

TRANSFORMING THE ENERGY MATRIX PETROBRAS 2024

April 2024

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Climate change as a driving factor for the energy transition

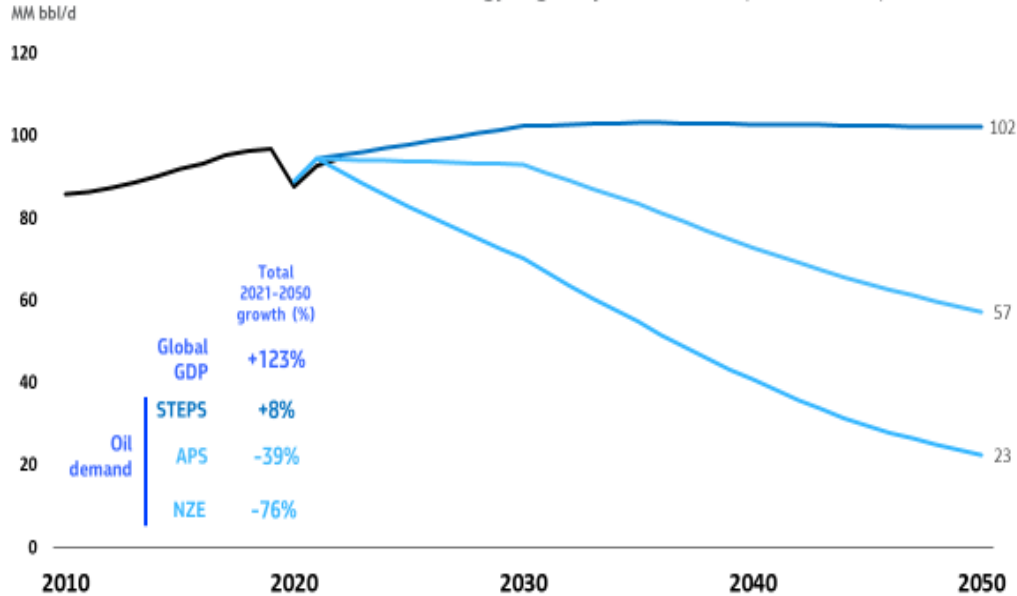
More restrictive CO2 scenarios decrease the O&G market and increase demand for clean energy

Source: IEA – World Energy Investment, 2023



Oil demand is forecasted to retract

Crude oil demand - International Energy Agency Scenarios (WEO 2022)



STEPS
Stated Policies

APS
Announced Pledges

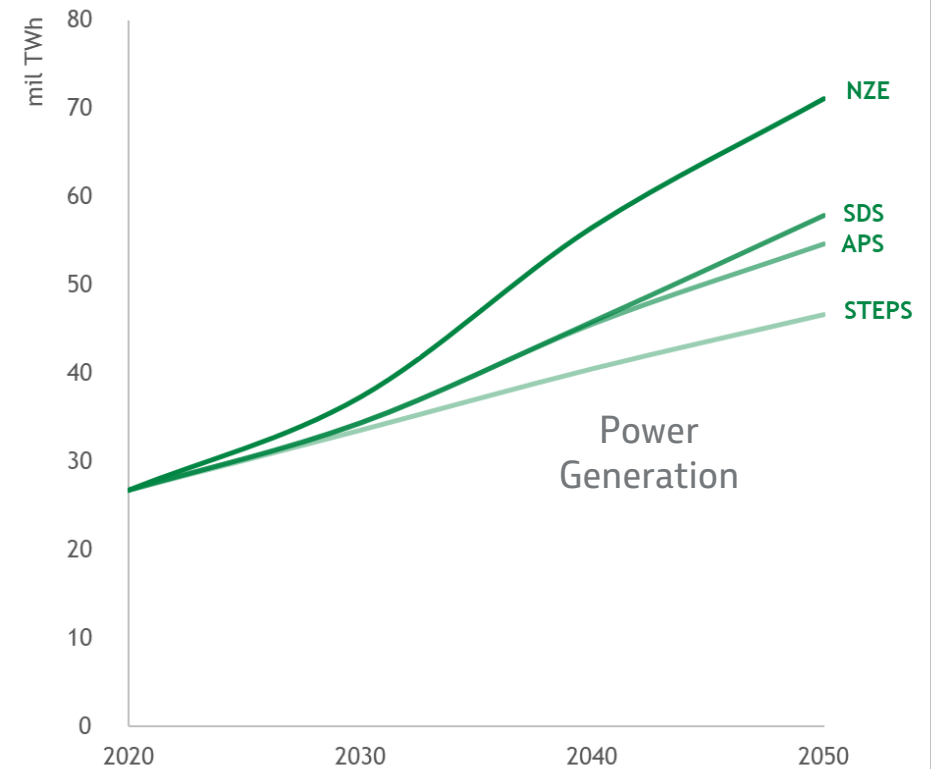
NZE
Net Zero Emissions
by 2050

Median
Temperature
increase until
2100

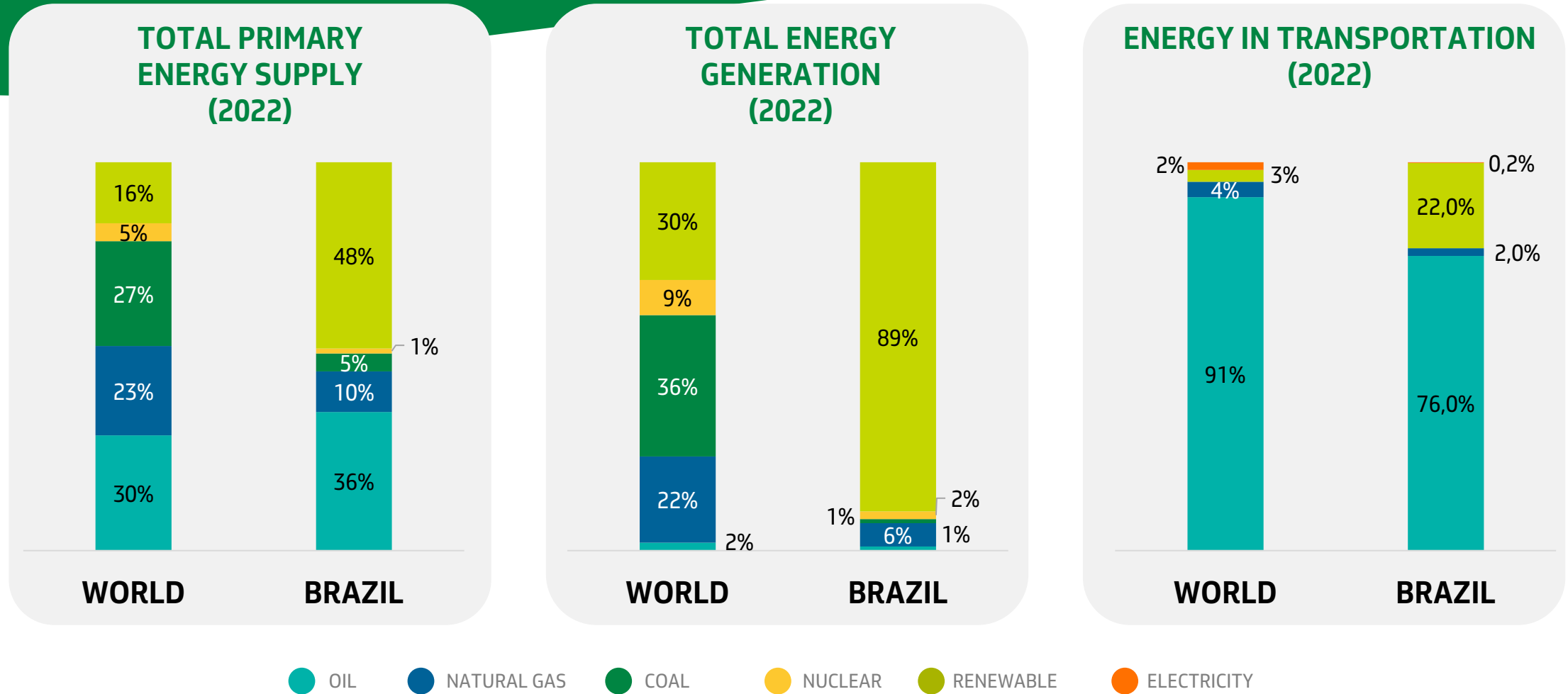
+2.5°C

+1.7°C

+1.4°C

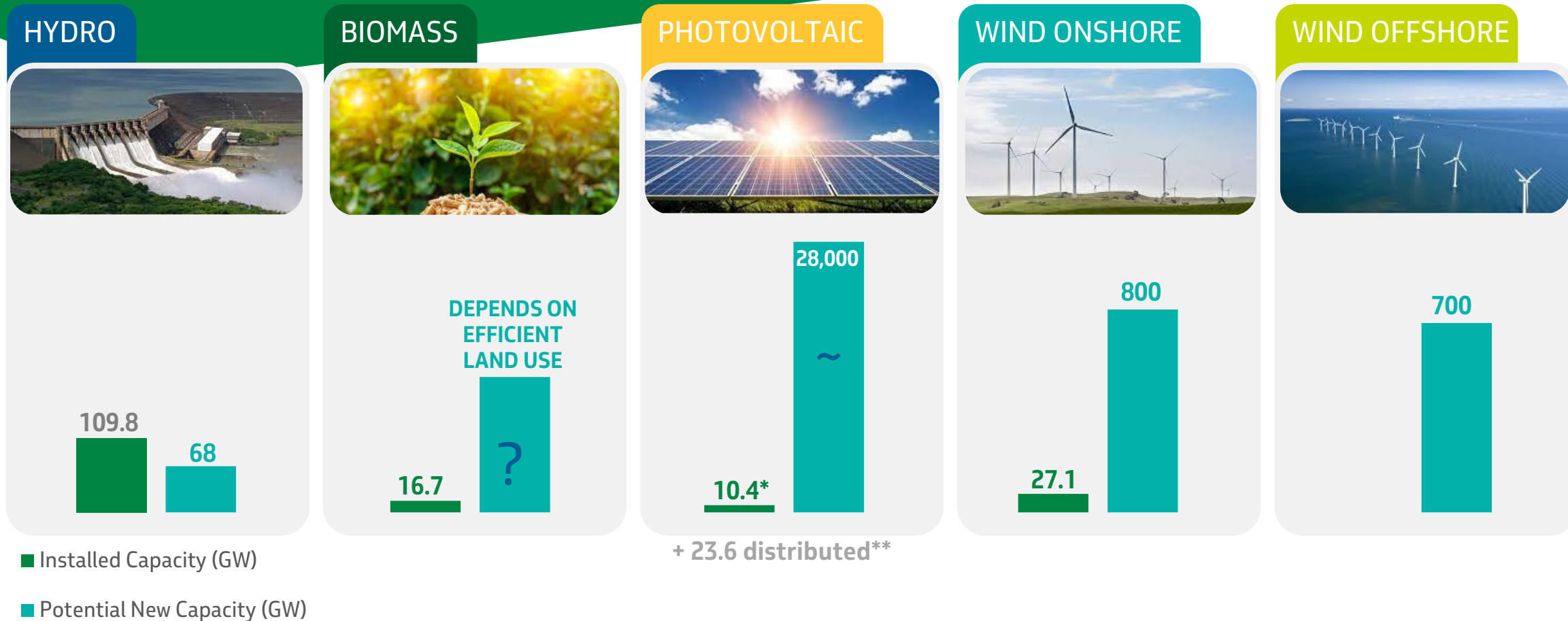


Brazil in a favorable position to face the Energy Transition...



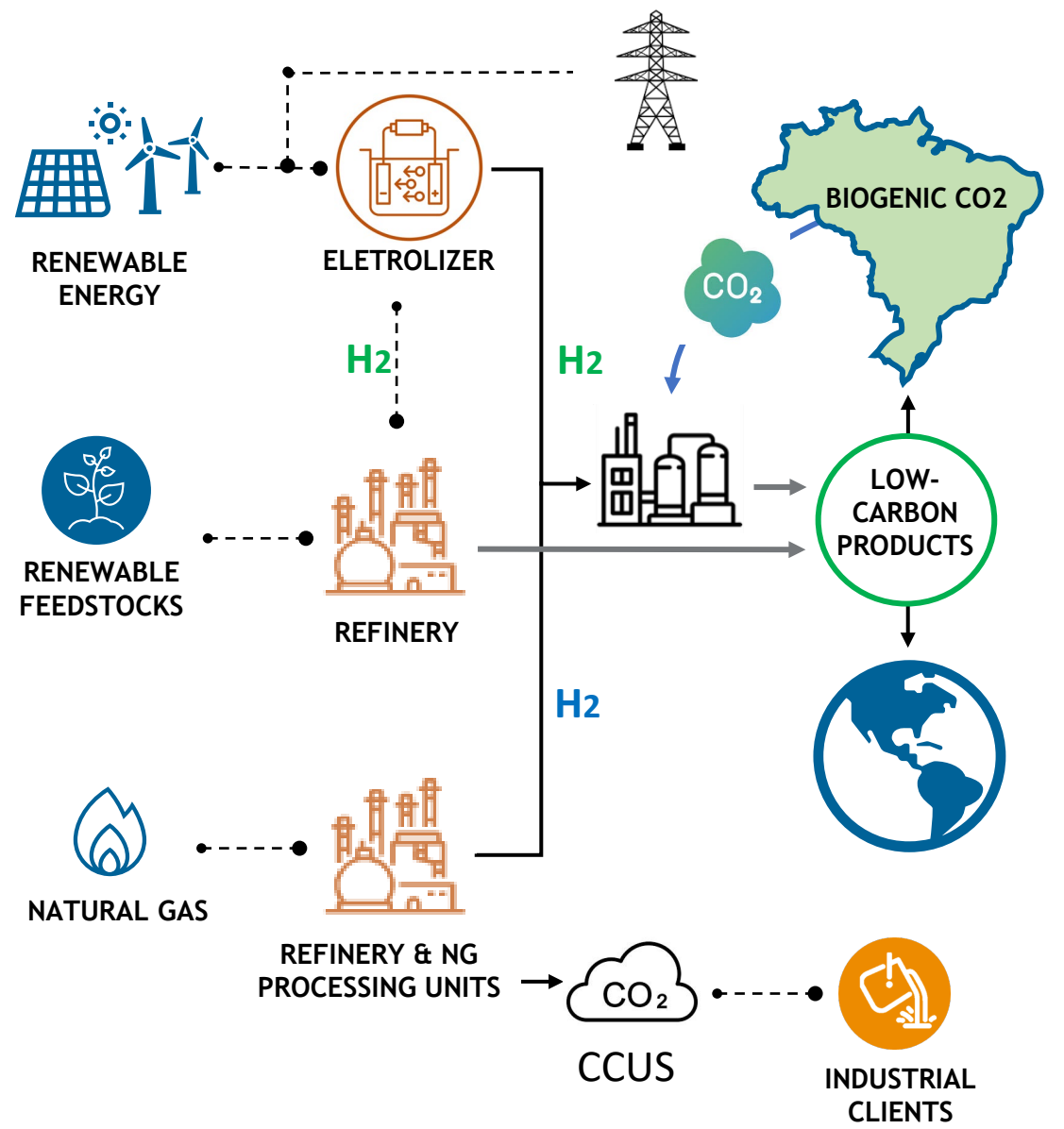
In the first three quarters of 2023, Brazil generated 91% of its electricity from hydro, solar, wind and nuclear sources (Source: ONS)

... And also in a competitive position for future investments

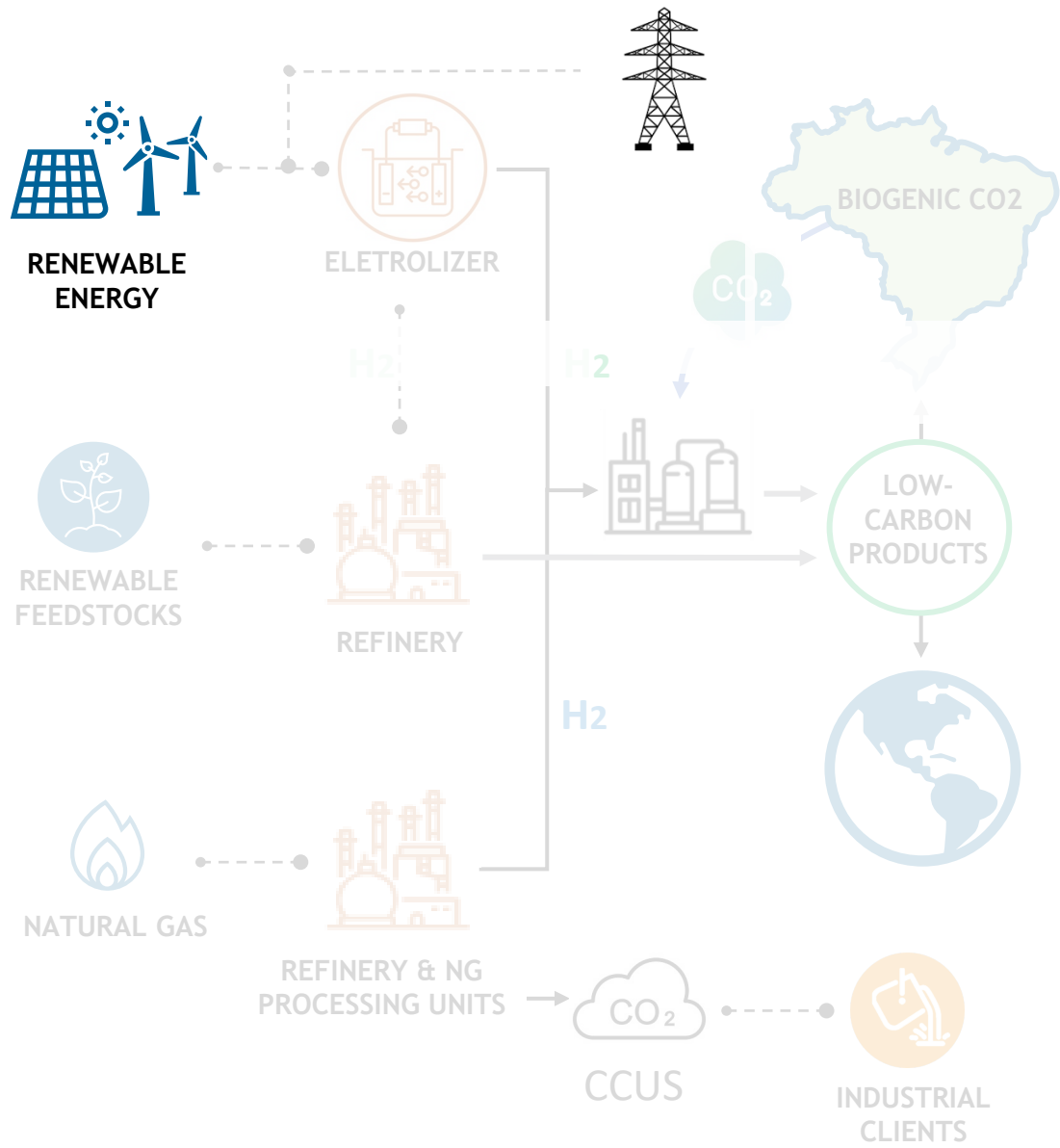


Source: EPE, ANEEL - *Centralized generation data - SCE (Superintendencia of Concessions, Permissions and Authorizations for Electric Energy Services) - reference date: 09/10/2023
** DISTRIBUTED ENERGY INFORMATION - ABSOLAR AND SOLAR PORTAL

Leveraging and integrating Petrobras' capabilities and assets with the competitiveness of Brazil in renewable energy, biofuels, hydrogen and CCUS

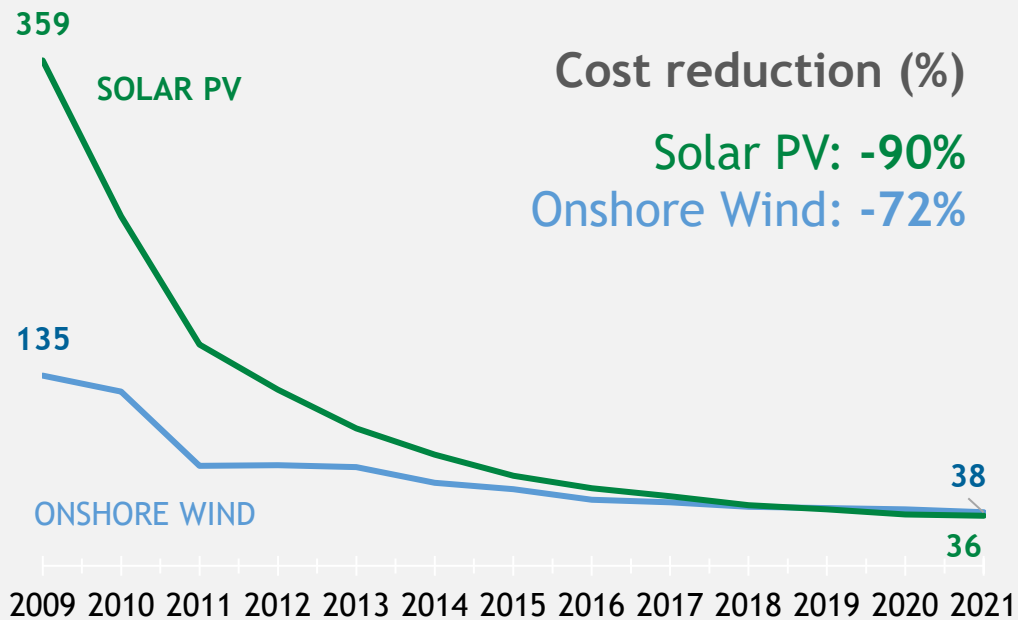


BRAZILIAN INTRINSIC ADVANTAGES	<ul style="list-style-type: none"> Competitive conditions in renewable energy Broad capacity of renewable feedstocks and biogenic CO₂
PETROBRAS TECHNICAL & FINANCIAL CAPABILITIES	<ul style="list-style-type: none"> Financial capacity to build world-scale projects Engineering talent to build mega projects Unparalleled experience in all aspects of Brazilian regulations
CONSOLIDATED ASSETS BASE	<ul style="list-style-type: none"> Largest Brazilian producer and user of Hydrogen Opportunities for existing assets to produce low-carbon hydrogen Logistics access to fuels market
MARKETS & COMERCIAL PORTFOLIO	<ul style="list-style-type: none"> Strong position in local and export markets Existing commercial portfolio in Brazil and abroad
RESEARCH & DEVELOPMENT	<ul style="list-style-type: none"> Largest R&D Center in LATAM Programs focused on renewables and low-carbon products Collaboration with academia and industry



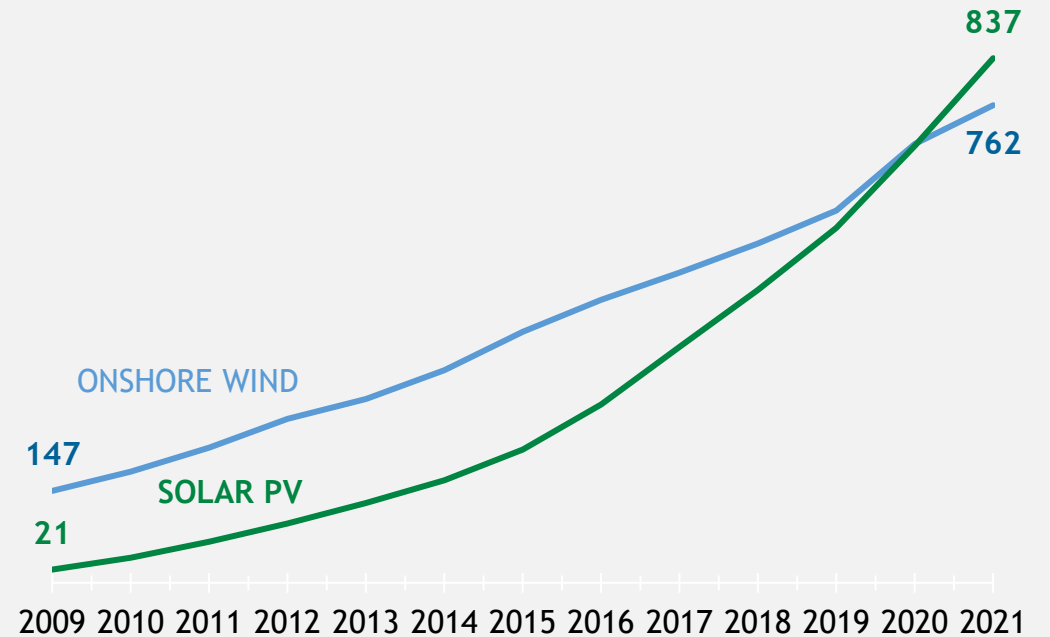
A relevant drop in the costs of several technologies over the time

LEVELED COST OF ENERGY* (US\$/MWh)

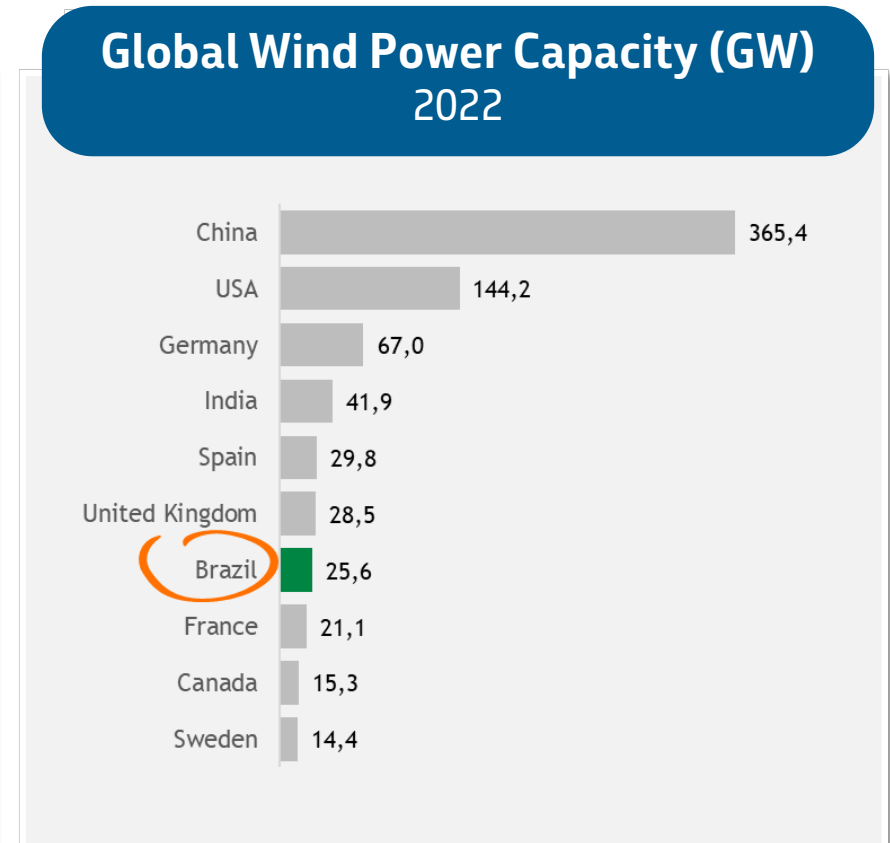
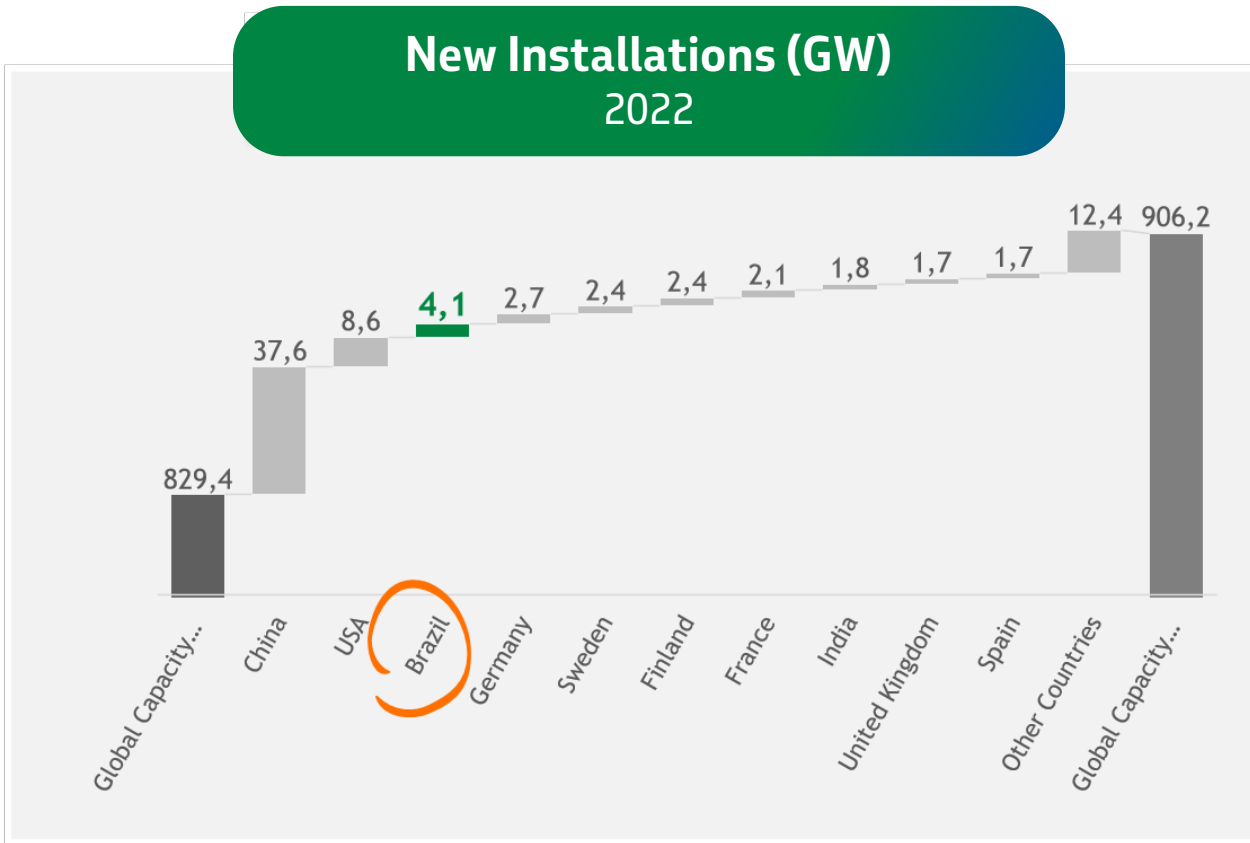


* Net present value of the unit cost of energy over the useful life of a generation asset

GLOBAL SOLAR AND WIND GENERATION CAPACITY(GW)

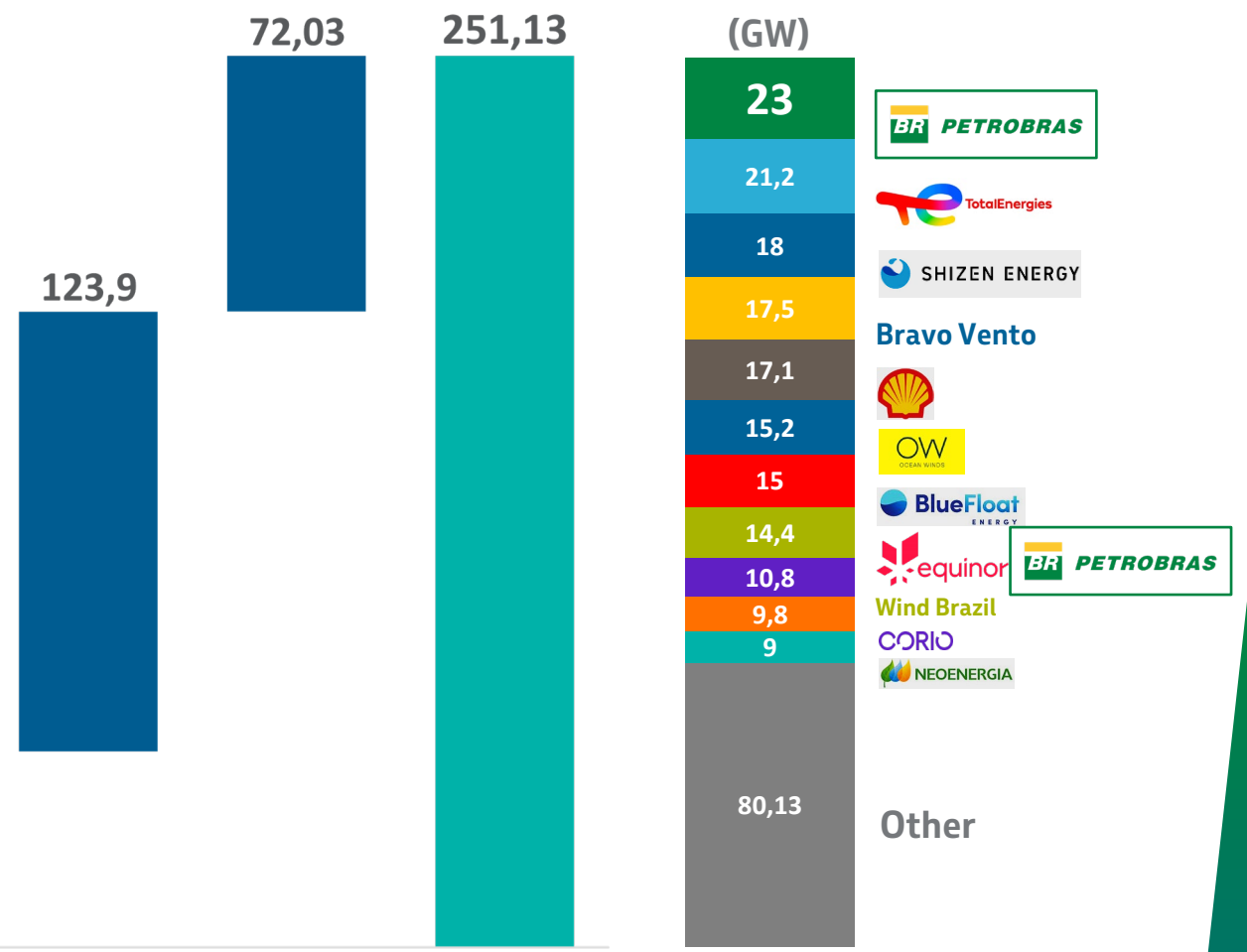
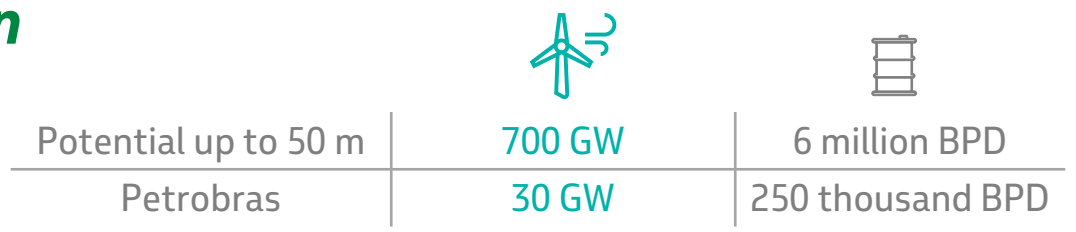
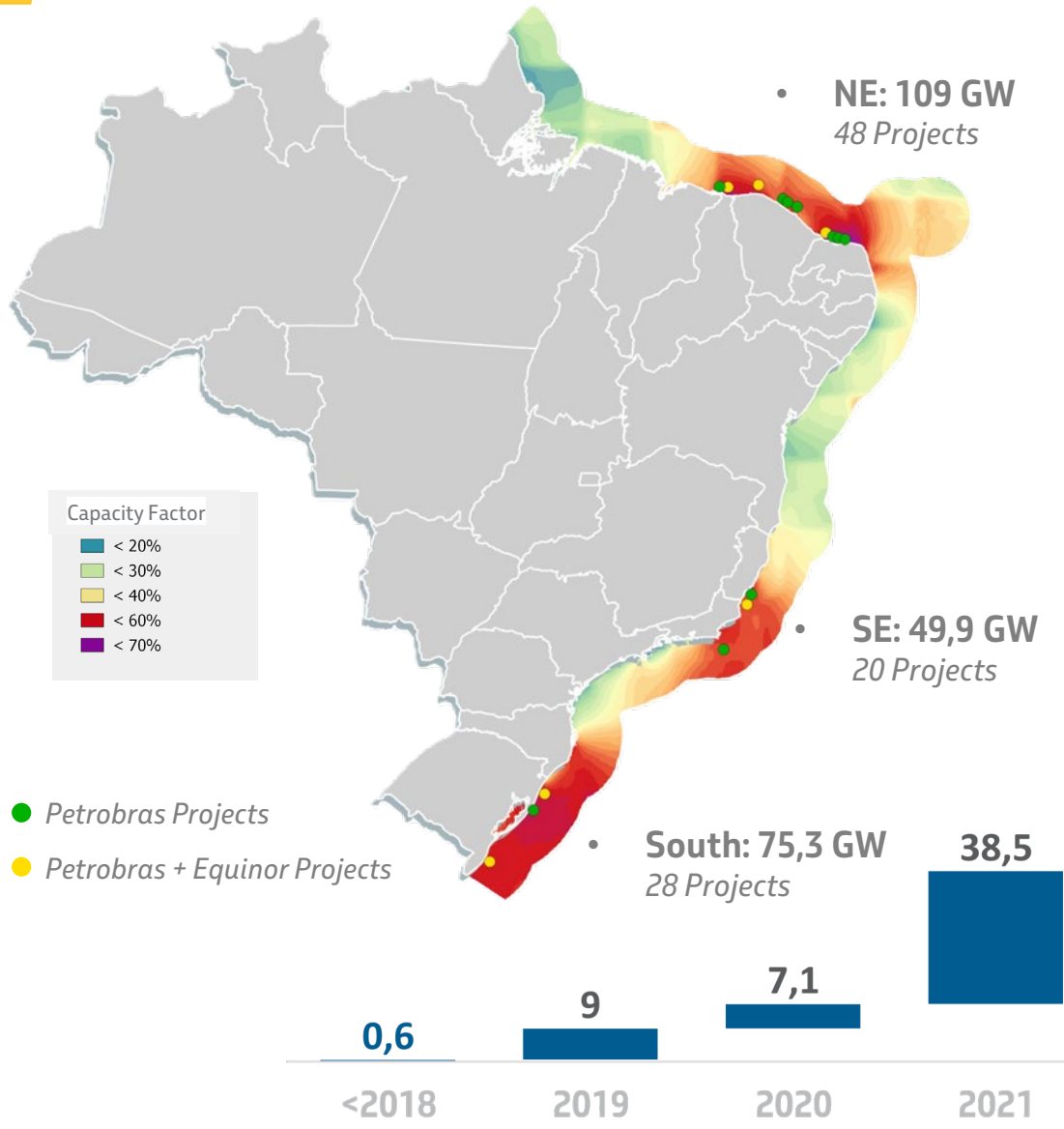


Onshore wind installed capacity has grown significantly and Brazil has been growing in the Global Ranking...



Fonte: GWEC - Global Wind Report 2023

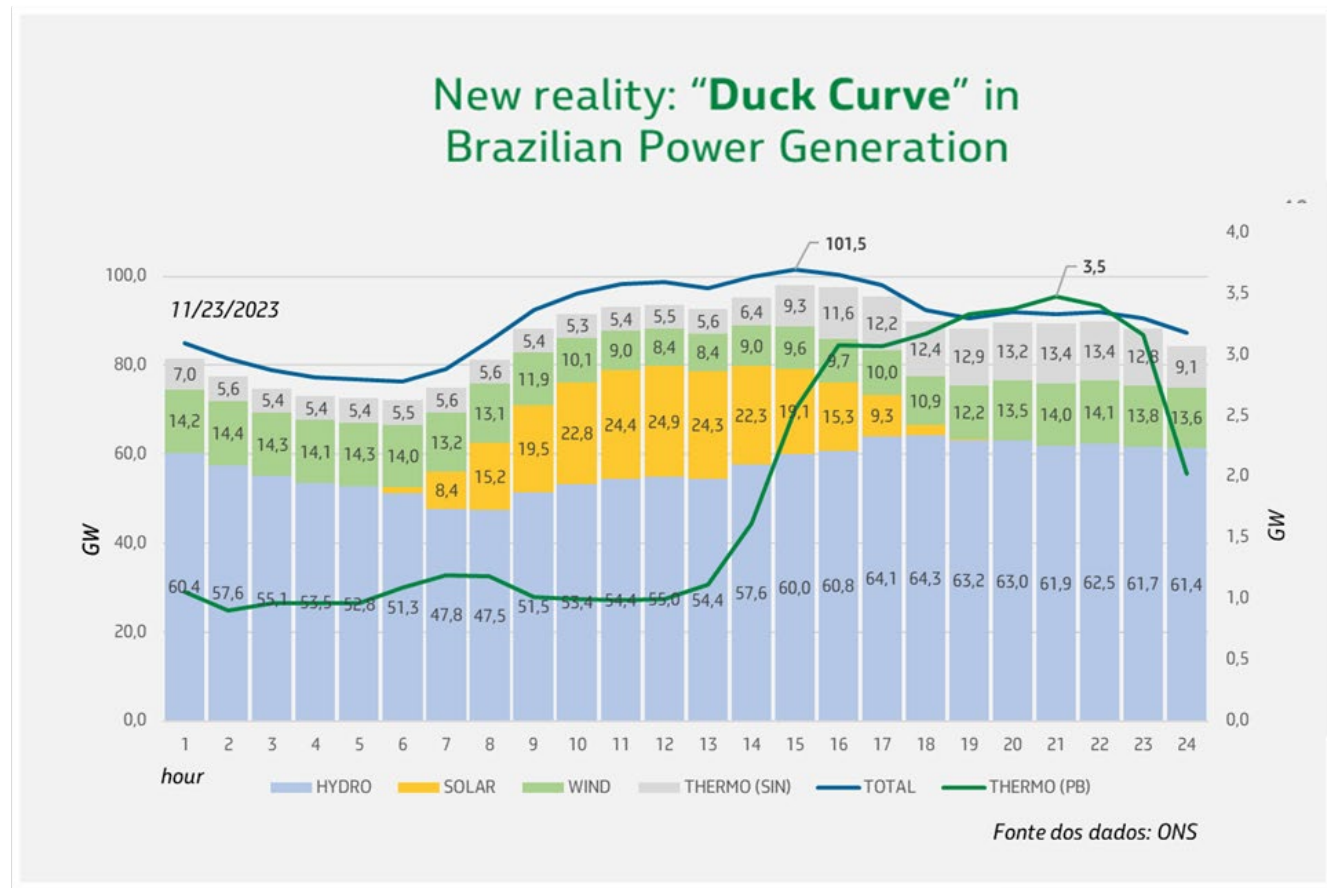
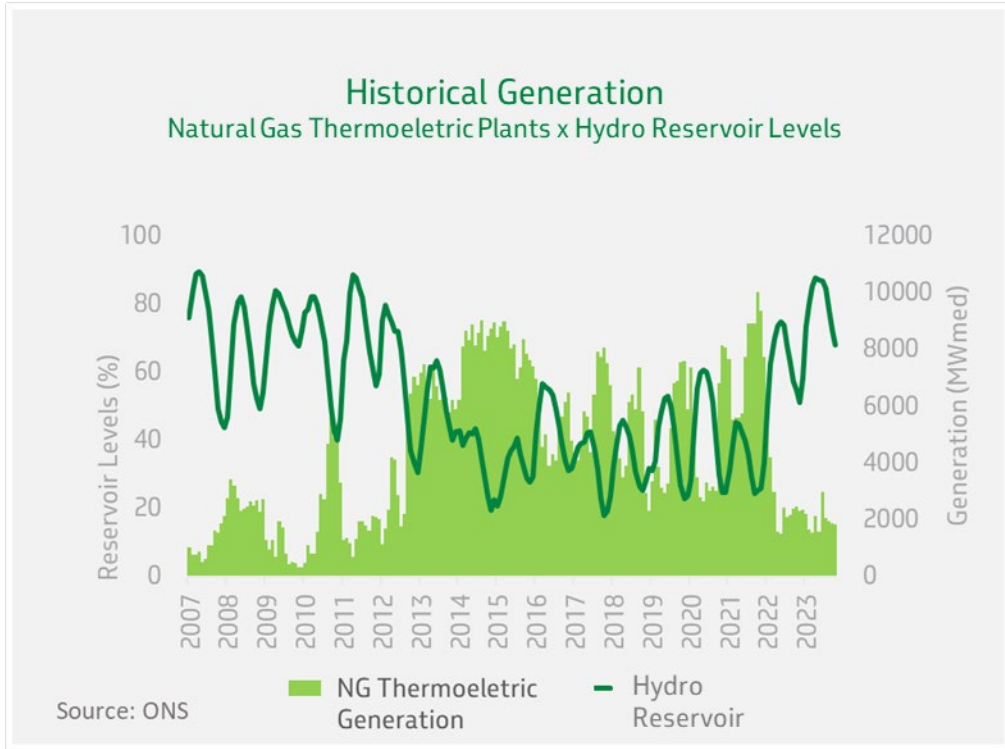
Brazil's Potential for Offshore Wind Generation



Source: Requests to IBAMA to start the environmental process (2024)*

*Requests to IBAMA does not guarantee any right on the offshore areas

Natural gas efficient power plants support more renewables in the mix



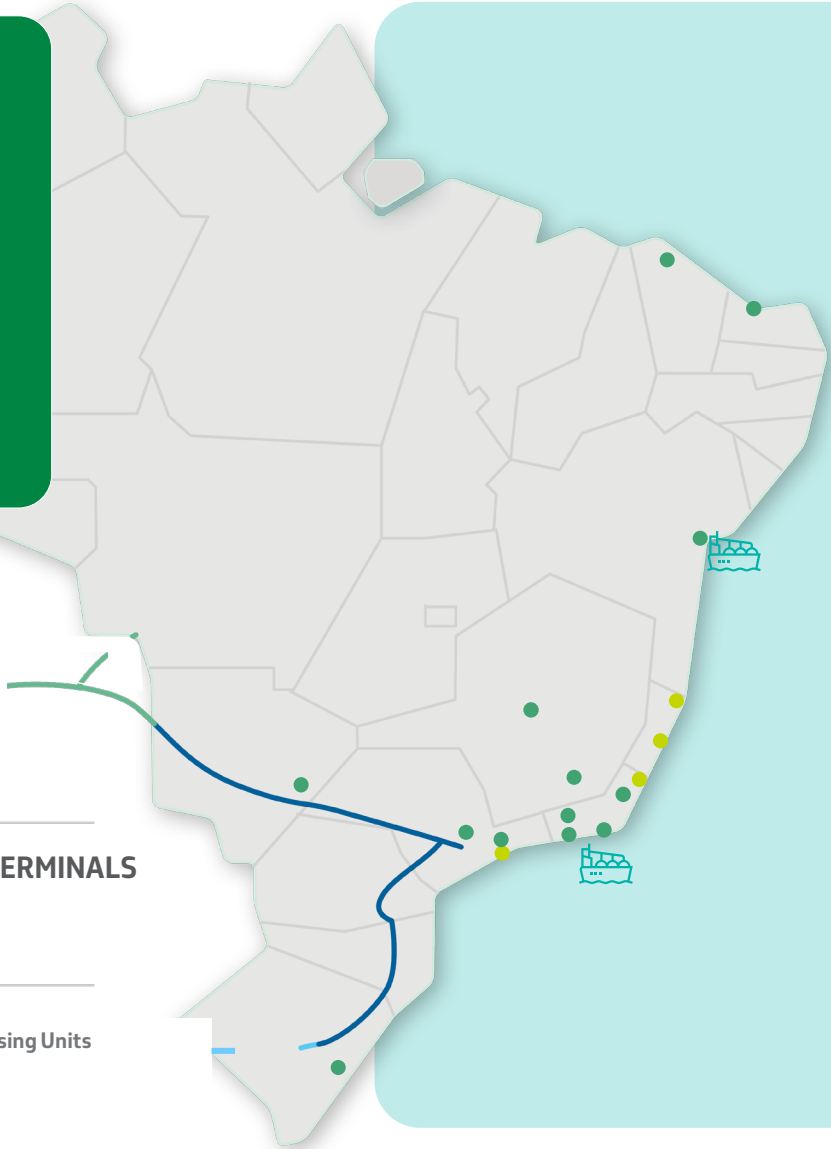
Petrobras Power Plants Performance

- 1º quartile Solomon in cost and availability
- 98,2% reliability
- 100% availability - End of 2023

Gas & Power portfolio ensures reliability and safety in the insertion of renewable sources



POWER PLANTS
13 units
Capacity 5.3 GW



IMPORT AND REGASIFICATION
2 Regasification Terminals
Capacity 50 million m³/day



NATURAL GAS PROCESSING UNITS
4 NG Treatment Units
Capacity 66 million m³/day



BOLIVIA IMPORTS
Bolivia – Brasil Gas Pipeline

NATURAL GAS TRANSPORTATION PIPELINE

- TSB
- TBG
- GTB

LNG REGASIFICATION TERMINALS

- LNG Bahia
- LNG Baía de Guanabara

- G&P Segment NG Processing Units
- Thermoelectric plants

Infrastructure and Petrobras E&P natural gas portfolio expansion

Competitiveness and resilience

Main projects and planned dates

2024

Route 3 Project

Gas Pipeline

Capacity:
18 million m³/d

Natural Gas
Processing Unit
Capacity
21 million m³/d

2028

BMC-33 Project*

Gas Pipeline

Capacity:
16 million m³/d

2028+

SEAP*

Gas Pipeline

Capacity:
18 million m³/d



E&P Exploration of New Frontiers

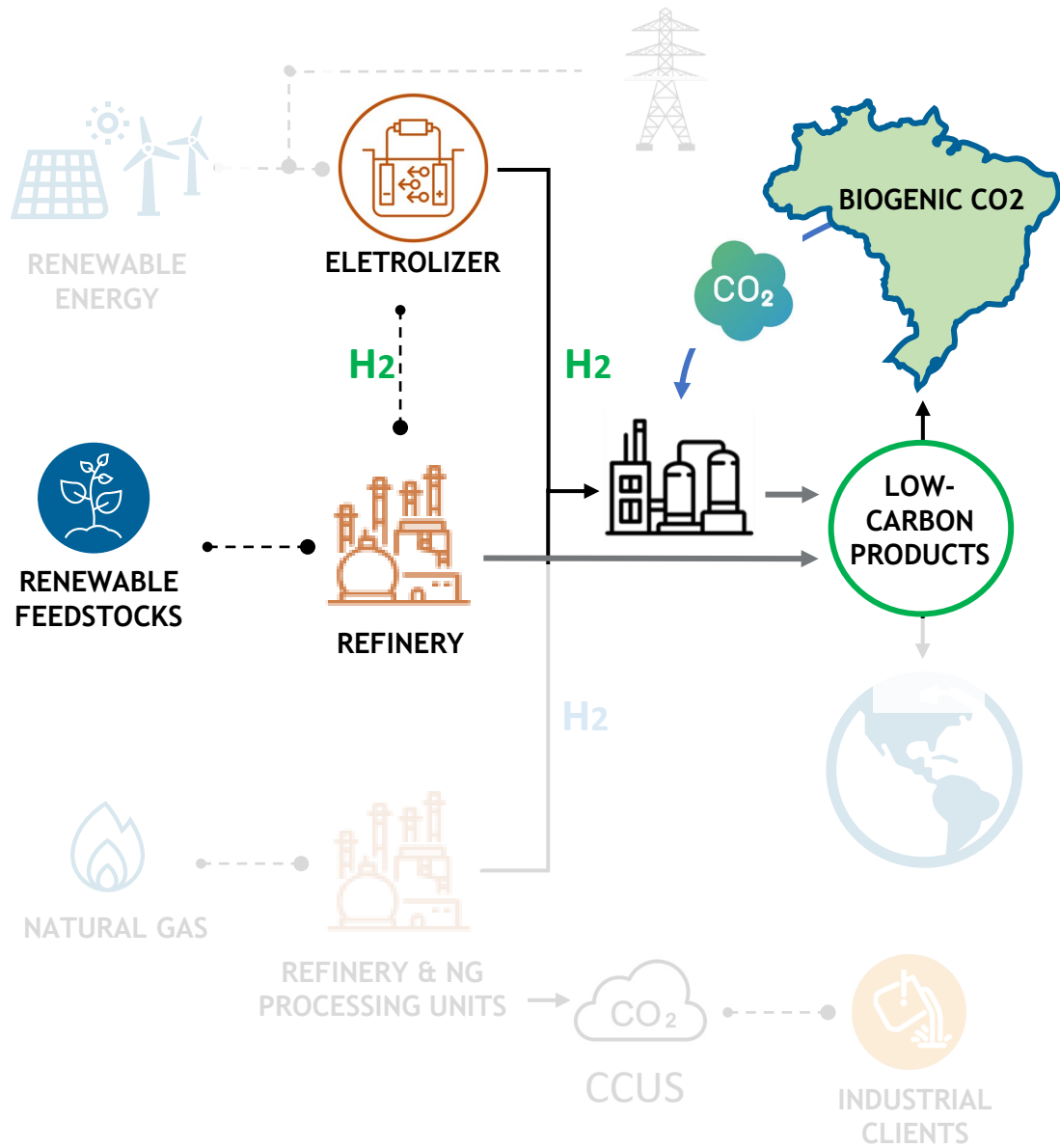
- *Southeastern Basins*
- *Equatorial Margin*
- *Other countries*

Southern Countries opportunities

LNG

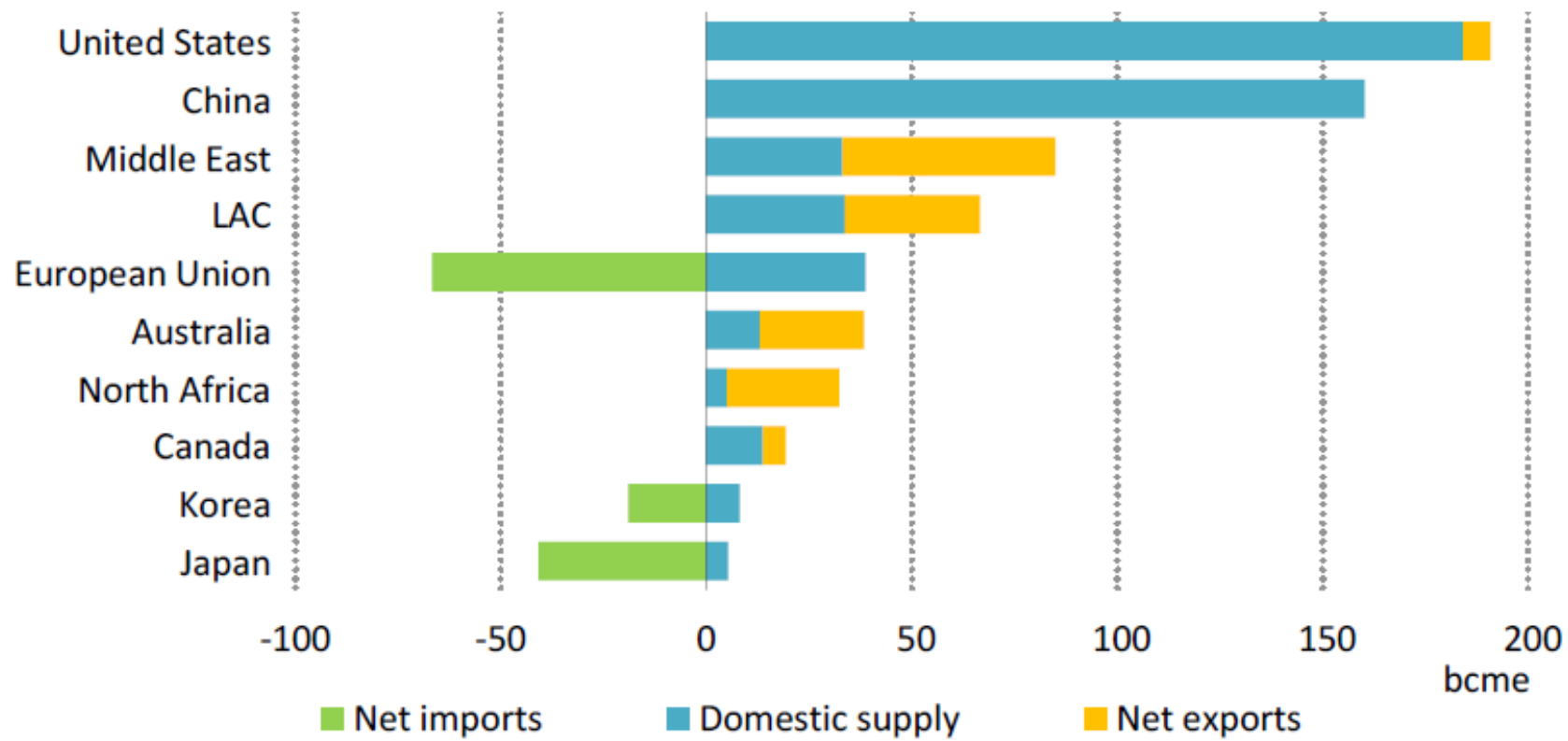
Biomethane

** Offshore Gas Processing Unit*



Brazil could play an important role in the global supply of H₂

Clean hydrogen demand and production in the APS scenario, 2050



IEA. CC BY 4.0.

Source: IEA, 2023

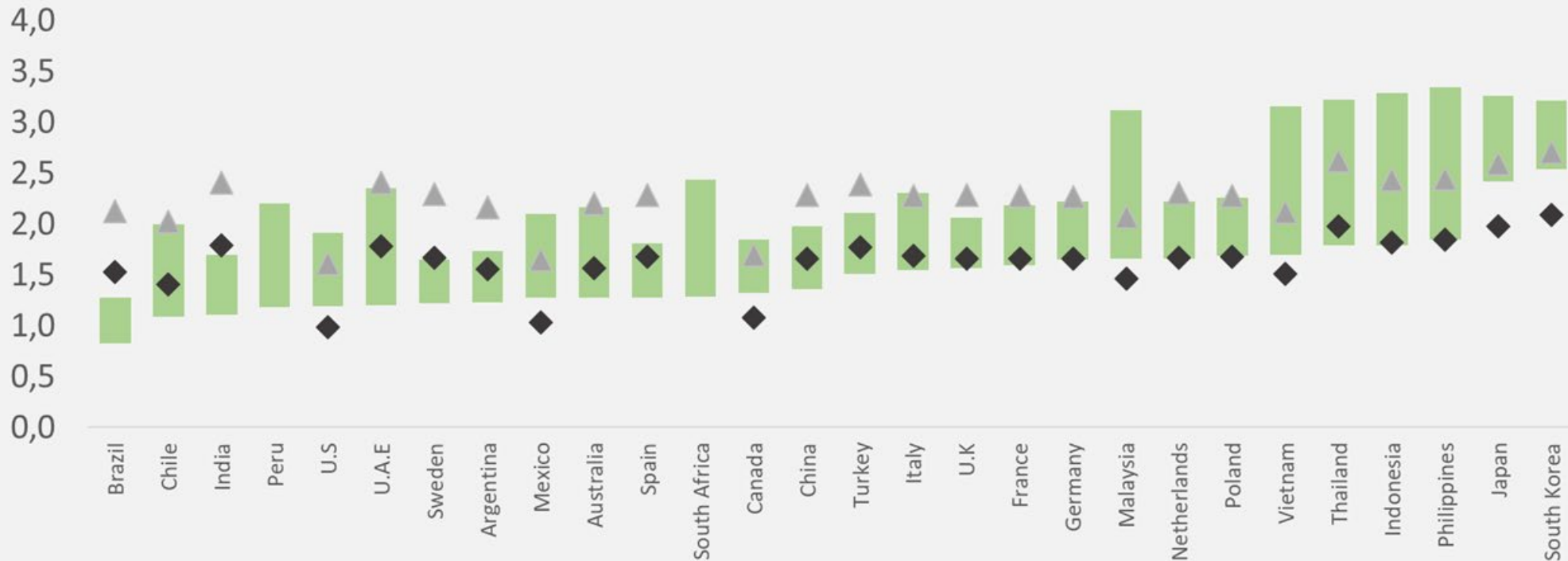
Notes: bcme = billion cubic metres of natural gas equivalent

According to external evaluations, Brazil is potentially the most competitive country in H₂

HYDROGEN PRODUCTION COSTS COMPARISON - 2030 SELECTED COUNTRIES

Values in \$/kg

"Green" renewable hydrogen
"Blue" hydrogen from natural gas with CCS
"Gray" hydrogen from natural gas without CCS



Source: BNEF

Note: Assumes our optimistic electrolyzer cost scenario. Renewable H₂ cost range reflects a diversity of electrolyzer types, from Chinese alkaline (low) to PEM(high). Assumes equal CCS costs in all countries.

Transition to low carbon products - legal & regulatory drivers



Decarbonization targets and mandates affect or will affect products that correspond to approximately 60% of the Company's revenues (diesel, gasoline, jet fuel, and bunker).

REGULATED SECTOR



Biofuels for the airline industry

Bio Jet Fuel



ICAO - UN body specialized in defining standards for international aviation

Brazil

- "Future Fuel" bill: 1 to 10% decarbonization 2027-2037

International

- Zero net growth from baseline emissions in 2019

REGULATED SECTOR



Biofuels for the road sector

Renewable Diesel and Biodiesel



Commitments to decarbonize countries through regional initiatives

Brazil

- "Future Fuel" bill: Renewable Diesel Mandate (3%) above biodiesel mandate

REGULATED SECTOR



Biofuels for the maritime industry

Biobunker and maritime diesel



IMO - UN body specialized in defining standards for international navigation

Brazil

- Still no mandate forecast

International

- 20-30% decarbonization in 2030
- 70-80% decarbonization in 2040
- Net zero in 2050

NON-REGULATED SECTOR



Bioproducts

Green Propylene, Green Ethylene, Green HLR, Green NAPHTHA, Green BTX

Biorefining – investments in dedicated units and integrated with refining facilities

ROAD TRANSPORTATION

CO-PROCESSING

Integrated to current Downstream operations to produce oil products with renewable content

Products in commercial phase

SHIPPING TRANSPORTATION

BIOBUNKER

Marine fuel with renewable content aligned with IMO decarbonization strategy

Commercial tests with 10% and 24% renewable content performed in 2023.

AIR TRANSPORTATION

RPBC AND GASLUB DEDICATED PLANTS*

- Aligned with CORSIA's demands
- Flexibility of raw materials (tallow and vegetable oil)
- Segregated production of 100% renewable derivatives
- SAF's decarbonization potential will depend on the raw materials

GREEN PETROCHEMICALS

PROCESSING

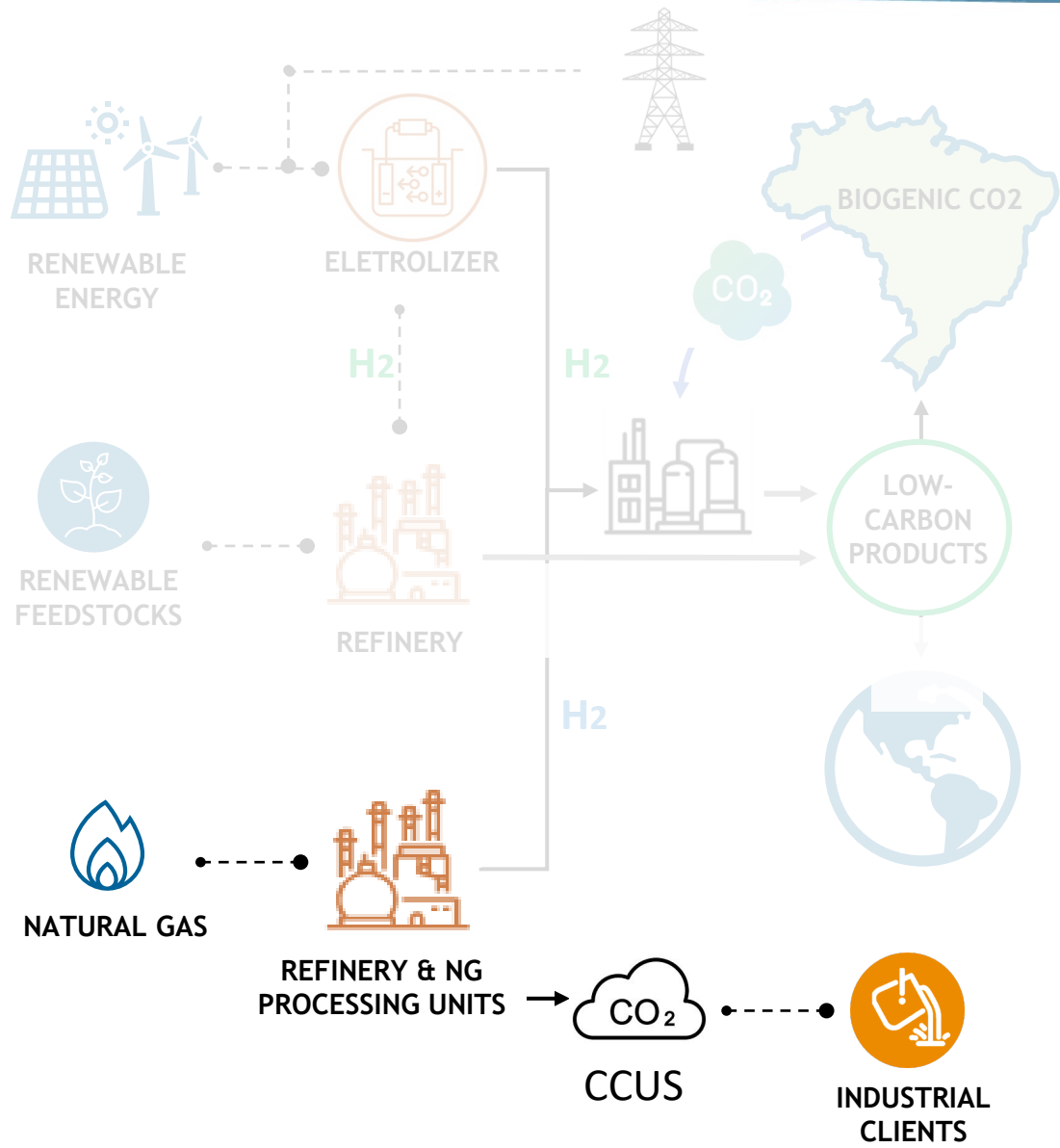
Vegetable oil in FCC at RPR for bioaromatics

CO-PROCESSING

Bio-Oil (RPR) or Ethanol (RECAP) in FCC for green HLR, Propene and Ethylene with renewable content

PARTNERSHIPS – Integration to the supply chain of more sustainable raw materials

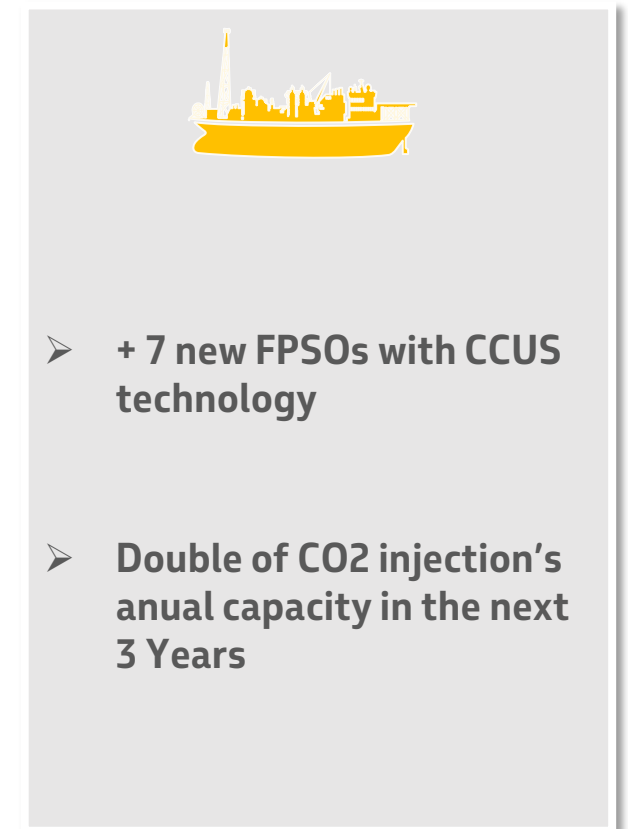
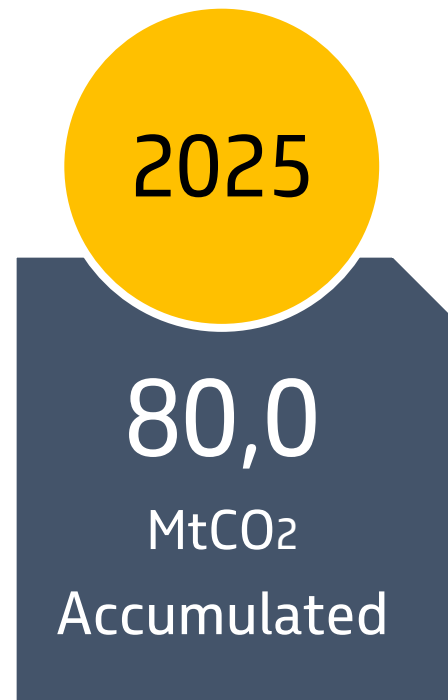
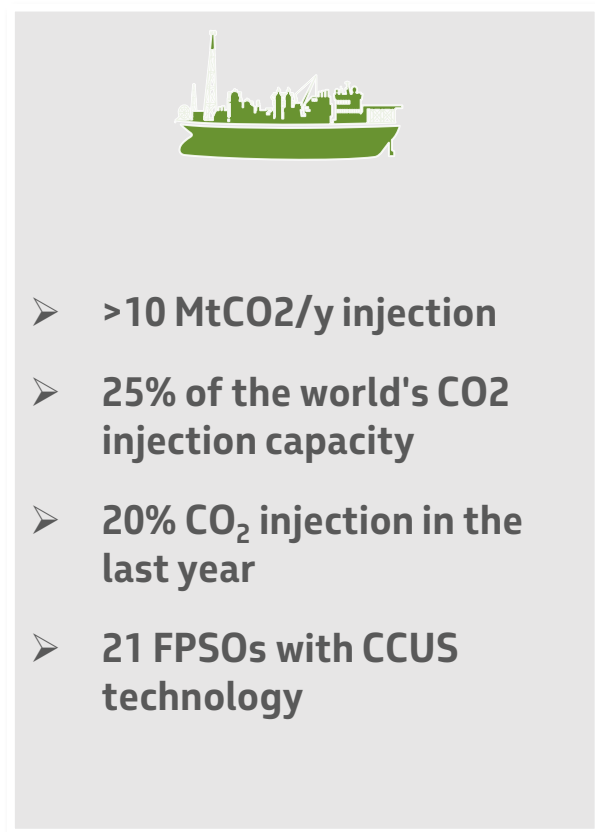
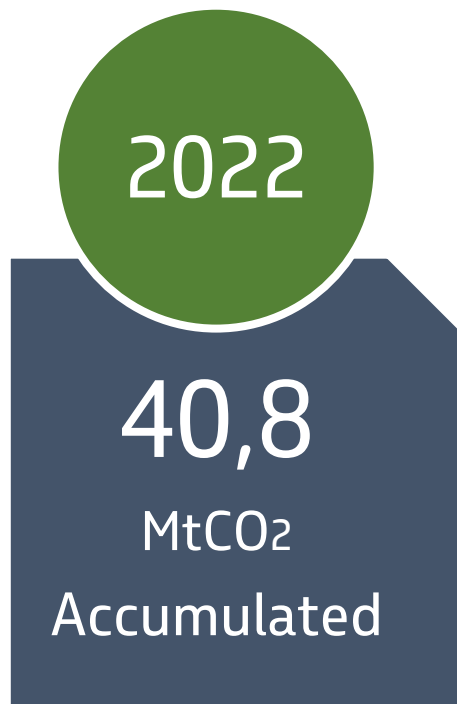
** Units have flexibility for renewable diesel production*



Pioneer and largest CCUS project in the world

Reducing emissions and increasing the reservoir's recovery

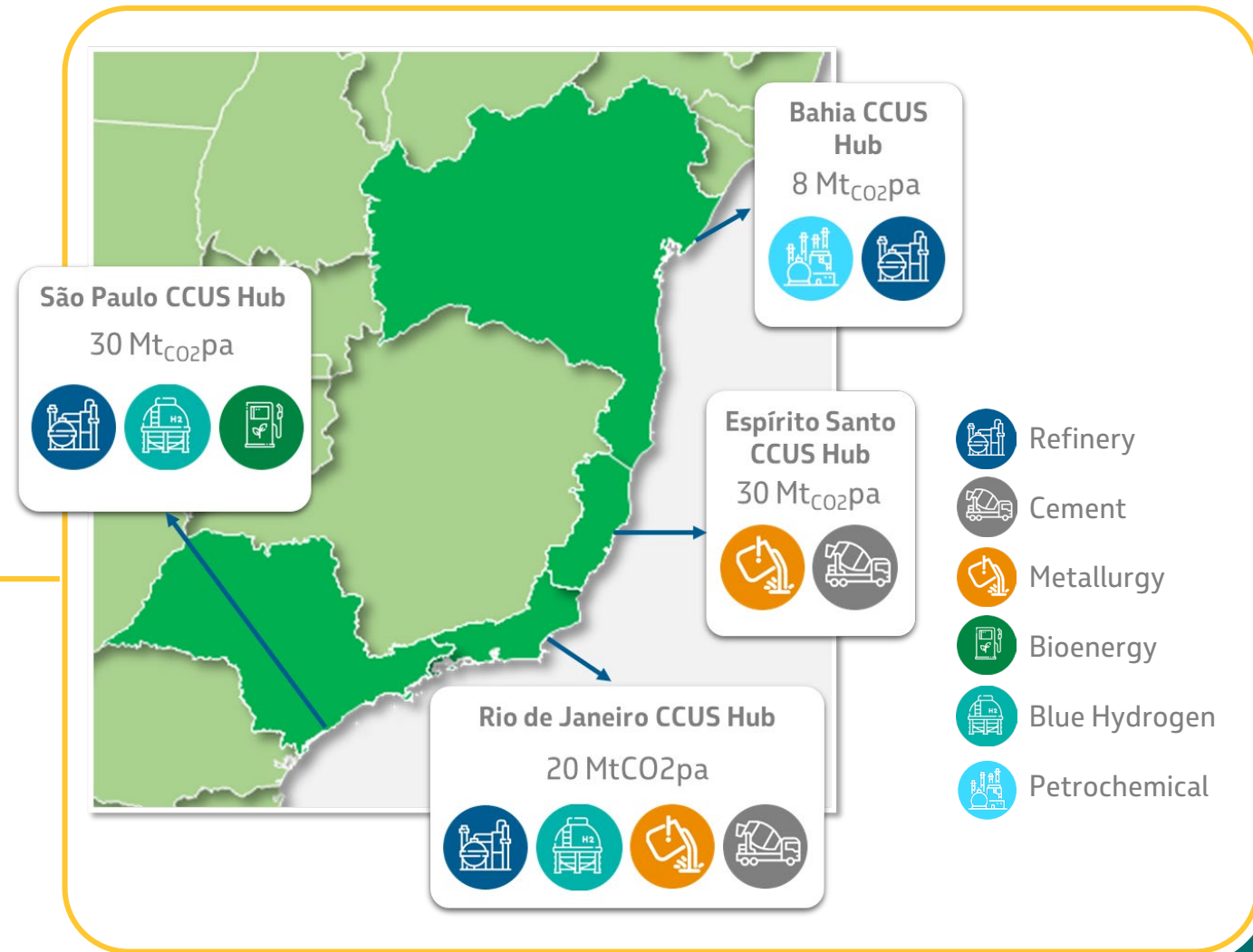
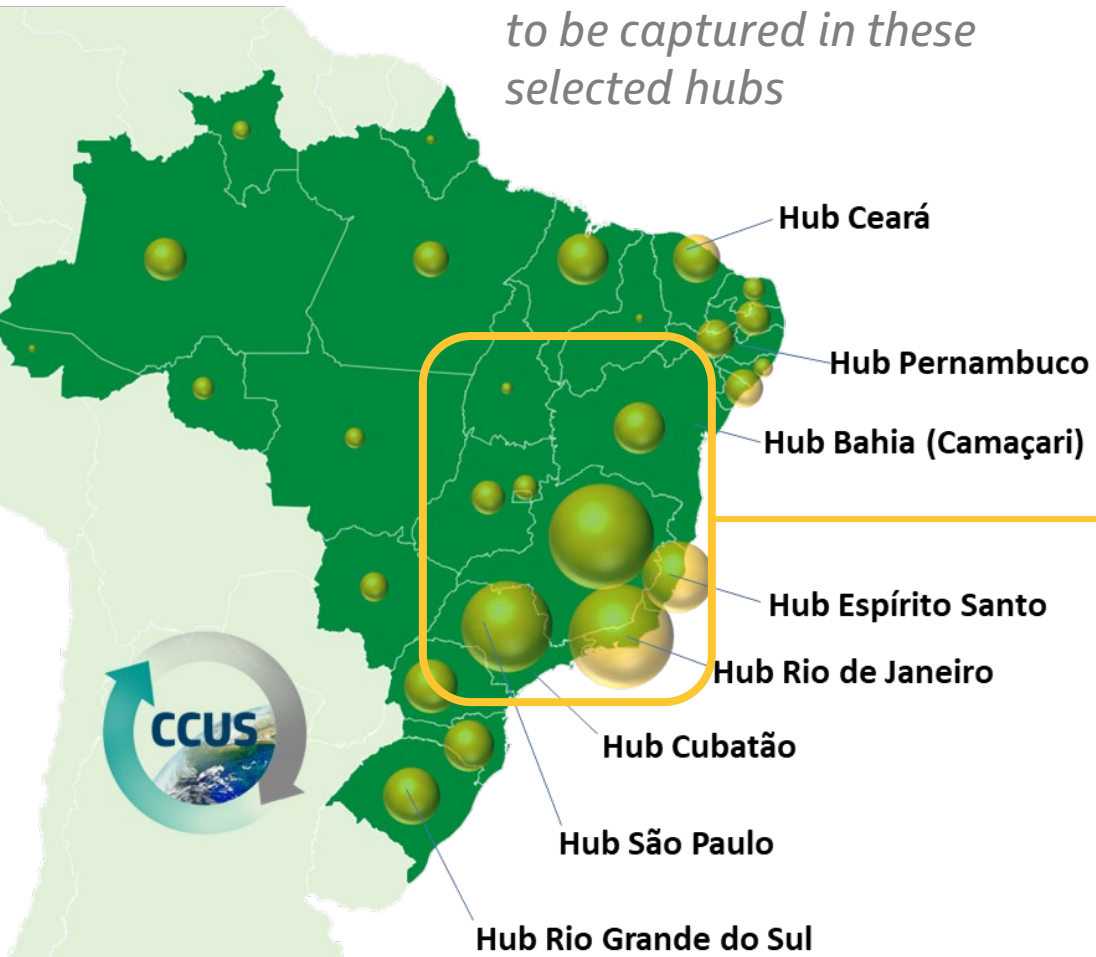
Currently the largest CO₂ injection project in the world:
First CCUS project in ultra-deep waters (started in 2010)
Increasing recovery factor



CCUS HUBS UNDER STUDY

Each of our CCUS hubs under study potentially have the capacity to store the CO₂ industrial emissions of their respective area of influence for more than 50 years

Capacity of 266 MtCO₂ /year to be captured in these selected hubs





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