

IS SHELL ON TRACK FOR 1.5°C?

**Reality check for financial
institutions**

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EXECUTIVE SUMMARY

Shell¹ aims to become a net-zero emissions energy business by 2050. However, based on our calculation using the company's own carbon intensity projection, Shell's strategy is not on track to meet the 1.5°C climate goal. Even under the conservative hypothesis that Shell meets its decarbonization targets and reduces its oil and gas production as per the IEA Net Zero-based 1.5°C scenario (referred to as the 1.5°C scenario in this briefing),² by 2050 Shell will have emitted 40.9% more greenhouse gas (GHG) than what is authorized under a 1.5°C compatible carbon budget. In fact, Shell will be overshooting its share of the remaining carbon budget to limit global warming to 1.5°C as soon as 2034.

Why? Because Shell short term plans are totally incompatible with efforts to stay below 1.5°C. Shell is currently the biggest European oil and gas producer. And the second biggest European developer of oil and gas.³ Instead of transitioning away from new oil and gas, Shell plans to rely on unrealistic offset plans to achieve its net zero ambitions by 2050. In 2030, Shell's investment strategy and energy mix will still be very focused on oil and gas, further jeopardizing the fossil fuel decline and any longer term climate ambitions.

Our methodology

This briefing analyzes how and if the company is aligned with a 1.5°C reference scenario. This scenario was computed by the Transition Pathway Initiative, based on the IEA Net Zero Scenario and on a IPCC scenario, to provide pathways for greenhouse gasses emissions and energy production.

A company is considered aligned if its cumulative GHG emissions fit within the 1.5°C carbon budget. To make these calculations, we considered its "climate" ambitions and targets, to calculate a conservative estimate of its cumulative GHG emissions. We also look at other indicators indicating the direction the company is taking: near term oil and gas production trend, CAPEX trends and energy mix forecasted in 2030, and reliance on offsets. To find out more, please look at [our methodology](#).

KEY FINDINGS



+41%

Excess of 1.5°C Carbon budget by 2050



2034

Year of the carbon budget overshoot



?

Oil and gas production between 2016 and 2024



N°2

Biggest European oil and gas developer



> 85%

Near term CAPEX dedicated to oil and gas



< 23%

Renewable share in the 2030 energy mix

1. SHELL'S DECARBONIZATION PATHWAY WILL EXCEED ITS 1.5°C CARBON BUDGET

a. Emission levels will remain too high for too long

Shell announced an ambition to become "a net-zero emissions energy business" by 2050,⁴ aiming for net zero worldwide on both operated activities (scope 1 and 2) and indirect emissions related to its energy business (scope 3). However, committing to distant carbon neutrality targets is not enough to keep global warming below 1.5°C. Our analysis shows that Shell's short-to-medium term strategic and operational orientations (GHG emissions, CAPEX allocation) are not consistent with achieving carbon neutrality by 2050 and therefore put the climate at risk.

Although Shell has pledged to reduce its scope 1 and 2 emissions by 50% by 2030 and its average carbon intensity of sold energy products⁵ by 9 to 12% by 2024 and by 20% by 2030 (see table 1 in the annex), these targets will not stop the company's absolute emissions from increasing quickly over the short term.

According to Shell's own projections and our calculations, until 2035, Shell's carbon intensity is on average 41.4% higher than the maximum carbon intensity levels allowed by **the 1.5°C reference scenario** (see graph 1).

In other words, each unit of energy the company will produce until 2035 (and beyond) will consistently emit too much GHG. Given that oil and gas production levels will also remain high, Shell will keep releasing high levels of GHG emissions. For Shell to align with

a 1.5°C decarbonization pathway, its absolute emission levels must decrease.⁶ For absolute emissions to decrease, fossil fuel production must decrease.

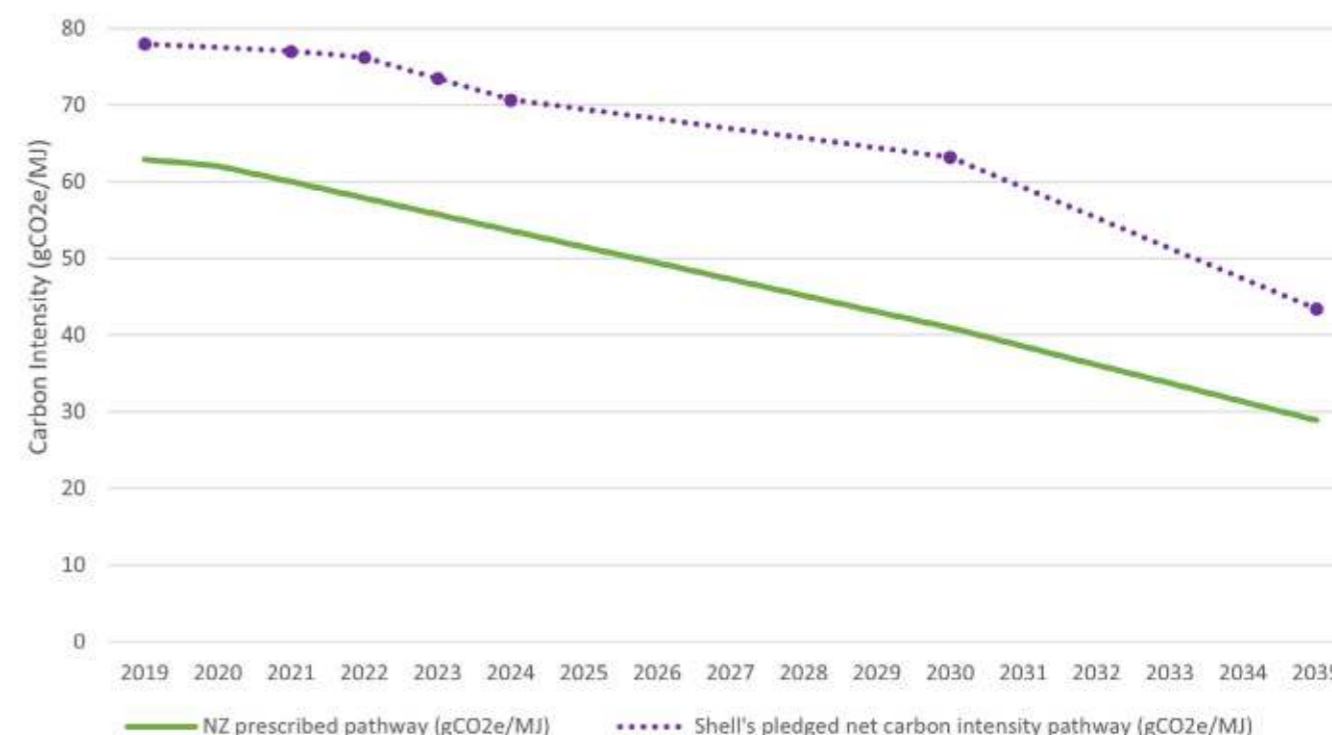
b. Shell will exceed its 1.5°C carbon budget by 2034

Given that Shell does not plan to reduce carbon intensity fast enough, and plans to maintain high levels of oil and gas production, its absolute emissions will not decrease quickly enough. By 2050, our analysis shows that Shell will exceed its 1.5°C carbon budget by at least 40.9% (see graph n°2).

Even in the unlikely event that Shell starts reducing hydrocarbon production as per the 1.5°C reference scenario,⁷ the major would still overshoot its allocated carbon budget as early as 2034. Based on Shell's own carbon intensity projections, Reclaim Finance calculations indicate that more than 80.2% of Shell's carbon budget would be consumed as early as 2030.

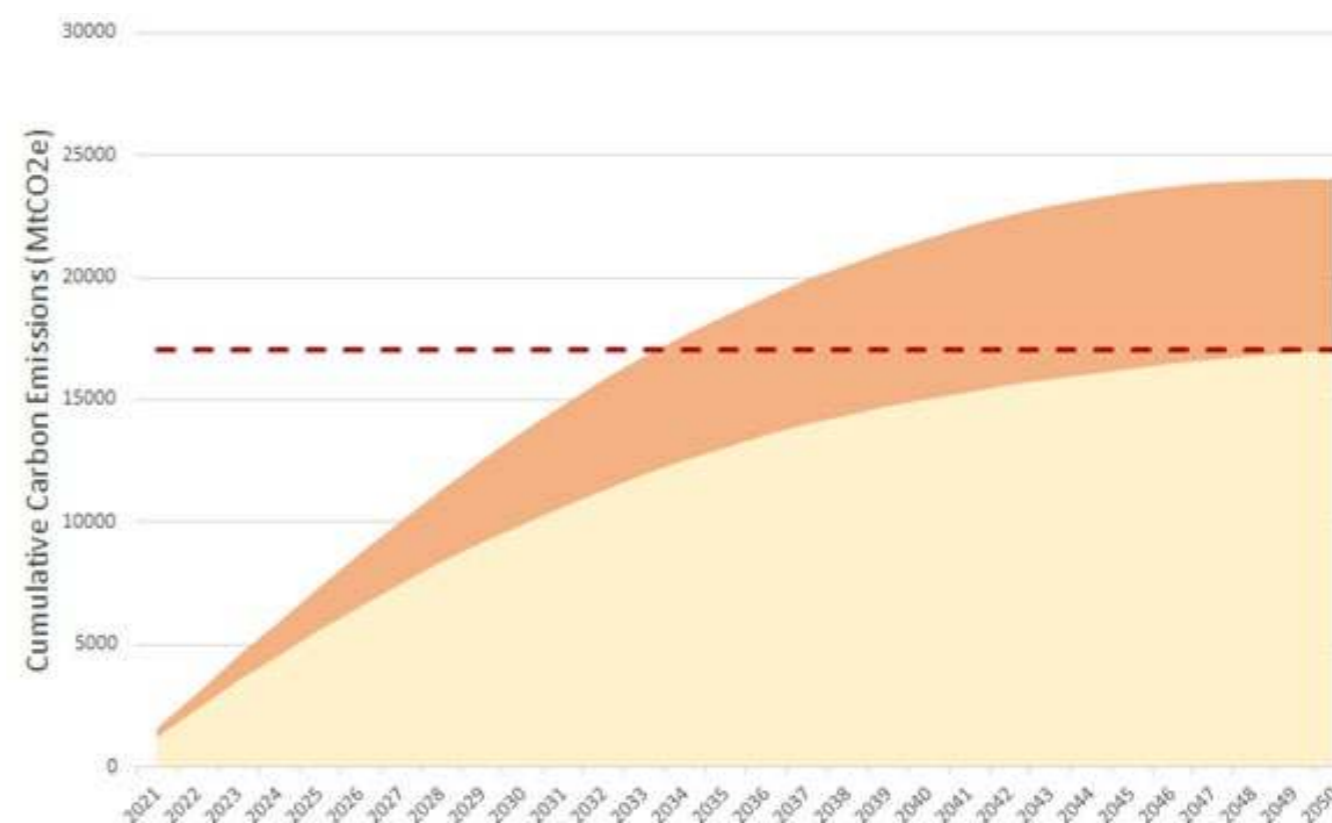
The carbon budget overshoot could keep increasing. Production levels will remain too high at least until 2024⁸ as Shell is developing new oil and gas assets. Beyond 2024, unless Shell makes a clear commitment to stop developing new oil and gas projects and investing in exploration, fossil fuel production will not decrease at a sufficient pace (see chapter 2).

Graph N°1. Shell's short and mid-term decarbonization pathway



Source: Shell's forecasted carbon intensity pathway, based on the company reported emissions, carbon intensity and decarbonization targets.⁹ "NZ prescribed pathway" based on TPI's work on IEA Net Zero scenario and an IPCC scenario (see methodology).

Graph N°2. Shell's carbon budget overshoot



Source: Reclaim Finance based on a) production forecasts using company data and the IEA Net Zero's demand projections b) the 1.5°C reference scenario carbon intensity pathway computed by TPI c) the company's pledged carbon intensity pathway.

c. Unsustainable reliance on offsets

Shell plans to heavily rely on offsets to achieve its climate targets. The company plans to offset 120 MtCO₂e per annum through Nature-based solutions (NBS) by 2030. This would require around 26 millions acres of plantations, the equivalent of nearly three times the size of the Netherlands. Shell is also developing Carbon Capture and Storage (CCUS) and aims to reach a capacity of 26 MtCO₂e per annum by 2035. This raises feasibility issues as it will require building 18 CCUS units. Currently there are only 28 operating around the world today because Carbon Capture Use and Storage technology is not mature at large-scale yet, and its economic viability is still in doubt.¹⁰

According to ACCR research in 2021,¹¹ Shell's offset plan requires amounts of NBS greater than the size of voluntary offsets traded in 2019 and Shell will require a material increase in offsets/CCUS capacity of 25x for CCUS and 30x for offsets to achieve its 2030 targets. According to our calculations based on the company's projections, offsets will cover 17.7% of absolute emission reductions required to meet Shell's targets by 2035.¹²

If Shell were to keep relying on offsets in the longer term, and meet around 17.7% of its decarbonization targets until 2050, the company would have to grow a forest five times the size of the Netherlands and open 35 new CCUS centers.¹³



Does the TPI benchmark really assess alignment with 1.5°C?

In November 2021, TPI updated its energy sector benchmark,¹⁴ stating that a company is "aligned with 1.5°C" on the ground that the company's carbon intensity is predicted to converge with the scenario's pathway by 2050. However, this conclusion is misleading. TPI declares a company aligned as soon as the carbon intensity of the company falls below the carbon intensity level allowed by the 1.5°C reference scenario that same year. TPI's approach, centered only on carbon intensity, does not take into account excess GHG emissions and fossil production stocks built up between today and 2050.

On the contrary, our stock-based method (based on carbon budgets), considers the cumulative GHG emissions piling up each year as a result of annual fossil production. If both carbon intensity and oil and gas production remain high, then GHG emissions increase quickly and fall short of the remaining carbon budget to stay below 1.5°C. For a company to be deemed "aligned" (in the short, mid or long-term), its absolute emissions must fall within the carbon budget allocated by the 1.5°C reference scenario in that same time frame (short, mid or long term).

"Carbon neutral LNG" - A dangerous marketing claim?

Shell claims to sell "carbon-neutral" liquefied natural gas (LNG) cargoes,¹⁵ whose emissions have, supposedly, been offset or avoided. However, most emissions created by these LNG shipments were not avoided or canceled out.¹⁶ Numerous studies have shown that tree plantations and supposed forest protection projects often have much lower carbon benefits than claimed and can have seriously negative impacts on Indigenous and other local communities, especially by taking over the land that they use for farming or other purposes. Furthermore studies have repeatedly shown that the carbon offsets market as a whole is rife with fraud, flawed methodologies, opacity and conflicts of interest. As a result the great majority of offsets generated since the global market started to grow in the late 1990s — 85% of the Kyoto Protocol Clean Development Mechanism's offsets according to one widely cited analysis — are likely fictitious and do not represent emission reductions or removals.¹⁷ The use of offsets justifies selling more fossil fuels, which will ultimately lead to more emissions. Carbon neutral-LNG is a dangerous claim as the use of offsets justifies selling more fossil fuels, which will ultimately lead to more emissions.

2. SHELL IS INVESTING IN AN OIL AND GAS FUTURE

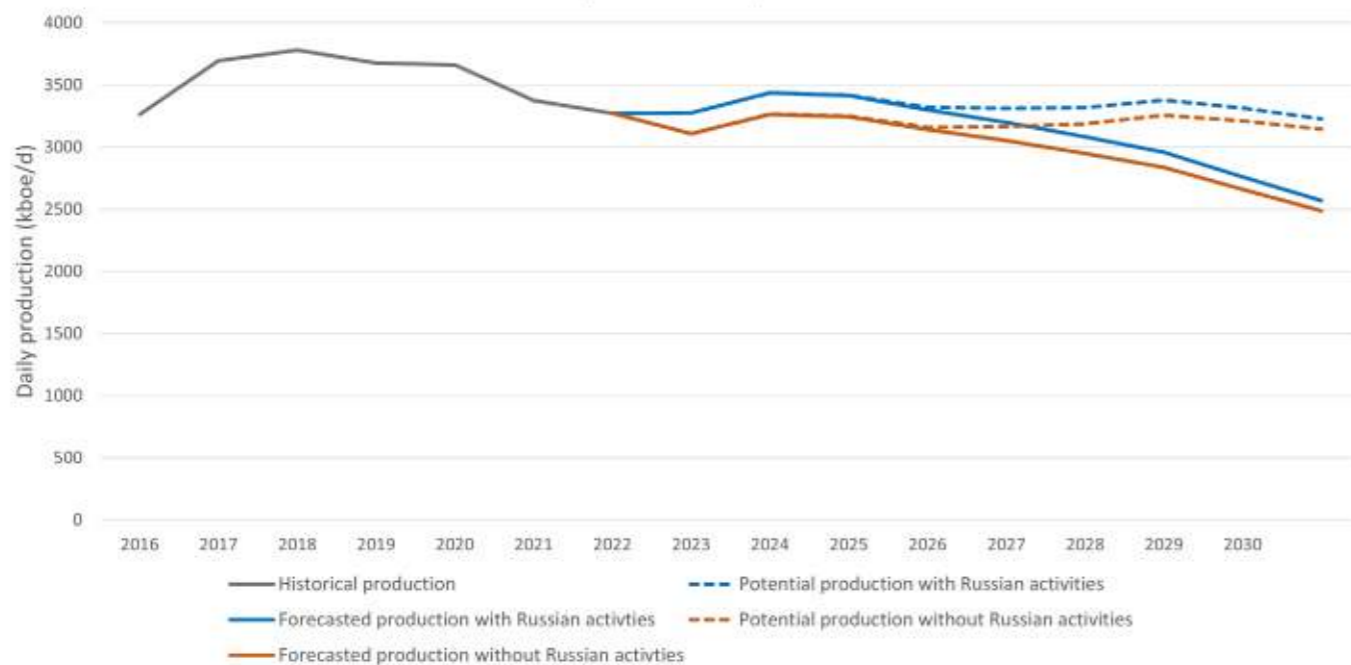
a. Shell still plans to increase oil and gas production in the short term

Reducing oil and gas production is a crucial part of any credible decarbonization pathway and is required to achieve deep emission cuts. Both the UN Production gap report and the 2021 World Energy Outlook Net Zero scenario entail a decline in fossil fuel production during this decade.¹⁸ According to Carbon Tracker models,¹⁹ to align with the IEA's Net Zero scenario, most oil and gas companies will need to drastically cut down on hydrocarbon production : by at least 50% by 2030 in the case of Shell.

Shell has committed to reduce oil production by 1 to 2% per year by 2030²⁰ (with a peak in 2019). Following the sale of its Russian assets, Shell's production is expected to decrease by 5.6% over the short-term instead of plateauing. By 2030, production could more or less decline, depending on Shell's strategic decisions.

- Will Shell replace its Russian assets with similar oil and gas assets? By 2030, production could decline by 8.5% compared with recent levels²¹ if Shell does not replace its Russian assets with similar oil and gas assets (vs. -6.1% with Russian assets).

Graph N°3. Shell production profiles



Source: Reclaim Finance calculations based on Rystad Energy UCube

- Will Shell invest in new oil and gas fields beyond those currently under development or evaluation? If Shell stops developing new oil and gas assets as per the IEA's net zero scenario²² and does not switch its Russian assets for other oil and gas assets, the major's production could drop by as much as 24% by 2030²³ (compared with 2021 levels).
- However, the decision to stop investing in new oil and gas has not been made. In fact, Shell ranks in the top 10 biggest hydrocarbon developers in the world.²⁴

Unless Shell decides to stop expansion, production is likely to decrease by a mere 1.4% to 3.9% by 2030 (compared with 2021 levels, depending on the decision regarding Russian assets). This is very far from the -50% cut required in Carbon Tracker's 2030 calculations.

- Even in the best case scenarios mentioned here, if there are no deeper cuts in existing production levels, Shell will keep producing too much oil and gas to be aligned with a 1.5°C scenario over mid-term.

Why increasing gas production is toxic for the climate

Shell claims to decrease oil production by 1-2% per year from 2019, but is essentially switching from one fossil fuel to another. Fossil gas production will account for 55% of the oil and gas mix by 2030, i.e. an increase of 6.9% by 2030. Shell is planning to invest \$4 billion per year to grow the gas business, more than it will commit for renewable energy. Gas production results in methane leaks in the atmosphere at different stages (eg. venting during extraction and evaporation during transportation of LNG by boat). Methane is a potent greenhouse gas with a warming potential 85 times that of CO2. According to the IPCC, methane emissions have nearly tripled since pre-industrial times and are increasingly responsible for rising temperatures. The IEA net zero roadmap is also adamant that there is no room for both new oil and new gas fields in the 1.5°C carbon budget.

b. Shell is a major oil and gas developer and top explorer

While Shell may have committed to reduce oil production by 2030, the company is still heavily invested in new oil and gas developments.

According to the Global Oil and Gas Exit List, Shell is the 2nd biggest European developer and is listed in the top10 developers worldwide.

- In 2020, the company's resources under production amounted to 22,010 mboe,²⁵

the equivalent of more than 18 years of production (at its recent level).²⁶

- Currently, there are more than 3,779²⁷ worth of assets being developed, which will allow Shell to add the equivalent of three years of recent production to its portfolio.
- Shell also has 8,962 mboe of discovered hydrocarbon resources that have not yet entered the field evaluation or development stage.
- Shell is heavily involved in exploration, looking for further undiscovered oil and gas resources to extract. From 2019 to

2021, Shell was the top explorer among European majors and over that period,²⁸ spent an average \$2.4 billion per year, twice as much as its European peers.

Not only is Shell expanding, it is also increasingly tapping into unconventional oil and gas resources. According to the Global Oil and Gas Exit List, circa 40% of the oil and gas resources currently being developed by Shell are in ultradeep water, in the Arctic, as well as from fracking.²⁹

c. Shell's investments will remain heavily focused on fossil fuels

Despite claims that Shell is gradually transitioning, a quick look at the CAPEX allocation demonstrates that the major's investment strategy is still focused on fossil fuels.

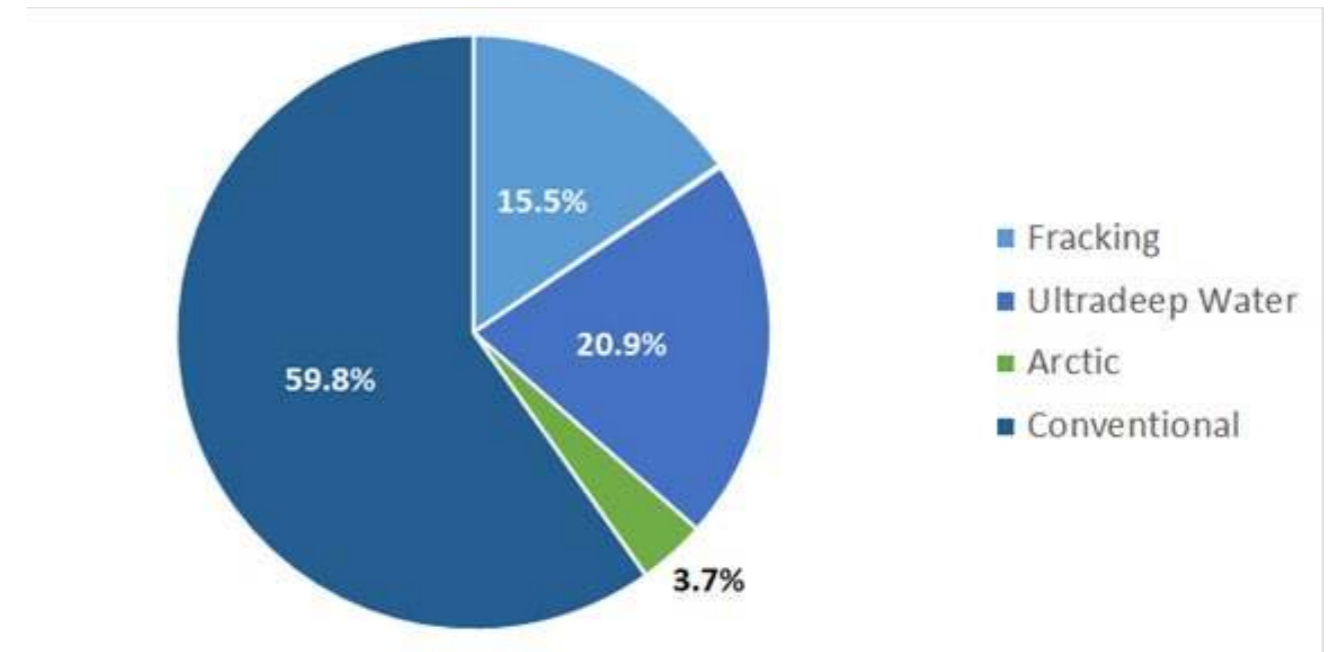
The company aims to dedicate 11.4% of its annual CAPEX to the Renewable and Energy services business line³⁰ "in the near term".³¹ Shell just announced that in 2022, approximately 90% of the CAPEX would be allocated to fossil fuels.³²

Although this will double the share of renewable investments (5 % allocated in 2020), this will not be enough for Shell's energy mix to transition away from fossil fuels in the near and medium term. In 2030, assuming the company meets its targets, Shell's renewable share of its energy mix will be at best 22.3%.³³

Shell and the other majors argue that they are in the process of "diversifying" their energy mix. However, for the time being, their diversification strategy is adding renewable energy capacity on top of oil and gas production, instead of replacing it. As long as the company maintains high levels of fossil fuel productions, it will not achieve the deep emission cuts required - 50% by 2030 - to keep climate change in check.



Graph n°4. Shell's short term expansion plan



Source: Urgewald analysis based on data from Rystad Energy

What the IEA says about the need for new CAPEX in oil and gas

According to the IEA Net Zero scenario, oil and gas capex are not "continued" but rather divided by two. The IEA estimates that an average \$365 billion per year would be spent on oil and gas until 2030: that's 50% less than oil and gas capital expenditures before the COVID crisis (\$719 Mds a year from 2016 to 2018).

Furthermore, the IEA explicitly states that investments are needed in existing fields, but it bans investment in new oil and gas fields after 2021. From the \$365 billion, only \$77 billion (20%) would go to new fields that have been approved for development before the end of 2021.

According to the IEA, the investment in oil and gas would continue to drop as time goes by, reaching an average \$171 billion per year from 2031 to 2050.

Table 1. Shell's pledged mitigation targets

Base year	Target year	Reduction target ³⁴	Net target	Geographical scope	Emission scope	Emission type ³⁵
2016	2021	-2/3%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2022	-3/4%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2023	-6/8%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2024	-9/12%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2030	-50%	Yes	World	1 & 2, operational control	Absolute
2016	2030	-20%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2035	-45%	Yes	World	1 & 2 & 3, carbon intensity of sold energy products	Intensity
2016	2050	-100%	Yes	World	1 & 2 & 3	-

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1. Shell, [Our climate target](#)
2. In this briefing, we analyze companies alignment against a 1.5°C reference scenario computed by the Transition Pathway Initiative. The latter based its work on the IEA Net Zero Scenario and on a IPCC scenario, to provide pathways for greenhouse gas emissions and energy production. See our methodology for more information.
All following mentions of “1.5°C reference scenario” refer to this output from the TPI.
3. See [Global Oil and Gas Exit List, 2021](#)
4. Shell, [Our climate target](#)
5. To simplify, the “carbon intensity of sold energy products” of the company is referred to by “carbon intensity” of the company in the rest of this briefing.
6. To analyze whether or not a company’s decarbonization pathway is aligned with the 1.5°C carbon budget, it’s critical to look at two indicators simultaneously: the carbon intensity pathway and the production pathway. Any company aligning on the emissions pathway but producing too much - or the other way around - will end up emitting too much GHG. The overarching goal being for absolute emissions to decrease, we hence look at the carbon intensity and production pathway of the company and compare it to the benchmark described by the 1.5°C reference scenario.
7. This is a conservative hypothesis: due to lack of reliable data regarding Shell’s production plans, we make the assumption that the company’s production levels will decrease in accordance with the IEA Net Zero demand projections. However, nothing in Shell current plans confirms this direction. In fact, we estimate that Shell’s hydrocarbon production will have increased by 2030 (see chapter 2).
8. Data on production levels is very reliable until 2024 and takes into account the production profile of reserves under production as well as oil and gas fields currently under evaluation or development. After 2024, the production levels will depend on the company’s plans that have not yet been made public.
9. Reported climate data are sourced from [Our performance data, 2020](#)
10. Carbon Tracker Initiative, [Oil companies should hedge their bets on CCUS and offsetting, 2021](#)
11. ACCR, In-depth: [Royal Dutch Shell plc \(Shell\) climate vote, 2021](#)
12. This calculation was done using the volume of offsets projected by Shell in 2035
13. Carbon Tracker Initiative, [Oil companies should hedge their bets on CCUS and offsetting, 2021](#)
14. TPI, Energy sector “finally moving out of first gear” on climate as first three oil and gas firms align with 1.5°C pathway, 2021
15. Shell, [Shell and PetroChina sign world’s first term contract for carbon-neutral LNG, 2021](#)
16. Bloomberg, [The Fictitious World of ‘Carbon Neutral’ Fossil Fuel, 2021](#). Most of the offset market does not even remove carbon from the atmosphere. Renewable energy generation and preventing deforestation accounted for 66% respectively of all offsets used by December 2020).
17. References “Bad Deal for the Planet: Why Carbon Offsets Aren’t Working...and How to Create a Fair Global Climate Accord,” International Rivers, 21 May, 2008; “How additional is the Clean Development Mechanism,” M. Cames et al., Öko Institut, March 2016; “Shell’s net zero climate plans need land up to three times the size of the Netherlands for carbon offsets,” ActionAid, 17 May 2021; “Systematic over-crediting of forest offsets,” Grayson Badgley et al. (carbon)plan, 29 April 2001.
18. According to the [2021 Production Gap report](#), global oil and gas production must fall by 4% and 3% respectively each year by 2030. According to the [2021 World Energy Outlook](#), global oil and gas demand will fall by 20% and 10% respectively by 2030.
19. Carbon Tracker Initiative, [Adapt to Survive: Why oil companies must plan for net zero and avoid stranded assets, 2021](#)
20. Shell, [Our climate target](#).
21. To establish “recent production levels” and avoid a “covid effect”, we calculated an average annual production level based on 2019, 2020 and 2021 production data.
22. IEA, [Net Zero by 2050 - A Roadmap for the Global Energy Sector](#).
23. Reclaim Finance calculations based on Rystad Energy UCube.
24. See [Global Oil and Gas Exit List, 2021](#)
25. Data collected by Reclaim Finance on Rystad UCube Energy database.
26. To establish “recent production levels” and avoid a “covid effect”, we calculated an average annual production level based on 2019, 2020 and 2021 production data.
27. Data collected by Urgewald for the Oil and Gas Exit List on the Rystad UCube Energy database.
28. See [Global Oil and Gas Exit List, 2021](#).
29. Fracking figure may not be updated as it does not factor in Shell’s sale of its Permian assets.
30. Shell does not disclose investments in renewable alone, but in renewable and electricity, which lead to an overestimation of the figure dedicated to renewable as electricity can be produced using fossil gas. Shell does not explicit its definition of “near term”
31. Shell, [Strategic report, 2020](#)
32. Shell, [Fourth quarter 2021 results](#)
33. According to Reclaim Finance calculations, based on Shell’s hydrocarbons and primary energy-equivalent renewable production plans. Refer to the methodology and datasheet for further details.
34. A net target is a target the company aims to achieve using offsets.
35. Targets can apply either to the absolute emissions (absolute amount of GHG emissions) or to the intensity of emissions (amount of GHG emissions per unit of energy produced)

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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 some financial actors, 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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