Repsol Sinopec Brasil

O Papel Da Inovação Na Transição Energética Offshore

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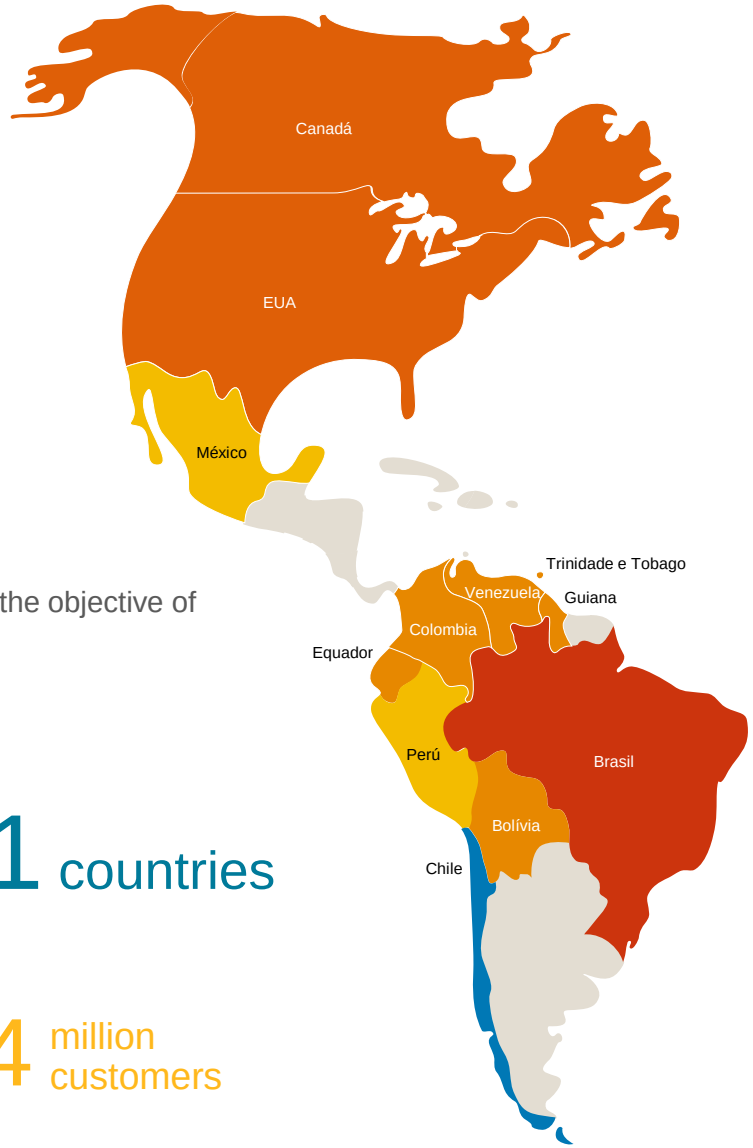
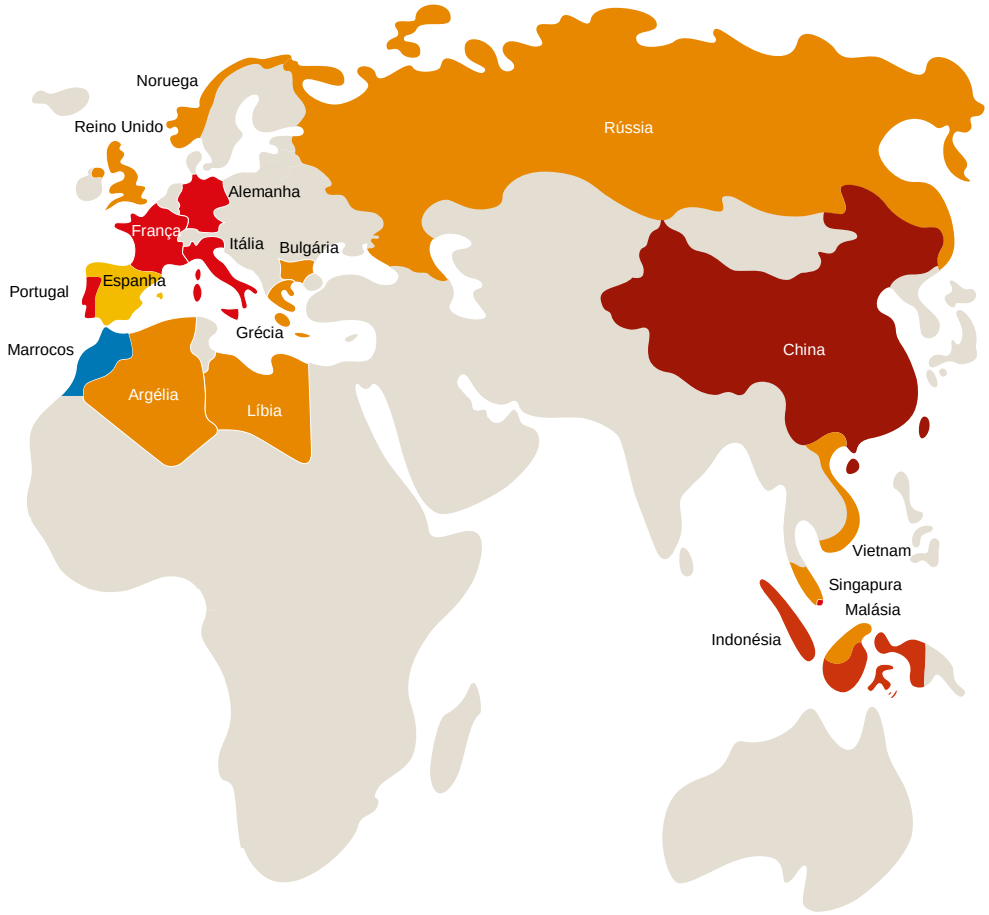
AGENDA

- Introduction
- R&D in Brazil
- Decarbonization Project

Repsol in the world





Commited to Net Zero Emissions

1st company in the industry to declare the objective of **zero net emissions by 2050**

+24,000 employees

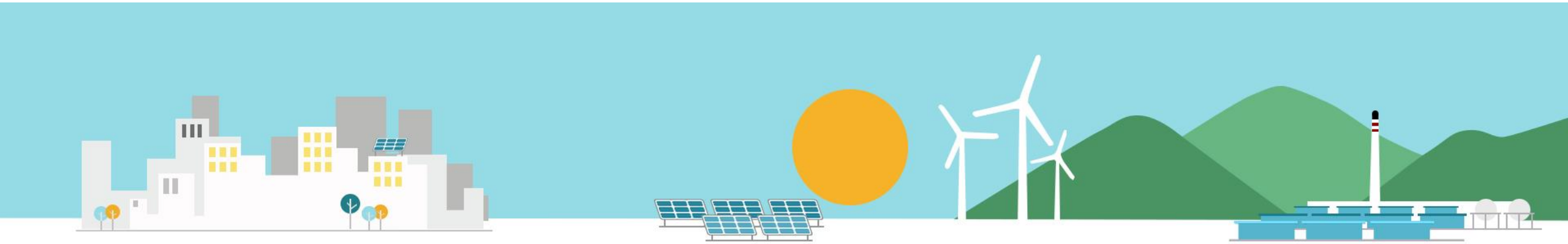
31 countries

Distribute products in 97 countries

24 million customers

All | Upstream | Upstream + Industrial | Upstream + Commercial + Renewables | Industrial | Commercial + Renewables

Repsol



14 short-term **Upstream projects** with attractive returns

average daily production
650.000 barrels

Natural Gas represents
66% production
68% reserves

6 **renewable projects**
Spain, Chile and USA

+1,300
electric charging points

4,6 mil service stations
Spain, Portugal, Peru and Mexico

7 **industrial complexes**
Spain, Portugal and Peru

We are Repsol Sinopec Brasil

An energy company focused on E&P

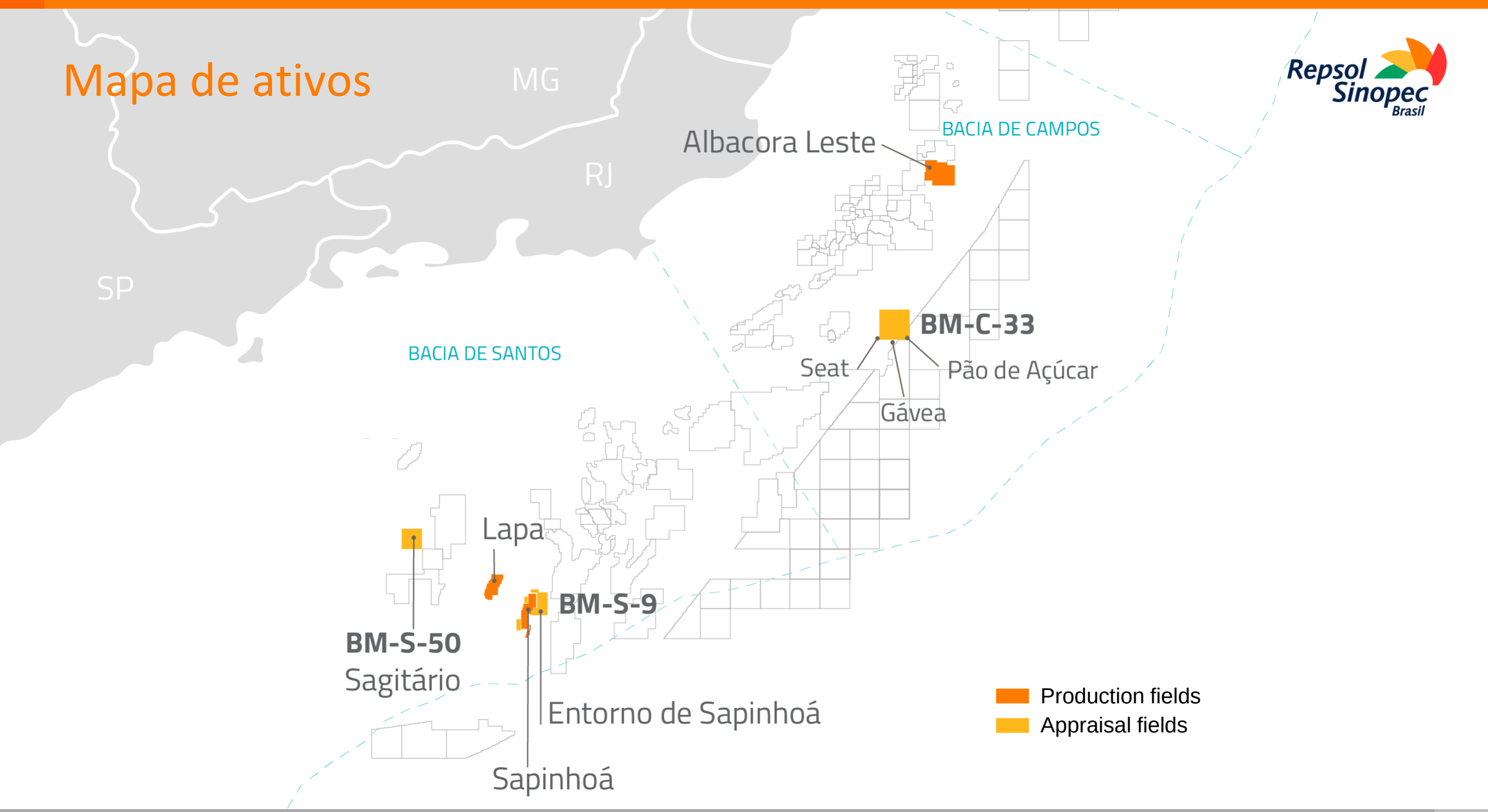
Pioneers in opening the E&P market in Brazil in 1997

First IOC to perform a Ship-to-Ship operation in Brazil in 2016

4th largest oil and natural gas producer in the country

Part of Repsol Group a company present throughout the value chain

Mapa de ativos



About Repsol Sinopec Brasil

25 years in **Brazil**

4th O&G producer
in the country

Sapinhoá
Albacora Leste
Lapa

BM-C-33

Project capable of being one of the main sources of gas supply in the country

73,7 Kboe/d

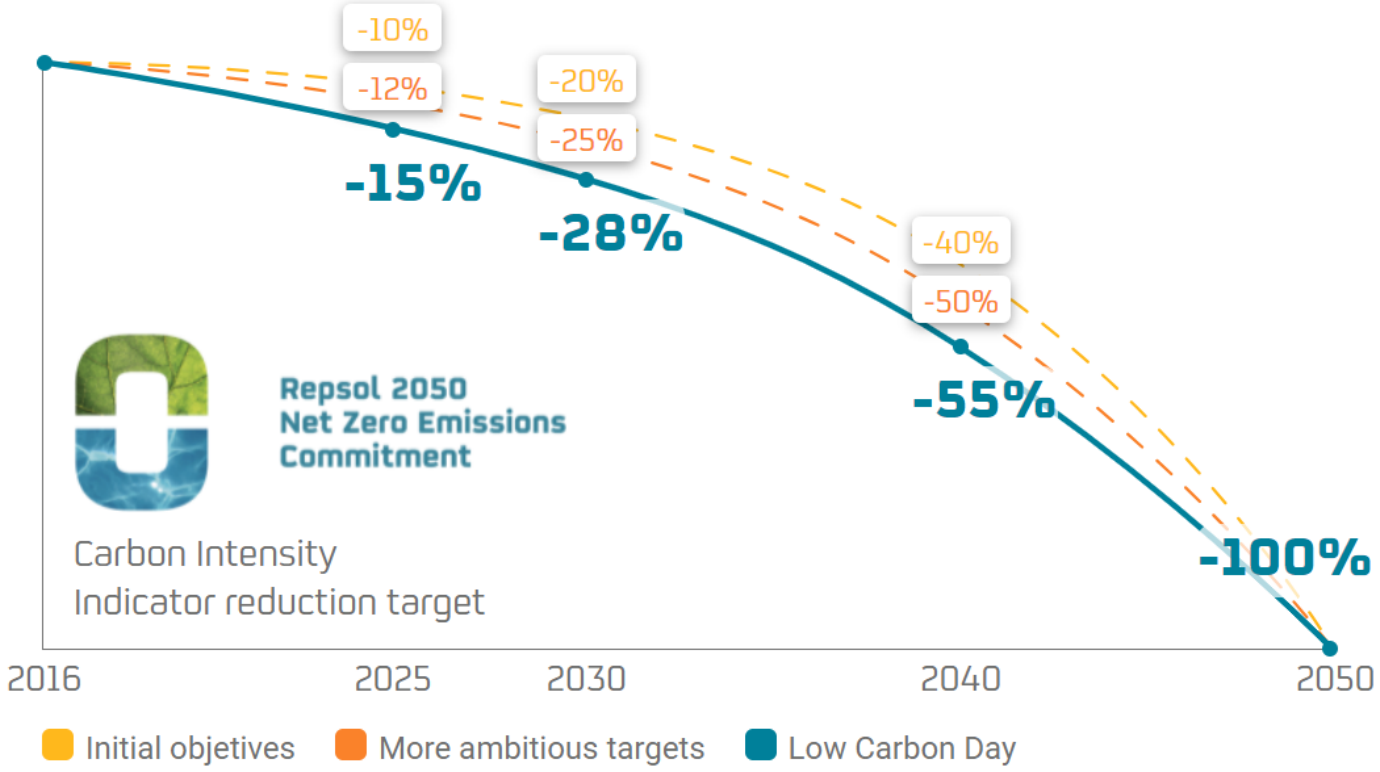
Daily production average
2021

Decarbonization

“We are convinced that we must set more ambitious objectives to fight climate change”

Josu Jon Imaz – Repsol CEO

Repsol path towards decarbonization



R&D in Brazil

Law nº 9.478, de 06/08/1997, established, among others, the responsibility for the National Petroleum Agency (ANP), to stimulate the research activities and the adoption of new technologies by the O&G sector, to develop the local content.

How much do we have?

- 1% of gross production revenue.
- +/- 80 MR$ to be invested in 2021
- Depends on production, brent and exchange rate R$/USD.

Where do we invest?

- Projects with relatively high intensity of CAPEX/OPEX, executed with Tech companies, universities and research institutes based in Brazil.
- Access to a wide O&G technology ecosystem and market.
- Collaboration with other operators: reduction of risk/investment.

How do we invest?

- According to ANP Regulation.
- Strategic interests of RSB, and its shareholders (confidentiality protection).
- Network innovation model, that promotes a close integration between the operational areas, executors, agencies and other operators.
- Commercial agreements with international services companies to accelerate deployment.

R&D in Brazil

Storage Tank test

SIMEX

Shell

PETROBRAS

Center of High Performance Computing

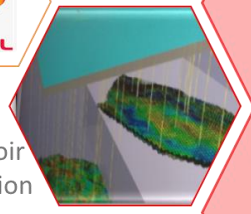
SENAI CIMATEC SISTEMA FIEB

Flooding with CT-Scanner

TOTAL

Laboratory of Miscible Recovery Methods (LMMR)

PETROBRAS



Reservoir Simulation

Research in Reservoir Simulation and Mgmt. (UNISIM)

Center of Petroleum Studies (CEPETRO)

UNICAMP

equinor

Artificial Lift & Flow Assurance Research (ALFA)

queiroz galvão

Electromagnetic flow loop

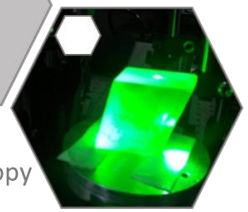
Repsol Sinopec Brasil

anp

Additive Manufacturing and Tooling Group (NUFER)

UTFPR

São Carlos Institute of Physics (IFSC)



SFG spectroscopy

Autonomous Inspection

Inspection Technology Research Center (CPTI)

Fluency Cell

Microhydrodynamicsand Flow in Porous Media (LMMP)

PUC RIO

HTHP Coreflooding Cell

Robotic Laboratory

Well Robotic Intervention

UFRJ

Alberto Luiz Coimbra Institute (COPPE)

equinor

HALLIBURTON

eneva

Well test facility

Geowellex

PETROBRAS

Materials Tech. in Sustainable Construction (LABEST)

Self Heating Cement

Control Autom. Applic. and Develop. Eng (LEAD)

Shell

Autonomous Vessel

Stewart Platform

Problem statement

- Operating offshore is **costly, expensive and dangerous**
- Logistics for inspecting and monitoring subsea assets is **labor intensive**
- **RSB is partner in 3 fields with 4 FPSOs in** operation and 1 new FPSO will be in operation in BMC-33
- BMC-33 has also pipeline to shore to be inspected
- **Offshore renewables** must need inspection on subsea cables and structure
- Unmanned surveillance on **decommissioning fields**

Monitoring Offshore Operation

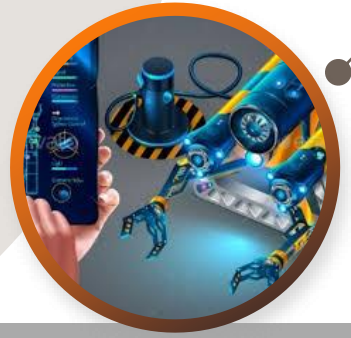
Offshore production is going for inhospitable regions e.g. longer, colder and deeper. Operations to monitor and survey those fields is becoming complex, expensive and risky. Also, survey and monitor the decommissioned fields will become an issue.

Autonomous Subsea Inspection

The operations to monitor and inspect subsea equipment and production systems is costly. The goal is to develop autonomous subsea vehicles and vessel to be resident in the field without the necessity of additional infrastructures and reduce the necessity of support vessels with ROVs.

USIS

Unmanned Subsea Inspection System



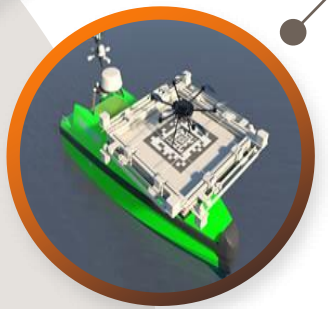
Cost Reduction

No needs of support vessels, reduce the CO_2 emissions, no additional infrastructure necessity, flexible and modular to attend large range of operations conditions.

R&D PARTNER: TIDEWISE

Autonomous Monitoring Improvements

Develop a new system, integrated with remote sensing units (such as satellites and radars) to increase the volume and quality of the collected data resulting in a brand new integrated system.



Beyond the Oil Spill Detection

Develop water sampling capture system and capability to measure offshore wind profile for windfarms.

ARIEL

Autonomous Robot for Identification of Emulsified Liquids and Beyond

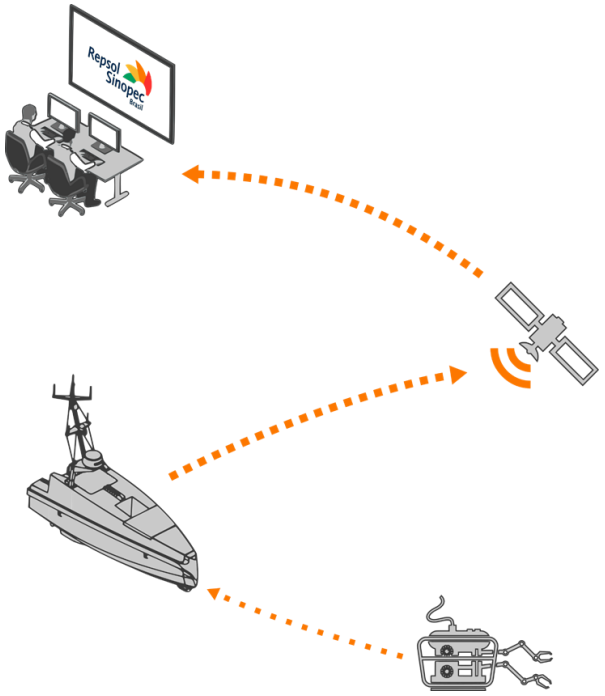
Efficiency, quality, speed and cost

Increase the maturity of the technology and add new features for autonomous operations to reduce people on board, cost, risks and increase the efficiency of offshore operations.

R&D PARTNER: TIDEWISE COPPE UFRJ

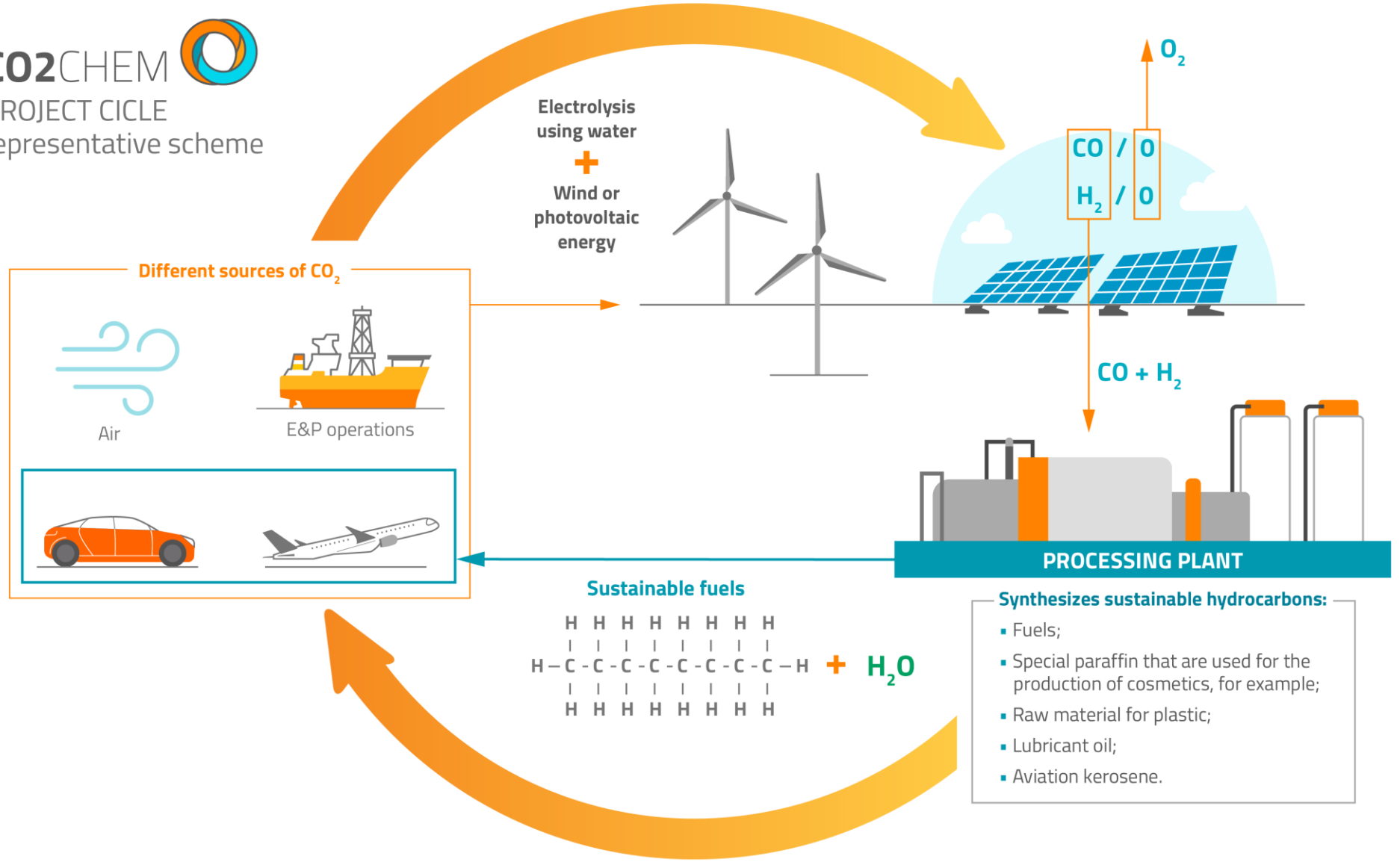
Business Case

- 80% reduction in monitoring cost
- 95% Reduction in CO^2 emission



Source: ESA Remote Sensing Exploitation Division, NL

CO2CHEM
PROJECT CICLE
representative scheme



Motivation

- Increase on **CO_2 emissions** has been directly linked with global warming
- The energy sector is responsible for just over 75% of global CO_2 emissions and technologies to mitigate it have been extensively investigated at Repsol
- Reduction of emissions in oil & gas plants (off-shore & onshore) due to the consumption of CO_2 to produce **synthetic fuels and polyolefins** is an alternative
- One of these alternatives is to use the CO_2 generated in Repsol operations to produce **value added products** and reduce its carbon footprint
- An **alternative for CO_2 re-injection** in the reservoir in those high CO2 content assets
- Opportunity to leverage a **new business model** and also **carbon credits**, becoming a reference in the international carbon market

Muito obrigado!

Repsol Sinopec Brasil