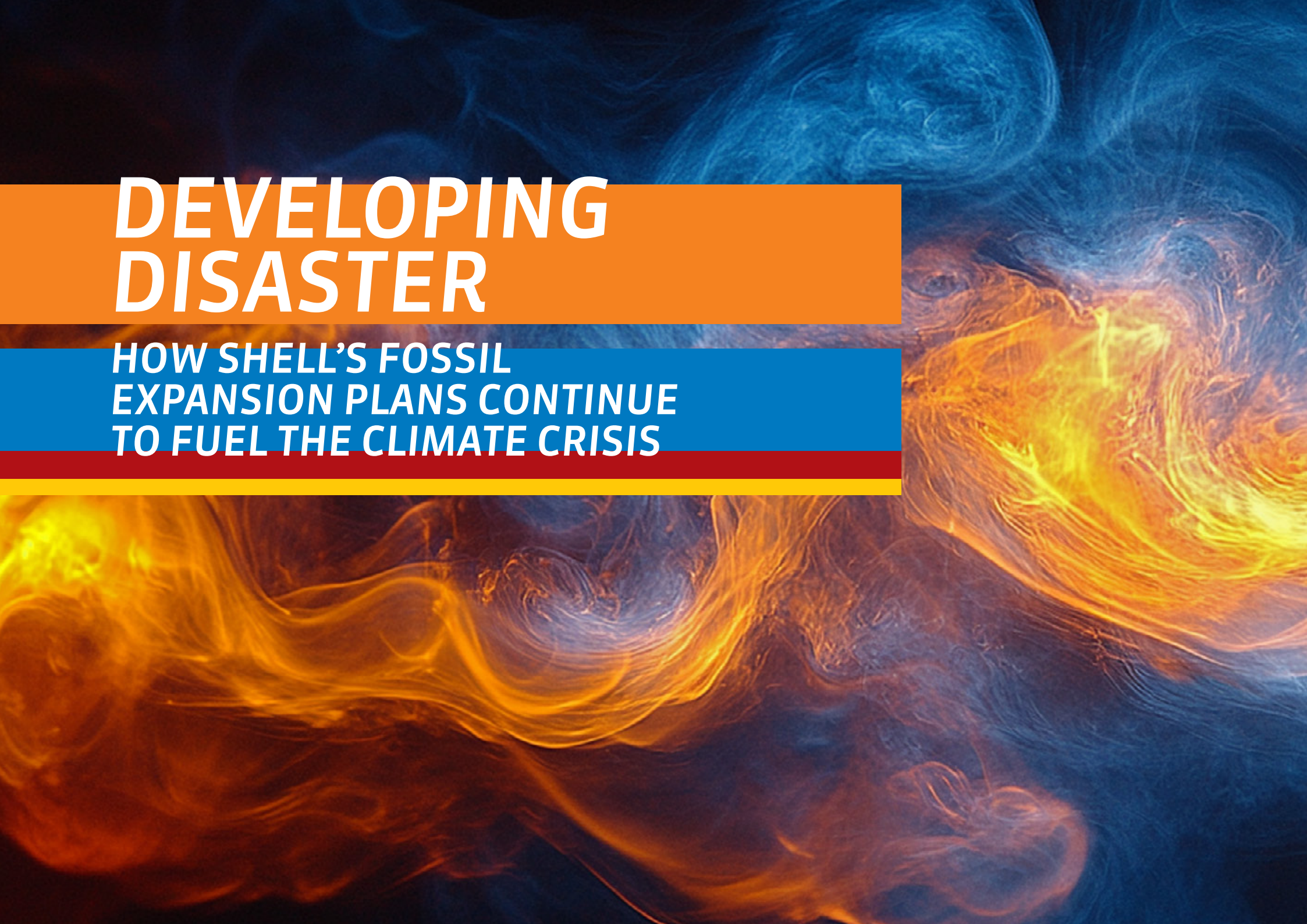

DEVELOPING DISASTER

HOW SHELL'S FOSSIL EXPANSION PLANS CONTINUE TO FUEL THE CLIMATE CRISIS

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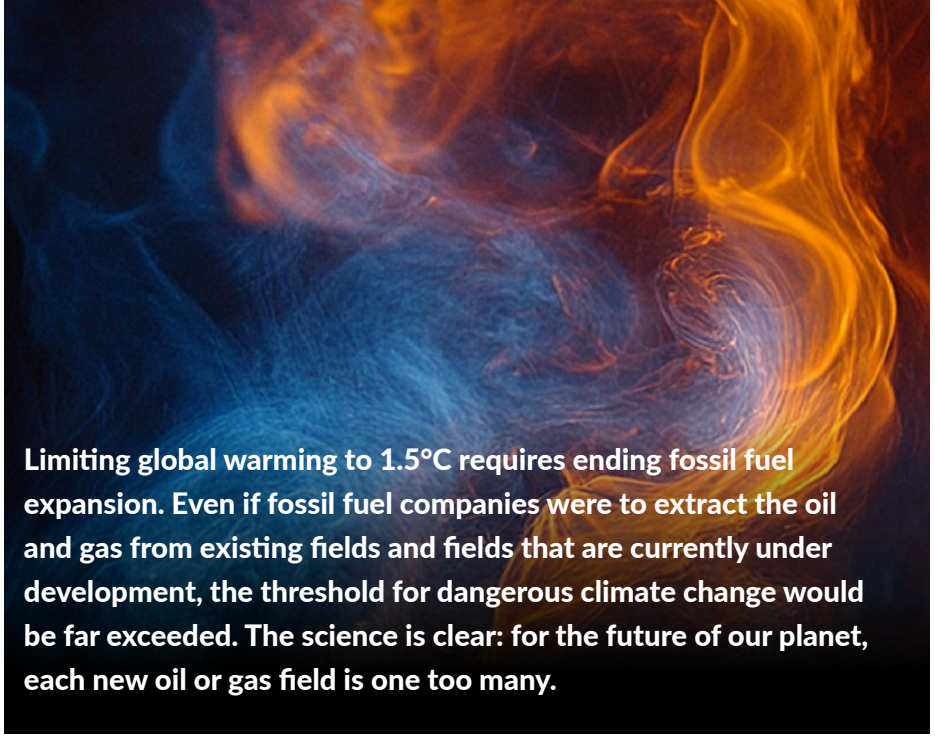
Milieudefensie is a Dutch environmental organisation and a member of Friends of the Earth International, the largest grass-roots environmental network in the world.

Global Witness is an investigative, campaigning organisation. We expose how the industries fuelling the climate crisis profit from destruction, and stand with the people fighting back to defend their communities and their rights.

1 INTRODUCTION & SUMMARY



Limiting global warming to 1.5°C requires ending fossil fuel expansion. Even if fossil fuel companies were to extract the oil and gas from existing fields and fields that are currently under development, the threshold for dangerous climate change would be far exceeded. The science is clear: for the future of our planet, each new oil or gas field is one too many.

Yet, today, Shell has 700 undeveloped oil and gas assets in its portfolio as the company continues exploration for even more new fields. The years leading up to 2030 are crucial to limit global warming to 1.5°C and prevent dangerous climate change. In this critical decade, global emissions need to be drastically reduced. However, as Shell continues to approve the development of new oil and gas assets, its associated CO_2 emissions will grow towards 2030.

This report is a follow-up to the briefings Oil Change International and Milieudefensie published in 2022 and 2024. While the number of individual undeveloped assets decreased since the 2024 briefing from 813 in 2024 to 700 in 2025, Shell's total volume of undeveloped oil and gas – and consequently, the amount of associated CO_2 emissions – has not. In the period from January 2024 to April 2025, Shell approved

another 13 oil and gas projects for development, bringing the total number of new fields approved for development up to 32 since the ruling of the District Court of The Hague in the *Milieudefensie v Shell* case in May 2021. Shell's development of new oil and gas diminishes the chances of the world to meet the goals of the Paris Agreement.

This report discusses the need to halt fossil fuel expansion in the context of the climate science (section 2), international commitments and legal and policy developments (section 3), the ruling of the Dutch Court of Appeal in the *Milieudefensie v Shell* case (section 4) and Shell's ever shrinking climate ambition (section 5), before outlining Shell's fossil fuel reserves and production plans (section 6).

It should be noted that Shell not only contributes to the climate crisis by producing oil and gas from its own fields, but Shell is also one of the largest and most integrated players in the oil and gas trade. Shell sells much more oil and gas from third-party producers than it produces itself. However, this report focuses solely on the production and emissions from Shell's upstream extraction.

BASED ON DATA FROM RYSTAD ENERGY, THESE ARE THE KEY FINDINGS:

- Out of the total number of 1196 oil and gas extraction assets (fields) that Shell fully or partly owns, 700 oil and gas assets (59%) are undeveloped, while 496 assets (41%) are developed.

- Over the past few years, the volume of oil and gas contained by Shell's undeveloped assets has increased. As of April 2025, Shell has 14.7 billion barrels oil equivalent (BOE) of undeveloped oil and gas resources in its portfolio. This is a 24% increase compared to September 2022, and unchanged compared to January 2024. By ceasing new oil and gas development after April 2025, Shell could keep 5.2 billion tonnes (Gt) of carbon pollution out of the atmosphere. For reference, 5.2 Gt CO_2 emissions are equivalent to 36 times the emissions of the Netherlands in 2024. An additional 5.6 Gt of CO_2 emissions are already committed by Shell's producing and under development projects.

- If Shell continues approving and developing assets, analysis of Rystad modelling indicates that Shell's oil and gas production and the CO_2 emissions caused by burning it could increase by 4% in 2030 compared to 2022. This is inconsistent with the IEA NZE scenario, which shows deep emission reductions for both oil and gas in 2030. To limit global warming to 1.5°C, global emissions need to be drastically reduced in the crucial decade leading up to 2030.

- If Shell extracts all of its commercially extractable oil and gas resources (developed and undeveloped), the resulting CO_2 from burning these fuels would amount to 10.8 Gt CO_2, equivalent to a quarter of all anthropogenic emissions in 2024. Based on these resource volumes, Shell's oil and gas extraction alone could exhaust as much as 5.4% of the world's remaining carbon budget for a 50% chance of holding warming to 1.5°C (based on a remaining carbon budget of 200 Gt CO_2 from the start of 2025).
- If Shell were to stop approving new projects for development from April 2025 onwards, it could prevent emissions associated with Shell's production from growing towards 2030, and by 2035, reduce them by 39% compared to 2022.
- Between May 2021 and April 2025, Shell has taken final investment decisions to develop 32 new oil and gas assets containing 2.7 billion barrels of oil and gas, set to impose over 972 Mt of CO_2 emissions on the world. This is equivalent to almost 7 times the emissions of the Netherlands in 2024. Some of these assets are projected to produce oil and gas for up to nearly 60 years.
- Of its total capital expenditure for oil and gas production through 2030 of USD 78 billion, Shell is expected to direct 50% (USD 38.9 billion) towards new oil and gas assets that have received a final investment decision after May 2021 or are still expected to receive a final investment decision until 2050.

Shell declined to comment when presented with the findings based on Rystad Energy modelling.

WHAT IS A NEW FIELD?

Shell's extraction assets can be broken down into four basic categories according to their stage of development, with different implications for global climate goals and Shell's own finances:

Developed assets (existing projects):

- Producing: Assets actively producing oil and gas.
- Under development: Assets for which a final investment decision (FID) has been made, but production has not yet started.

Undeveloped assets (potential new projects):

- Discovered: Assets Shell has already explored and announced discoveries of oil and gas it could choose to develop, but no FID has been made.
- Undiscovered (licensed but not yet explored): Assets where Shell has a stake in an exploration licence but has not yet finished exploration and/or confirmed a discovery.

2 NEW OIL AND GAS FIELDS WILL OVERSHOOT THE REMAINING CARBON BUDGET

The science is clear: if we want to prevent dangerous climate change, we have to reduce global greenhouse gas emissions drastically. In 2015, countries from around the world committed under the Paris Agreement keeping global warming well below 2°C and pursue "efforts to limit the temperature increase to 1.5°C".[1] Global CO_2 emissions need to be reduced by 48% by 2030 to limit global warming to 1.5°C.[2]

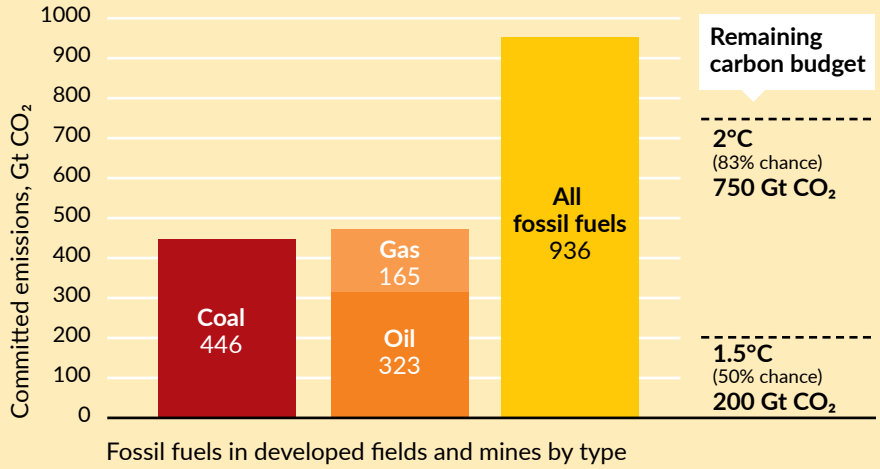
Now, almost 10 years after the Paris Agreement, the window of opportunity to achieve the Paris goals and secure a liveable and sustainable future is closing rapidly. The remaining carbon budget to have a 50% chance of limiting global warming to 1.5°C is 200 billion tonnes (Gigaton, Gt) CO_2 from the beginning of 2025.[3] If the world continues to emit greenhouse gases into the atmosphere at the current rate, the remaining carbon budget for 1.5°C will be exhausted within roughly 4 to 6 years.[4]

THE FOSSIL FUEL INFRASTRUCTURE OVERSHOOT

A key factor contributing to the risk of exhausting the remaining carbon budget is the fossil fuel industry: more than 80% of all CO_2 emissions come from the production and use of oil, gas and coal.[5] The fossil fuel-producing infrastructure of oil and gas fields and coal mines that is in place today threatens to cause more emissions than what is compatible with the remaining carbon budget. Peer-reviewed research shows that the global stock of oil and gas fields and coal mines that are in production and under development will push global warming far beyond 1.5°C.[6] If these projects are fully developed and exploited, they are estimated to cause 936 Gt CO_2 emissions and push emissions far beyond the 1.5°C threshold.[7] More than half of those committed CO_2 emissions are related to developed oil and gas fields – almost 2.5 times as much as the remaining carbon budget[8] (Figure 1).

FIGURE 1:

CO_2 emissions committed by developed oil and gas fields and coal mines, compared to remaining carbon budgets from 1 January 2025. This graph is designed by Milieudefensie and based on the sources indicated below.[9]



Source: Trout et al (2022),[10] *Forster et al (2024),*[11] *Friedlingstein et al (2025),*[12] *UNEP 2024*[13]

Given that there are already more fossil projects in place than what we can afford to burn, it is clear that fossil fuel companies need to stop new fossil fuel projects and drastically scale down the existing fossil fuel production.

THE EVIDENCE BASE IS STRONG

The Intergovernmental Panel on Climate Change (IPCC) cautions that "estimates of future CO_2 emissions from existing fossil fuel infrastructures without additional abatement already exceed the remaining carbon budget for limiting warming to 1.5°C".[14]
This committed overshoot of CO_2 emissions is only getting worse: according to the IPCC, more fossil infrastructure is being set up than being dismantled, which "may require more and faster retirement of fossil fuel-based infrastructures later".[15] Recent research underlines that selected representative pathways which limit global warming to 1.5°C with no or low overshoot do not require new oil and gas fields.[16]
The IPCC also warns that with continued investments and further expansion of fossil fuel infrastructure in the period up to 2030, it will even become much more difficult to limit global warming to 2°C.[17]

The International Energy Agency (IEA) already concluded in 2021 that under its Net Zero Emissions (NZE) scenario – a scenario consistent with a 50% chance of limiting global warming to 1.5°C – no new oil and gas fields and coal mines are required to meet global energy demand in line with the Paris Agreement.[18] In its 2023 update to the NZE scenario, the IEA states that "no new long lead time conventional oil and gas projects need to be approved for development".[19] Because the world has continued the fossil fuel expansion course after 2021, the IEA concludes in its 2023 NZE report that emissions have to decrease even steeper in the 2030s, which may imply the premature closure of oil and gas fields under the NZE scenario.[20] Halting new approvals of oil and gas fields is an important and logic step towards achieving the needed absolute emission reductions from oil and gas and needs to be accompanied by additional measures to also bring down emissions from existing production.

THE LOCK-IN EFFECT OF NEW FIELDS

Still, the fossil fuel expansion course continues. Every fossil fuel project requires large upfront investments. Whenever a company takes a final investment decision (FID), it commits to sinking a large amount of capital into the development of a project and the production of fossil fuels.
Fossil fuel projects like new oil and gas fields often require large initial investments which far exceed the later costs of operating them. It is then in the economic interest of companies to operate developed fossil fuel projects for as long as possible, to earn back their upfront investment and to make profits off them.[21] This creates a 'lock-in' effect, which can be reinforced by political and legal factors, such as the lobbying power of fossil fuel companies or legal claims of fossil firms under international investment law. The lock-in effect therefore makes a shutdown of producing fields and mines more costly than halting new projects.[22]

The window of opportunity to limit global warming to 1.5°C is closing quickly and requires immediate and deep emission reductions during this critical decade towards 2030.[23] Every new fossil fuel project will make achieving the thresholds of the Paris Agreement harder, and is an obstacle to bringing down fossil fuel emissions.

3 INSTITUTIONS WORLDWIDE RECOGNISE THE CLIMATE RISKS OF FOSSIL EXPANSION

An increasing number of institutions and countries worldwide is committing to halting new fossil fuel projects, aligning with climate science that emphasises the need to stop fossil fuel expansion to limit global warming.

More and more institutions are recognising the science that new fossil fuel projects are incompatible with climate goals, particularly the 1.5°C target. International commitments are increasingly shaping a 'no new fossil' standard. A prominent supranational initiative is the call for a Fossil Fuel Non-Proliferation Treaty. This is an effort led by governments, cities, scientists and international organisations from all over the world to end the expansion of coal, oil and gas, and to ensure an equitable phase-out of existing production.[24] Also António Guterres, the United Nations Secretary-General, has repeatedly urged countries to halt new fossil fuel projects, reinforcing the growing concern over the continued expansion of fossil fuels.[25] He specifically targeted companies in the oil and gas industry, calling them "Godfathers of climate chaos" on World Environmental Day 2024.[26]

The need to transition away from fossil fuels was already at the heart of the 2021 Conference of the Parties to the Climate Convention in Glasgow (COP26) with the Clean Energy Transition Partnership. Through this instrument, governments and financial institutions committed to halting public financing for new unabated fossil fuel projects.[27] Further cementing the growing global consensus, members of the Beyond Oil and Gas Alliance (BOGA),[28] formed during COP26, committed to ending new oil and gas licensing.[29] The BOGA Declaration outlines a shared engagement among national and subnational governments to end new licensing rounds, with a focus on aligning oil and gas production with the Paris Agreement goals.[30] Following this, the 'Integrity Matters: Net-Zero Emissions Commitments of Non-State Entities' report from the UN High-Level Expert Group at COP27 made specific recommendations regarding oil and gas, urging the end of (i) exploration for new oil and gas fields, (ii) the expansion of current reserves, and (iii) oil and gas production.[31] At COP28 in Dubai in 2023, 198 countries agreed on the need to transition energy systems away from fossil fuels to align with the Paris Agreement goals.[32] Parties will come together at COP30 in Brazil at the end of 2025 to take steps towards the implementation of this decision.[33]

The evolving commitment towards ceasing investments in new oil and gas is not confined to international climate agreements alone. Notable are recent developments in the United Kingdom (UK) and Norway. Two draft guidances by the UK government align with the growing legal push towards halting new fossil fuel projects. Both draft guidances accompanied by open consultations, stem from the UK Supreme Court ruling in the *Finch v Surrey County Council case* in June 2024[34] in which the Court held that Scope 3 emissions from the combustion of extracted oil had to be assessed as part of the Environmental Impact Assessment (EIA) accompanying the planning application. On 29 January 2025, the Court of Session in Scotland ruled in *Greenpeace and Uplift v Secretary of State and the Oil and Gas Authority* that the consents for Shell's Jackdaw gas project in the North Sea and Equinor's Rosebank oil field in the Atlantic are not valid, on the same basis as in the *Finch* case.[35] The first UK government's draft guidance was on the inclusion of Scope 3 emissions in EIAs for new oil and gas projects,[36] and in the second draft, the UK government envisages a ban for new exploration licenses in the North Sea.[37]

A similar legal development is taking place in Norway. Greenpeace Nordic and Natur og Ungdom have been challenging the approvals for the Breidablikk, Yggdrasil, and Tyrving offshore oil fields as their global climate impact was not assessed. The Oslo District Court put a temporary ban on the development of the fields, which was lifted by the Court of Appeal in October 2024, but Norway's Supreme Court has reversed that decision in April 2025, keeping the temporary ban in place.[38] The Norwegian State also appealed the judgement on the lawfulness of the permits in a separate case, which is set to be heard by the Court of Appeal in September 2025.[39] Both developments in the UK and in Norway underline the environmental cost of new fossil fuel projects, reinforcing the move towards scrutinising fossil fuel projects for their full climate impact.

These developments are not isolated but part of a broader trend of international commitments and legal rulings recognising the need to ban new fossil fuel projects. This highlights the increasing alignment of policy, law, and climate goals in driving the transition away from fossil fuels.

4 MILIEUDEFENSIE V SHELL RULING COURT OF APPEAL

In November 2024, the Dutch Court of Appeal in The Hague delivered its ruling in the Climate Case brought by Milieudefensie against Shell. Milieudefensie demanded that Shell reduce its CO_2 emissions by 45% by 2030 compared to 2019, in line with the Paris Agreement. In 2021, the District Court in The Hague ruled in favour of Milieudefensie. On appeal, the Court of Appeal ruled that Shell has a legal obligation to reduce its emissions and help combat dangerous climate change.[40]

However, the Court stated that it could not determine the exact percentage by which Shell must reduce its emissions, and subsequently annulled the 2021 court order. On 11 February 2025, Milieudefensie filed an appeal to the Dutch Supreme Court.

The Court of Appeal did, however, make several key findings regarding Shell's responsibilities and obligations in the context of human rights, dangerous climate change, and the energy transition.

PROTECTION FROM DANGEROUS CLIMATE CHANGE IS A HUMAN RIGHT

The Court of Appeal has ruled that there can be no doubt that protection from dangerous climate change is a human right. The Court has confirmed that climate change is the biggest problem of our time and states: "*Climate change damages the rights protected by Articles 2 and 8 ECHR [European Convention on Human Rights], both in the Netherlands and abroad, and will damage them even further*". In addition to Articles 2 and 8 ECHR the Court of Appeal refers to the UN, the *Urgenda* ruling of the Supreme Court and the *KlimaSeniorinnen* judgment of the European Court of Human Rights (ECtHR).

SHELL HAS A DUTY TO PROTECT HUMAN RIGHTS

The Court of Appeal has ruled that companies like Shell have a special obligation to inhabitants of our planet to limit their CO_2 emissions in order to combat dangerous climate change.[41] This is due to companies such as Shell being major contributors to climate change and having the capabilities to address the issue. This obligation applies even if it is not explicitly stated in the laws of the countries where the company operates. The Court also confirms that human rights provisions (such as those in treaties) can impact private law relationships. In this way, human rights can help shape open standards, like the societal standard of care, which sets expectations for companies.

SHELL MUST MAKE AN ADEQUATE CONTRIBUTION TO ACHIEVING THE PARIS CLIMATE GOALS

In light of the above, the Court of Appeal concludes that companies like Shell have their own responsibility in achieving the goals of the Paris Agreement.

NEW OIL AND GAS FIELDS COULD CONFLICT WITH THE PARIS AGREEMENT

The Court of Appeal further finds that oil and gas companies must take into account the negative impact that their investments may have on the energy transition. The Court of Appeal recognises that Shell is aware of the importance of preventing (further) carbon lock-in effect, caused by investments in new oil and gas fields (and other fossil fuel infrastructure). According to the Court, the energy transition will be "seriously slowed down" if fossil fuels are forced onto the market in the coming years, as this will prevent sustainable alternatives from competing effectively with oil and gas. The Court stated it could not provide a ruling on whether Shell's planned investments in new oil and gas fields conflict with Shell's duty of care because this was not in-scope of Milieudefensie's demand. However, the Court did explicitly find that Shell's planned investments in new oil and gas fields may be at odds with its responsibility in the light of the Paris Agreement.

SUPPLY OF FOSSIL FUELS SHOULD BE LIMITED

The Court of Appeal emphasises that global CO_2 emissions must be drastically reduced by 2030 in order to achieve the goals of the Paris Agreement. According to the Court, it is plausible that this goal cannot be achieved by reducing the demand for fossil fuels alone: supply must also be limited. Shell and other producers of fossil fuels must therefore fulfil their responsibility in this respect.

SHELL IS RESPONSIBLE FOR ITS SCOPE 3 EMISSIONS

Another key finding by the Court is that Shell bears responsibility not only for reducing their operational CO_2 emissions and those of their suppliers (Scope 1 and 2) but also for reducing the CO_2 emissions of their products (Scope 3).

5 SHELL'S EVER SHRINKING CLIMATE AMBITION

Even though Shell has a legal obligation to prevent dangerous climate change and respect human rights by reducing its CO_2 emissions, Shell's climate pledges are far away from being aligned with the Paris Agreement.

LACKING ABSOLUTE EMISSION REDUCTION TARGETS

Shell does not have a target that ensures that Shell will reduce its total Scope 1, 2 and 3 emissions towards 2030. In 2021, Shell announced that it aims to halve its Scope 1 and 2 emissions by 2030 relative to 2016.[42] Shell's Scope 1 and 2 emissions make up only 5% of Shell's total emissions.[43] Until 2023, Shell reported that it had achieved a 31% reduction of Scope 1 and 2 emissions already,[44] of which a large part was due to divestments.[45] Towards 2030, Shell bets on "portfolio changes" (including divestment), carbon credits and carbon capture and storage, among others, to halve its Scope 1 and 2 emissions.[46]

In 2024, Shell for the first time introduced an ambition to reduce its absolute Scope 3 emissions related to the sale of oil products with 15-20% by 2030, relative to 2021.[47] However, this is an ambition, not a target, and it does not lead to a reduction of Shell's total emissions. Shell is simultaneously planning to grow its Liquefied Natural Gas (LNG) sales with 20-30% in 2030 compared to 2022.[48] This planned growth in LNG sales threatens to undo the potential emissions reductions from any possible reduced sale of oil products. During the hearings in the appeal phase of the *Milieudefensie v Shell* case, Shell stated that it expects its "total Scope 3 emissions will remain more or less the same through to 2030" due to the planned growth of Shell's LNG business.[49]

NET CARBON INTENSITY TARGETS DO NOT ENSURE EMISSION REDUCTIONS

To achieve its headline pledge of 'net-zero emissions by 2050', Shell has implemented a 'Net Carbon Intensity' (NCI) target.[50] In essence, Shell's NCI measures the amount of CO_2 emission relative to every unit of energy Shell sells.[51] A company like Shell can reduce its emissions intensity by selling more renewable energy without meaningfully reducing its fossil fuel sales. An intensity target like Shell's NCI target does therefore not guarantee the absolute emissions reductions that are needed to align with the Paris Agreement.

Since publishing its 'Powering Progress' strategy in 2021, Shell pledged to reduce its NCI with 20% by 2030, 45% by 2035, and 100% by 2050 (compared to 2016).[52] In 2024, Shell watered down these already inadequate targets: the company now only aims for a 15-20% reduction by 2030 and removed the 2035 NCI target altogether.[53] Shell prides itself on already having achieved reductions of its NCI in 2022, 2023 and 2024.[54] The largest driver for Shell to achieve its NCI target for 2030 is an increase in electricity sales.[55]

THE LARGEST BUYER OF CARBON CREDITS

Another factor that helped Shell achieve its NCI target for 2023 was its use of carbon credits.[56] Carbon credits certify that Shell invested in projects that claim to protect nature and prevent CO_2 emissions, such as reforestation projects. The use of carbon credits does not mean that Shell emits any less CO_2. In essence, Shell pays others to capture or prevent CO_2 emissions and then counts this towards its own emissions balance. The use of carbon credits is highly contested[57] and international climate experts strongly discourage the use of carbon credits for achieving emission reductions.[58] However, this has not stopped Shell from using carbon credits to label tankers filled with fossil LNG as 'carbon neutral'.[59] In 2024, Shell was the biggest purchaser of carbon credits worldwide.[60]

SHRINKING INVESTMENTS IN RENEWABLES

Shell prides itself on being a "significant investor in the energy transition", committed to spending USD 10-15 billion on 'low-carbon solutions' between 2023 and 2025.[61] This budget includes the acquisition of existing businesses in the low-carbon sector, carbon offsetting and carbon capture and storage, among others.[62] Only a fraction of that is going towards renewable energy, and this spending on renewable energy is shrinking. In 2024, Shell invested USD 1.026 billion in solar and wind energy, accounting only for 4.9% of its total cash capital expenditures of USD 21.085 billion.[63] That is less than Shell's spending on wind and solar energy of 6.5% a year earlier in 2023.[64]

NON-BINDING AND CONDITIONAL

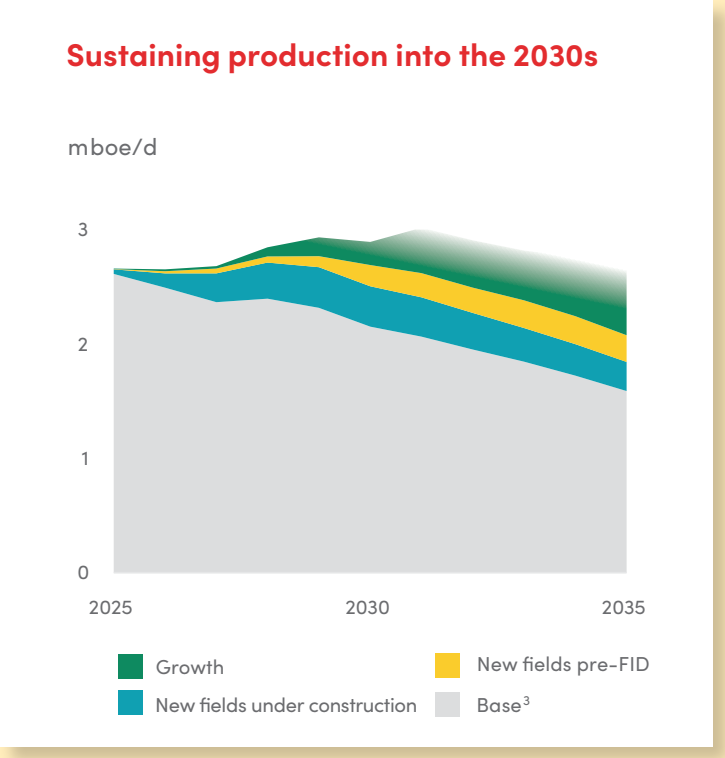
None of Shell's climate ambitions, targets and commitments are binding. Shell warns in fine print that the achievement of all of its "forward-looking statements", which would include its climate ambition and climate targets, are conditional and dependent on many different circumstances and actual results are not guaranteed.[65] As a result of this, Shell's ambition to reduce Scope 3 emissions from oil products by 15-20% in 2030 is nothing more than a prognosis of future changes in the global oil market, which Shell made clear during the oral hearings of the appeal phase of the *Milieudefensie v Shell* climate case.[66]

CONTINUED EXPANSION OF SHELL'S FOSSIL FUEL BUSINESS

Shell is continuously exploring for new oil and gas. From 2025 onwards, Shell does not aim to pursue exploration activities in locations where oil and gas have not been discovered and extracted yet by Shell and other companies.[67] However, Shell's exploration activities elsewhere continue. In 2024, Shell was actively exploring oil and gas resources in 23 countries[68] and spent USD 2.4 billion on exploration, a 38% increase compared to the previous year.[69]

Shell aims to keep oil production stable towards 2030 at 1.4 million barrels per day while scaling up its gas production on average by 1% per year.[70] Based on Shell's most recent update of its business plans on 25 March 2025, Shell is on track to grow its total oil and gas production beyond 2030 and committed to "sustaining production into the 2030s" (Figure 2).[71] Figure 2 shows that Shell expects to realise this growth through new oil and gas resources.

FIGURE 2:
Shell's projected production 2025-2035
as announced during Shell's Capital Markets Day 2025



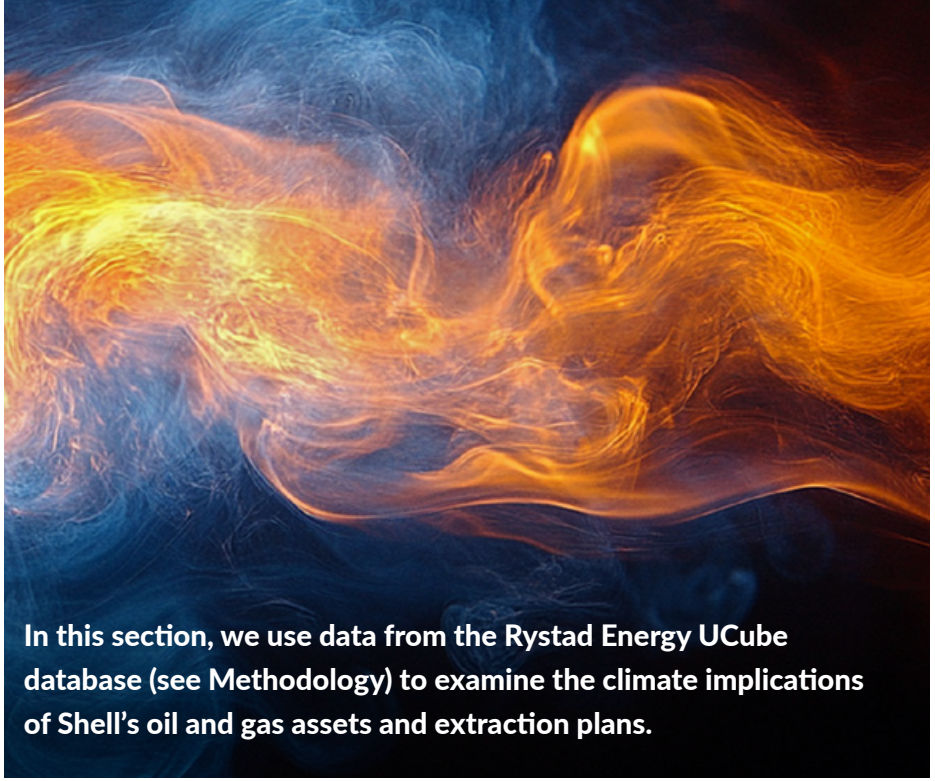
Source: Shell, Capital Markets Day 2025[72]

HOW SHELL IS DRIVING FOSSIL DEMAND

Shell states that it is aiming to adapt its energy portfolio to its customers' changing energy needs as the energy transition evolves.[73]

However, Shell is lobbying actively for continued fossil fuel demand. A 2024 report from the Australasian Centre for Corporate Responsibility (ACCR) found that Shell does not disclose much of its lobbying in emerging markets – lobbying that aims to build and expand fossil fuel markets, oppose the transition away from fossil fuels, and promote fossil fuel production.[74]

6 SHELL'S EXPANSION PLANS FOR NEW OIL AND GAS



In this section, we use data from the Rystad Energy UCube database (see Methodology) to examine the climate implications of Shell's oil and gas assets and extraction plans.

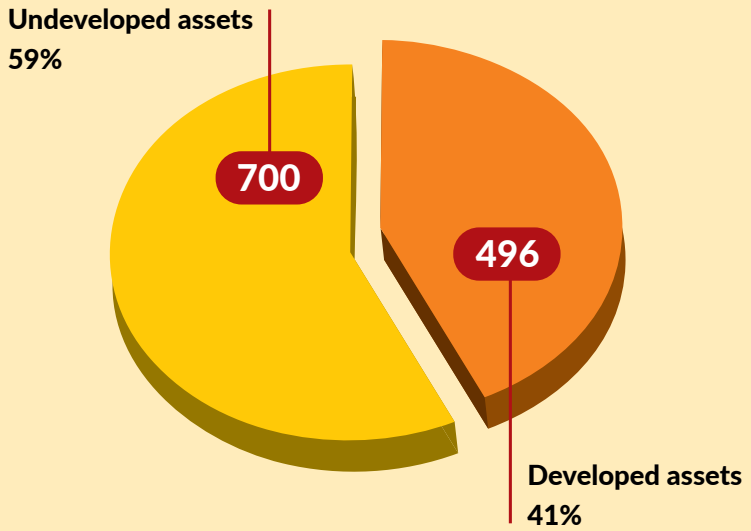
SHELL'S OIL AND GAS RESOURCES

According to data from Rystad Energy, Shell has 1196 oil and gas extraction assets (fields) that it fully or partly owns. Of these, 496 assets (41%) are already developed while the majority of 700 assets (59%) is undeveloped (Figure 3).[A]

In total, Shell's oil and gas extraction assets (developed and undeveloped) hold an estimated 29.9 billion barrels of oil equivalent (BOE) of oil and gas, according to Rystad data (Table 1). This volume of oil and gas is equivalent to 29 times Shell's production at 2024 levels.[75]

A According to the 2024 Shell briefing from Oil Change International and Milieudefensie, Shell had 1386 oil and gas assets at the beginning of January 2024, of which 813 assets were undeveloped and 573 assets were developed, see Oil Change International and Milieudefensie, "Shell vs. The Climate: Expanding Oil and Gas, Fueling the Climate Crisis", 2024. The downward shift of the number of assets in this year's briefing may be caused by a variety of factors, such as ownership changes (acquisitions and divestment), the maturation of assets through their lifecycle, and economic factors, among other factors (see also Methodology).

FIGURE 3:
Count of Shell's oil and gas extraction assets, by developed vs undeveloped



Source: Global Witness using data from the Rystad Energy UCube (April 2025). We exclude marginal assets estimated to have less than 50 thousand barrels of commercial resources.

If Shell extracts all of these resources, burning them would release 10.8 billion tonnes (Gt) of CO_2. This is equivalent to more than a quarter of global anthropogenic CO_2 emissions in 2024.[76] Based on these resource volumes, Shell's oil and gas extraction alone could exhaust as much as 5.4% of the world's remaining carbon budget for a 50% chance of limiting warming to 1.5°C (based on a remaining carbon budget of 200 Gt CO_2 from the start of 2025). This is before accounting for the additional and larger portion of carbon emissions caused by the oil and gas Shell sells but does not directly produce itself.

TABLE 1:
Shell's commercially extractable oil and gas resources and estimated CO_2 emissions from combustion by stage of development (as of April 2025)

Stage of development	Oil and gas resources, Billion BOE	Projected CO_2 emissions from combustion, Billion tonnes CO_2
Producing	11.8	4.4
Under development	3.4	1.2
Discovered	11.7	4.1
Undiscovered	3.0	1.1
Total	**29.9**	**10.8**

Source: Global Witness' calculations using data from the Rystad Energy UCube (April 2025)

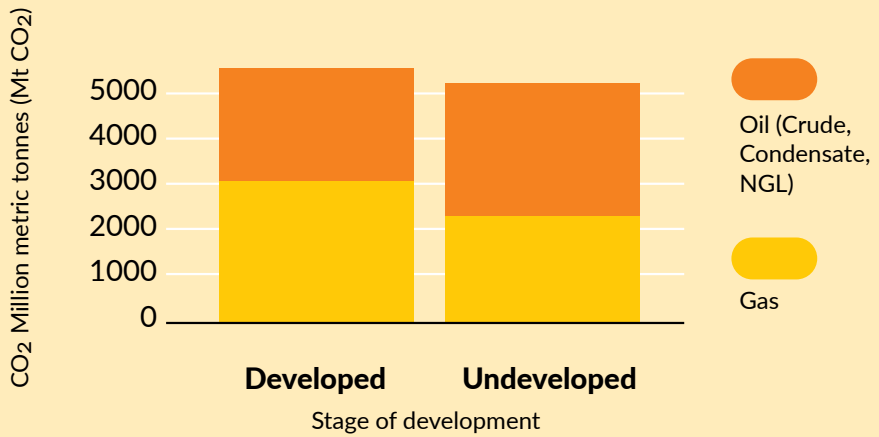
When only considering Shell's developed assets (both producing and under development), the volume of these assets is still equivalent to almost 15 times Shell's production at the 2024 level.[77]

Shell's total estimated oil and gas resources and the carbon emissions that would result from burning these are slightly lower than the results of the 2024 briefing. Since January 2024, Shell's volume of resources in producing assets has declined by 19%, partly driven by divestments.[78] At the same time, Shell is not leaving undeveloped oil and gas in the ground, but actively continuing to explore for and bring new oil and gas resources closer to development. Rystad projections show that the amount of Shell's undeveloped resources has grown over the last years. As of April 2025, Shell's undeveloped assets amount to 14.7 billion BOE. This is close to 24% larger than in September 2022 and equal to the amount of Shell's undeveloped oil and gas resources in January 2024.[B] By ceasing new oil and gas development as of April 2025, Shell could help keep these 14.7 billion BOE of oil and gas in the ground, and the associated 5.2 Gt of carbon pollution out of the atmosphere (Table 1; Figure 4). For reference, 5.2 Gt CO_2 are equivalent to 36 times the CO_2 emissions of the Netherlands in 2024.[79]

B The September 2022 analysis found that Shell had 11.9 billion BOE in undeveloped resources at that time (Oil Change International and Milieudefensie, "Shell's Fossil Fuel Production: Still Pushing the World Towards Climate Chaos," 2022). In January 2024, Shell's undeveloped resources were 14.7 billion BOE (Oil Change International and Milieudefensie, "Shell vs. The Climate: Expanding Oil and Gas, Fueling the Climate Crisis", 2024).

FIGURE 4:

Projected CO_2 emissions from burning Shell's remaining oil and gas resources, by fuel and by life cycle category (developed vs undeveloped resources)



Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

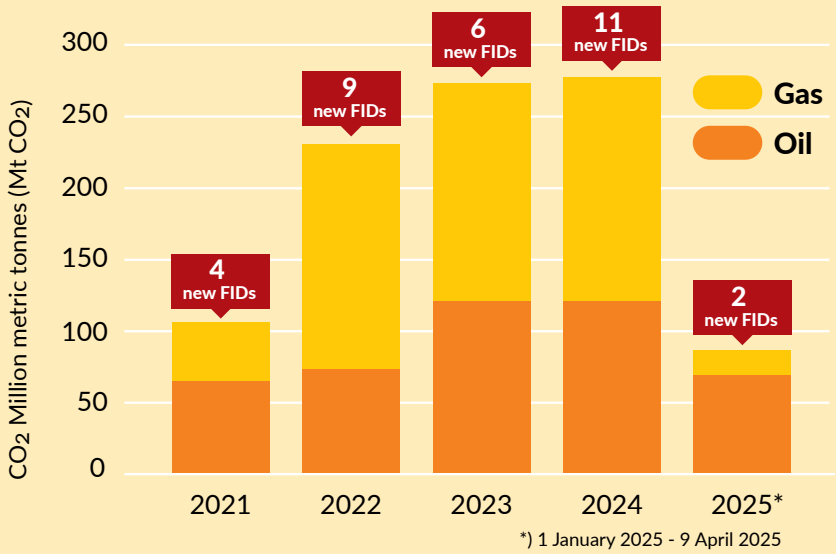
SHELL'S NEWLY APPROVED OIL AND GAS ASSETS SINCE THE MILIEUDEFENSIE V SHELL JUDGMENT 2021

In 2021, when the District Court of The Hague issued its judgment in *Milieudefensie v Shell*,[80] there were already clear indications that there was no room for new oil and gas development.[81] As of April 2025, we tracked that Shell had made final investment decisions to develop 32 new oil and gas assets containing over 2.7 billion BOE between the District Court's judgment of May 2021 and April 2025 (see Appendix Table A1). Of these 32 new oil and gas assets, Shell has approved 13 assets between January 2024 and April 2025. Some of these assets are expected to produce oil and gas far beyond 2050, the year in which the world needs to reach net-zero emissions to keep global warming below 1.5°C. The QatarGas T12 (North Field) project in Qatar, for example, is projected to start producing oil and gas in 2028 and continue extraction for almost 60 years until the year 2087 – almost 40 years later than the year in which the world needs to reach net-zero emissions.

Figure 5 shows the cumulative CO_2 emissions that these 32 assets could cause if their reserves are brought into production and fully extracted. Cumulatively, Shell's new assets approved between May 2021 and April 2025 could cause 972 Mt of CO_2 emissions, equivalent to almost 7 times the emissions of the Netherlands in 2024.[82]

FIGURE 5:

Projected cumulative CO_2 emissions from Shell's new oil and gas approvals by CO_2 emissions approved per year between May 2021 and April 2025. For assets approved in 2021, they were also checked to confirm the FID had been given after the May 2021 court ruling.[C] FIDs = final investment decisions.



Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

C Since the publication of Oil Change International's and Milieudefensie's 2024 Shell briefing based on Rystad data from January 2024, Rystad reassigned the approval year of one asset from 2022 to 2024 and also reassigned resource volumes of this asset. This explains why in Figure 5 the number of FIDs and associated CO_2 emissions for the year 2022 differ from the 2024 briefing (see Appendix Table A1).

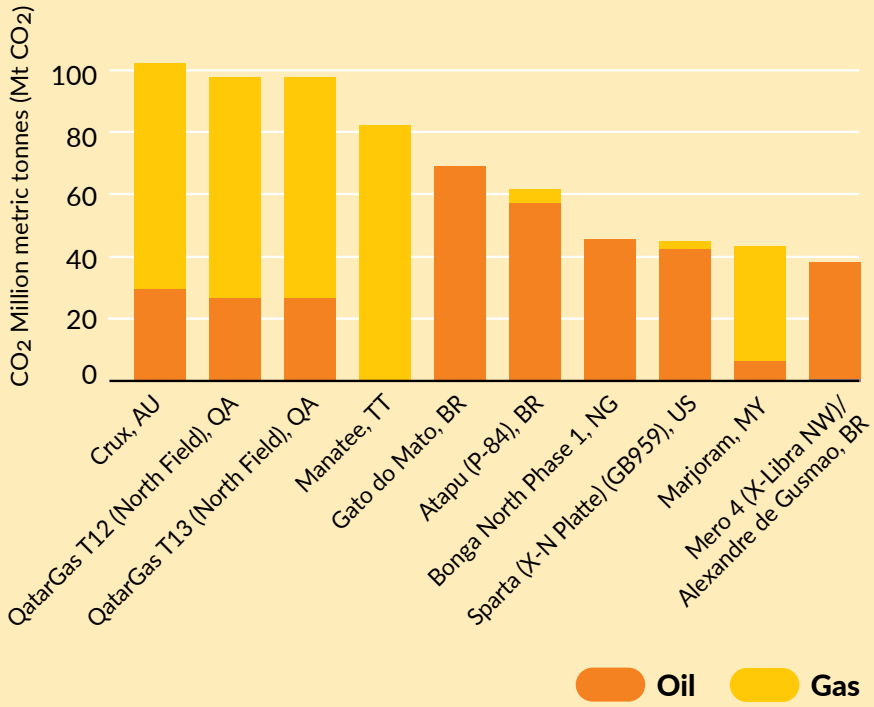
Figure 6 shows the recently approved assets with the largest potential CO_2 emissions associated with the combustion of the respective oil and gas reserves. Although we track 32 new assets approved for development since May 2021, the top 10 new projects alone account for 70% of the projected total CO_2 emissions that will result from these 32 projects, led by offshore developments in Australia and by Shell's stake in a LNG expansion project in Qatar. The Qatar LNG project is one of the largest 'carbon bombs' under development in the world.[83] Since publication of the previous briefing in 2024, Shell has also approved major offshore gas developments in Trinidad and Tobago,[84] Brazil[85] and Nigeria,[86] among others.

SHELL'S OIL AND GAS PRODUCTION: ON TRACK TO GROW IF NEW DEVELOPMENT CONTINUES

Shell states in its reporting that it is aiming to keep its oil production stable towards 2030 at 1.4 million barrels per day. At the same time, Shell plans to grow its gas production with an average of 1% every year towards 2030, as part of company plans to increase LNG sales on average by 4-5% per year between 2025 and 2030.[87]

FIGURE 6:

Top 10 new extraction assets approved for development since May 2021, by projected CO_2 emissions from combustion of reserves



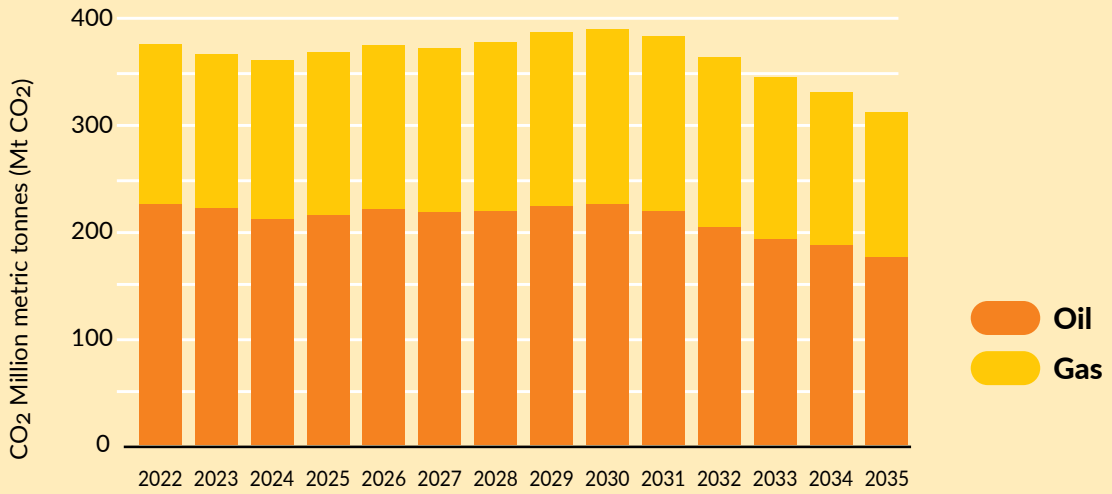
Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

These trends are reflected in Rystad Energy's projections of Shell's oil and gas production trajectory to 2035 (Figure 7). Rystad Energy modelling indicates that Shell's production and associated emissions could grow towards 2030 – with a 4% increase projected between 2022 and 2030, led by growing gas production (Figure 7).[D] In this critical decade, Shell's projected production plans would lead to a growth in associated emissions, instead of the decline that is necessary to keep global climate targets within reach. Based on current Rystad projections, the emissions associated with Shell's oil and gas production would only start to decline after 2030. By 2035, Rystad's projections model a 16% decrease in emissions compared to 2022.

Shell's own future projections released during Shell's Capital Markets Day on 25 March 2025 paint an even more worrying picture than the Rystad estimations depicted in this briefing: Shell projects that its future production grows beyond 2030 and commits to "sustaining production into the 2030s" (see also Figure 2, p. 18).[88]

FIGURE 7:

Projected CO_2 emissions from Shell's annual oil and gas extraction, 2022-2035, by oil vs gas [E]



Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

D Based on Rystad projections, the emissions associated with Shell's oil and gas production could rise to 391 Mt CO_2 in 2030, compared to 375 Mt CO_2 in 2022, an increase of 4%.

E Even though estimated emissions associated with Shell's production based on Rystad data decline towards 2035 (and beyond), it is not a given that this decline will ultimately materialise due to the fact that Shell continues to explore and develop new fields. Because Rystad bases its future production estimates on current investment plans and assumptions, it is a given that the production resulting from these current investment plans will decline again in the medium term. However, Shell shows no intent to stop developing new fields and – as explained in the main text – indicates that it is committed to "sustaining production into the 2030s". Therefore, it is actually unlikely that the visualised long-term decline in production will materialise, with Shell planning to continue exploration and development of new oil and gas resources. Shell's own data indicates that this decline will not materialise (see Figure 2).

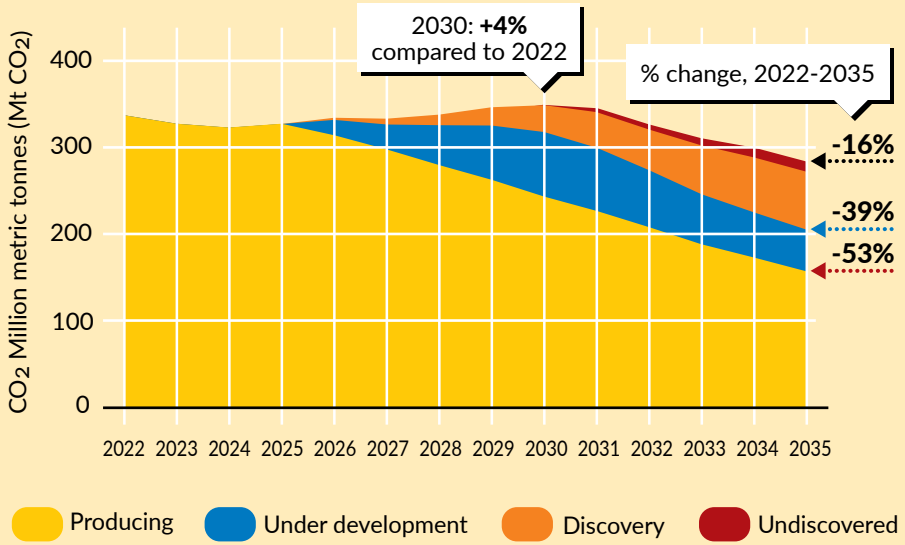
Figure 8 shows how the associated emissions of Shell's oil and gas production would evolve over the coming years, depending on whether Shell continues its fossil fuel expansion course or stops the development of new oil and gas assets.

If Shell were to stop approving new projects for development from April 2025 onwards, it would leave enough oil and gas in the ground such that emissions associated with Shell's production would not rise by 2030, and by 2035, reduce them by 39% compared to 2022. If Shell would also stop new oil and gas projects currently under development from April 2025 onwards, Shell could achieve a 53% reduction in 2035, compared to 2022.

Again, we emphasise that the CO_2 emissions discussed here and depicted in Figure 8 and Figure 9 relate only to the climate impact of Shell's upstream production and do not account for the company's total emissions associated with its oil and gas sales to end users.

FIGURE 8:

Projected CO_2 emissions from Shell's annual oil and gas extraction, 2022-2035, by producing, under development, and undeveloped fields [F]



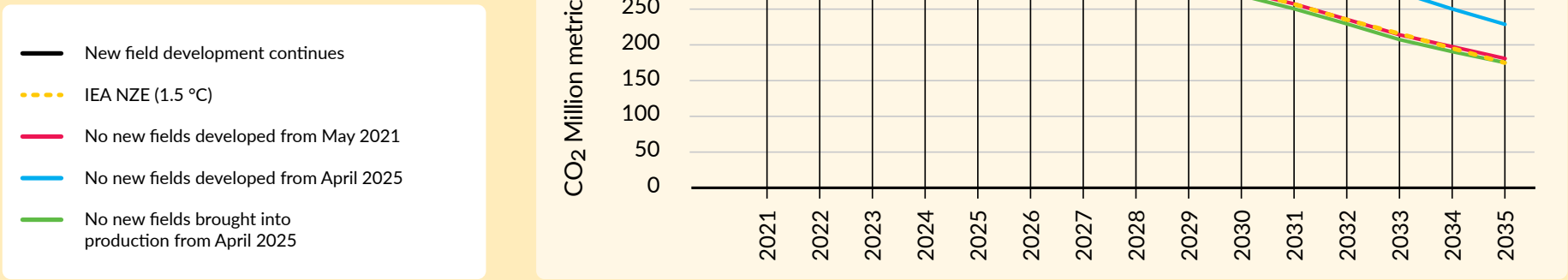
Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

F Undeveloped fields include those that are discovered or undergoing exploration as of April 2025. The largest part of the emissions associated with undeveloped fields through 2035 would come from those already in the discovery stage, with a small fraction also projected to come from fields in exploration. This reflects the long lead times between making a discovery and bringing a new field into production.

Continuing business as usual means that Shell locks in new carbon emissions. How large the effects of business as usual and postponing ending the development of new oil and gas resources is becomes clear in Figure 9. Figure 9 shows how emissions associated with Shell's oil and gas production under a business-as-usual scenario (black line) compare to scenarios in which Shell were to stop approving new fields as of May 2021 (verdict in the *Milieudefensie v Shell* case) (red line), and in which Shell were to stop approving new fields or bringing new fields into production as of April 2025 (blue and green lines). We compare these lines to the IEA's NZE scenario.

FIGURE 9:

CO_2 emissions from Shell's annual oil and gas extraction by scenario, compared to oil and gas CO_2 emissions under IEA scenarios[G]



G Average annual percentage decline rates were calculated for oil and gas based on the NZE scenario (2023 Update) between 2022, 2030, 2040 and 2050. These percentage decline rates were then applied to Shell's emissions from oil and gas in 2022 and projected up to 2035. In the NZE scenario, CO_2 emissions from oil and gas decline somewhat faster to 2030 than total oil and gas supply due to assumptions regarding CO_2 emissions avoided via CCS and oil used for non-energy uses.

Source:
Global Witness calculations using data from the Rystad Energy UCube (April 2025), IEA (2023)[89]

Figure 9 shows that if Shell had stopped approving new oil and gas fields immediately after the verdict in the climate case of *Milieudefensie v Shell* in May 2021, it could have accomplished an emission reduction of 27% by 2030, compared to 2022 (Table 2). This would have put Shell on a path in which the emissions associated with its oil and gas production would have been closer to aligning with the global oil and gas pathway following from the IEA NZE scenario. It should be noted that the IEA NZE projects that emissions in advanced economies fall almost two-times faster towards 2030 than emissions in emerging markets and developing economies.[90]

Shell chose a different path. After the verdict in the climate case of *Milieudefensie v Shell* and the IEA's first publication of the NZE scenario in May 2021, Shell approved 32 new oil and gas projects which decreased the prospects of emission reductions towards 2030 and 2035 drastically. In this critical decade, Shell wasted valuable time by continuing to approve new fields for development. The longer Shell continues approving new oil and gas projects, the further it misaligns its business with global climate goals.

Shell can still go a long way by heeding the warning of the Court of Appeal that Shell's intended investments in new oil and gas fields may conflict with its responsibility to keep within reach the goals of the Paris Agreement. If Shell no longer approves new fields from April 2025 onwards, Shell can prevent the emissions associated with its oil and gas production from growing towards 2030, compared to 2022, and achieve a 39% reduction by 2035, compared to 2022. An ever higher reduction would be achieved by also halting projects that are currently under development: no longer bringing new fields into production after April 2025 would lead to a reduction of the emissions associated with Shell's oil and gas production by 28% in 2030 and 53% by 2035, compared to 2022.

TABLE 2:

Percent change in oil and gas CO_2 emissions in Shell production scenarios 2022-2035

	New field development continues	No new field approval from May 2021	No new field approval from April 2025	No new fields brought into production from April 2025
% change, 2022 to 2030	+4%	-27%	-6%	-28%
% change, 2022 to 2035	-16%[H]	-51%	-39%	-53%

Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

H Even though estimated emissions associated with Shell's production based on Rystad data decline towards 2035 (and beyond), it is not a given that this decline will ultimately materialise due to the fact that Shell continues to explore and develop new fields. See also footnote E on page 25.

INVESTING IN NEW FOSSIL FUEL ASSETS

Rystad Energy's projections of Shell's future investments in its oil and gas production reveal a concerning misalignment with international climate goals. For the period through 2030, Shell will invest more than USD 78 billion into its oil and gas assets, based on Rystad projections. This is equivalent to more than USD 13 billion per year. These numbers align closely with Shell's announced capital expenditure (capex) of USD 12 to 14 billion per year on upstream production over the period 2025 to 2028.[91] From 2030 through 2035, Rystad projects that Shell's expected capex on its oil and gas production will be another USD 52 billion, and another USD 43 billion from 2035 through 2040.

Despite the clear evidence that new fossil fuel projects are not compatible with limiting global warming to 1.5°C, Shell will spend a large share of its future oil and gas investments on the development of new oil and gas projects, according to Rystad projections. Of the total capex for oil and gas production through 2030 of USD 78 billion, Shell will direct 50% (USD 38.9 billion) towards new oil and gas assets that have received a final investment decision after May 2021 or are expected to receive a final investment decision until 2050.[I] In the same period, when only considering projects that have not yet received a final investment decision as of April 2025, Shell is projected to spend close to USD 30 billion on undeveloped assets, according to Rystad projections. This comes down to 38% of Shell's total capex on all oil and gas assets through 2030.

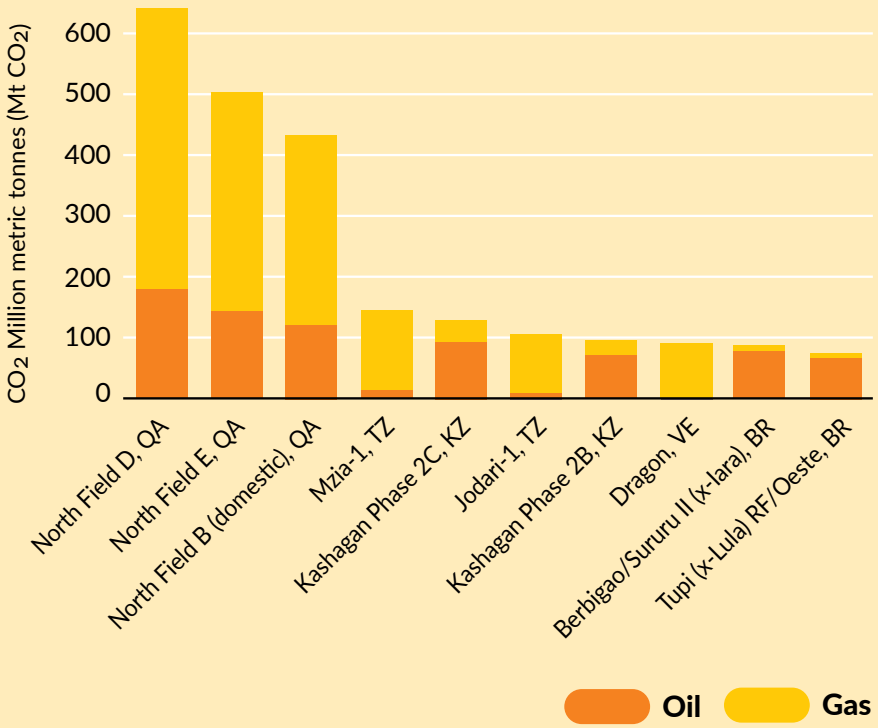
This data only captures the capex Shell is projected to spend exploring for, developing, and sustaining upstream production. This compares to what Shell reports as Upstream capex, plus Shell's Integrated Gas segment capex going towards upstream LNG production (which Shell does not disaggregate in its own Integrated Gas reporting). This data excludes projections for Shell's capex on midstream and downstream fossil fuel and petrochemical infrastructure. Thus, Shell's total capex on oil and gas activities is expected to be much higher.

Figure 10 and Figure 11 depict some of the most significant undeveloped conventional assets that could receive Shell's future investment if the company continues to invest in new oil and gas extraction. Figure 10 and Figure 11 indicate Shell's particular focus on developing new oil and gas assets in Qatar, Brazil, Kazakhstan and Tanzania. While gas is the primary resource in the discovery stage, oil dominates among the most significant exploration assets. Whilst Shell sold off its major fracking assets in the U.S., Shell still holds significant undeveloped resources in the Vaca Muerta and Montney shale plays in Argentina and Canada, respectively, the largest fracking hotspots outside of the U.S.

I For assets that are projected to receive a final investment decision between 2030 and 2050, the spending through 2030 includes activities that bring these assets closer to development, such as exploration and appraisal activities.

FIGURE 10:

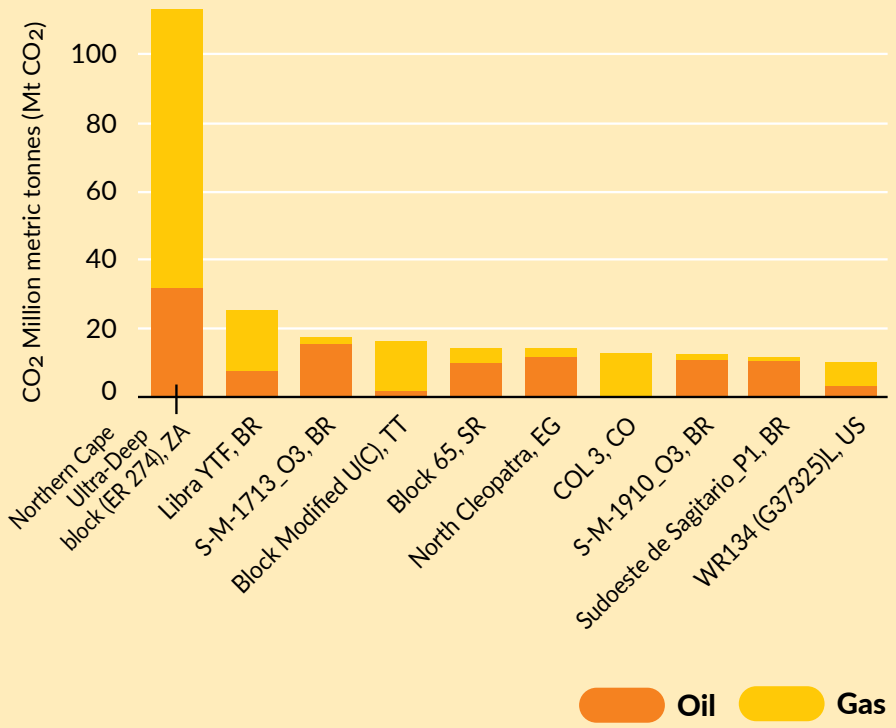
Top 10 Shell discovered assets by projected cumulative future CO_2 emissions



Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

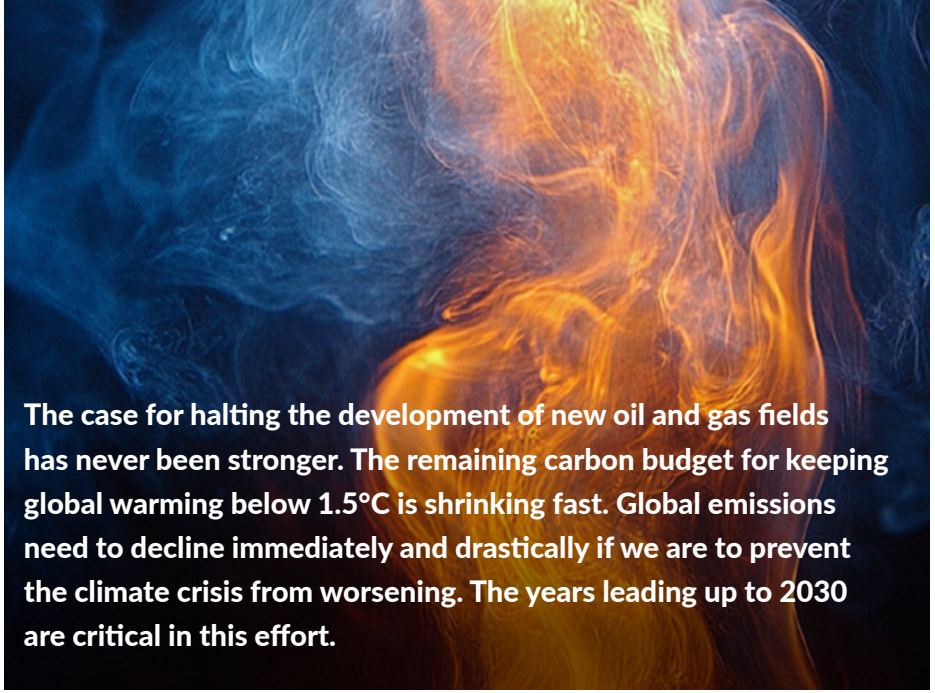
FIGURE 11:

Top 10 Shell undiscovered assets by projected cumulative future CO_2 emissions



Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

7 CONCLUSION



The case for halting the development of new oil and gas fields has never been stronger. The remaining carbon budget for keeping global warming below 1.5°C is shrinking fast. Global emissions need to decline immediately and drastically if we are to prevent the climate crisis from worsening. The years leading up to 2030 are critical in this effort.

The current fossil infrastructure is already set to deplete the remaining carbon budget for 1.5°C, with committed emissions related to developed oil and gas fields already being almost 2.5 times higher than the remaining carbon budget. It is therefore a necessary and common-sense step to halt the development of new oil and gas fields.

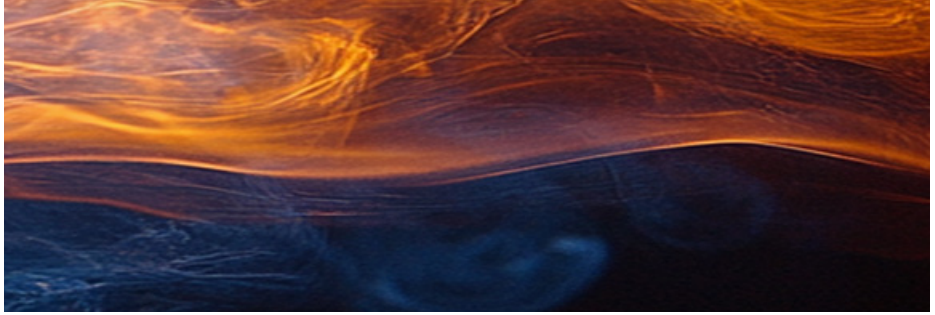
International institutions recognise the climate risks of fossil expansion and emphasise the need to halt the development of new fossil fuel projects. Among institutions, scientists and courts, a new norm of halting new fossil fuel developments has been materialising.
Shell has a legal obligation to reduce its emissions and combat dangerous climate change. The ruling on appeal in November 2024 confirmed that Shell must reduce its emissions and stated that its intended investments in new oil and gas fields may conflict with its responsibility to keep the goals of the Paris Agreement within reach.

Yet, Shell's climate ambition and fossil fuel expansion plans directly contradict the Court's statements and the 'no new fossil fuels' norm that is increasingly being recognised internationally.

During a time when global emissions must drastically decrease, Shell continues to explore for and develop new oil and gas assets. As of April 2025, Shell has a stake in 700 undeveloped assets which contain 24% more oil and gas than Shell's undeveloped assets in 2022. Towards 2030, Shell is projected to expand its oil and gas production compared to 2022, leading it off-track from a scenario aligned with the 1.5°C threshold and in direct contradiction to Shell's legal obligation to reduce its emissions.

If Shell had stopped the development of new oil and gas fields after the ruling in the climate case of *Milieudefensie v Shell* in in May 2021, Shell could have achieved a 27% reduction of the emissions associated with its oil and gas production towards 2030, compared with 2022. However, Shell chose to approve another 32 new oil and gas fields between May 2021 and April 2025. If Shell continues its business in developing new gas and oil fields as before, the Scope 3 emissions related to Shell's oil and gas production are set to grow by 4% by 2030, compared to 2022. If Shell, however, halts the development of new projects from April 2025 onwards, it could prevent emissions associated with its production from growing towards 2030, and by 2035, reduce them by 39% compared to 2022.

With its fossil fuel expansion plans, Shell bets on sustaining fossil fuel demand and heads for a climate disaster. Every new oil and gas field that Shell approves risks deepening the carbon lock-in, accelerating the depletion of the remaining carbon budget for 1.5°C and aggravating the climate crisis. Shell should have stopped approving new oil and gas fields years ago. The second best moment to do it is now.



8 APPENDIX

I. METHODOLOGY

The data and projections in this briefing relate to Shell's current upstream oil and gas asset base as of 9 April 2025. Data on Shell's commercial oil and gas resources and future oil and gas production and upstream capex are derived from Rystad Energy's UCube database, unless otherwise specified.

Rystad Energy's UCube is a commercial, asset-based database and model that contains reserves, production, economics and valuation data for every oil and gas field, discovery and exploration licence globally. Historical data and forward projections span 1900 to 2100, and are updated monthly. Projections are based on Rystad's assessment of the geology and costs of each asset – using governmental databases, company presentations, professional and scientific reports, media reports, and independent analyses – and the asset's expected rate of return, under a future oil price forecast.

The projections used in this analysis are sensitive to Rystad's base Brent oil price case as of 9 April 2025. This base price case sees an average oil price of USD 70/bbl (barrel) over the medium to long term (in real $2025).

For context, this base price case assumption falls in between long-term price cases associated with the IEA's Stated Energy Policies Scenario and Announced Policies Scenarios.[92]

The estimates of Shell's recoverable oil and gas resources and future production represent net volumes, according to Shell's ownership share in each asset and excluding production owed to governments and thus not saleable by Shell. Oil volumes include crude oil, condensate, and natural gas liquids. The data accounts for asset divestments executed by Shell before 9 April 2025. Thus, the results in the briefing do not account for asset sales Shell has announced but not yet completed.
Calculations of the CO_2 emissions that would result from burning Shell's resources and production in the future are done by Global Witness. Global Witness applied CO_2 emissions factors of 0.42 tCO_2/bbl of crude oil and condensate, 0.23 tCO_2/bbl of natural gas liquids, and 54.7 tCO_2/Mmcf of gas to the oil and gas volumes taken from Rystad. These emissions factors are derived from the IPCC.[93]

Rystad Energy updates its UCube data on a monthly basis, utilising data from companies, governments, agencies and other sources which undergo Rystad's quality control and validation procedure before being fed into the database. With every monthly Rystad data release, geological and economic information for oil and gas assets, among other data that feeds Rystad's forward-looking and backward-looking estimates, may be updated. The most recent update of Rystad data reflects Rystad's most up-to-date estimations of historic, current and future production and reserves. Consequently, this briefing's findings in regards to Shell's estimated production, resources and associated emissions may differ from the findings of previous briefings and potential future findings.

II. SHELL'S NEWLY APPROVED OIL AND GAS EXTRACTION SINCE THE MILIEUDEFENSIE V SHELL JUDGMENT 2021[J]

TABLE A1

Asset	Country	Oil and gas resources, Million BOE [K]	Projected CO_2 emissions from combustion, Mt CO_2	FID date / year [L]	Start Year [M]	End Year [N]
Whale (AC772)	United States	77	30	July 2021 [94]	2025	2056
Timi	Malaysia	79	26	August 2021 [95]	2023	2044
Mero 4 (x-Libra NW) (Alexandre de Gusmao)	Brazil	89	38	August 2021 [96]	2025	2041
Ormen Lange Subsea Compression	Norway	37	12	September 2021 [97]	2025	2041
Crux	Australia	309	104	May 2022 [98]	2027	2063
Jackdaw (30/2a- 6)	United Kingdom	53	18	July 2022 [99]	2026	2049
Rosmari	Malaysia	83	27	September 2022 [100]	2026	2063
Marjoram	Malaysia	129	43	September 2022 [101]	2026	2065
Rydberg (MC525)	United States	26	11	September 2022 [102]	2024	2057

J Compared to Oil Change International's and Milieudefensie's 2024 Shell briefing based on Rystad data from January 2024, Rystad has reassigned the approval years and oil and gas resource volumes for a number of assets, which explains differences to last year's briefing. To make the number of new fields approved since the 2024 briefing more visible, these have been indicated in blue.

K Based on Shell's ownership share in the asset.

L 'FID date / year' is the date or year in which a financial investment decision has been taken for an asset.

M 'Startup year' is the date an asset has started production or is estimated to start production.

N 'End year' is the historical or forecasted last year of production for an asset.

TABLE A1 (CONTINUED)

Asset	Country	Oil and gas resources, Million BOE [K]	Projected CO_2 emissions from combustion, Mt CO_2	FID date / year [L]	Start Year [M]	End Year [N]
Geronggong	Brunei	20	8	October 2022 [103]	2025	2049
Jagus East	Brunei	20	8	October 2022 [104]	2025	2049
Karachaganak Expansion Project 1B	Kazakhstan	15	6	November 2022 [105]	2027	2058
Irpa (Asterix)	Norway	13	4	November 2022 [106]	2026	2038
Lapa (x-Carioca) Southwest (BM-S-9)	Brazil	21	9	January 2023 [107]	2025	2053
QatarGas T12 (North Field)	Qatar	296	99	2023 [108]	2028	2087
QatarGas T13 (North Field)	Qatar	296	99	2023 [109]	2028	2087
Dover (MC612)	United States	45	18	March 2023 [110]	2025	2057
WDDM Phase 10	Egypt	9	3	July 2023 [111]	2025	2035
Sparta (x-N Platte) (GB959)	United States	109	45	December 2023 [112]	2028	2061
Mabrouk North East (Block 10) (FFD Phase 2)	Oman	88	30	2024 [113]	2028	2064
Victory (207/01- 3)	United Kingdom	25	8	January 2024 [114]	2026	2047
Iseni (Okpokunou Cluster)	Nigeria	16	5	February 2024 [115]	2026	2056
Lambert West (NWS project)	Australia	2	1	2024 [116]	2025	2037
Troll Phase 3 Step 2	Norway	27	9	May 2024 [117]	2026	2054
Atapu (P-84)	Brazil	150	62	May 2024 [118]	2029	2054
Manatee	Trinidad and Tobago	249	82	July 2024 [119]	2027	2048

TABLE A1 (CONTINUED)

Asset	Country	Oil and gas resources, Million BOE [K]	Projected CO_2 emissions from combustion, Mt CO_2	FID date / year [L]	Start Year [M]	End Year [N]
Miles – SGP North Stage 1 (Alderly, Castledean, Yeronga),	Australia	24	8	August 2024 [120]	2026	2070
Miles – SGP North Stage 2 (Alderly, Kedron, Guluguba, Punchbowl, Yeronga)	Australia	43	14	August 2024 [121]	2028	2071
Vito (Waterflood)	United States	33	14	August 2024 [122]	2027	2057
Bonga North Phase 1	Nigeria	108	46	December 2024 [123]	2028	2061
HI	Nigeria	52	17	2025 [124]	2027	2044
Gato do Mato	Brazil	163	69	2025 [125]	2029	2052
Total		**2710**	**972**			

Source: Global Witness calculations using data from the Rystad Energy UCube (April 2025)

III. COMPARING TO SHELL'S REPORTED DATA ON RESERVES, PRODUCTION, AND SCOPE 3 EMISSIONS

RESOURCE ESTIMATES

Reserves of oil and gas are a measure of how much can be extracted, given a company's plan for investments and operations. They constitute a subset of the total amount of the oil and gas resources that are geologically in place.

Given their inherent uncertainty, oil and gas resources are generally quoted in terms of low estimates, best estimates, and/or high estimates. The three common measures of reserves are 1P (P90, or proven), 2P (P50, or proven+probable), and 3P (P10, or proven+probable+possible).[O] Shell and other companies are required to report proven, or 1P, reserves in their financial statements and annual reports because this provides investors with a highly conservative estimate for evaluating financial risk. Proven reserves represent a likely underestimate of future extraction from projects already producing or under development – by definition, the amount ultimately extracted is very likely to be higher.[P]

Rystad's estimate of Shell's 1P reserves closely aligns to that of Shell.[Q] The Rystad UCube estimates used in this analysis are best estimates of what will eventually be extracted: in technical terms, the expectation value or probabilistic mean.[126,R] This measure is appropriate for assessing the climate risk of Shell's future production, as it reflects the most likely amount that will be extracted. For developed fields, Rystad UCube estimates used in this briefing are similar (though not equivalent to) 2P estimates. For undiscovered fields, they are comparable to best estimates of commercially recoverable, prospective resources (or 'unrisked', i.e., less certain, shale).

To our knowledge, Shell does not publish estimates of its commercial resources that are directly comparable to Rystad's. Shell's March 2025 Capital Markets Day presentation includes a graph illustrating Shell and Wood Mackenzie estimates of commercial 2P+2C resources of Shell compared to other oil and gas majors. In this graph, Shell's estimate of its commercial resources (2P+2C) is around 20 billion BOE (with the exact amount and date of the estimate unspecified).[127]

O P90, P50 and P10 refer to the probabilities that the amount extracted will be higher than the stated estimate. In this sense, P50 (also known as a median) may be considered a "best estimate," in that the amount extracted is as likely to be higher as it is to be lower.

P For proven reserves, there is a 90% probability that the amount ultimately extracted will exceed the reserves estimate.

Q The Rystad UCube estimates Shell's 1P reserves as 9412 million BOE at 7 March 2025, compared to Shell's reported 1P reserves of 9990 million BOE at 31 December 2024. See Shell, "Annual Report 2024," p. 49.

R In technical terms, this is the 'PMean' value. For aggregating resource estimates across many fields, the mean is a better estimate of expected future extraction than the median (P50) value because it accounts for the lower-probability, larger quantities (the right-hand tail of the distribution), which become significant when considered across many fields. In practice, the median and mean will often be similar values, although they differ depending on the probability distribution.

PRODUCTION

We use the Rystad UCube for data on Shell's historical production as well as forward looking projections in order to maintain comparability across the data. The Rystad UCube's data on Shell's historical production is aligned with that reported by Shell but differs slightly due to methodology (e.g., Rystad data differs from Shell's by -3% to -7% for years 2021 to 2024, with Rystad data being more conservative than Shell's reported production data). Rystad's production data is sourced by asset, and then distributed across companies based on their ownership in each asset. These bottom-up estimates are then benchmarked against company reporting.

CO_2 EMISSIONS

Our estimates of CO_2 emissions resulting from combusting Shell's oil and gas production represent a portion of Shell's total Scope 3 emissions. A larger portion of Shell's reported Scope 3 emissions come from oil and gas Shell sells but does not directly produce. In 2024, Shell reported 1084 Mt CO_2e of Scope 3 emissions, 845 Mt CO_2e of which are attributed to oil and gas sold by Shell (Scope 3, category 11). In previous years, Shell distinguished the emissions from sold product coming from "own production" (319 Mt CO_2e (36%) in 2023) and from third-party production sold by Shell (559 Mt CO_2e (64%) in 2023).[128] In this case, Shell bases estimates of emissions from its own production on its refinery and gas processing facility production, rather than its total production from the point of extraction.[129] This is a key reason our estimates of annual emissions attributable to combustion of Shell's extracted oil and gas (eg, 366 Mt CO_2 in 2023 in Figure 6) differ from Shell's reporting of end-use emissions from direct sales of "own production." We estimate emissions based on total upstream extraction volumes. In either case, Shell sells more oil and gas than it directly produces.

IV. INTERPRETING THE IEA'S NZE SCENARIO

The IEA's 2021 NZE scenario states, "Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required."[130] In subsequent updates to the scenario, the IEA has reconfirmed that "there is no need for investment in new coal, oil and natural gas", whilst also making a technical clarification that 'new oil and gas' refers to "new long lead time conventional oil and gas projects".[131]

By definition, this includes final investment decisions to develop new conventional oil and gas fields. The IEA clarifies that its scenario includes some ongoing investment in unconventional shale production because of its high decline rates, but this is in the context of steady declines in shale drilling and does not justify new infrastructure.[132] Otherwise, investment is limited to existing oil and gas fields in terms of minor field extensions, infill drilling, and other measures to moderate decline rates from those fields.[133] Because global fossil fuel production and use has tracked higher to date in the 2020s than in the 2021 NZE scenario, leading to higher carbon pollution, the IEA now sees significantly faster declines in oil and gas supply in the 2030s compared to the 2021 version. The implication is that a higher proportion of production from fields already operating or approved as of 2021 and 2022 will need to be shut in prematurely.[134]

9 NOTES

1 UNFCCC, "Paris Agreement", 2015, https://unfccc.int/sites/default/files/english_paris_agreement.pdf

2 IPCC, "Summary for Policymakers", In: Climate Change 2023: Synthesis Report, Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. Geneva, Switzerland, 2023, doi: 10.59327/IPCC/AR6-9789291691647.001, p. 21

3 A remaining carbon budget of 200 Gt CO_2 for limiting global warming to 1.5°C as of the beginning of 2025 is an estimated mid-value based on different studies. Pierre Friedlingstein et al, "Global Carbon Budget 2024", Earth Syst. Sci. Data, 2025, https://doi.org/10.5194/essd-17-965-2025 estimate that as of January 2025, the remaining carbon budget for a 50% chance of limiting 1.5°C is 235 Gt CO_2. Piers M. Forster et al, "Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence", https://doi.org/10.5194/essd-16-2625-2024 estimate in Table 8 that the remaining carbon budget as of the beginning of 2024 is 200 Gt CO_2 for a 50% of limiting global warming to 1.5°C. Similarly, the UNEP Emissions Gap Report 2024 also states on p. XVII a remaining carbon budget of 200 Gt CO_2 as of the beginning of 2024. Considering that according to Friedlingstein et al (2025), global anthropogenic emissions were 40.6 Gt CO_2 in 2023 and 41.6 Gt CO_2 in 2024, this leaves a remaining carbon budget for 1.5°C of ca. 170 Gt CO_2 as of the beginning of 2025. 200 Gt CO_2 from the beginning of 2025 for 1.5°C therefore provides an estimated mid-value between these estimates based on different sources.

4 Considering a remaining carbon budget estimate for 1.5°C between 170 Gt CO_2 and 235 Gt CO_2 as of the beginning of 2025 and annual emissions of 41.6 Gt CO_2 in 2024 (see note 3 above), the remaining carbon budget will be depleted in 4 to 6 years.

5 IPCC, "Technical Summary", In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.002. Figure TS.3 on p. 62 shows that in 2019, 29% of total global anthropogenic emissions came from burning oil, 33% from burning coal, and 18% from burning gas, with an additional 1% coming from flaring off excessive gas during production and processing of oil and gas.

6 Kelly Trout et al, "Existing fossil fuel extraction would warm the world beyond 1.5 °C", Environ. Res. Lett. 2022, https://iopscience.iop.org/article/10.1088/1748-9326/ac6228

7 Kelly Trout et al, "Existing fossil fuel extraction would warm the world beyond 1.5 °C", Environ. Res. Lett. 2022, https://iopscience.iop.org/article/10.1088/1748-9326/ac6228

8 Kelly Trout et al, "Existing fossil fuel extraction would warm the world beyond 1.5 °C", Environ. Res. Lett. 2022, https://iopscience.iop.org/article/10.1088/1748-9326/ac6228

9 For the estimated remaining carbon budget for a 50% chance of limiting global warming to 1.5°C, see note 3 above. The estimated remaining carbon budget for limiting global warming to 2°C is based on the finding from Forster et al (2024) that the remaining carbon budget for a 83% chance of limiting global warming to 2°C is 750 Gt as of the beginning of 2024 and the annual emissions of 41.6 Gt CO_2 in 2024, according to Friedlingstein et al (2025), which reduces the remaining carbon budget for a chance of 83% to limit global warming to 2°C to roughly 710 Gt CO_2 as of the beginning of 2025.

10 Kelly Trout et al, "Existing fossil fuel extraction would warm the world beyond 1.5 °C", Environ. Res. Lett. 2022, https://iopscience.iop.org/article/10.1088/1748-9326/ac6228

11 Piers M. Forster et al, "Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence", Earth Syst. Sci. Data, 2024, https://doi.org/10.5194/essd-16-2625-2024

12 Pierre Friedlingstein et al, "Global Carbon Budget 2024", Earth Syst. Sci. Data, 2025, https://doi.org/10.5194/essd-17-965-2025

13 United Nations Environment Programme, Emissions Gap Report 2024: No more hot air ... please! Nairobi. https://doi.org/10.59117/20.500.11822/46404, 2024, p. XVII

14 IPCC, Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, doi: 10.59327/IPCC/AR6-9789291691647. In footnote 42 on p. 20, the IPCC lays out that abatement refers to "human interventions that reduce the amount of greenhouse gases that are released from fossil fuel infrastructure to the atmosphere"

15 IPCC, "Emissions Trends and Drivers", in IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.004, p. 267

16 Fergus Green et al, "No new fossil fuel projects: The norm we need", Science, 2024, https://doi.org/10.1126/science.adn6533

17 IPCC, "Mitigation pathways compatible with long-term goals", in IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.005, p. 298.

18 IEA, Net Zero by 2050, p. 21

19 IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach, p. 55

20 IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach, pp. 150-151

21 Fergus Green et al, "No new fossil fuel projects: The norm we need", Science, 2024, https://doi.org/10.1126/science.adn6533

22 Fergus Green et al, "No new fossil fuel projects: The norm we need", Science, 2024, https://doi.org/10.1126/science.adn6533

23 IPCC, Press Release: "The evidence is clear: the time for action is now. We can halve emissions by 2030", 1 April 2022, https://www.ipcc.ch/site/assets/uploads/2022/04/IPCC_AR6_WGIII_PressRelease_English.pdf

24 The idea for a Fossil Fuel Non-Proliferation Treaty is organised by governments, civil society, Indigenous, grassroots and other leaders, particularly from the Global South, and aims to compliment the work being advanced by the Beyond Oil and Gas Alliance and the Power Past Coal Alliance. Countries formally engaging in discussions on developing a Fossil Fuel Non-Proliferation Treaty consist of 16 nation-states, backed by 120 cities and subnational governments, the EU Parliament and the World Health Organisation. See: https://fossilfueltreaty.org/about-treaty.

25 United Nations, "Secretary-General's video message for press conference to launch the Synthesis Report of the Intergovernmental Panel on Climate Change", 20 March 2023, https://www.un.org/sg/en/content/sg/statement/2023-03-20/secretary-generals-video-message-for-press-conference-launch-the-synthesis-report-of-the-intergovernmental-panel-climate-change

26 United Nations, "There is an exit off 'the highway to climate hell', Guterres insists", 5 June 2024, https://news.un.org/en/story/2024/06/1150661

27 "Statement on International Public Support for the Clean Energy Transition", https://cleanenergytransitionpartnership.org/the-statement/

28 BOGA is an international alliance of governments and stakeholders working together to facilitate the managed phase-out of oil and gas production. Its core members are Denmark, Costa Rica, France, Greenland, Ireland, The Marshall Islands, Portugal, Quebec, Samoa, Spain, Sweden, Tuvalu, Vanuatu, Wales and Washington State. Associate Members are Belize, California and New Zealand. Friends of BOGA are Chile, Colombia, Fiji, Finland, Italy, Kenia and Luxembourg. See: https://beyondoilandgasalliance.org/

29 BOGA, "At COP26, 11 National and Subnational Governments Launch The Beyond Oil & Gas Alliance", https://beyondoilandgasalliance.org/wp-content/uploads/2021/11/11-10-21-BOGA-Press-Release.pdf, p. 4: "Oil and gas production is defined as upstream exploration, development and production of oil and gas up to, but not including, midstream and downstream activities"

30 BOGA, "At COP26, 11 National and Subnational Governments Launch The Beyond Oil & Gas Alliance", https://beyondoilandgasalliance.org/wp-content/uploads/2021/11/11-10-21-BOGA-Press-Release.pdf, p. 4

31 UN High-Level Expert Group, Integrity Matters: Net Zero Commitments by Businesss, Financial Institutions, Cities and Regions, 2022, p. 24

32 UNFCCC, "First global stocktake. Proposal by the President. Draft decision -/CMA.5. Outcome of the first global stocktake", https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf, 2023, p. 5,

33 "First Letter from the President of COP30, Ambassador André Corrêa do Lago", 10 March 2025, https://cop30.br/en/brazilian-presidency/letter-from-the-brazilian-presidency

34 UK Supreme Court, R (on the application of Finch on behalf of the Weald Action Group) (Appellant) v Surrey County Council and others (Respondents), 20 June 2024, https://supremecourt.uk/cases/uksc-2022-0064

35 Court of Sessions of Scotland, 'Petitions by Greenpeace Limited & Uplift for Judicial Review', 29 January 2025, https://www.scotcourts.gov.uk/media/v0zkbsxy/2025csoh10-petitions-by-greenpeace-limited-and-uplift-for-judicial-review.pdf

36 UK Department for Energy Security & Net Zero, "Environmental Impact Assessment (EIA) – Assessing effects of scope 3 emissions on climate: Draft supplementary guidance for assessing the effects of scope 3 emissions on climate from offshore oil and gas projects", October 2024, https://assets.publishing.service.gov.uk/media/6722411910b0d582ee8c4928/Supplementary_EIA_guidance_-_Effects_of_Scope_3_Emissions.pdf

37 UK Department for Energy Security & Net Zero, "Open consultation: Building the North Sea's energy future", 5 March 2025, https://www.gov.uk/government/consultations/building-the-north-seas-energy-future

38 See for more information: Supreme Court of Norway, 'The Court of Appeal's order set aside in case regarding petroleum fields in the North Sea', https://www.domstol.no/en/supremecourt/rulings/rulings-2025/supreme-court---civil-cases/HR-2025-677-A/

39 The decision of the Court of Appeal on the merits is pending the outcome of proceedings on preliminary questions in the context of Scope 3 emissions by the European Free Trade Area. See Greenpeace Nordic and Nature & Youth v. Energy Ministry (The North Sea Fields Case) (2023, pending) https://climatecasechart.com/non-us-case/the-north-sea-fields-case-greenpeace-nordic-and-nature-youth-v-energy-ministry/

40 Gerechtshof den Haag 12 November 2024, ECLI:NL:GHDHA:2024:2100

41 "Especially companies whose products have contributed to the creation of the climate problem and have it in their power to contribute to combating it are obliged to do so vis-à-vis other inhabitants of the earth, even when (public law) rules do not necessarily compel them to do so." see para. 7.26 of the ruling of the Court of Appeal in Milieudefensie v Shell, https://uitspraken.rechtspraak.nl/details?id=ECLI:NL:GHDHA:2024:2100 .

42 Shell, Powering Progress Summary, 2021, p. 9

43 In 2024, Shell's Scope 1 and 2 emissions were 58 Mt CO_2e, while Shell's Scope 3 emissions were 1084 Mt CO_2e, according to Shell's Annual Report 2024, pp. 94 and 97

44 Shell, Energy Transition Strategy 2024, p. 47

45 Shell, Annual Report 2024, p. 95

46 Shell, Energy Transition Strategy 2024, p. 47

47 Shell, Energy Transition Strategy 2024, p. 9

48 Shell, Energy Transition Strategy 2024, p. 22

49 Vragen van het Hof en antwoorden van Shell hoger beroep Klimaatzaak Shell, para 8.2.3 (in Dutch) https://milieudefensie.nl/actueel/vragen-van-het-hof-en-antwoorden-van-shell-hoger-beroep-klimaatzaak-shell

50 Shell, Energy Transition Strategy 2024, p. 9

51 Shell, Energy Transition Strategy 2024, p. 10

52 Shell, Energy Transition Progress Report 2021, p.6

53 Shell, Energy Transition Strategy 2024, p. 10, footnote [D]

54 Shell, Energy Transition Strategy 2024, p. 10

55 Shell, Energy Transition Strategy 2024, pp. 49-50

56 Shell, Energy Transition Strategy 2024, pp. 41 and 50

57 Jutta Kill, Simon Counsell, Milieudefensie, How Shell is Using Nature Based Solutions to Continue Its Fossil Fuel Agenda, 2022, https://en.milieudefensie.nl/news/2486-f19b4682dbb1aaeeb1bff8680f75c70b-2.pdf

58 UN High-Level Expert Group, Integrity Matters: Net Zero Commitments by Businesss, Financial Institutions, Cities and Regions, 2022, p. 19

59 Shell, "First carbon neutral LNG cargo delivered in Europe", 8 March 2021, https://www.shell.com/business-customers/trading-and-supply/trading/news-and-media-releases/first-carbon-neutral-lng-cargo-delivered-in-europe.html Sustainability Report 2022, p. 30

60 AlliedOffsets, "2024 End of Year Report: VCM 2024 Review and Emerging Trends for 2025", 2025, p. 18

61 Shell, Energy Transition Strategy 2024, p. 7

62 In 2023, Shell acquired the biogas company Nature Energy for almost USD 2 billion, counting towards Shell's cash capital expenditure in low-carbon energy solutions, see Shell, Annual Report 2023, p. 64. Shell's low-carbon energy solutions comprise those products that have a lower carbon intensity than its conventional hydrocarbon products, see Shell, Annual Report 2024, p. 87. 'Environmental Solutions', which comprises projects for carbon offsetting, fall within Shell's low-carbon category, see Shell, Annual Report 2024, p. 71

63 Shell, Annual Report 2024, pp. 21 and 382

64 In 2023, Shell spent USD 1.596 billion of its total cash capital expenditure of USD 24.392 billion on solar and wind energy, see Shell, Annual Report 2023, pp. 32 and 341

65 Shell, Annual Report 2024, pp. v-vi

66 "Milieudefensie et al.'s appendix with speaking notes for session day 3" (Unofficial Translation), para 5-7 and para 13-15 https://en.milieudefensie.nl/news/2024-04-04-milieudefensie-et-al-s-appendix-with-speaking-notes-for-session-day-3-unofficial-translation.pdf

67 Shell, Annual Report 2024, p. 10

68 Shell, Annual Report 2024, p. 50

69 Shell, Annual Report 2024, p. 241. In 2023, Shell had spent USD 1.75 billion on exploration, see Shell, Annual Report 2023, p. 245

70 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 24

71 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 25

72 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 25

73 Shell, Annual Report 2024, p. 11

74 ACCR, In the dark: gaps in Shell's climate lobbying disclosures, 2024

75 Shell reported oil and gas production available for sale of 2.84 million barrels oil equivalent per day (boe/d) in 2024, see Shell, Annual Report 2024, p. 23

76 Pierre Friedlingstein et al, "Global Carbon Budget 2024," Earth Syst. Sci. Data, 2025. According to Friedlingstein et al (2025), global anthropogenic emissions were 41.6 Gt CO_2 in 2024.

77 Shell reported oil and gas production available for sale of 2.84 million barrels oil equivalent per day (boe/d) in 2024, see Shell, Annual Report 2024, p. 23

78 Shell reports that it divested assets in the North Sea, Norway and Nigeria, among others, see Shell, Annual Report 2024, pp. 41 and 312

79 CBS, "Decrease in greenhouse gas emissions levelled off in 2024", 12 March 2025, https://www.cbs.nl/en-gb/news/2025/11/decrease-in-greenhouse-gas-emissions-levelled-off-in-2024. The emissions of the Dutch economy amount to 144 Mt CO_2e in 2024.

80 Rechtbank den Haag 26 May 2021, ECLI:NL:RBDHA:2021:5337 (*Milieudefensie et al. v. Royal Dutch Shell* plc.

81 IEA, Net Zero by 2050

82 CBS, "Decrease in greenhouse gas emissions levelled off in 2024", 12 March 2025, https://www.cbs.nl/en-gb/news/2025/11/decrease-in-greenhouse-gas-emissions-levelled-off-in-2024. The emissions of the Dutch economy amount to 144 Mt CO_2e in 2024.

83 Damian Carrington and Matthew Taylor, "Revealed: the 'carbon bombs' set to trigger catastrophic climate breakdown," The Guardian, 11 May 2022, https://www.theguardian.com/environment/ng-interactive/2022/may/11/fossil-fuel-carbon-bombs-climate-breakdown-oil-gas

84 Reuters, "Shell takes final investment decision to develop Manatee gasfield offshore Trinidad", 9 July 2024, https://www.reuters.com/business/energy/shell-takes-final-investment-decision-develop-manatee-gas-field-offshore-2024-07-09/

85 Shell, "Atapu consortium takes final investment decision on Atapu two project in Brazil's Pre-Salt", 24 May 2024, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2024/atapu-consortium-takes-final-investment-decision-on-atapu-two-project-in-brazils-pre-salt.html

86 Reuters, "Shell invests Nigeria's Bonga North deep-water project", 16 December 2024, https://www.reuters.com/business/energy/shell-invests-nigerias-bonga-north-deep-water-project-2024-12-16/

87 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", pp. 21 and 24

88 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 25

89 IEA emissions scenario were taken from the IEA World Energy Outlook 2023. Average annual percentage decline rates were calculated for oil and gas based on these scenarios between 2022, 2030, 2040 and 2050.

90 IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach, p. 59, Box 2.1

91 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 50

92 IEA, World Energy Outlook 2024, Table 2.3

93 IPCC, IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 (Energy), Chapter 1 (Introduction), 2006, Table 1.3, https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

94 Shell, "Shell Invests in the Whale Development in the Gulf of Mexico", 25 July 2021, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2021/shell-invests-in-the-whale-development-in-the-gulf-of-mexico.html

95 Shell, "Shell commits to investment on Timi, its first offshore wellhead platform in Malaysia to be powered by solar and wind", 30 August 2021, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2021/shell-commits-to-investment-on-timi-its-first-offshore-wellhead-platform-in-malaysia-to-be-powered-by-solar-and-wind.html

96 Shell, "Libra Consortium takes final investment decision on Mero-4 FPSO in Brazilian pre-salt", 2 August 2021, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2021/libra-consortium-takes-final-investment-decision-on-mero-4-fpso-in-brazilian-pre-salt.html

97 Shell, "Investeringsbeslutning for havbunnskompresjon på ormen lange", 20 September 2021, https://www.shell.no/presserom/nyhetsoversikt-artikler-og-nyhetsarkiv/2021/investeringsbeslutning-for-havbunnskompresjon-pa-ormen-lange.html#

98 Shell, "Shell to develop Crux project in Western Australia", 30 May 2022, https://www.shell.com/media/news-and-media-releases/2022/shell-to-develop-crux-project-in-western-australia.html

99 Shell, "Shell invests in the Jackdaw gas field in the UK North Sea", 25 July 2022, https://www.shell.com/media/news-and-media-releases/2022/shell-invests-in-the-jackdaw-gas-field-in-the-uk-north-sea.html

100 Shell, "Shell invests in Rosmari-Marjoram in Sarawak, Malaysia", 5 September 2022. https://www.shell.com/media/news-and-media-releases/2022/shell-invests-in-rosmari-marjoram-in-sarawak-malaysia.html

101 Shell, "Shell invests in Rosmari-Marjoram in Sarawak, Malaysia", 5 September 2022. https://www.shell.com/media/news-and-media-releases/2022/shell-invests-in-rosmari-marjoram-in-sarawak-malaysia.html

102 Energy Intelligence, "Shell Takes FID on Rydberg Project in US Gulf", 2 September 2022, https://www.energyintel.com/00000182-ff68-dd33-a7bf-ff7a74900000

103 Shell, "Shell invests in Phase 4 of the Gumusut-Kakap-Geronggong-Jagus East (GKGJE) deepwater development", 3 October 2022, https://www.shell.com.my/media/2022-press-releases/shell-invests-in-phase-4-of-the-gumusut-kakap-geronggong-jagus-east-gkgje-deepwater-development.html

104 Shell, "Shell invests in Phase 4 of the Gumusut-Kakap-Geronggong-Jagus East (GKGJE) deepwater development", 3 October 2022, https://www.shell.com.my/media/2022-press-releases/shell-invests-in-phase-4-of-the-gumusut-kakap-geronggong-jagus-east-gkgje-deepwater-development.html

105 "Partners in the Karachaganak project and the Authorized body sanction the implementation of a major investment project by signing the agreement for the Karachaganak Expansion Project-1B", 25 November 2022, https://www.kpo.kz/en/news-room/featured-stories?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=3105&cHash=c76f4bde0af04659b323f27d6c7912a0

106 Reuters, "Equinor and partners to invest $1.44 bln in Arctic gas field", 22 November 2022, https://web.archive.org/web/20221122084544/https://www.reuters.com/business/energy/equinor-partners-invest-144-bln-arctic-gas-field-2022-11-22/ (accessed through Web Archive)

107 Offshore Technology, "Brazil: TotalEnergies to invest $1bn in Lapa south-west Project", 16 January 2023, https://www.offshore-technology.com/news/brazil-totalenergies-to-invest-1bn-in-lapa-south-west-project/

108 Argus Media, "Qatar picks Shell as second North Field South partner", 23 October 2023, https://www.argusmedia.com/en/news/2383364-qatar-picks-shell-as-second-north-field-south-partner; "Qatarenergy Announces Awarding The Epc Contract For The North Field South Project", 16 May 2023, https://www.qatarenergy.qa/en/MediaCenter/Pages/newsdetails.aspx?ItemId=3757

109 Argus Media, "Qatar picks Shell as second North Field South partner", 23 October 2023, https://www.argusmedia.com/en/news/2383364-qatar-picks-shell-as-second-north-field-south-partner; "Qatarenergy Announces Awarding The Epc Contract For The North Field South Project", 16 May 2023, https://www.qatarenergy.qa/en/MediaCenter/Pages/newsdetails.aspx?ItemId=3757

110 Shell, "Shell Takes Investment Decision At Dover In Us Gulf Of Mexico", 15 March 2023, https://www.shell.us/about-us/news-and-insights/media/2023-media-releases/shell-takes-investment-decision-at-dover-in-us-gulf-of-mexico.html

111 Egypt Oil & Gas, "Shell, Partners to develop phase 10 in Egypt's WDDM Concession", 6 July 2023, https://egyptoil-gas.com/news/shell-partners-to-develop-phase-10-in-egypts-wddm-concession/

112 Shell, "Shell Invests In The Sparta Development In The Gulf Of Mexico", 19 December 2023, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2023/shell-invests-in-the-sparta-development-in-the-gulf-of-mexico.html

113 Source: Rystad Energy, 9 April 2025.

114 Shell, "Shell invests in the Victory Gas field in the UK North Sea", 17 January 2024, https://www.shell.co.uk/about-us/news-and-publications/media-releases/2024-media-releases/shell-invests-in-the-victory-gas-field-in-the-uk-north-sea.html

115 NS Energy Business, "SPDC and partners take FID to develop Iseni gas field in Nigeria", 6 February 2025, https://www.nsenergybusiness.com/company-news/spdc-and-partners-take-fid-to-develop-iseni-gas-field-in-nigeria/

116 "(...) the NWS partners recently took the final investment decision on the Lambert West project, which will support ongoing production from NWS" in Upstream Online,"Woodside sees Q1 revenues slump as output falls", 19 April 2024, https://www.upstreamonline.com/field-development/woodside-sees-q1-revenues-slump-as-output-falls/2-1-1629585. The NWS project webpage of Woodside mentions Shell Australia Pyt Ltd as partner to the project, https://www.woodside.com/what-we-do/operations/north-west-shelf

117 NS Energy Business, "Equinor and partners sanction $1.1bn Troll phase 3 project stage 2", 27 May 2024, https://www.nsenergybusiness.com/company-news/equinor-and-partners-sanction-1-1bn-troll-phase-3-project-stage-2/?cf-view

118 Petrobas, "Petrobas signs contracts for Platforms P-84 and P-85", 5 May 2024, https://agencia.petrobras.com.br/en/w/negocio/petrobras-assina-contratos-para-aquisicao-das-plataformas-p-84-e-p-85

119 Shell, "Shell boosts LNG business with Manatee", 9 July 2024, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2024/shell-boosts-lng-business-with-manatee-fid-in-trinidad-and-tobago.html

120 Arrow Energy, "Arrow Energy Surat Gas Project North expansion to start in late 2024", 12 August 2024, https://www.arrowenergy.com.au/news/media-releases/current-releases/arrow-energy-surat-gas-project-north-expansion-to-start-in-late-2024

121 Arrow Energy, "Arrow Energy Surat Gas Project North expansion to start in late 2024", 12 August 2024, https://www.arrowenergy.com.au/news/media-releases/current-releases/arrow-energy-surat-gas-project-north-expansion-to-start-in-late-2024

122 Shell, "Shell invests in water injection at Gulf of Mexico", 14 August 2024, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2024/shell-invests-in-water-injection-at-gulf-of-mexico-field.html

123 Shell, "Shell invests in Bonga North deep water project Nigeria", 16 December 2024, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2024/shell-invests-in-bonga-north-deep-water-project-nigeria.html

124 Source: Rystad Energy, 9 April 2025. News reports confirm that Shell has awarded engineering contracts, indicating that investment in this asset has been approved: Business Day, "Shell taps Chinese contractor for Nigeria's OML 144 gas project", 6 January, 2025, https://businessday.ng/energy/article/shell-taps-chinese-contractor-for-nigerias-oml-144-gas-project/

125 Shell, "Shell invests in the Gato do Mato project in Brazil's pre-salt", 21 March 2025, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2025/shell-invests-in-the-gato-do-mato-project-in-brazils-pre-salt.html

126 Thompson, E., Sorrell, S. and Speirs, J, UKERC Review of Evidence on Global Oil Depletion, Technical Report 2: Definition and interpretation of reserve estimates, UK Energy Research Centre, 2009, https://ukerc.ac.uk/publications/ukerc-review-of-evidence-on-global-oil-depletion-technical-report-2-definition-and-interpretation-of-reserve-estimates/, pp. 7-11

127 Shell, Capital Markets Day 2025 slides, "Delivering more value, with less emissions", p. 25

128 Shell, Sustainability Report 2023, p. 81

129 Shell, "Shell's Net Carbon Footprint: Methodology," February 2023, https://fourleafdigital.shell.com/webapps/climate_ambition/downloads/THE-NET-CARBON-FOOTPRINT.pdf, pp. 15, 19-20, 25-26

130 IEA, Net Zero by 2050, p. 21

131 IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach, pp. 16 and 55

132 IEA, The Oil and Gas Industry in Net Zero Transitions, pp. 36 and 39

133 IEA, The Oil and Gas Industry in Net Zero Transitions, p. 36

134 IEA, World Energy Outlook 2023, pp. 133 and 138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