ASSESSMENT OF PETROBRAS' CLIMATE STRATEGY

RECLAIM Finance

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INTRODUCTION

In 2023, Petrobras ranked as the 16th largest oil and gas producer and 4th largest upstream developer worldwide.

As one of the largest National Oil Companies (NOC) and one of the largest greenhouse gas (GHG) emitters globally, Petrobras is among the few companies in the world whose climate strategy (or lack thereof) in the coming years will have a determining impact on our collective ability to limit global temperature rise to 1.5°C. The company has pledged to achieve carbon neutrality by 2050 on its scope 1, 2 and 3.

Petrobras' investors and other financial stakeholders both have a key interest and a crucial responsibility to ensure the company swiftly aligns with a 1.5°C pathway.

Key findings:

- Petrobras does not provide sufficient information on its decarbonization plan to allow investors and other financial stakeholders to correctly assess its capacity to align with a 1.5°C pathway. Insufficient information is given on the company's emissions, capital expenditure (CAPEX) plan, its 2030 production volumes, as well as on the reference scenario it uses to establish its climate plan.
- Taking into account Petrobras' oil and gas production from currently producing fields, plus its fields under development and field evaluation, the company's production in 2030 will be 50% higher than the level required to align with the International Energy Agency's (IEA) Net Zero Emissions by 2050 Scenario (NZE).
- Petrobras plans an increase of its oil production by 19% to 2,500 kboe per day (kboepd) compared to 2023 and its gas production by 50% to 300 kboepd by 2027. If it meets this target and in the hypothesis that Petrobras maintains its production at plateau beyond 2027, its production will be 26% higher than the NZE in 2030.
- Petrobras does not report any investment in sustainable energy in its 2023-2027 strategic plan.
- Petrobras has pledged mitigation targets for 2030 on scopes 1 and 2 only. As the group does not disclose any scope 3 target nor exhaustively reports its current emissions, it is not possible to project Petrobras' GHG emissions trajectory.

1. PETROBRAS IN A NUTSHELL TODAY

Petrobras is the state-owned oil company of Brazil, detained by the Federal Government through its 50% direct common shares ownership and its 18% preferred shares indirect interest through the Brazil's National Development Bank (BNDES).

The NOC is active in diverse activities including upstream, regasification, refining and transport.

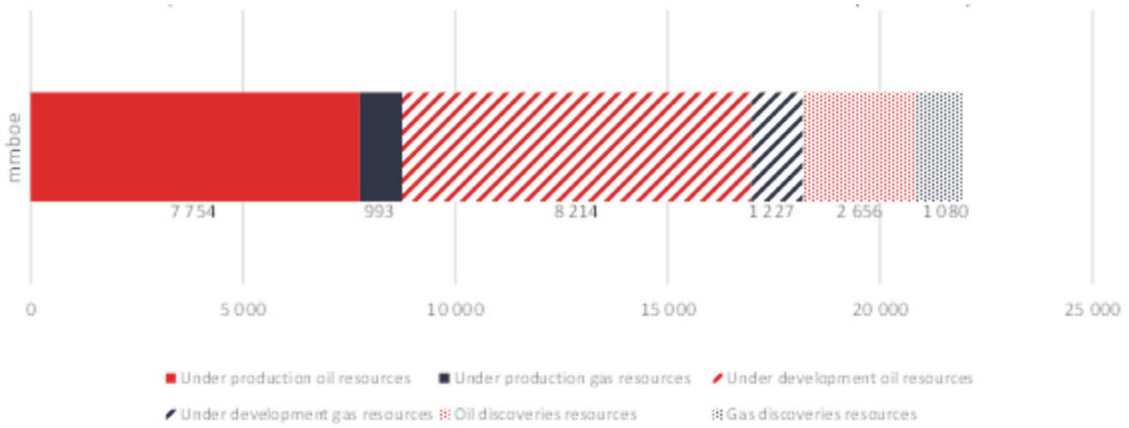
Petrobras accounts for 1.6% of global oil and gas production and 4.2% of upstream short-term expansion plans.[1] Considering expansion overshooting the IEA NZE pathway,[2] the NOC has the 4th highest absolute overshoot of any oil and gas company in the world with 5,899 mmboe of resources from fields under development or under evaluation with a FID beyond 2021.

As of August 1, 2023:[3]

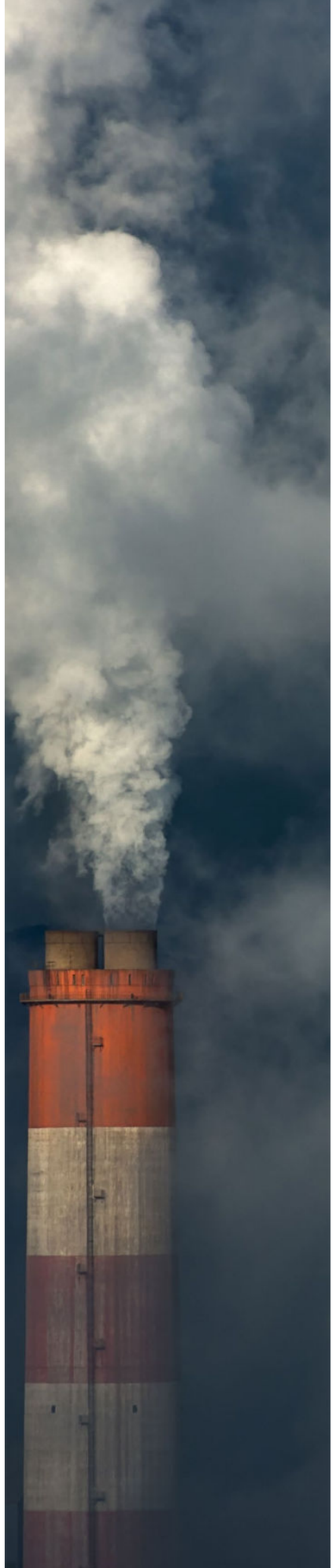
- Petrobras had 8,747 mmboe of resources under production, including 7,754 mmbbl of oil and 993 mmboe of fossil gas. This represents the equivalent of 10.4 years of production at 2022 levels.
- Petrobras had 9,441 mmboe of resources under development or field evaluation, including 8,214 mmbbl of oil and 1,227 mmboe of fossil gas. This represents 11.3 years of production at 2022 levels.
- Petrobras hold 3,736 mmboe of oil and fossil gas discoveries, including 2,656 mmbbl of oil and 1,080 mmboe of fossil gas. This represents 4.5 years of production at 2022 levels.

In 2023, Petrobras extracted 785 mmbbl of oil and 83 mmboe of fossil gas. Beyond exploration and production, Petrobras is also active in other segments such as midstream, refining and distribution and plans to develop biofuel activities.

Petrobras' 's oil and gas resources
(based on current ressources in million barrels of oil equivalent)



Source: Rystad Energy, accessed in August 2023



2. TRANSPARENCY OF PETROBRAS' CLIMATE PLAN

The adoption and publication of sufficiently detailed targets and indicators are a prerequisite for assessing how a company's climate strategy aligns with a 1.5°C trajectory.

Petrobras publishes a climate plan and indicators with detailed climate targets.

However, while Petrobras provides 2030 scope 1 and scope 2 decarbonization targets,[4] Petrobras does not disclose either closer decarbonization targets nor scope 3 decarbonization targets. The information given does not allow investors to understand the company's trajectory for GHG emissions and its production model through to 2030, or the risks associated with financial exposure to the company.

For example, Petrobras does not communicate on its oil and gas production beyond 2027. Moreover, the NOC does not report its projected energy mix. This type of information is key to identifying the company's planned strategy, and therefore the credibility of its emissions reduction goals.

The table below summarizes the level of disclosure by Petrobras on a few key indicators. It does not provide a comprehensive assessment of the transparency and completeness of Petrobras' climate strategy, but rather focuses on the basic indicators that should be the foundation of any oil and gas major's plan.

Assessment of the transparency of Petrobas' climate plan

Does Petrobras publish detailed information about the following indicators up to 2030?	Yes - No Partially	Comments
Absolute and relative GHG emissions reduction targets covering scope 1, 2 and 3.	No	• Petrobras publishes 2030 carbon intensity targets on scope 1 and 2 only.
Contribution to emission reduction targets of carbon capture and storage (CCS) along the company's value chain .	No	• Petrobras publishes 2025 CCS targets only.
Contribution to emission reduction targets of offsets and offsetting approaches.[5]	No	• Petrobras publishes 2025 offset targets only.
CAPEX breakdown by activity, and by production maintenance and growth.	No	• Petrobras details its 2023 to 2027 average CAPEX range target with upstream activities and its CAPEX target dedicated specifically to oil and gas exploration. • Petrobras' CAPEX targets are not split between maintenance and growth CAPEX.
2030 targeted energy mix and production volumes.	No	• Petrobras does not report either its 2030 oil and gas production nor its power generation capacity.
Reference scenario used to define climate targets.[6]	No	• Petrobras constructed 3 scenarios, including a Resilience scenario. The scenario is not sufficiently detailed and forecasts higher oil demand than the NZE.

Source: Petrobras' investor presentations, Sustainability Report, company website

3. QUALITY OF PETROBRAS' CLIMATE PLAN

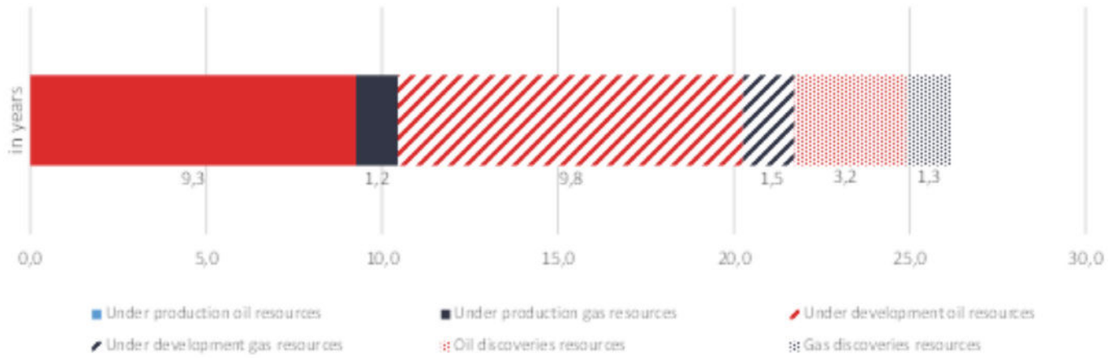
a. Oil and gas trajectory

In May 2021, the IEA published its Net Zero Emissions by 2050 Scenario (NZE) which provides a pathway to meet global energy needs while having a 50% chance of keeping global temperature increases below 1.5°C.[7] It was used as the reference scenario in the World Energy Outlook (WEO) 2021 and was updated in the WEO 2023 published in October 2023.[8] It projects a reduction in oil and gas production by 2030 compared to 2022 levels of 20.9% and 17.9%, respectively,[9] and an end to the development of new oil and gas production projects and LNG terminals.

According to the Global Oil and Gas Exit List (GOGEL),[10] Petrobras is the fourth largest global oil and gas upstream developer. 61.6% of its expansion plans did not obtain their FID before 2022 and are therefore overshooting the IEA's NZE. Petrobras is the company with the fourth highest absolute volume of resources from fields under development or under evaluation that are not aligned with the IEA NZE scenario. Petrobras is focusing its expansion plans on oil production: 87% of its resources under development or under evaluation are oil, while 13% are gas.

Despite the disrupted energy environment caused by the invasion of Ukraine, the need to halt oil and gas expansion as soon as possible remains a key feature of the NZE. The May 2021 NZE projected a halt to the development of new oil and gas fields for which FID was not

Petrobras' oil and gas resources
(based on current ressources and 2022 level of production)



Source: Rystad Energy, accessed in August 2023

"I am also calling on CEOs of all oil and gas companies to be part of the solution. They should present credible, comprehensive and detailed transition plans in line with the recommendations of my High-Level Expert Group on net-zero pledges.

These plans must clearly detail actual emission cuts for 2025 and 2030, and efforts to change business models to phase out fossil fuels and scale up renewable energy."

Antonio Guterres,
Secretary-General of the United Nations,
March 2023

approved by January 1st, 2022. The updated WEO 2023 version of the NZE also highlights the need to end the development of new LNG terminals beyond those approved by January 1st, 2023.

The completion of some projects that can swiftly enter production and operate for a limited time only – mainly shale oil and gas projects – is not expressly forbidden in the WEO version of the NZE. However, the IEA notably stresses that the invasion of Ukraine cannot justify a "new wave of oil and gas infrastructure", and that any new oil and gas fields will make it "even more challenging" to meet carbon neutrality targets and "creates the clear risk that [the 1.5°C] target moves out of reach". Concretely, any such project will require even greater reduction efforts in other sectors and activities.

The IPCC also highlights the risks associated with the development of any new fossil fuel projects.[11] This concurs with a large and growing body of scientific evidence showing the need to immediately end fossil fuel development and a growing consensus on this in net-zero policy discussions.[12]

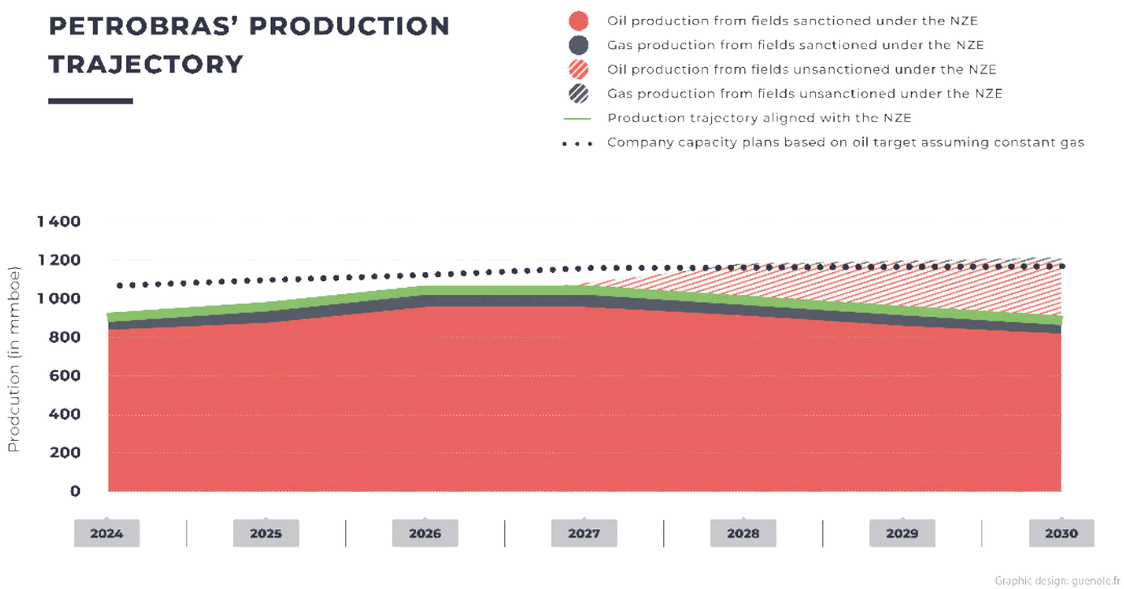
Oil and gas production should decrease by 20.9% and 17.9%, respectively,[13] during this decade according to the NZE. However, without developing any new oil and gas fields and by only extracting resources that are already under production, Petrobras has enough resources to produce the equivalent of 10.4 years of oil and gas production at its 2022 level. Petrobras' resources under development and field evaluation will provide the equivalent of another 11.3 years of production at its 2022 production level. Additionally, if the company exploits all its oil and gas discoveries, it will have enough resources to produce the equivalent of a further 4.5 years of production at its 2022 level.

In the IEA's NZE, the rate of oil and gas production declines due to the combination of the natural depletion of existing oil and gas fields and the absence of new fields to fill the gap. This decline happens even though the NZE relies on material levels of negative emissions, including through the deployment of technologies unproven at scale, and would be much faster without such a reliance. Other prominent 1.5°C scenarios with no or low overshoot also show oil and gas production declining by 2030. These include the One Earth Climate Model (OECM),[14] the Network for Greening the Financial System's (NGFS) net zero climate scenarios,[15] and the IPCC 1.5°C with no or low overshoot scenarios filtered to limit to reasonable volumes the reliance on negative emissions (CCS, NBS, etc.).[16]

The following chart compares Petrobras' planned oil and gas production level in 2030 with NZE alignment. The company plans to increase its oil production by 19% to 2,500 kboepd and its gas production by 50% to 300 kboepd by 2027.[17] Given Petrobras lacks of production target beyond 2027, we set the very conservative hypothesis that Petrobras' production would maintain at plateau from 2028 to 2030.

The production level from fields sanctioned under the IEA NZE is an aggregate of both its producing fields and its fields under development with a FID obtained before 2022. With the production from fields unsanctioned under the NZE, the chart also indicates the level achieved from fields under production as well as those under development and under field evaluation with a FID in 2022 and beyond.

Beyond resources represented in this chart, Petrobras also owns 3,736 mmboe of discovered hydrocarbon resources that have not yet entered the field evaluation or development stage that could be developed in a near future.



Source: Rystad Energy on oil and gas production and expansion, accessed in August 2023

In 2030, with oil and gas from currently producing fields, plus fi elds under development and under evaluation, Petrobras' production level will be 50% higher than the NZE.
Petrobras' production target for oil and gas is 26% above NZE alignment.

Petrobras is developing more oil and gas than its production target, meaning that the NOC's target is underestimated or that the company plans to divest some of its oil and gas assets. Petrobras is currently developing Buzios VI to Buzios XI oilfields that will enter production in the second part of the decade. In 2030, Buzios oilfield will be its most important asset in terms of yearly production.

b. Cash flow allocation

The future energy mix of a company is determined by its current investment strategy. In the NZE, total energy investment needs to more than double by 2030, with a shift from high-carbon energy to clean alternatives. Investment in clean energy, end-use and efficiency more than triple in the NZE, and ten dollars must be spent on clean energy, end-use and efficiency f or e ach d ollar s pent o n fossil fuels by 2030.[18]

Among its US$78 billion 2023-2027 CAPEX plan, 83% is dedicated to upstream.[19] While the Brazilian company claims that offshore wind power is part of its prospective business, no investment is allocated to sustainable energy in its strategic plan.[20]

The company does not communicate details on its 2030 energy mix. Given the absence of existing sustainable energy capacities and the absence of sustainable energy deployment in its 2023-27 strategic plan, sustainable energy would remain absent or extremely low by the end of the decade.

Hydrogen is part of Petrobras' prospective business, but no investment is allocated to hydrogen and no production target has been set.

c. Decarbonization targets and emissions trajectory

Petrobras pledged mitigation targets for 2025 and 2030 on its upstream assets, compared to its 2008 level, measured in intensity terms, and including scope 1 and 2 only.[21] Petrobras also pledged mitigation targets for 2030, compared to its 2015 level, measured in absolute terms, and including scope 1 and 2 only. Petrobras does not disclose its energy supply evolution, while it plans to increase its oil and gas production by 2027 at least. Moreover, Petrobras does not report scope 3 emissions and does not indicate any scope 3 target. Therefore, it is not possible to project Petrobras' emission trajectory.

Petrobras relies on CCS and aims to capture 80 Mt between 2008 and 2025. Half of its CCS target has been carried out between 2008 and 2022, and 40 Mt still must be captured between 2023 and 2025 to reach its target. That would result in more than 13 Mtpa captured by 2025. As highlighted by the IPCC, however, CCS in the energy sector still has limitations to overcome before it can be scaled up, which means it comes with limited potential and prohibitive costs. Too high reliance on these types of mitigation approaches represents a material risk factor for Petrobras' ability to reach its decarbonization targets.

Petrobras' pledged mitigation targets

Base year	Target year	Reduction target	Net target	Geographical scope	Emission scope	Emission Type
2009	2025	-50%	Yes	World	1 & 2	Intensity
2009	2030	-50%	Yes	World	1 & 2	Intensity
2015	2030	-30%	Absolute	World	1 & 2	Absolute

Source: Petrobras' 2023 Climate change supplement

References

1. Using the Urgewald 2023 Global Oil & Gas Exit List. The list was constructed based on September 2023 Rystad data.
2. Based on the original scenario as published in 2021 and updated in 2022, which states that in a 1.5°C world, approval of new oil and gas fields is not needed after 2021.
3. Calculations made using Rystad Energy Ucube with data from August 2023.
4. Petrobras, *Climate change supplement 2022-2023*
5. The IPCC estimates between 500 and 3,600 million metric tons of CO_2 could be removed annually through planting new forests by 2050. Greenpeace, Net Expectations: Assessing the role of carbon dioxide removal in companies' climate plans, 2021.
6. To meet this criterion, the company must disclose the publicly available 1.5°C pathway with no or low overshoot that it uses to set its targets. While all oil and gas companies somewhat rely on 1.5°C pathways to conduct analysis and inform their decision-making, this does not mean that the targets they set are coherent with these pathways.
7. IEA, Net Zero Emissions by 2050 Scenario (NZE), 2021.
8. IEA, World Energy Outlook 2023, 2023.
9. Reclaim Finance calculation using IEA's WEO 2023 dataset with oil and natural gas world energy supply.
10. Urgewald, Global Oil and Gas Exit List, 2023
11. IPCC, Climate Change 2022: Mitigation of Climate Change, 2022.
12. For example, the UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions, November 2022; Race to Zero Expert Peer Review Group, Interpretation Guide. Version 2.0, June 2022, para 5b; Net-Zero Asset Owner Alliance (NZAOA), Position on the Oil and Gas Sector, March 2023.
13. Reclaim Finance calculation using IEA's WEO 2023 dataset with oil and natural gas world energy supply.
14. OECM, Limit global warming to 1.5°C, 2022
15. NGFS, Climate scenarios
16. The International Institute for Sustainable Development (IISD) filtered the various 1.5°C scenarios provided by the IPCC to ensure they do not rely on volumes of negative emission that are not coherent with the IPCC's own realistic potentials. These "limited negative emissions" pathways are analyzed in the report Lighting the Path.
17. Petrobras, *2022 20-F Report*
18. The IEA 10 for 1 ratio includes renewable energy, efficiency and end-use but also biomass and other activities (like CCS) that could lead to some environmental harm and/or raise sustainability questions. Relying on a different scope of clean energy investment, BloombergNEF estimates that $4 must be spent on clean energy for every dollar spent on fossil fuels by 2030, based on energy supply only.
19. Petrobras, *2022 20-F Report*
20. Petrobras, *Sustainability report*, 2023
21. Petrobras, *Sustainability report*, 2023

Useful links

Methodology - Glossary

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Reclaim Finance is an NGO affiliated with Friends of the Earth France. It was founded in 2020 and is 100% dedicated to issues linking finance with social and climate justice. In the context of the climate emergency and biodiversity losses, one of Reclaim Finance's priorities is to accelerate the decarbonization of financial flows. Reclaim Finance exposes the climate impacts of financial players, denounces the most harmful practices and puts its expertise at the service of public authorities and financial stakeholders who desire to bend existing practices to ecological imperatives.

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