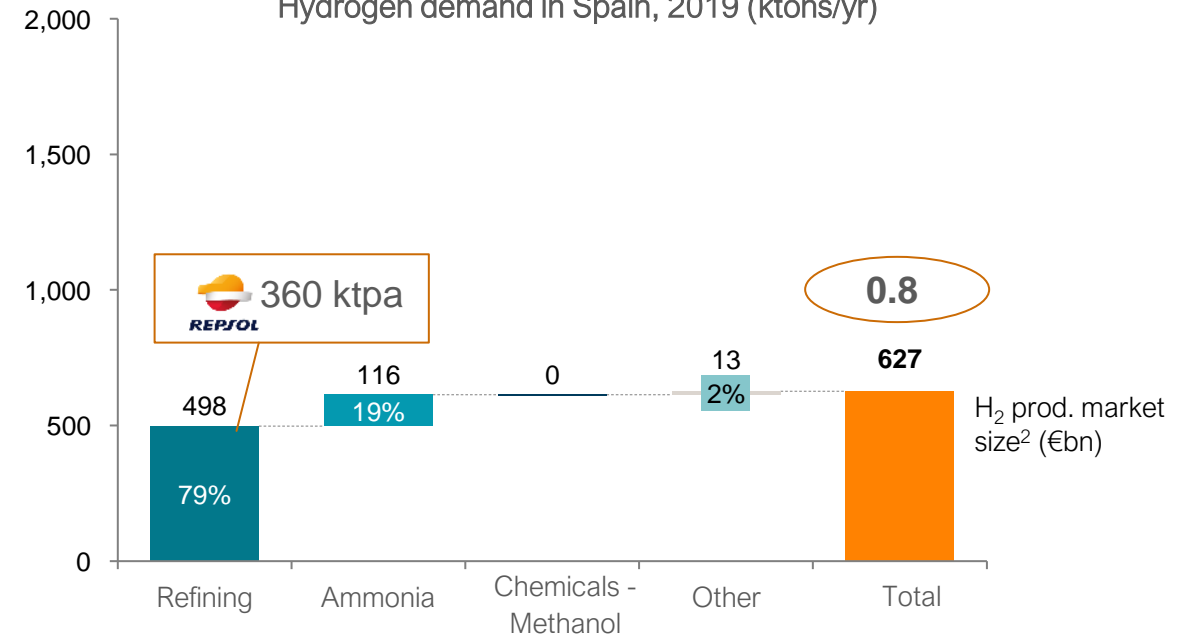
Europe's H₂ market (~6.6 M tons/yr, €8.5bn) represents c.9% of world market and is concentrated on ammonia and refinery uses

Hydrogen demand in Europe, 2020 (M tons/yr)



Spain's H₂ market driven by refinery end-use, accounts for 79% of total demand

Hydrogen demand in Spain, 2019 (ktons/yr)



1. Market size estimated with 1.3 €/kg full grey (incl. capex) H₂ production cost (assuming natural gas cost of 20 €/MWh and excluding CO₂ price)
Source: IEA; Nexant

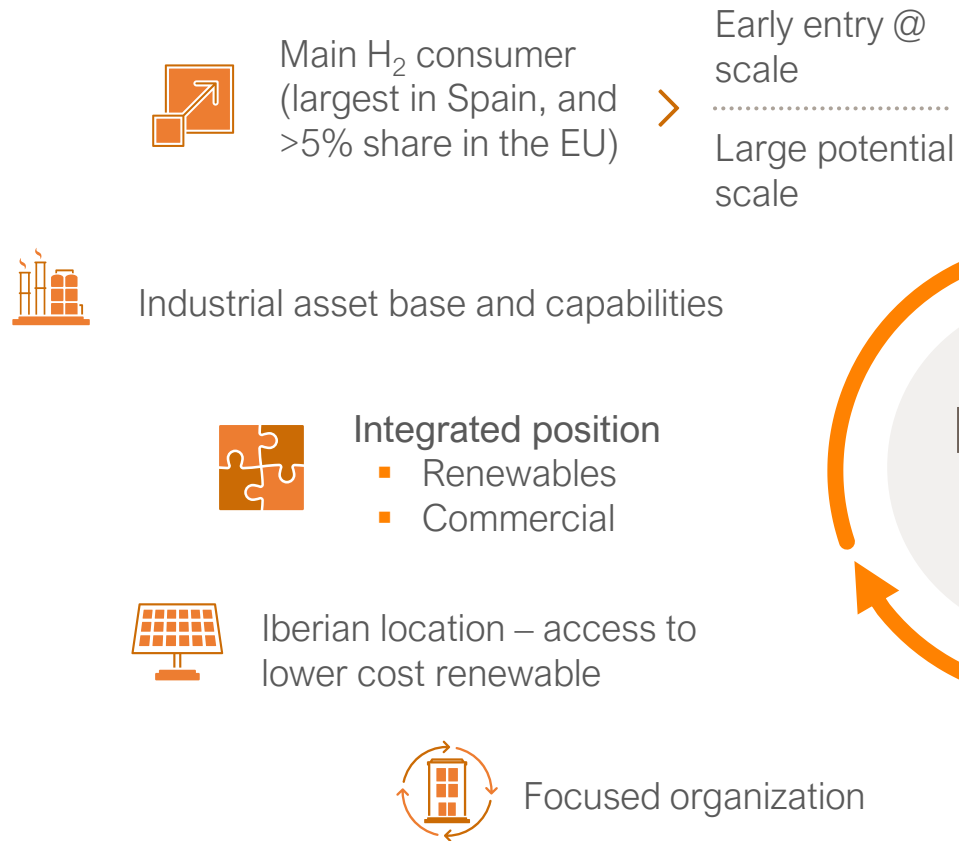


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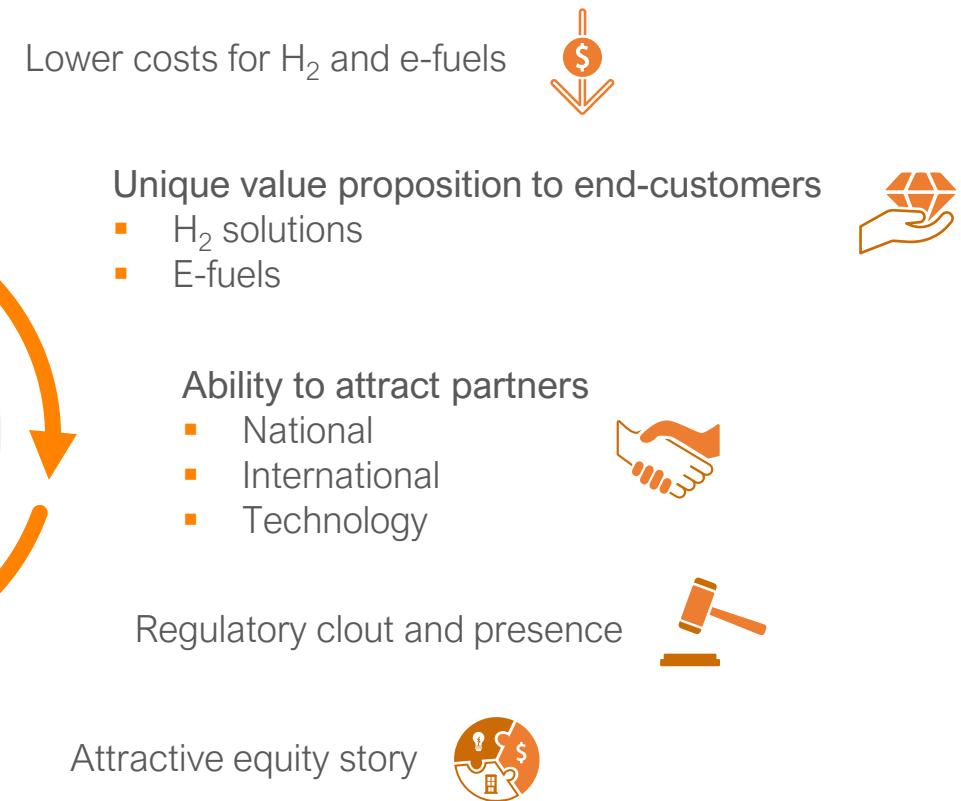
02. Repsol Position

Repsol competitive advantages

Leveraging sources of competitive advantage...

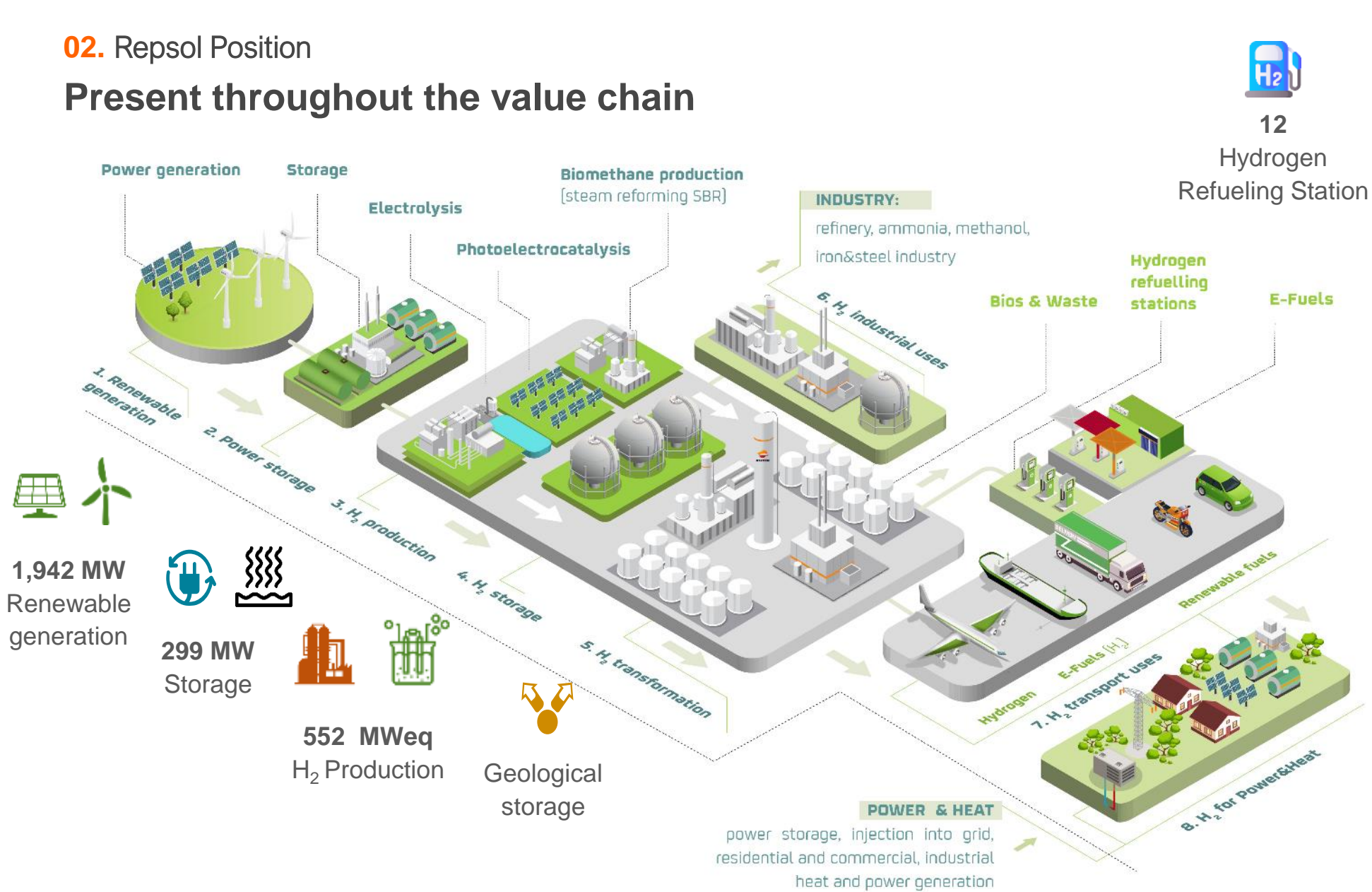


... driving a differentiated market position



02. Repsol Position

Present throughout the value chain



12

Hydrogen
Refueling Station



2,7 MM l/year
of e-fuels



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03.

Ambition



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Repsol Hydrogen Video



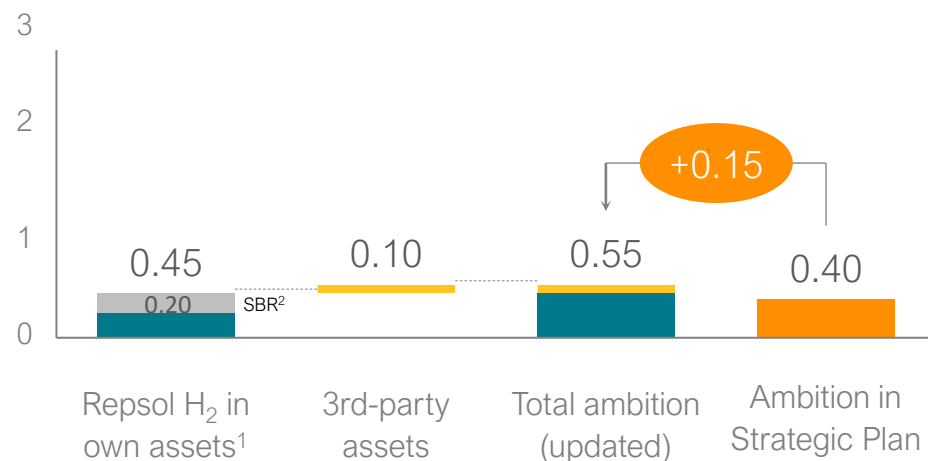
03. Ambition

Current ambition aligned with “Fit for 55” targets



2025 objective

H₂ capacity objective, 2025 (GW)

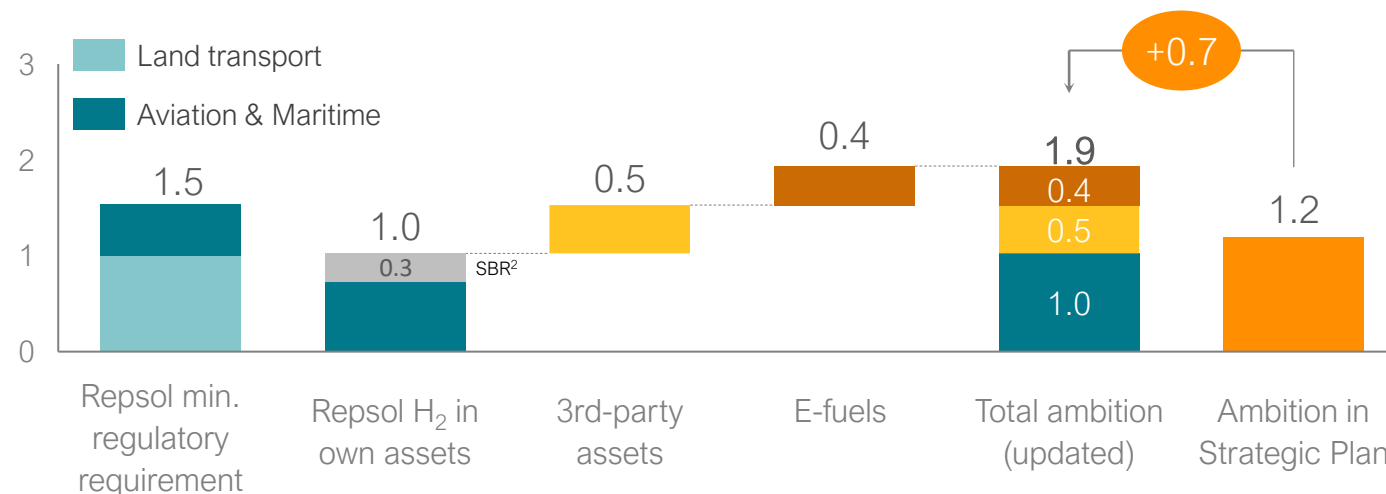


- Deployment of **electrolyzer capacity in own refineries to develop experience and scale**
- Developing H₂ hubs around own site
- Participation in **pilots** with 3rd-parties to develop positioning and know-how in new applications

1. Including the e-fuel pilot plant in Petronor;
2. SBR: Steam biomethane Reforming, renewable hydrogen production from biomethane
3. Renewable Fuel of Non Biological Origin – H₂ and H₂ derivatives (e.g. e-fuels)

2030 ambition

Required H₂ capacity vs. ambition, 2030 (GW)



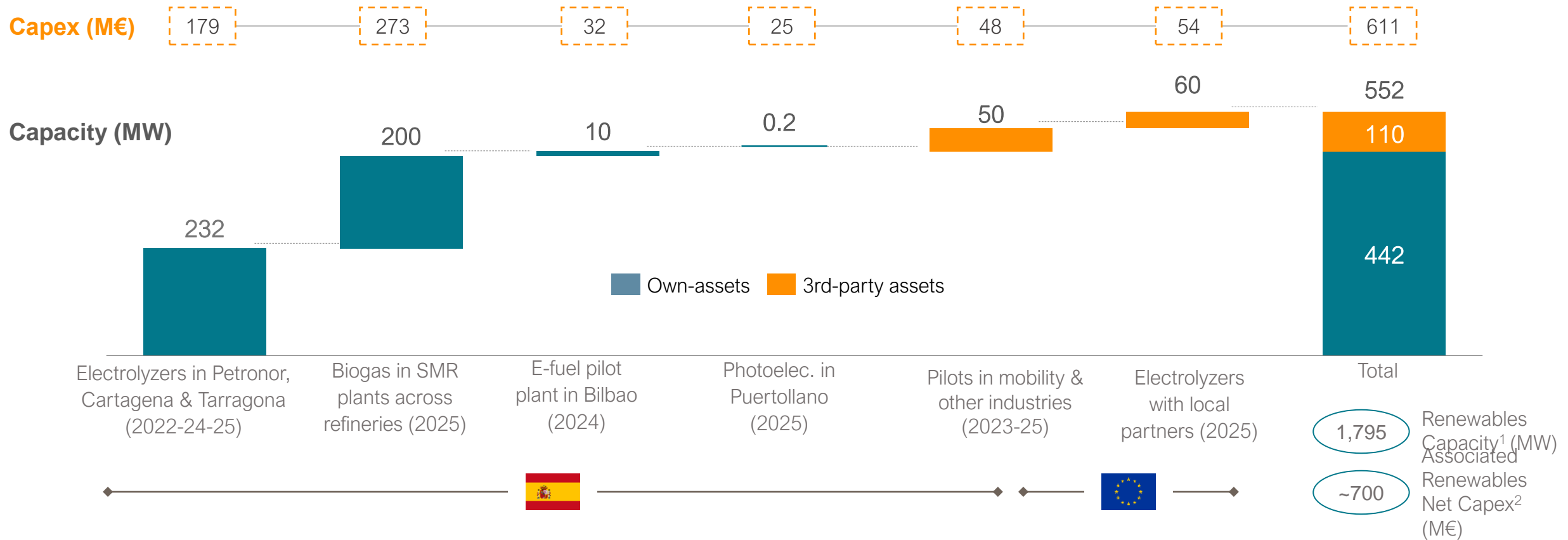
- **Fit for 55 proposal strongly supports renewable H₂ development in Europe**
- Current **H₂ ambition in own-assets achieves minimum regulatory targets**
- **E-fuels plant to strengthen Repsol H₂ position** and increase market share in a highly synergetic long-term business line
- **Third party volumes to cover additional industrial needs**



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03. Business Roadmap

Pipeline of projects up to 2025



1. Assumes sizing of 3.25 MW renewable generation capacity per MW of electrolyzer (70% of Renewables power generation is dedicated H2 production, with the rest fed to the grid); Gross capacity assumes 100% of renewables development in projects in which Repsol's stake is >=50%.

2. Renewables Capex assumptions: 2022-2025-> Solar: 595 €/kW Wind: 920€/kw.

Note 1: Capacities assume a 95% capacity factor;

Note 2: Equity share between 50% and 100% in projects deployed in Repsol refineries before 2025. Equity share for projects deployed in third-party assets in Spain of 50%. Equity share for international projects of 30%;



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04.

Business Roadmap

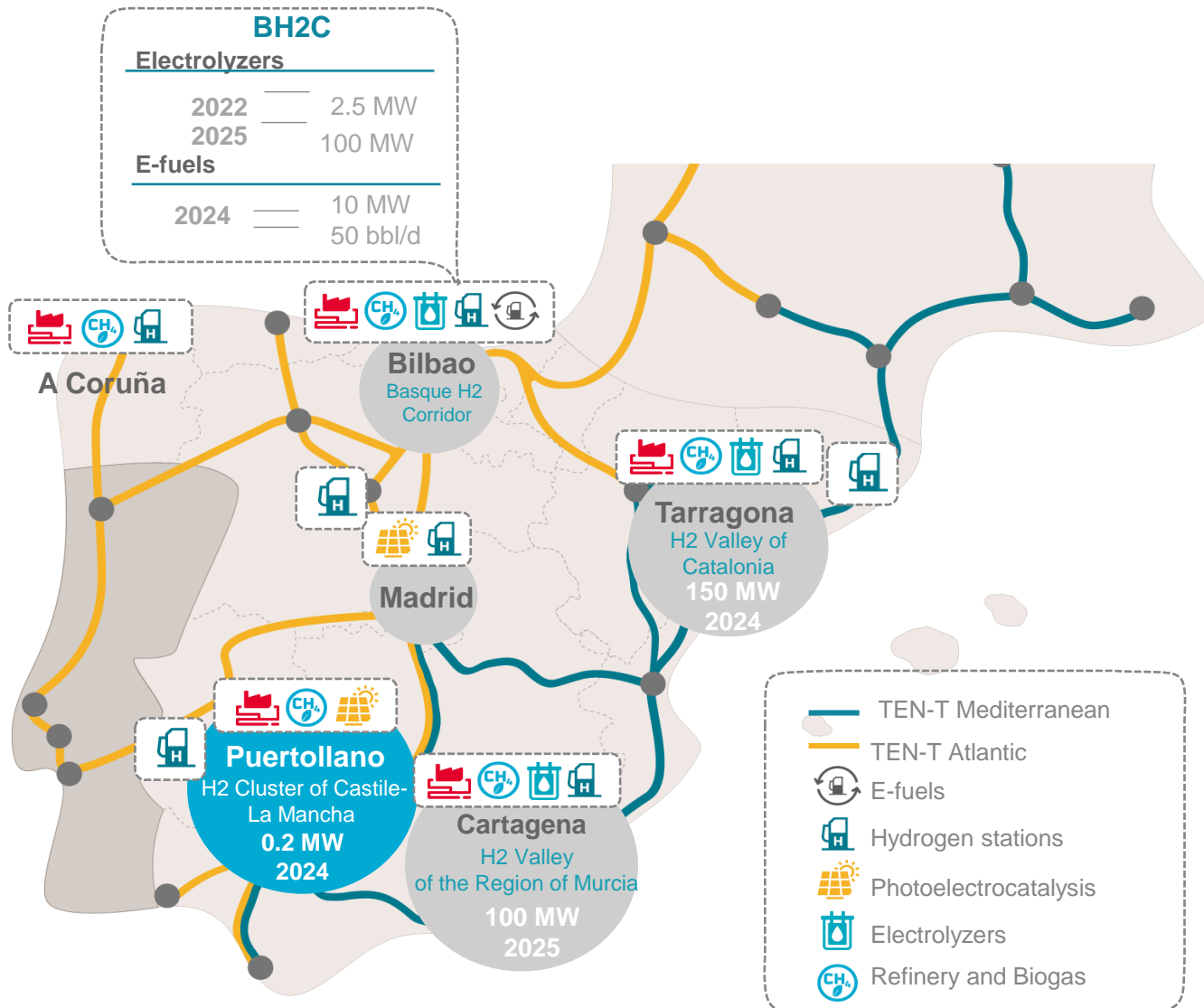


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04. Business Roadmap

Early-developments are based on Hydrogen Valleys

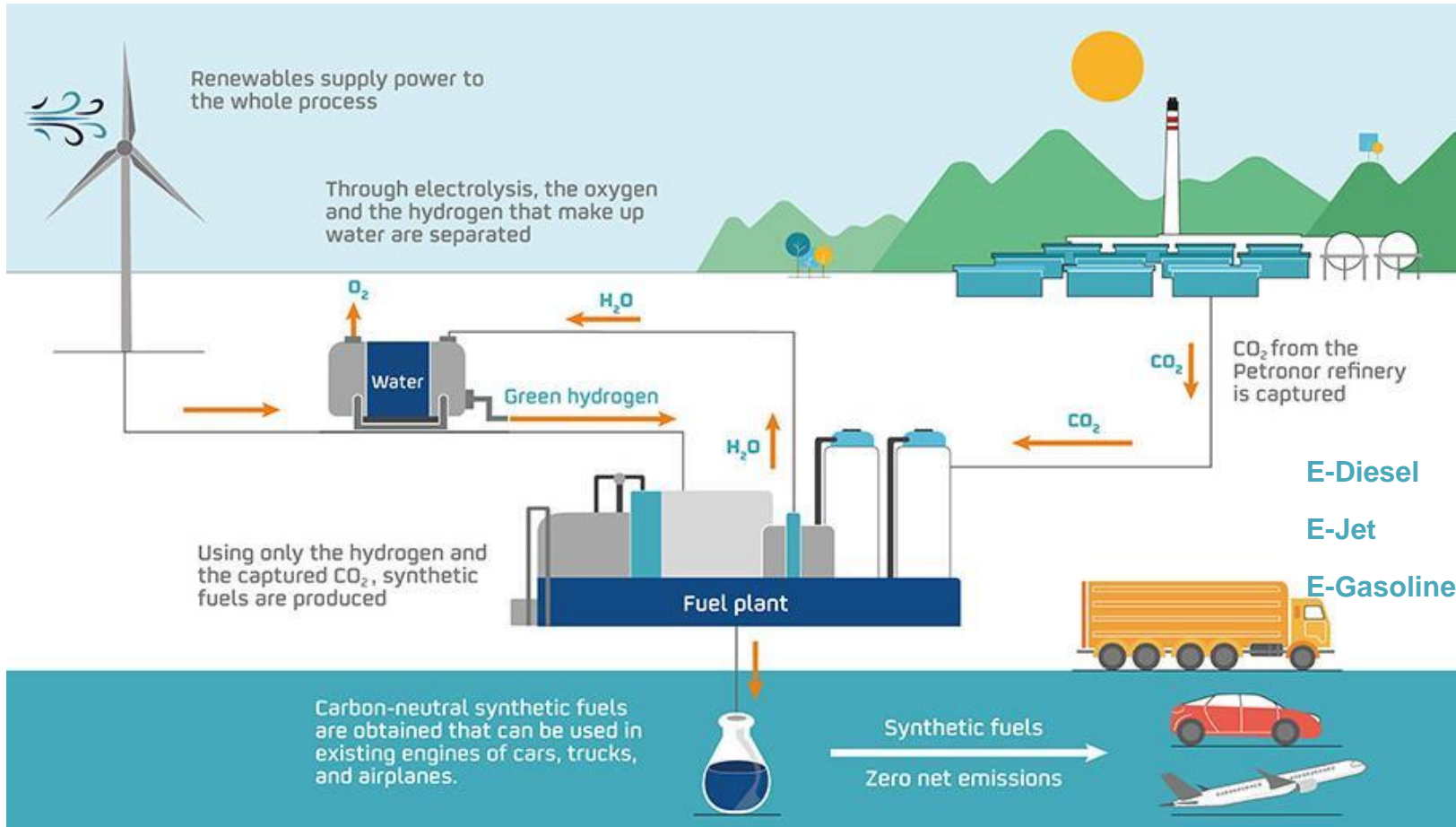


- Repsol is promoting the creation of large regional hubs focusing on renewable hydrogen with the aim of coupling the production and demand.
- H2 ecosystem involves the development of transport infrastructure and promotion of different uses.
- The supply of hydrogen to this first network will be carried out from the main production and consumption hubs, such as refineries, which are already located near ports and in the TEN-T corridors.
- The extensive network of 3.200 Repsol service stations in Spain, together with the large-scale production allows the company to develop HRS in main cities- 12 HRS by 2025.

04. Business Roadmap

Production of e-fuels in Petronor

Development of worldwide reference plant to achieve commercial level and leading position in production of synthetic fuels



Investments:

Wind generation,
electrolysis, e-fuels plant:
74 M€

Production: 50 bbl/d

Partners



ENERGIAREN
EUSKAL
ERAKUNDEA

ENTE VASCO
DE LA
ENERGÍA



أرامكو السعودية
saudi aramco

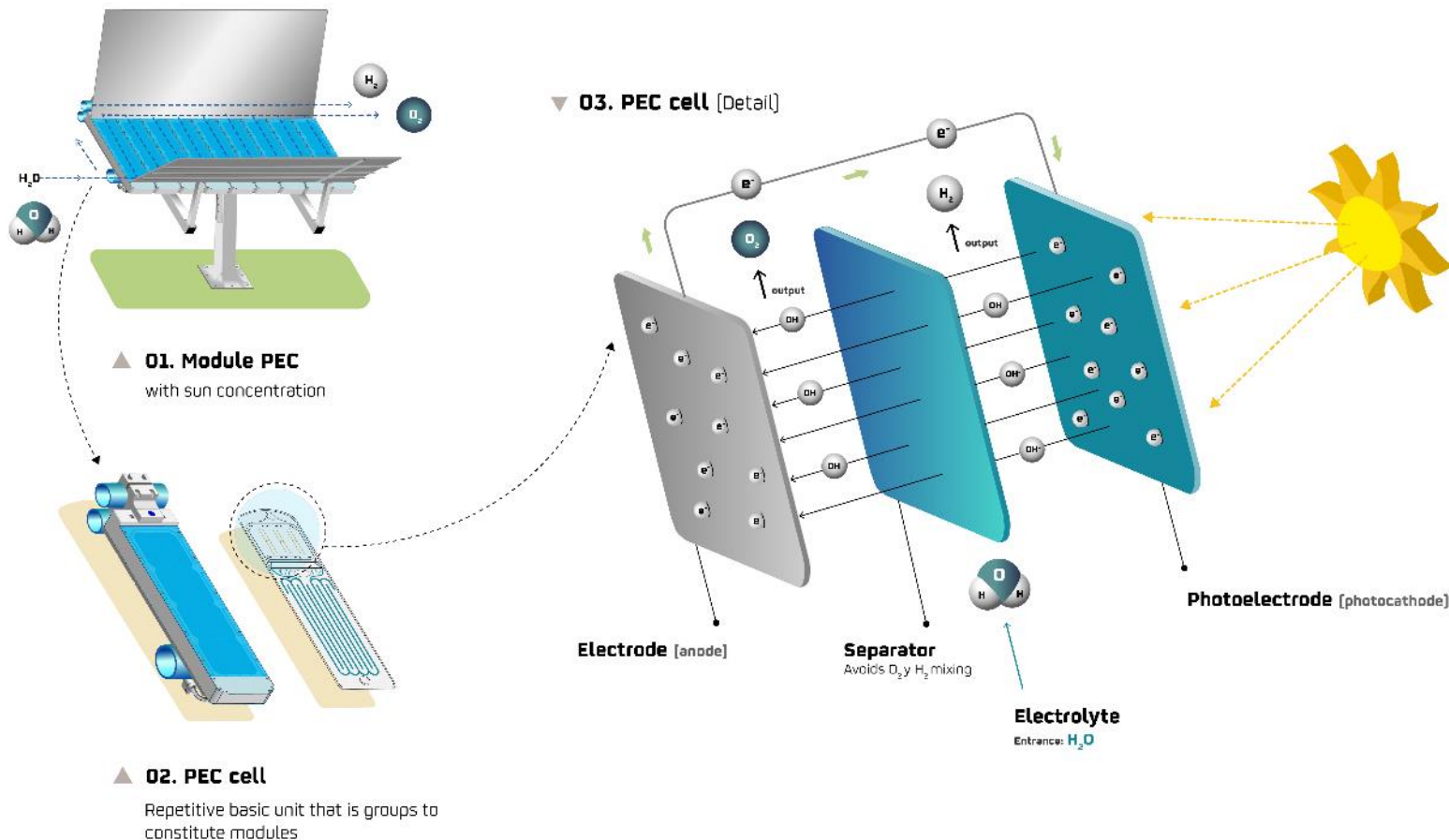


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04. Business Roadmap

SUNRGYZE – Renewable H₂ production technology

Repsol - Enagas partnership: technological development of disruptive and photo-electrocatalytic process for production of cost-competitive renewable hydrogen



- 100% renewable
- 100% CO₂ reduction vs conventional hydrogen.
- Based on the **direct conversion of solar energy** into chemical energy
- Collaboration with different public and private entities



Universitat d'Alacant
Universidad de Alicante



- Co-funded by European Regional Development Funds (**FEDER**) and EU Innovation Fund



Centro para el
Desarrollo
Tecnológico
Industrial



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04. Business Roadmap

First electrolyser in Petronor

First Project of Basque H2 Corridor (BH2C)

The project will contribute to changing the energy and economic model to progress on decarbonisation of strategic sectors such as energy, mobility, industry and services



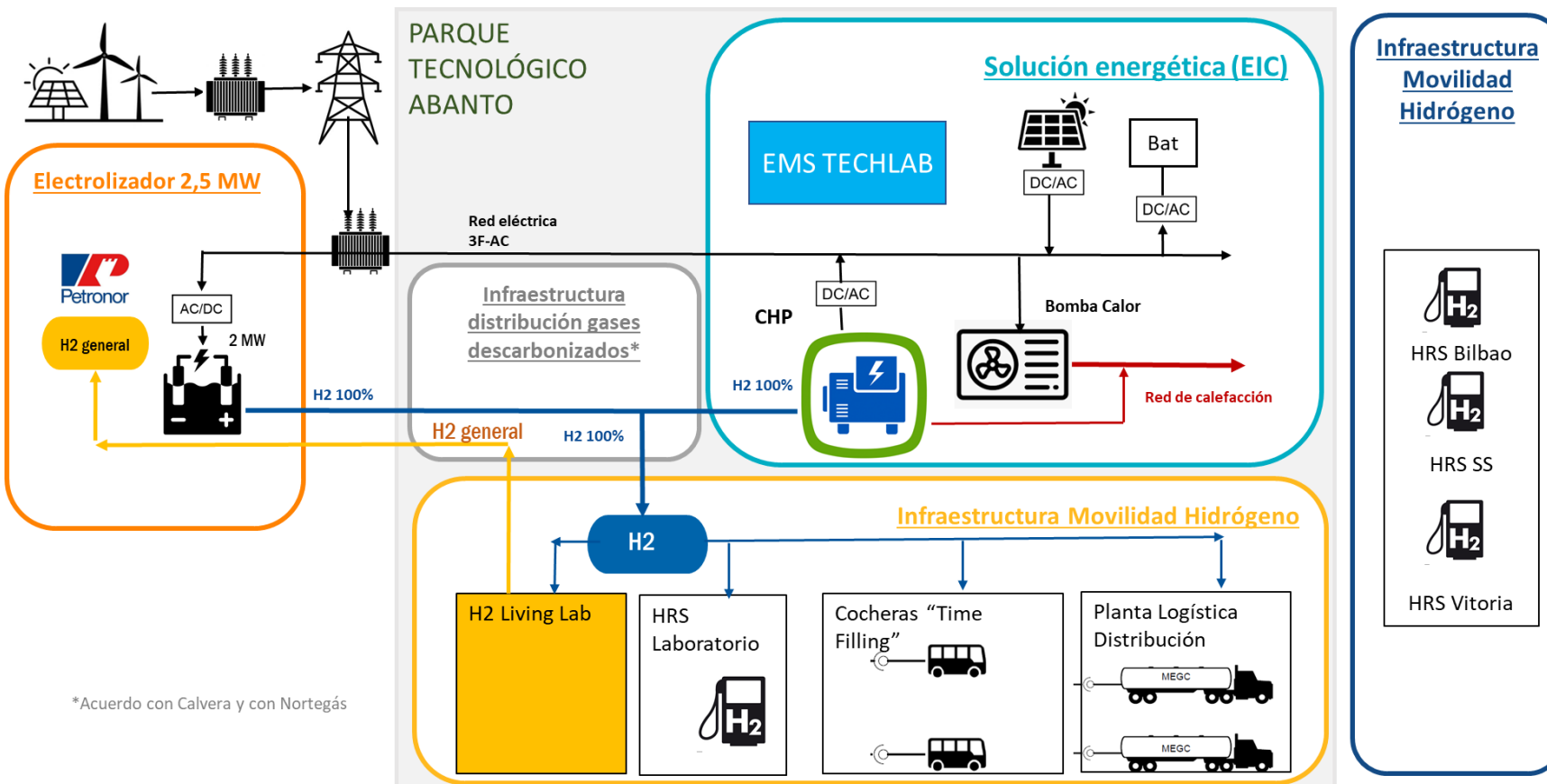
2,5 MW:
Electrolyser

Q4 2022
Start-up

Investment: 8.9 M €

Main uses

- Refinery
- Energy Intelligence Center
- Technological CentreEzkerraldea-Meatzaldea
- Buses and vehicles in logistical platform



*Acuerdo con Calvera y con Nortegás



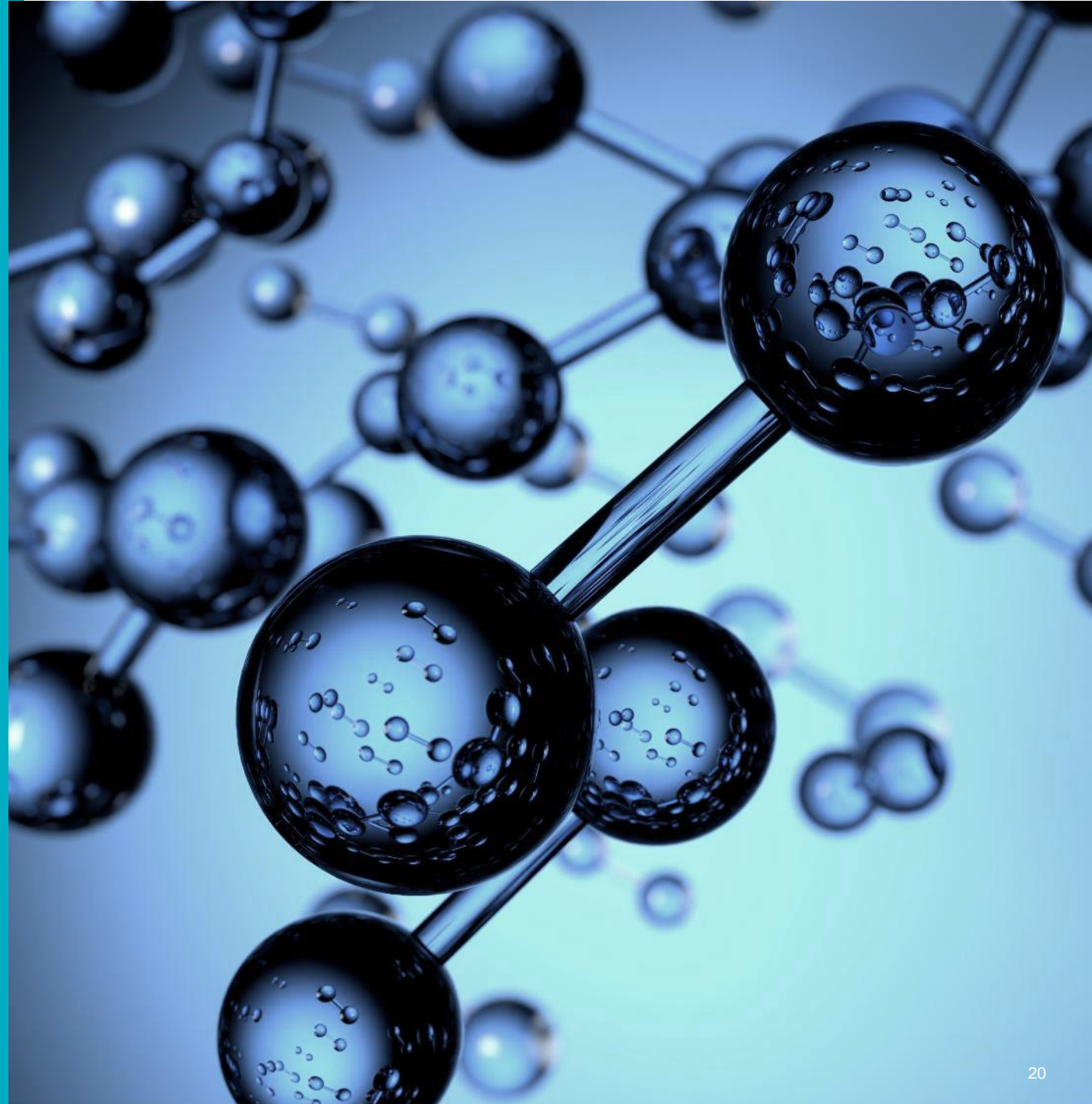
05.

SHYNE

Spanish Hydrogen Network



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06. SHYNE: Spanish Hydrogen Network Project



Repsol with great strengths to be the backbone of the Renewable Hydrogen roadmap and its sectoral integration, together with growing demand for H₂ in the coming years, and the role played by the European Funds, will lead Spanish national project.

1

Repsol's objective is to **develop a national project** for the deployment of the renewable hydrogen vector, supported by public-private collaboration, which will take the form of the creation/boosting of:

- **4 hydrogen valleys** where they will develop specific renewable H₂ production projects and end uses in industry and transport, in addition to renewable Electricity Generation and Storage Projects.
- **3 Transversal Innovation Hubs and 1 Digitalisation and Knowledge Management Hub** with R&D&I and technological development, Knowledge Management and Digitalisation projects that guarantee a sustainable economy based on this energy vector.

Multi-sectoral vision

- Impacts in terms of ecology, job creation, knowledge and technological sovereignty
- Presence in 10 **Autonomous Regions**
- Investment of 3,230 M€*

2

Project **aligned with both the EEFF and the Spanish Plan “España Puede”**, especially with component 9, based on **technological and sectoral diversification and a coherent systemic approach**

3

Tractor effect of SMEs, with **71 partners** involved in the project and will be conveyed through **two relationship models**, strategic agreements and declarations of interest, to **facilitate the governance** of the project and **unify interests** of entities from different sectors and along the value chain.

* Total CAPEX. Repsol's CAPEX is approximately 2,250 M€

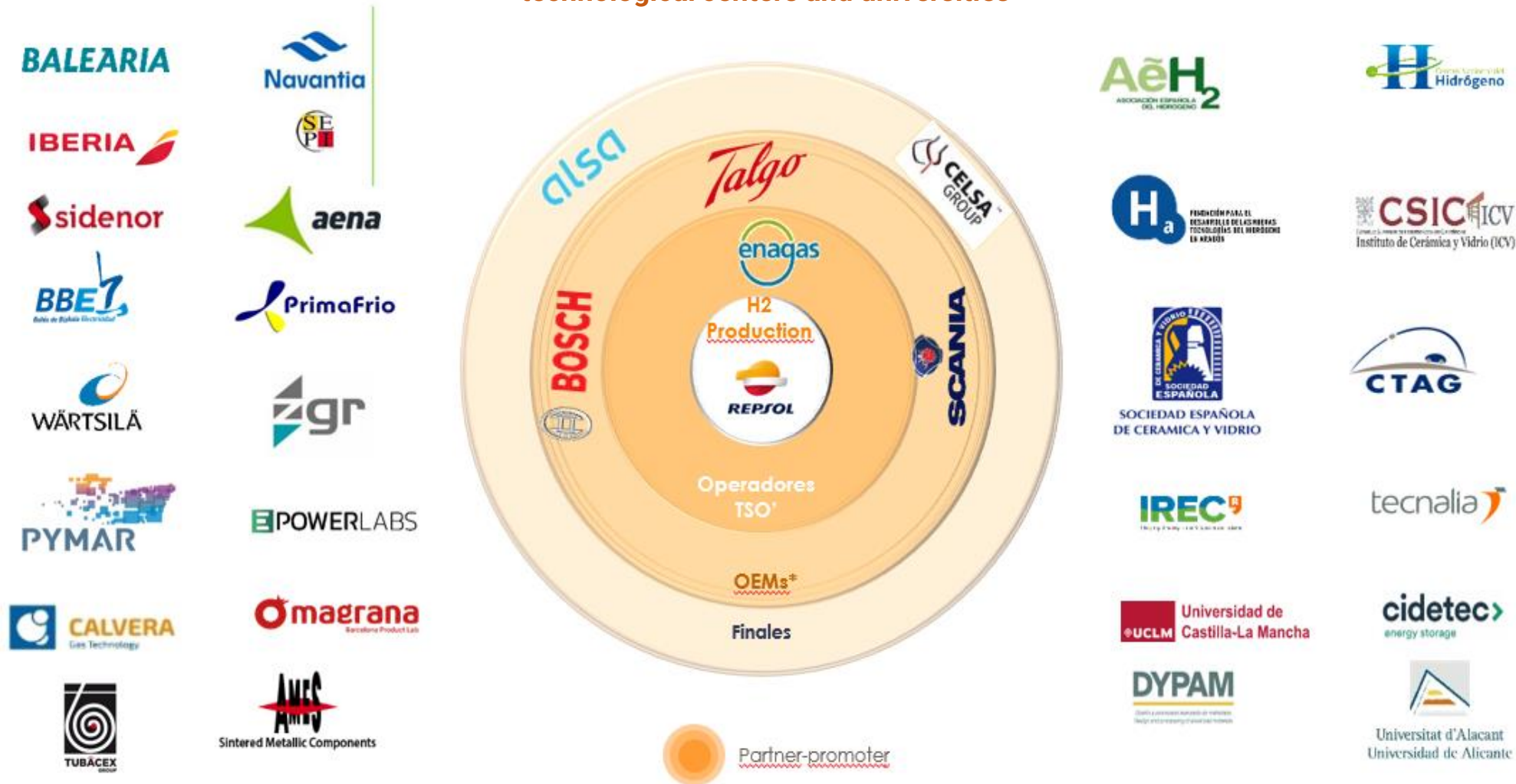


06. SHYNE: Spanish Hydrogen Network Project

Repsol's Industrial Leadership and the sum of the capabilities of partners, and the growth of the hydrogen industry with the boost of FFEE, result in SHYNE creation



In January 2022 SHYNE- 33 partners: 22 companies ,11 associations, technological centers and universities



SHYNE is growing with new companies which interested in membership

+ 3
new promoters

+ 38
companies and associations

06. SHYNE: Spanish Hydrogen Network Project



SHYNE is a backbone agent in the integration of the hydrogen value chain in Spain



Environmental impacts



1.430 kt/year
avoided



580 kt/año
residuos
utilizados

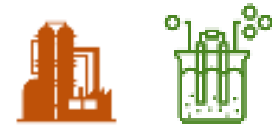
Renewable generation impacts



1.942 MW
Renewable
generation



299 MW
Storage



550 MWeq
H₂ production

Macroeconomic impacts



3.230M€
CAPEX



>5.000 M€ of
economic impact



>13.700
new jobs



4
H₂ Valleys

Other impacts



12 Hydrogen
refueling stations



8.000 l/day
of e-fuels



112 M€
Investment in digitization
(Digitization and Knowledge
Management hub)

*Se incluye un proyecto de producción de 40 MW y 120 M€ (CAPEX total), 81 M€ (CAPEX Repsol) a partir de residuos en Galicia.

06. SHYNE: Spanish Hydrogen Network Project



SHYNE project is fully aligned with the guidelines and objectives both at European and national level for Hydrogen



Taxonomy

Project is aligned with the European taxonomy:

- ▶ **Renewable H2 production**
- ▶ **H2 Storage**
- ▶ **Emissions even below thresholds**

Reglamento MRR

- ▶ The annex VI of the regulation, activity 022 is identified with a 100% impact on the ecological transition
- ▶ Projects are alligned with the principle- **DNSH***

Flagships



Power up



Recharge & Refuel

National Plan “España Puede”

III. Just and inclusive energy transition

9. Renewable Hydrogen Roadmap and its sectoral integration

With strong relation with other components of the Plan related to climate change mitigation: 6, 7 and 12**

Hydrogen Roadmap and its sectoral integration

Objectives of Hydrogen Roadmap of October 2020:



4 GW of installed electrolyser capacity by 2030



25 % of renewable H2 in total industrial consumption



5.000 -7.500 vehicles with renewable Hydrogen fuel



150-200 busses with renewable Hydrogen fuel cell



2 commercial train lines powered by renewable H2

Note: *Do Not Significant Harm

**Component 6- Safe and Sustainable Mobility, 7- Development and integration of Renewables, 12- Spanish industrial policy 2030



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Thank You



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Annex.

Sustainable Mobility



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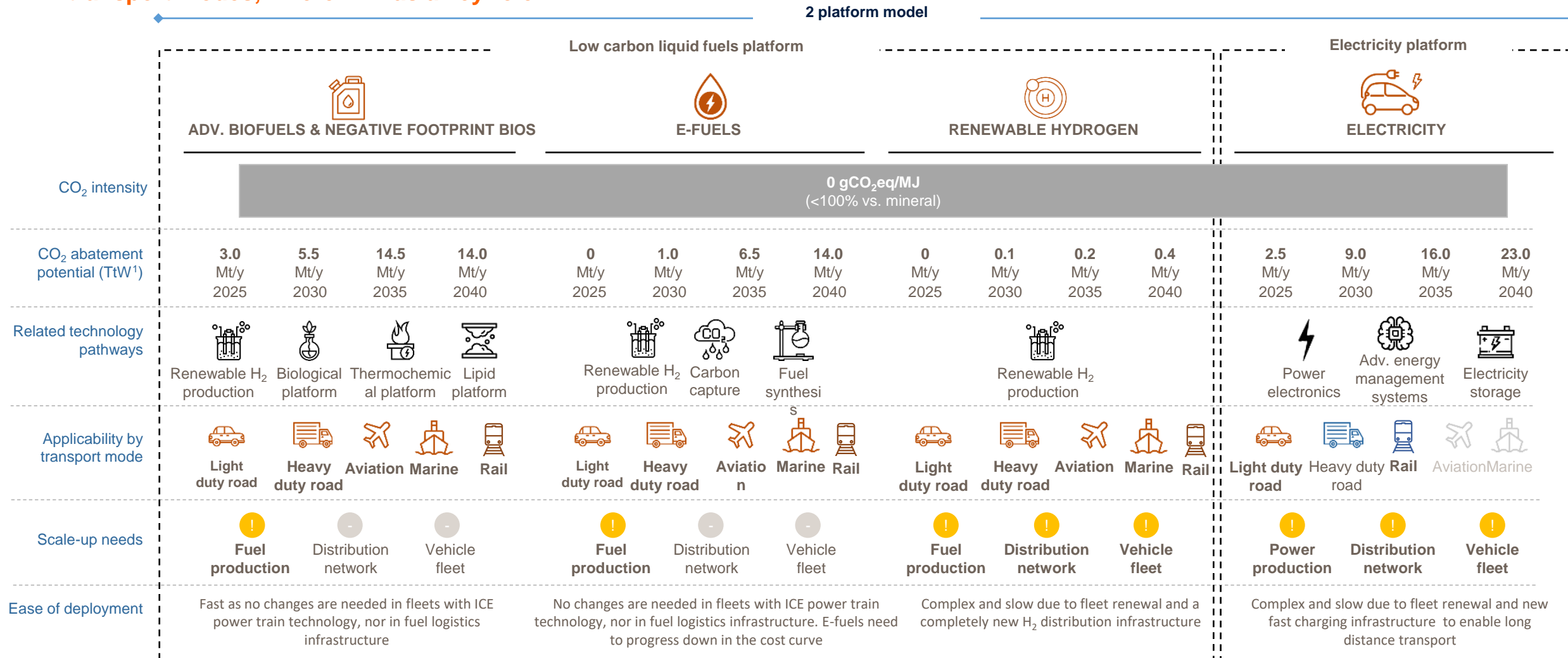
Repsol is a national leader in energy and mobility products



Repsol low carbon fuels



A 2- platform model creates synergies with electrification to accelerate the decarbonization of all transport modes, where H2 has a key role



¹ TtW: Tank-to-Wheel.

Hydrogen competitiveness

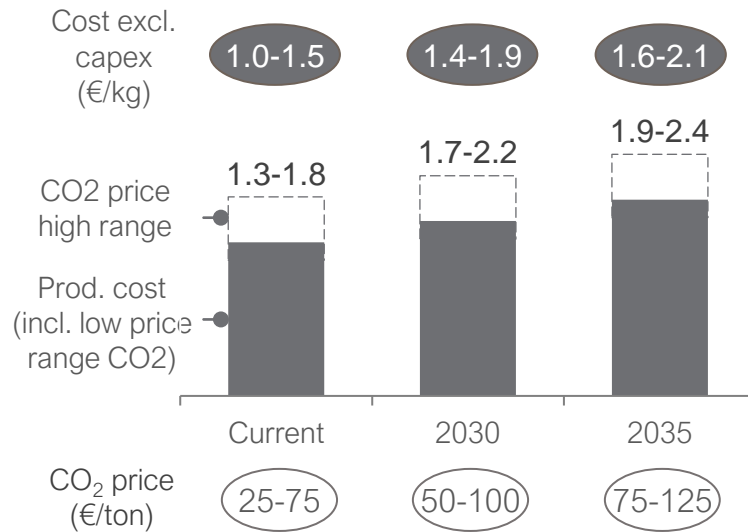
Low-carbon H₂ expected to become competitive vs incumbent by 2030-35

Conventional H₂



EU

H₂ production cost¹ (€/kg)

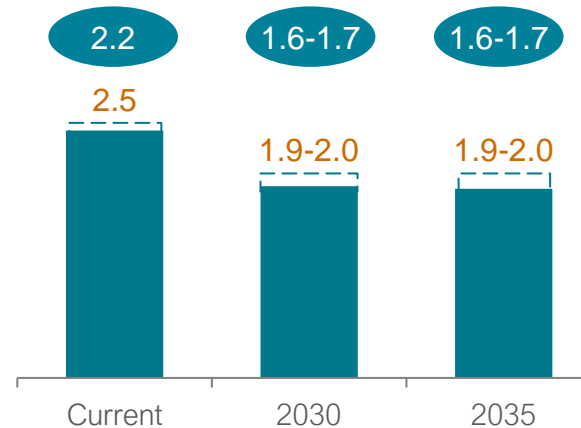


Low carbon H₂



North Europe estimates

H₂ production cost² (€/kg)

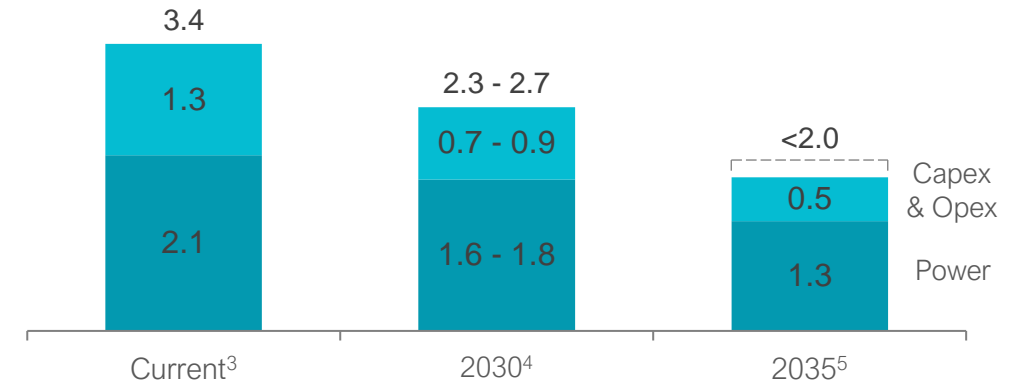


Renewable H₂



Spain estimates

H₂ production cost (€/kg)



1. 20 €/MWh natural gas price
2. Considers carbon capture of 90% of total CO₂ produced
3. 100 MW electrolyser, 1200€/kW of CapEx (full project costs incl. electrical connection, civil, H₂ intermediate storage, project costs), 65% electrolyser efficiency, ~70% load factor, electricity price 32€/MWh, 6.4€/MWh grid toll.
4. Low range: 100 MW electrolyser, 579€/kW CapEx, 68% efficiency, ~70% LF, electricity price 25 €/MWh, 6.4€/MWh toll; high range: 100 MW electrolyser, 760€/kW CapEx, 68% efficiency, 70% LF, electricity price 30€/MWh, 6.4€/MWh toll.
5. CapEx 400 €/kw, 68% efficiency, LF ~70%; electricity price 20 €/MWh, 6.4€/MWh toll, OpEx 24 €/kW



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