



equinor



## Emission Reduction

Bacalhau Project

Diogo Sandy – HSE Manager

## Equinor Climate Ambitions

# Net-zero ambition backed by actions

### Advantaged upstream position

- <8 kg CO<sub>2</sub> per boe by 2025 and ~6 kg CO<sub>2</sub> per boe by 2030<sup>1</sup>
- Carbon neutral Equinor global operations by 2030<sup>2</sup>

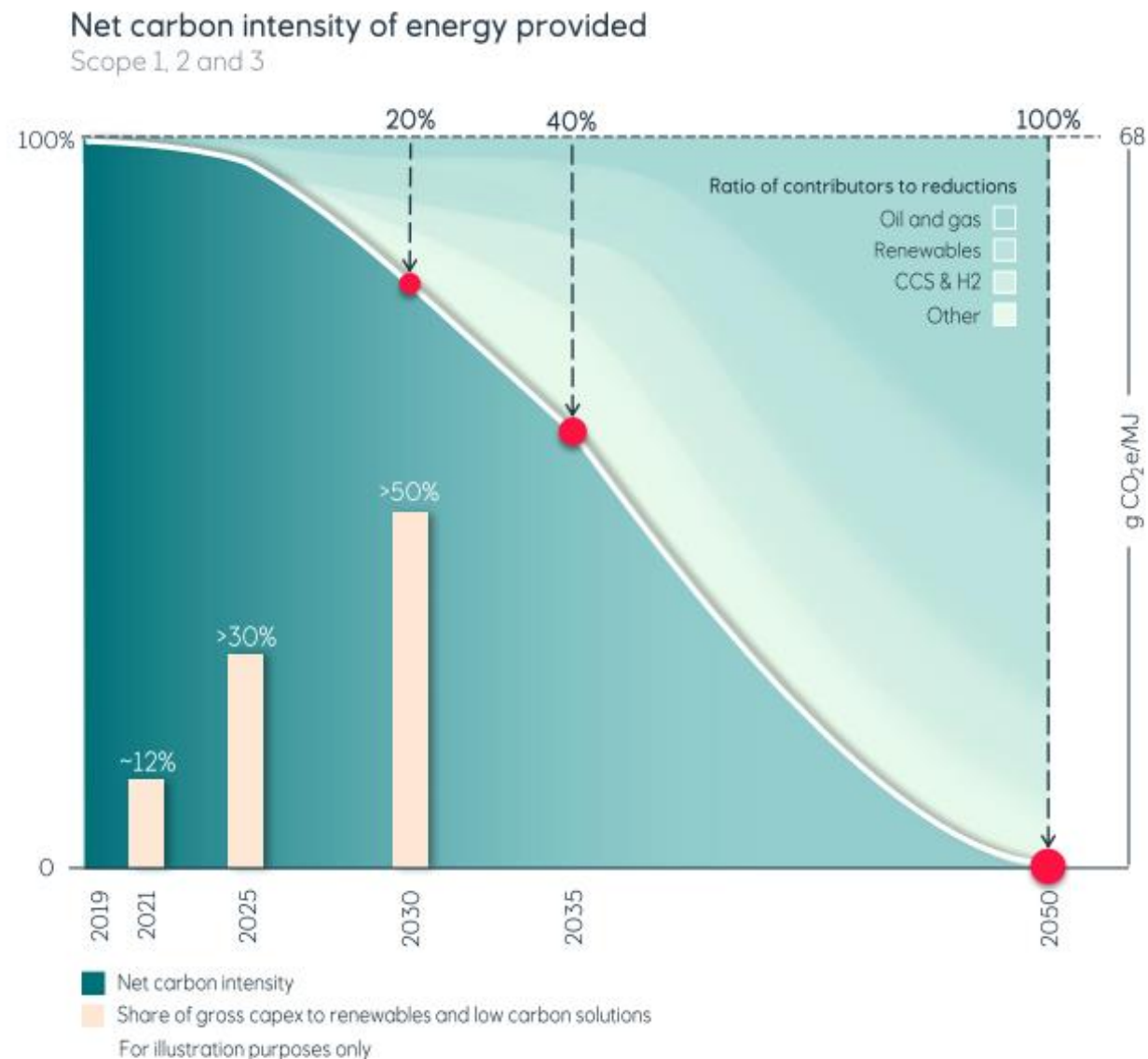
### Accelerating renewables

- 12-16 GW installed capacity by 2030<sup>3</sup>

### Scaling up CCS and hydrogen

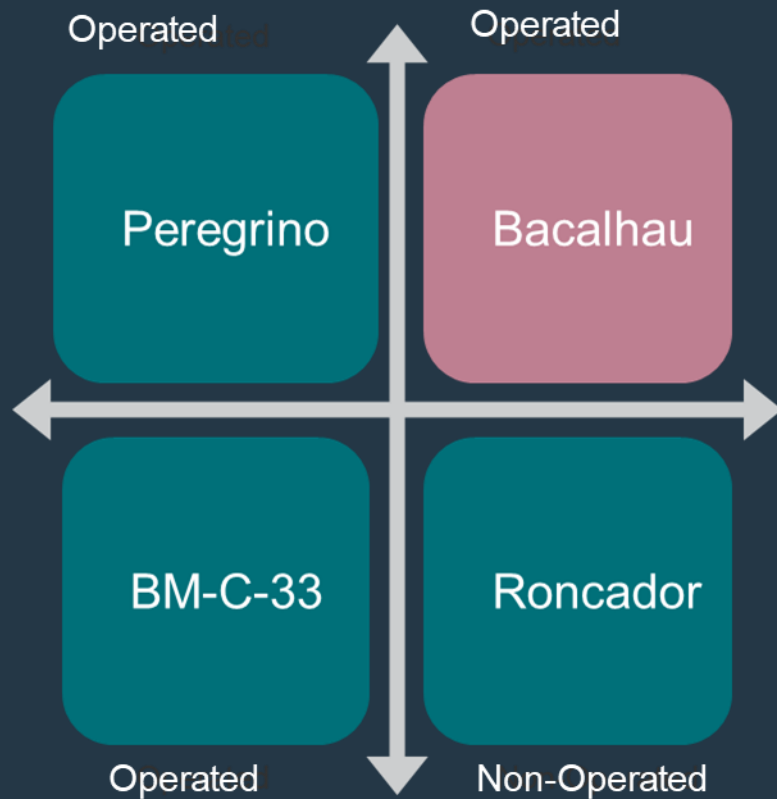
- 15-30 million tonnes CO<sub>2</sub> storage per year by 2035<sup>3</sup>
- 3-5 major industrial clusters for clean hydrogen projects by 2035

1. Upstream intensity, scope 1 CO<sub>2</sub> emissions, Equinor operated, 100% basis  
 2. Scope 1 and 2 GHG emissions. Remaining emissions will be compensated through quota trading mechanisms and offsets.  
 3. Equinor share





# Emissions reduction initiatives | Brasil



- Each project has several reduction initiatives to minimize CO2 emissions aligned with Equinor's expectations
- Deep decline of CO2 intensity for Equinor in Brasil will be a result of the Bacalhau Project (<10kg CO2/ Boe in 2050)

## Bacalhau | Developing a world class asset

- Located at Santos Basin (185km from Ilha Bela)
- One of the biggest oil discovery in the last decade (1-2 Bi recovery oil)
- The largest ever Equinor operated development outside Norway
- Ultra deep-water, high pressure, light oil (32° API)
- Final Investment decision (FID) in 2021. USD 8billions for Phase I
- Partner: Equinor (40%); Exxon (40%); Petrogal (20%) and PPSA (government company)
- Biggest FPSO in Brazil when start the operation
- FPSO based on international standards with Equinor add-on
- Full gas Re-injection strategy for Phase I to optimize oil production

First oil target  
**2024**

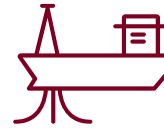
Oil production capacity  
**220** Kbbbl per day



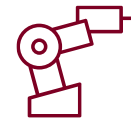


## Bacalhau SSU Ambition

*“Zero harm. To be an industry leader in safety, security, sustainability and carbon efficiency”*



Bacalhau base case (DG2): CO2 emissions of 500k tons/year (12.9 Mill tons over lifetime)



Project reduction initiatives during engineering phase are expected to reduce 25% of the CO2 emissions over lifetime



The current CO2 intensity for the Project is 8,8 kg CO2/boe over the lifetime



The CO2 intensity for the Project in 2025 will be ~7 kg CO2/boe , being a positive contributor for the corporate target

*How was Bacalhau able to reduce the CO2 emission even with high energy required for Gas Reinjection?*





*By Implementing an efficient electrical power production and flexible heat supply for process facilities*

## Gas Turbine Combined Cycle

- About 33% of the energy in the fuel to the gas turbine is converted to mechanical or electrical energy
- The rest of the energy is found in the hot exhaust (>500 °C) from the gas turbine
- In the Combined Cycle Technology, there is a combination of a Gas Turbine with Steam Turbine
- Generate steam at high pressure and temperature on a Steam Generator is used to
  - Provide heat to the process on the FPSO
  - Generate further electric or mechanical power in a steam turbine.

# Conclusion | Bacalhau project

- First Combined Cycle technology implemented in a FPSO and the first offshore unit in the Brazilian Waters
- FPSO Bacalhau will be the lowest emissions self-powered FPSO in the world
- The introduction of Combined Cycle increases energy efficiency and reduces CO2 emissions by about 110K tons/year, which is about 3 million tons over the field lifetime (-25%)
- CO2 intensity <9kg CO2/Boe over the lifetime. Industry average of 18 kg CO2/Boe
- Economic incentives clearly communicated to FPSO bidders to promote carbon efficiency, including Combined cycle on their proposals.
- Support from Bacalhau’s partners (ExxonMobil; Petrogal and PPSA)
- Sets the standard for the next generation of FPSO.
- **But it is just the beginning.....** Equinor are assessing additional measures to be implemented during operation to reduce even further the emissions supporting Equinor’s climate goals and ambitions to be Net Zero in 2050.

# Thank you

Diogo Sandy

[disan@equinor.com](mailto:disan@equinor.com)

