Shell plc publishes its Energy Transition Progress Report 2022

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Shell reports good progress on journey to net-zero emissions

Shell plc has published its Energy Transition Progress Report 2022, which can be viewed and downloaded from www.shell.com/agm. The report shows Shell has again met its climate targets as part of its energy transition strategy. The report will be put to shareholders for an advisory vote at Shell's Annual General Meeting, currently scheduled for May 23, 2023.

"In this report, we show the progress we have made towards becoming a net-zero emissions energy business by 2050, as we continue to supply the vital energy the world needs during a time of great volatility," said Wael Sawan, Shell's Chief Executive Officer. "I am especially proud of the progress we have made in reducing carbon emissions from our operations, with a 30% reduction by the end of 2022 compared with 2016 on a net basis."

By the end of 2022, the net carbon intensity of the energy products sold by Shell had also fallen by 3.8%, compared with 2016. Our analysis, using data from the International Energy Agency, shows the net carbon intensity of the global energy system fell by around 2% over that time. (For more details see www.shell.com/energytransitionfaq).

The report highlights important steps that Shell has taken to advance its energy transition strategy. These include significant investments in liquefied natural gas (LNG), which Shell expects to remain an important part of the energy mix for many years to come, partly because of its role in reducing emissions from power generation and transport.

Other steps include Shell's $1.6 billion investment in Indian renewable power developer Sprng Energy, and the final investment decision on the Holland Hydrogen 1 project in the Netherlands, which will be Europe's largest renewable hydrogen plant. In 2022, Shell also announced the acquisition of Denmark's Nature Energy, which produces renewable natural gas, for around $2 billion. This deal was completed at the beginning of 2023.

Shell also increased the number of electric vehicle charge points it owned or operated worldwide by 62% to around 139,000 in 2022, up from 86,000 the previous year.

Sir Andrew Mackenzie, Shell Chair, said: "We believe the progress we have made in line with our energy transition strategy has been to the benefit of our customers, our shareholders and wider society."

This progress comes at a time when the energy system still faces challenges as high energy prices continue to contribute to a cost-of-living crisis for many people. These challenges have highlighted the need for a balanced energy transition: one in which the world achieves net-zero emissions, while still providing a secure and affordable supply of energy.

Shell's energy transition strategy was put to an advisory shareholder vote at its 2021 Annual General Meeting, where it secured 89% of the vote. At the 2022 AGM, almost 80% of shareholders who voted supported our progress in implementing this strategy.

This year, Shell is again asking shareholders to vote on its annual progress.

Read the report at www.shell.com/energy-transition-progress-report

Notes to editors

The publication of annual progress reports, along with the advisory votes, have resulted in a more informed dialogue between Shell and its institutional investors. The vote is purely advisory and is not binding on our shareholders. The legal responsibility for Shell's strategy lies with the Board and Executive Committee.

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Shell plc

Energy Transition Progress Report 2022

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Introduction and summary

Welcome to Shell's Energy Transition Progress Report. This report aims to update shareholders and wider society on how Shell has progressed in 2022 against the energy transition strategy we announced in 2021.

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Chair's message

Sir Andrew Mackenzie, Chair

Our second Energy Transition Progress Report comes as the Russian war in Ukraine continues to have a devastating effect on the lives of many. The conflict has also highlighted the need for a global supply of secure and affordable energy. Amid this period of heightened uncertainty, we have worked hard to keep energy flowing to households and businesses around the world.

In 2022, I witnessed first-hand how our staff diverted energy supplies to where they were most needed. In total, we delivered 194 cargoes of liquefied natural gas to Europe - almost five times our usual average. This work helped to avert the threat of blackouts and to build up energy supplies ahead of next winter.

Against this backdrop, we made good progress in putting our energy transition strategy into action. As we delivered the oil and gas the world needs today, we reduced carbon emissions from our operations by 30% by the end of 2022, compared with 2016 on a net basis. This is more than halfway towards our target of a 50% reduction by 2030. Global energy-related carbon emissions increased by around 4% over the same period. [A]

We continued to work towards becoming a net-zero emissions energy business by 2050 by making significant investments in solar and wind power, biofuels and hydrogen. For example, we made our biggest acquisition in the energy transition yet with the purchase of Denmark's Nature Energy for around $2 billion. This acquisition makes us Europe's largest producer of renewable natural gas, which is made from agricultural, industrial and household waste.

Renewable natural gas can be used by customers in sectors such as commercial road transport and shipping. This is part of the work we are undertaking, sector by sector, to identify the low- and zero-carbon products that our customers need to reduce their emissions.

We continued to build infrastructure to help our customers switch to low- and zero-carbon energy. In 2022, for example, we increased the number of electric vehicle chargers we owned or operated by 62% to around 139,000, compared with the previous year.

The development of new technologies is vital to decarbonising our own operations, as well as reducing the emissions for our customers. In 2022, we launched the Energy Transition Campus Amsterdam in the Netherlands, which creates an opportunity for Shell and other companies to research new technologies for the energy transition.

Engaging with shareholders

The continued support of our shareholders is critical to Shell's success as a company. In 2021, shareholders supported our energy transition strategy with 89% of the votes. In contrast, a resolution by shareholder group Follow This calling for a different energy transition strategy received 30% of the votes. Shareholders will get the opportunity to vote again on our strategy in 2024.

In 2022, 80% of our shareholders voted in support of the progress we had made in 2021 in implementing our energy transition strategy. Along with other Board members, I met many of our largest investors following that vote, including during investor engagements in September. I am grateful for their time and feedback, and look forward to our next engagements in April 2023.

The publication of annual progress reports, along with the advisory votes, have resulted in a more informed dialogue with our institutional investors. We heard, for example, that some large investors did not follow the Board's recommendation to vote in support of Shell's progress in 2022, because they mainly focused on Shell's energy transition strategy overall, and not on our progress. Some shareholders also indicated that societal pressure, potential media coverage, and expectations from investors in their funds were reasons for not following the Board's recommendation.

Other investors told us they would like Shell to introduce medium-term targets to reduce absolute Scope 3 emissions produced by customers when they use our products. The Board has considered setting a Scope 3 absolute emissions target but has found it would be against the financial interests of our shareholders and would not help to mitigate global warming.

This year, we are again asking shareholders to vote at our Annual General Meeting on the progress we have made in 2022 as we implement our energy transition strategy. As in previous years, this vote on our progress measured against our targets and plans is purely advisory, and not binding for our shareholders. The legal responsibility for approving or objecting to Shell's strategy lies with the Board and Executive Committee.

We believe the progress we have made in line with our energy transition strategy has been to the benefit of our customers, our shareholders and wider society. The Board recommends that you vote in favour of Resolution 25 in support of the energy transition progress that Shell made in 2022, as described in this report and in our Annual Report and Accounts 2022.

[A] According to our analysis and data from the International Energy Agency.

Chief Executive Officer's introduction

Wael Sawan, Chief Executive Officer

The Russian invasion of Ukraine has had significant effects on the global energy system, with many countries needing to replace the supplies of natural gas that previously came from Russia.

Governments acted swiftly. The European Union's REPowerEU plan and the Inflation Reduction Act in the USA gave strong support to renewable energy. In Germany, two floating storage and regasification terminals were up and running by the end of the year, allowing the country to import more of the liquefied natural gas (LNG) it needs.

But the energy system still faces huge challenges as high energy prices continue to contribute to a cost-of-living crisis for many people. These challenges have highlighted the need for a balanced energy transition: one in which the world achieves net-zero emissions, while still providing a secure and affordable supply of energy.

Supplying vital energy

In this report, we show the progress we have made towards becoming a net-zero emissions energy business by 2050, as we continue to supply the vital energy the world needs during a time of great volatility.

I am especially proud of the progress we have made in reducing carbon emissions from our operations, with a 30% reduction by the end of 2022, compared with 2016 on a net basis. That puts us more than halfway towards our target to reduce them by 50% by 2030.

We also continued to change the energy mix of our portfolio. By the end of 2022, the net carbon intensity of the energy products sold by Shell had fallen by 3.8%, compared with 2016. Our analysis, using data from the International Energy Agency, shows the net carbon intensity of the global energy system fell by around 2% over that time [A].

Beyond our immediate performance against our targets, we have taken other important steps to advance our strategy. In LNG, for example, we expanded what is already a world-leading business. We expect that LNG will play a key role in a balanced energy transition. It produces fewer greenhouse gas emissions than coal when used to generate electricity, and fewer emissions than petrol or diesel when used as a fuel for transport.

In 2022, we joined two exciting projects in Qatar, including what will be the largest LNG project in the world.

These projects will use carbon capture and storage, helping to reduce emissions.

Investing in low-carbon projects

At the same time, we made significant moves to increase our supply of low- and zero-carbon energy, in line with our strategy. In 2022, we invested $1.6 billion in Indian renewable power developer Sprng Energy. We also announced the acquisition of Denmark's Nature Energy, which produces renewable natural gas from agricultural, industrial and household waste, for around $2 billion.

Our Powering Progress strategy is designed to transform Shell into a net-zero emissions energy business, while generating strong returns for our shareholders. We will use the strength of our brand, customer relationships and balance sheet to add value to these acquisitions.

With Nature Energy, for example, we expect to make strong returns from our investment because we already have customers for biofuels in commercial road transport and shipping, and the trading expertise to connect opportunities in supply and demand.

[A] For more details see shell.com/energytransitionfaq

Similarly, the strength of our integrated portfolio gives us confidence in our investment in Holland Hydrogen 1 in the Netherlands, which will be Europe's largest renewable hydrogen plant. The power for the electrolyser will come from an offshore wind farm that is partly owned by Shell. The renewable hydrogen will be used at the Shell Energy and Chemicals Park Rotterdam to help decarbonise the production of products like petrol, diesel and aviation fuel. Renewable hydrogen can also be used for commercial road transport, a sector where we already have a leading position in Europe.

Building on our strengths

In 2022, we invested $8.2 billion in low-carbon energy and non-energy products, around a third of our total cash capital expenditure. Of that, we invested $4.3 billion in low-carbon energy solutions, including biofuels, hydrogen, charging for electric vehicles and renewable power generation. The remaining $3.9 billion was spent on non-energy products such as chemicals, lubricants and convenience retail, which do not produce emissions when they are used by our customers.

As we invest in the energy transition, we will continue to build on our competitive strengths. We will earn the trust of investors and the right to grow these emerging businesses by demonstrating that we can deliver strong returns.

Shareholder support

In 2021, 89% of shareholders at our Annual General Meeting voted in favour of Shell's energy transition strategy, which centres on our target to become a net-zero emissions energy business by 2050. As you will read in this report, we have made good progress in the first two years of that strategy by reducing emissions from our operations, and by making more low- and zero-carbon products available to our customers. Today, I ask our shareholders for their continued support, by voting in favour of the progress we are making on our journey to net-zero emissions.

Steps on the path to net-zero emissions

In 2023, for the second time, we are offering shareholders an advisory vote on our progress in implementing our energy transition strategy. This vote is part of our continuing dialogue with shareholders as we work to become a net-zero emissions energy business by 2050. Shareholders supported our energy transition strategy in 2021.

2023

- Increased the weighting of the energy transition performance metric in the Long-term incentive plan from 20% to 25%.

2022

- Achieved our target to reduce the net carbon intensity of the energy products we sell by 3-4% compared to 2016.
- Made significant investment decisions and portfolio changes. These include Nature Energy, a renewable natural gas producer, Holland Hydrogen 1, and renewable power developer Sprng Energy.
- Invested $4.3 billion in low-carbon energy solutions and $3.9 billion in non-energy products.
- Introduced three new metrics in the annual bonus scorecard, to more fully reflect Shell's role in the energy transition.
- For the first time offered shareholders an advisory vote on the annual progress made in implementing our energy transition strategy.
- Simplified our share structure, allowing us to manage our portfolio with greater agility in the energy transition.

2021

- Launched our Powering Progress strategy setting out how we will transform into a net-zero emissions energy business.
- Offered shareholders an advisory vote on our energy transition strategy. They overwhelmingly supported the strategy.
- Set a new target to reduce absolute emissions from our operations (Scope 1 and 2) by 50% by 2030, compared to 2016 on a net basis.

2020

- Announced target to become a net-zero emissions energy business by 2050.
- Extended the energy transition performance metric to around 16,500 employees through the Performance Share Plan (PSP).

2019

- Published our first Industry Associations Climate Review, which reviewed the alignment between our climate-related policy positions and those of 19 key industry associations of which we are a member.

2018

- Signed a joint statement with institutional investors on behalf of Climate Action 100+ investor group announcing steps that Shell has taken to demonstrate alignment with the goals of the Paris Agreement on climate change.

2017

- Announced ambition to reduce the carbon intensity of the energy products we sell by around half by 2050, including the full life-cycle emissions from the use of our energy products by customers.

Our Progress in 2022 towards net zero

Our performance

Reduced Scope 1 and 2 absolute emissions by 30%

More than halfway towards our target to reduce them by 50% by 2030, compared to 2016 on a net basis

Reduced net carbon intensity by 3.8%

Achieved 2022 target of 3-4% reduction, making progress towards reducing our net carbon intensity by 20% by 2030 and 100% by 2050, compared to 2016

Invested $4.3 billion in low-carbon energy solutions, and $3.9 billion in non-energy products

Providing our customers with more electricity

- Increased electric vehicle charge points by 62% to around 139,000
- More than doubled renewable generation capacity to 6.4 GW
- Acquired Sprng Energy, a leading renewable power platform (India)
- Integrated Savion, a solar and energy storage developer (USA)
- Won offshore wind bids (NL, UK, USA)

Developing renewable hydrogen

- Took final investment decision for Holland Hydrogen 1 in the Netherlands (200 MW electrolyser capacity)
- Added 20 MW electrolyser capacity in China
-

Growing our biofuels portfolio

- Blended 9.5 billion litres of biofuels (6% of global consumption)
- Acquired Nature Energy (Denmark), the largest producer of renewable natural gas in Europe
- Signed large, long-term agreement to buy ethanol made from sugar-cane waste from Ra?zen (Brazil)

Providing conventional fuels

- Selected as partner in 2 large LNG projects with carbon capture and storage in Qatar
- Delivered 194 LNG cargoes to Europe (almost five times our usual average)

Carbon performance at a glance

Our carbon targets for absolute Scope 1 and 2 emissions and net carbon intensity

In 2022, we continued to make progress towards our 2030 targets. By the end of 2022, we had reduced our Scope 1 and 2 emissions from our operations by 30%, compared with our 2016 reference year on a net basis. The net carbon intensity of the energy products we sell decreased by 3.8%, compared with our 2016 reference year. This reduction in net carbon intensity reflects an increase in sales of low- and zero-carbon energy, helping our customers to decarbonise their energy use.

Reducing Scope 1 and 2 emissions under our operational control

More than halfway towards our target to reduce Scope 1 and 2 emissions by 50% by 2030

2016 [B] 2021 2022 Targets

Scope 1 and 2 operational emissions [A] million tonnes CO_2e	83	68	58	by -50%in2030, net-zeroby2050
Routine flaring [A] [C] (million tonnes hydrocarbons flared)	N/A	0.2	0.1	N/A
Methane intensity [A] [C] (%)	N/A	0.06 %	0.05 %	N/A

Reducing emissions associated with our customers' use of energy products

	Actual			Target					
	unit	2016 [B]	2021 [E]	2022 [E]	2023	2024	2025	2030	2035	2050
Net carbon intensity	CO_2e/MJ	79	77	76	-6-8%	-9-12%	-9-13%	-20%	-45%	-100%

Net carbon intensity reduction target achieved for two consecutive years. we believe our total absolute emissions peaked in 2018 at 1.73 gigatonnes of carbon dioxide equivalent.

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	2016 [B]	2021	2022	Targets
Estimated total GHG emissions included in NCI (net) [B]	1,645	1,375	1,240	Net zero by 2050

1. Operational control boundary.
2. Reference year.
3. Our target is to eliminate routine gas flaring from the upstream assets we operate and to have kept methane emissions intensity of Shell-operated assets under 0.2% by 2025.
4. Shell's NCI is the average intensity, weighted by sales volume, of the energy products sold by Shell. Estimated total greenhouse gas (GHG) emissions included in NCI (net) correspond to well-to-wheel emissions associated with energy products sold by Shell, on an equity boundary, net of carbon credits. This includes the well-to-tank emissions associated with the manufacturing of energy products by others that are sold by Shell. Emissions associated with the manufacturing and use of non-energy products are excluded.
5. 2021 target 2-3% reduction, 2022 target 3-4% reduction, both achieved.
6. There was a decrease in 2020 from 2019 related to volumes associated with additional contracts being classified as held for trading purposes with effect from January 2020. We estimate that netting of oil products sales volumes resulted in a reduction in GHG emissions of 102 million tonnes CO_2e

For more details of climate-related definitions and methodologies, please see our Annual Report and Accounts

Our

Performance

Read about our performance against our climate targets and how we are working to achieve net-zero emissions by 2050.

Absolute emissions

Net carbon intensity

Net carbon intensity

Reducing carbon intensity

Absolute emissions

Reducing our absolute Scope 1 and 2 emissions

To achieve net-zero emissions by 2050, we are transforming how we produce energy. In October 2021, we set a target to halve the emissions from our operations (Scope 1), plus the energy we buy to run them (Scope 2), by 2030 compared with 2016 levels on a net basis.

To decarbonise our operations, we are focusing on:

- making portfolio changes such as acquisitions and investments in new, low-carbon projects. We are also decommissioning plants, divesting assets, and reducing our production through the natural decline of existing oil and gas fields;
- improving the energy efficiency of our operations;
- transforming our remaining integrated refineries into low-carbon energy and chemicals parks, which involves decommissioning plants;
- using more renewable electricity to power our operations; and
- developing carbon capture and storage (CCS) for our facilities.

If required, we may choose to use high-quality carbon credits to offset any remaining emissions from our operations, in line with the mitigation hierarchy of avoid, reduce and compensate.

The chart below shows our progress since 2016 in reducing our Scope 1 and 2 emissions and gives an indication of how we expect to achieve our target in 2030. The actions we will take to achieve our target will depend on the evolution of our asset portfolio and the continued development of technologies which reduce carbon emissions. Following divestment activity in 2022, we expect that on a net portfolio basis, new investments across our portfolio will increase our Scope 1 and 2 emissions between 2023 and 2030 and that they will exceed reductions associated with planned divestments and natural decline. Our investments in producing low-carbon energy such as biofuels will increase our Scope 1 and 2 emissions, while reducing the net carbon intensity of the products we sell. Subsequent reductions in our emissions are reflected in the mechanisms outlined below and reflect an expected path to meeting our target in 2030.

Working to reduce our absolute Scope 1 and 2 emissions

Scope 1 and 2 emissions in million tonnes per annum [A],[B]

Emissions	2016 actual	2019 actual	2020 actual	2021 actual	2022 actual	2030 target
Scope 1	72	70	63	60	51	
Scope 2	11	10	8	8	7	
Total	83	80	71	68	58	41
Reduction					-30%	-50%

Indication of how we expect to achieve our 2030 target	Expected impact of action
Portfolio changes	Increase
Efficiency improvements	Decrease
Energy and chemicals park transformation	Decrease
Use of renewable power	Decrease
Carbon capture and storage	Decrease
Carbon credits [C]	Decrease

1. The 2016 Base Year was not recalculated in 2022. The 2016 Base Year may be recalculated in future years if an acquisition or a divestment has an impact of more than 10% on the total Scope 1 and 2 emissions.
2. Operational control boundary.
3. Including nature-based solutions.

Absolute emissions progress

In 2022, our total combined Scope 1 and 2 absolute greenhouse gas (GHG) emissions (from assets and activities under our operational control) were 58 million tonnes on a CO_2 equivalent basis, a 15% reduction compared with 2021, and a 30% reduction compared with 2016, the reference year. Our direct GHG emissions (Scope 1) decreased from 60 million tonnes of carbon dioxide equivalent (CO_2e) in 2021 to 51 million tonnes CO_2e in 2022. This reduction was achieved through divestments in 2021 and 2022 (such as the Deer Park and Puget Sound refineries in the USA) and the handover of operations in OML 11 in Nigeria in 2022; shutdowns or conversion of existing assets, including the shutdown of some units at the Shell Energy and Chemicals Park Singapore; GHG abatement projects and purchase of renewable electricity. These decreases were partly offset by the commissioning of Shell Polymers Monaca.

Our Annual Report and Accounts 2022 provides more details of how we reduced our Scope 1 and 2 emissions. To date, we have not used carbon credits to achieve our Scope 1 and 2 emissions reductions.

Scope 1 and Scope 2 greenhouse gas emissions changes from 2016 to 2021 and from 2021 to 2022

million tonnes carbon dioxide equivalent (CO₂e)

Period	Emissions [A] in first year of period	Changes		
		Acquisitions	Divestments	Reduction activities and purchased renewa
2016 to 2021	83	5.0	(15.4)	(9.2)
2021 to 2022	68	0.0	(7.5)	(2.0)

1. Total Scope 1 and Scope 2 emissions, rounded to the closest million tonnes. Scope 2 emissions were calculated using the market-based method.
2. In addition to reductions from GHG abatement and energy efficiency projects, this category also includes reductions from permanent shutdown of Convent and Tabangao refineries and the impact of transformational activities at our Shell Energy and Chemicals Park in Singapore.
3. Excludes 5.80 million tonnes of CO₂ captured and sequestered by the Shell-operated Quest CCS facility in Canada in 2016-2021. Scope 1 and 2 GHG emissions from operating Quest are included in our total emissions.
4. Excludes 0.97 million tonnes of CO₂ captured and sequestered by the Shell-operated Quest CCS facility in Canada in 2022. Scope 1 and 2 GHG emissions from operating Quest are included in our total emissions.
5. Of the 2,010 thousand tonnes of reduction activities and purchased renewable electricity in 2022, around 80 thousand tonnes related to purchased renewable electricity.
6. Change in output relates to changes in production levels, including those resulting from shutdowns and turnarounds as well as production from new facilities.

Methane emissions

Methane emissions are included in our Scope 1 and 2 emissions reporting. In 2022, we reduced total methane emissions from our operations by 27% to 40,000 tonnes, compared with 55,000 tonnes in 2021. Our target to keep methane emissions intensity below 0.2% was met in 2022 with Shell's overall methane emissions intensity at 0.05% for facilities with marketing gas and 0.01% for facilities without marketing gas.

Routine flaring

In 2022, routine flaring from our upstream operations fell to 0.1 million tonnes of hydrocarbons from 0.2 million tonnes of hydrocarbons in the previous year. Our aim is to eliminate routine gas flaring from our upstream operations by 2025.

We undertake external verification of our greenhouse gas (GHG) emissions annually. Our Scope 1 and 2 GHG emissions from assets and activities under our operational control and emissions associated with the use of our energy products (Scope 3) included in our net carbon intensity have been verified to a level of limited assurance.

Net carbon intensity

We use net carbon intensity [A] to show our progress in changing the mix of energy products we sell to customers. Net carbon intensity measures emissions associated with each unit of energy we sell. It reflects changes in sales of oil and gas products, and changes in sales of low- and zero-carbon products and services -- such as biofuels, hydrogen and renewable electricity.

Net carbon intensity measures the transformation that is happening in our portfolio as we implement our energy transition strategy. Achieving net-zero emissions by 2050 is the same as achieving 100% reduction in net carbon intensity.

Unlike Scope 1 and 2 emissions, reducing the net carbon intensity of the products we sell requires action by both Shell and our customers, with the support of governments and policymakers to create the right conditions for change.

[A] Shell's net carbon intensity is the average intensity, weighted by sales volume, of the energy products sold by Shell. It is tracked, measured and reported using our Net Carbon Footprint (NCF) methodology.

Aligning our targets with Paris

Shell's target is to become a net-zero emissions energy business by 2050. We also have short-, medium- and long-term targets to reduce our carbon intensity, measured using our net carbon intensity metric. We believe these targets are aligned with a 1.5?C pathway derived from the scenarios used in the IPCC Special Report on Global Warming of 1.5?C (SR 1.5), most of which show the global energy system reaching net zero between 2040 and 2060.

There is no established standard for aligning an energy supplier's decarbonisation targets with the temperature limit goal of the Paris Agreement. In the absence of a broadly accepted standard, we have developed our own approach for demonstrating Paris alignment by setting carbon intensity targets within a pathway derived from the IPCC SR 1.5 scenarios. This pathway is aligned with the more ambitious temperature goal of the Paris Agreement to limit global average temperature rise to 1.5?C above pre-industrial levels by 2100.

When constructing the pathway, we started by filtering out certain scenarios to ensure that Shell's targets are aligned with earlier action and low-overshoot scenarios. Overshoot refers to the extent to which a scenario exceeds an emissions budget and subsequently relies on sinks to compensate for the excess emissions. Next, we calculated the carbon intensity (grammes of CO_2/MJ of energy) for each of the remaining scenarios by dividing net emissions by total final energy consumption, with electricity represented as a fossil fuel equivalent.

To set a starting point, we then indexed the resulting carbon intensities to a common value of 100 in 2016 to remove the impact of differences between Shell's historical net carbon intensity and the intensities calculated from the IPCC scenarios. Finally, the pathway was constructed using the range of carbon intensity reductions over time. Outlying values at the top and bottom of the range were removed, which had the effect of narrowing the final pathway.

By using the 1.5?C pathway produced by this approach to set our targets, we aligned them with the necessary reduction in carbon intensity shown in the 1.5?C scenarios. This is illustrated in the table, which shows that our targets are positioned within the range of the 1.5?C pathway. The upper and lower limits represent the upper and lower boundaries of the 1.5?C pathway derived using the approach described above.

Shell's Paris-aligned targets

	2023	2024	2025	2030	2035	2050
IPCC-derived upper range	-4%	-5%	-7%	-15%	-34%	-68%
IPCC-derived lower range	-10%	-13%	-17%	-36%	-64%	-104%

Shell target range	6-8%	9-12%	9-13%	20%	45%	100%

Until 2035, our calculation of the total net emissions of each scenario includes only the expected mitigation actions by Shell, such as carbon capture and storage and offsetting using natural sinks. Any use of offsets included in the carbon-neutral energy products we offer our customers is also part of our calculation. After that date, we include mitigation actions taken separately by our customers. This is because we expect that customers will need to take action to mitigate their emissions from the use of our products if society is to achieve the goals of the Paris Agreement.

To account for reductions in emissions across full energy value chains it is necessary to build new protocols to include mitigation actions by both energy suppliers and users. Currently, energy suppliers report the Scope 3 emissions from the use of their products, which are equivalent to the Scope 1 emissions reported by the users of those products. However, when users of energy products mitigate their Scope 1 emissions by the use of carbon capture and storage or offsets there is no protocol for reflecting a corresponding reduction in the Scope 3 emissions reported by the energy supplier. We will continue to engage stakeholders on these carbon protocols and will seek to align with new frameworks as they evolve.

As an energy provider, Shell has set a target to reduce the net carbon intensity of the energy products it sells by 20% by 2030. We believe that this target is aligned with a 1.5?C pathway derived from the IPCC SR 1.5 scenarios. We also believe that the pace of change will vary around the world by region and by sector, taking into consideration the time needed for energy users to invest in large-scale equipment, and the energy infrastructure changes needed for Shell to deliver more low- and zero-carbon energy.

Reducing carbon intensity

The biggest driver for reducing our net carbon intensity is increasing the sales of and demand for low-carbon energy. The chart below illustrates how changes in the volume of products and services we sell could result in net carbon intensity reductions through to 2030. The change in our sales of these products and services will also reflect the development and adoption of new technologies and infrastructure, and the adoption of public policies designed to encourage the energy transition.

Working to reduce our net carbon intensity

Net carbon intensity in gCO_2e/MJ [A]

	2016 Actual	2021 Actual	2022 Actual	2030 Target
Net carbon Intensity	79	77	76	63
Net carbon intensity reduction			-3.8%	-20%

Levers to reduce our net carbon intensity between the end of 2022 and 2030	Action
Hydrocarbon sales [B]	
Electricity sales [C]	Grow power sales
Low-carbon fuels sales [D]	Grow biofuels, develop hydrogen
Carbon capture and storage [E]	Develop CCS
Carbon credits [F]	High quality carbon credits

1. Grams of carbon dioxide equivalent per megajoule.
2. Hydrocarbon sales reflect the effect of lower sales of oil products, and higher sales of natural gas. Emissions associated with gas are lower than those of oil products.
3. Electricity sales show the expected growth of our integrated power business and increasing sales of renewable electricity.
4. Sales of low-carbon fuels reflect higher sales of biofuels and hydrogen, which are low- and zero-carbon products.
5. Carbon capture and storage (CCS) reduces carbon emissions by capturing them at source.
6. Carbon credits such as nature-based solutions can be used to offset remaining carbon emissions, particularly in hard-to-abate sectors such as aviation and industries including cement and steel.

Carbon intensity performance

In 2022, Shell's NCI was 76 grams of carbon dioxide equivalent per megajoule of energy (gCO_2e/MJ), a 1.3% decrease from the previous year and a 3.8% reduction compared with 2016, the reference year. The decrease in Shell's NCI in 2022 was primarily due to an increased proportion of renewable power and corresponding reduction in the carbon intensity of our power sales. Shell's 2022 NCI includes 4.1 million tonnes of carbon credits, compared with 5.1 million tonnes which were included in Shell's 2021 NCI. The net carbon intensity only includes carbon credits that are retired against energy products.

Share of energy delivered per energy product type
[A]-[F]

Energy product type	2016 Share	2020 Share	2021 Share	2022 Share	2022 carbon intensity (gCO2e/
Oil products and gas-to-liquids (GTL)	54%	47%	45%	44%	91
Gas	24%	21%	25%	22%	65
Liquefied natural gas	14%	19%	18%	20%	70
Biofuels	1%	1%	1%	1%	39
Power	7%	12%	12%	12%	58

1. Percentage of delivered energy may not add up to 100% because of rounding.
2. Total volume of energy products sold by Shell, aggregated on an energy basis, with electricity represented as fossil equivalents. This value is derived from energy product sales figures disclosed by Shell in the Annual Report and the Sustainability Report.
3. Lower heating values are used for the energy content of the different products and a fossil-equivalence approach is used to account for electrical energy, so that it is assessed on the same basis as our other energy products.
4. The NCI calculation uses Shell's energy product sales volumes data, as disclosed in the Annual Report and Sustainability Report. This excludes certain contracts held for trading purposes and reported net rather than gross. Business-specific methodologies to net volumes have been applied in oil products and pipeline gas and power. Paper trades that do not result in physical product delivery are excluded. Retail sales volumes from markets where Shell operates under trademark licensing agreements are also excluded from the scope of Shell's carbon intensity metric.
5. Emissions included in the carbon intensity of power have been calculated using the market-based method.
6. The carbon intensity of biofuels provided in the graph "Share of energy delivered per energy product type" reflects the global average for biofuels sold by Shell for 2022.
7.

Decarbonising our portfolio

Read how Shell is helping customers reduce their emissions.

Transforming the energy system
Electricity
Hydrogen
Biofuels
Conventional fuels
In focus: Carbon capture and storage
In focus: Carbon credits
Energy Transition in action

Transforming the energy system

To help to transform the energy system, we:

- provide more electricity to customers, while also driving a shift to renewable electricity;

- develop low- and zero-carbon alternatives to traditional fuels, including biofuels, hydrogen, and other low- and zero-carbon gases;
- work with our customers across different sectors to decarbonise their use of energy; and
- address any remaining emissions from conventional fuels with solutions such as carbon capture and storage and carbon credits.

Electricity

In 2022, we sold 243 terawatt hours (TWh) of electricity, and we took significant steps to invest in renewable generation and grow our electric vehicle charging network.

We more than doubled our solar and wind generation capacity in operation, under construction and/or committed for sale to 6.4 gigawatt (GW), from 3 GW in 2021. This includes 2.2 GW in operation and 4.2 GW in development. We also have a further 45 GW of renewable generation capacity in our pipeline of future projects.

Our single biggest investment was the $1.6 billion acquisition of Sprng Energy, a solar and wind platform in India. It added 2.3 GW to our renewable generation capacity and 7.5 GW to our pipeline of future projects. We have integrated Savion, a solar and energy storage company in the USA, into our business after acquiring it in 2021.

We also won bids with our partners to build two offshore wind farms in the UK, one in the USA and one in the Netherlands. These will have the potential to generate around 7.3 GW (Shell share 3.7 GW). The UK joint venture will develop two of the world's first floating wind farms off the east coast of Scotland, which are expected to be operational in the early 2030s.

In 2022, we also made strong progress in rolling out our electric vehicle (EV) charging network to 28 countries, making it easier for motorists around the world to reduce their emissions. We increased the number of EV charge points we own or operate by 62% to around 139,000 in 2022, up from around 86,000 the previous year. In November 2022, we completed our acquisition of German company SBRS GmbH, which provides electric charging services for buses, trucks and vans. It will allow us to offer more charging services to business customers who need to decarbonise their fleets and improve their depot charging capabilities.

Renewable power generation and the marketing and trading of power sit within our Renewables and Energy Solutions business segment. Mobility, including electric vehicle charging services, sits within Marketing.

Read more about our power business: www.shell.com/energy-and-innovation/electricity

In Focus

Helping our customers reduce their emissions

We are helping software company SAP move to an emissions-free global car fleet by 2030 in support of its net-zero targets. Through our Accelerate to Zero programme, Shell is providing on-the-go and home charging for electric vehicles, as well as other fleet solutions, for SAP employees in several countries. At SAP's headquarters in Walldorf, Germany, we are working to build solar generation capacity to help the company decarbonise and become more self-reliant in its energy use.

In 2022, we also helped wine producer Treasury Wine Estates get closer to achieving its net-zero target and become a renewable energy producer by installing 9,500 solar panels on rooftops and on the ground at two of its Australian sites. These solar panels are expected to generate more than 5,500 megawatt-hours of electricity a year. Shell Energy is working with Treasury Wine Estates, which has 13,000 hectares of vineyards around the world, to provide renewable energy across the company's operations. A further 9,000 solar panels are being installed at its California vineyards.

Read more about how we help our customers decarbonise and meet their net-zero commitments on our website: www.shell.com/business-customers

Hydrogen

Hydrogen can play a crucial role in helping the world reach net-zero emissions. It is particularly suitable for use in hard-to-electrify sectors like heavy-duty transport, heavy industry, shipping and aviation because of its high energy density. We are increasing our investment in the production and supply of hydrogen.

In July 2022, we took the final investment decision to build Holland Hydrogen 1 in the Netherlands, which will be Europe's largest renewable hydrogen plant once operational. The 200 MW electrolyser will produce up to 80 tonnes of renewable hydrogen a day, enough to meet up to 10% of the annual hydrogen demand from Shell Energy and Chemicals Park Rotterdam. Holland Hydrogen 1 could also meet future demand for renewable hydrogen from the transport and industrial sectors.

This adds to our 20 MW hydrogen electrolyser project in Zhangjiakou, China, which was completed in time to supply renewable-based hydrogen to the 2022 Winter Olympics in February. By the end of 2022, our total electrolyser capacity was 30 MW. This is about 6% of the global capacity of installed electrolysers in 2021, according to the International Energy Agency (IEA).

Hydrogen is not yet widely used by motorists or commercial road transport customers. We have more than 50 hydrogen retail sites in Europe and North America, where drivers can fill up their vehicles with hydrogen fuel. To encourage some commercial road transport customers to gain experience with hydrogen, we ordered 25 hydrogen trucks in Germany. The trucks will be rented out in a pay-per-use system, allowing us to better understand what it will take to increase the uptake of hydrogen by commercial drivers.

Hydrogen sits within our Renewables and Energy Solutions business segment.

Read more about our hydrogen business at www.shell.com/energy-and-innovation/new-energies/hydrogen .

In Focus

The new technologies behind the energy transition

We continue to invest in the research and development of new technologies that will help to decarbonise our operations and reduce emissions for our customers. In 2022, research and development expenditure on projects that contributed to decarbonisation was around $440 million, representing about 41% of our total research and development spend.

We launched our Energy Transition Campus Amsterdam, creating opportunities for others to join us in finding solutions to the world's energy challenges. One such project is a collaboration between Shell and Dow, an American chemicals company, to electrify steam cracking furnaces with renewable energy. Steam cracking is one of the most carbon-intensive processes in petrochemical production. E-cracking furnaces operated using renewable electricity have the potential to reduce Scope 1 emissions from steam cracking by up to 90%.

Shell invests in start-ups that develop new technologies and business models which have the potential to accelerate the energy transition. Globally, Shell Ventures is one of the most active venture capital investors in climate technology and mobility. In 2022, Shell Ventures invested in more than 20 start-ups, including Statiq, a company that is building a charging network for electric vehicles in India; the Dutch company enie.nl, which installs solar panels on roofs in the Netherlands and Africa; and Li-Industries, an American company that has developed a unique technology to recycle lithium batteries.

Read more about the role technology plays at
www.shell.com/energy-and-innovation/the-role-technology-plays and
www.shell.com/energy-and-innovation/new-energies/shell-ventures

Biofuels

Biofuels such as renewable natural gas (RNG), sustainable aviation fuel (SAF), biodiesel and bioethanol can help customers reduce their emissions without having to change their aeroplanes, cars, trucks, or ships.

Shell is already one of the world's largest traders and blenders of biofuels. In 2022, around 9.5 billion litres of biofuels, which is around 6% of the global biofuels consumption, went into Shell's fuels worldwide. This is up from 9.1 billion litres in 2021 and includes sales made by Ra?zen, our non-operated joint venture in Brazil (Shell interest 44%).

We continued to grow our biofuels business in 2022 through projects and acquisitions. We acquired Nature Energy for around $2 billion, our biggest acquisition in the energy transition to date. Nature Energy is the largest producer of renewable natural gas in Europe, with 14 biogas plants. The company also has around 30 new plant projects in the pipeline in Europe and the USA. This acquisition complements our growing RNG business in the USA.

Our Brazilian joint venture Ra?zen is one of the world's largest biofuels producers. In November 2022, Shell announced an agreement with Ra?zen to buy 3.25 billion litres of ethanol made from sugar-cane waste. Ra?zen's second-generation ethanol technology can produce about 50% more ethanol from the same amount of land. The low-carbon fuel is expected to be produced by five plants that Ra?zen will build in Brazil, bringing its total portfolio of ethanol facilities to nine.

Earlier in the year, we began construction of a bio-LNG plant at the Energy and Chemicals Park Rheinland in Germany to make liquefied natural gas from biological waste. Once operational, the plant will produce 100,000 tonnes of bio-LNG each year. In the Netherlands, Shell became the first fuel retailer to offer bio-LNG blended with regular LNG to all its customers. Trucks using this blend emit around 30% less CO_2.

In the aviation sector, we became the first company to supply SAF to customers in Singapore in February 2022. By the end of the year we were supplying SAF to airlines at seven airports around the world. We also acquired Malaysian waste oil recycling firm EcoOils, securing long-term access to advanced biofuels feedstock that will enable the production and supply of low-carbon fuels like SAF to customers.

Biofuels is part of our Marketing business segment.

Read more about our biofuels business at
www.shell.com/energy-and-innovation/new-energies/low-carbon-fuels

Conventional fuels

Oil and gas currently meet more than half of the world's energy needs, according to the International Energy Agency (IEA). The volatility caused by Russia's war in Ukraine has highlighted the need for a global supply of secure and affordable energy. We continue to supply the conventional fuels needed to help meet this demand, including natural gas and traditional fuels (such as fuel oil, gasoline, diesel and jet fuel), while lowering emissions from our own operations.

Natural gas

In 2022, as one of the world's largest suppliers of liquefied natural gas (LNG), we shipped natural gas to where it was needed most. We delivered 194 cargoes of LNG to Europe - almost five times our usual average. In total, we sold 66.0 million tonnes of LNG in 2022 compared with 64.2 million tonnes in 2021.

LNG plays an important role in enabling countries to replace coal-fired power generation with a lower-carbon alternative. For example, combined-cycle gas turbines emit about 50% less CO_2 per unit of electricity generated than an average coal-fired power plant, according to the IEA. LNG also helps to decarbonise shipping operations and commercial road transport. In 2022, we completed more than 250 ship-to-ship LNG bunkering operations. We provide LNG to ships at 15 ports in 10 countries. We also expanded our LNG refuelling network to more than 60 operated sites, bringing the number of sites where Shell customers can access LNG in Europe to more than 160.

Shell was selected as a partner in two projects in Qatar: the expansion of the North Field East, which is the largest LNG project in the world, and the North Field South project [A]. By using carbon capture and storage, these landmark projects will help provide LNG with a lower carbon footprint to our customers. Shell's share of these two projects will be around 3.5 million tonnes per annum (mtpa) of LNG when production starts later in the decade.

In 2022, we also took final investment decisions to develop offshore gas projects in Malaysia, the UK and Australia. One of them, the Rosmari-Marjoram project, situated 220 kilometres off the coast of Malaysia, will mainly be powered by renewable energy.

Traditional fuels

From exploration to refining and distribution, traditional fuels continue to play a key role in the energy system. We estimate that our oil production peaked in 2019. In 2022, our crude oil and natural gas liquids production available for sale was 13% lower than in the previous year. This larger than usual decline was mainly driven by portfolio changes, including the sale of our Permian business in late 2021 and the derecognition of volumes related to Sakhalin in Russia.

In 2022, we continued the transformation of our integrated refineries into Energy and Chemicals Parks. This involves developing new facilities and converting or dismantling existing units. We plan to process less crude oil and use more renewable and recycled feedstocks such as hydrogen, biofuels and plastic waste. In the USA, we completed the sale of our Mobile refinery in Alabama and of our interest in the Deer Park refinery in Texas.

We have implemented a variety of measures to reduce the energy use and increase the energy efficiency of our operations, with estimated total savings of around 1,155 million kilowatt hours (kWh). Please refer to the "Our journey to net zero" section in our Annual Report and Accounts 2022 for examples of the measures we took in 2022.

Our conventional fuels activities are part of our Upstream, Marketing, Integrated Gas and Chemicals and Products business segments.

[A] Shell participation in the North Field South project remains subject to clearance of remaining customary conditions precedent.

In Focus

Carbon capture and storage (CCS)

Shell continues to work with governments, customers and partners to unlock the potential for CCS to reduce emissions where there are currently few viable low-carbon alternatives.

In 2022, Shell's spending on CCS opportunities (operating expenses and cash capital expenditure) amounted to around $220 million, an increase of 51% from the $146 million invested in 2021. Shell's equity share of captured and stored CO_2 was around 0.4 million tonnes in 2022, in line with the 2021 amount.

In Norway, our Northern Lights CCS joint venture (Shell interest 33%) signed a letter of intent on cross-border CO_2 transport and storage in August. Under this agreement, some 800,000 tonnes of CO_2 will be captured, compressed and liquefied at a Yara ammonia and fertiliser plant in the Netherlands from early 2025. The CO_2 will then be transported to Norway for permanent storage 2,600 metres below the seabed in the North Sea. In November 2022, construction started on the first two ships that will be used to transport CO_2 to the Northern Lights facilities.

We are making progress in other CCS projects in our portfolio. In Canada, for example, the Alberta government selected the Atlas Sequestration Hub (with Shell as 50% partner) to move to the next stage for further evaluation in April 2022.

CCS is part of our Renewables and Energy Solutions business segment.

Read more about CCS on our website:
https://www.shell.com/energy-and-innovation/carbon-capture-and-storage

In Focus

Carbon credits, including nature-based solutions (NBS)

Carbon credits may be used by Shell and our customers to compensate emissions in line with the mitigation hierarchy of avoid, reduce and compensate. We are clear that carbon credits need to have a robust carbon benefit but also deliver a positive impact on ecosystems and communities. We work closely with local partners to ensure that the carbon credits projects we invest in are of a high quality.

In 2022, we invested $69 million in nature-based projects and $23 million in technology-based projects, such as fuel-efficient cookstoves. The nature-based projects include reforestation and the prevention of landscape degradation and destruction. The spend on nature-based projects includes a $40 million investment in Brazilian carbon credit developer Carbonext. This company's portfolio protects more than 2 million hectares of the Amazon rainforest.

We offer carbon credits to drivers and business customers who wish to compensate for the life-cycle CO_2 -equivalent emissions of the Shell product they buy. In 2022, this offer was extended to motorists at more than 4,000 service stations in Austria, Canada, Denmark, Germany, Hungary, the Netherlands, Switzerland and the UK.

We delivered 11 carbon-compensated liquefied natural gas (LNG) cargoes to our customers across the globe, and for the first time, a GHG-neutral LNG cargo in line with the GIIGNL Framework [A]. We also launched our Avgas carbon-compensated offer for aviation customers in selected markets in Europe and in Singapore, through our airport network.

In 2022, we retired 5.8 million carbon credits, including 4.1 million credits included in our net carbon intensity, and 1.7 million carbon credits associated mainly with the sale of non-energy products and with Shell's business travel. One carbon credit represents the avoidance or removal of 1 tonne of CO_2. We carefully source and screen the credits we purchase and retire from the market, and work with certification standards and ratings agencies to check that our requirements are met.

Carbon credits, including nature-based solutions are part of our Renewables and Energy Solutions business segment.

Read more about how we ensure high-quality carbon credits on our website: www.shell.com/nbs

[A] This framework, published by the International Group of Liquefied Natural Gas Importers, provides a common source of best practice principles in the monitoring, reporting, reduction, offsetting and verification, of GHG emissions associated with a delivered cargo of LNG.

Energy transition in Action: a selection of 2022 developments (map)

Financial framework

Read about our investments through the energy transition and our targeted returns.

Investments and returns
Investing in net zero

Investments and returns

Since the first quarter of 2022, we have reported separately on the performance of our five business segments [A]:

- Our Marketing business has targeted returns of 15-25%. It comprises Mobility, Lubricants, and Sectors and Decarbonisation. Mobility operates Shell's retail network, including electric vehicle charging services. Lubricants produces, markets and sells lubricants for road transport, and machinery used in manufacturing, mining, power generation, agriculture and construction. Sectors and Decarbonisation sells fuels, speciality products and services, including energy solutions that help customers reduce emissions in the aviation, marine, commercial road transport and agricultural sectors, among others.

- Our Renewables and Energy Solutions business has targeted returns of more than 10% [B]. It includes renewable power generation, the marketing and trading of power and pipeline gas, as well as carbon credits, and digitally enabled customer solutions. Renewables and Energy Solutions also includes the production and marketing of hydrogen, development of commercial carbon capture and storage hubs, investment in nature-based projects that avoid or reduce carbon emissions (Nature-based solutions), and Shell Ventures, which invests in companies that work to accelerate the energy and mobility transformation.
- Our Integrated Gas business has targeted returns of 14-18%. It includes liquefied natural gas (LNG), conversion of natural gas into gas-to-liquids (GTL) fuels and other products. It includes natural gas and liquids exploration and extraction, and the operation of the upstream and midstream infrastructure necessary to deliver these to market. Integrated Gas also includes the marketing, trading and optimisation of LNG, including LNG as a fuel for heavy-duty vehicles.
- Our Chemicals and Products business has targeted returns of 10-15%. It includes chemicals manufacturing plants with their own marketing network, and refineries which turn crude oil and other feedstocks into a range of oil products. These are moved and marketed around the world for domestic, industrial and transport use. The business also includes pipelines, trading of crude oil, oil products and petrochemicals, and oil sands activities, which involves the extraction of bitumen from mined oil sands and its conversion into synthetic oil.
- Our Upstream business has targeted returns of 20-25%. It explores for and extracts crude oil, natural gas and natural gas liquids. It also markets and transports oil and gas, and operates the infrastructure necessary to deliver them to the market. Shell's Upstream business delivers reliable energy from conventional oil and gas operations, as well as deep-water exploration and production activities. We are focusing our Upstream portfolio to become more resilient, prioritising value over volume to provide the energy the world needs today whilst funding the energy system of tomorrow.

For all these businesses, our target returns consider the risks and uncertainties associated with our investments, and the scale of spending that is required to develop opportunities. For example, in our Upstream business, they reflect the costs of exploration, feasibility studies and construction, as well as risks linked to commodity prices.

In 2022, our cash capital expenditure [C] was around $25 billion and our operating expenses were around $39 billion. The table below shows how much we spent and the cash flow from operations in 2021 and 2022 across our businesses.

[A] On January 31, 2023, we announced that our Integrated Gas and Upstream businesses will be combined to form a new Integrated Gas and Upstream Directorate. The Downstream business will be combined with Renewables and Energy Solutions to form a new Downstream and Renewables Directorate. These changes are expected to take effect on July 1, 2023 and will not affect Shell's financial reporting segments in 2023. Please refer to the "Our organisation" section in the Annual Report and Accounts 2022. Please refer to the "Our organisation" section in the Annual Report and Accounts 2022.

[B] The IRR target for Renewables and Energy Solutions covers Integrated Power only. The target of more than 10% relates to the integrated value chain returns over time and includes equity returns from minority investments.

[C] Please refer to the Annual Report and Accounts 2022 for the definitions of cash capital expenditure and operating expenses.

2022 delivery

Net debt end 2022 $45 billion	Cash capital expenditure [A]		Operating expenses [A]		Cash flow from operations (CFFO) $	
	2022	2021	2022	2021	2022	2021
Marketing	20%	12%	21%	20%	2.4	5.0
Renewables and Energy Solutions	14%	12%	9%	7%	(6.4) [B]	0.5
Integrated Gas	17%	18%	13%	13%	27.7	13.2
Chemicals and Products	16%	27%	28%	28%	12.9	3.7
Upstream	33%	32%	29%	32%	29.6	21.6

[A] Excluding Corporate segment. Operating expenses include exploration expenses.

[B] Negative CFFO primarily driven by net cash outflows related to derivatives and working capital outflow partly offset by Adjusted EBITDA .

Read more about our Outlook for 2023 and beyond in the Annual Report and Accounts 2022

Investing in net zero

In 2022, we invested $8.2 billion in low-carbon energy and non-energy products, around a third of our total cash capital expenditure [A] of $25 billion. Of that, we invested $4.3 billion in low-carbon energy solutions, an increase of 89% compared with the previous year. This includes capital spending on biofuels, hydrogen and charging for electric vehicles, as well as wind and solar power [B]. The remaining $3.9 billion was invested in non-energy products such as chemicals, lubricants and convenience retail, which do not produce emissions when they are used by our customers. Our investment in non-energy products decreased by 9% compared with 2021.

These investments advance a central part of our strategy which is to sell more products with low-carbon emissions to help both Shell and our customers meet their climate targets.

Two-thirds of our capital spending in 2022 was on maintaining supplies of the vital energy the world needs today. We invested $4.2 billion in liquefied natural gas (LNG) as well as gas and power marketing and trading, an increase of 17% compared with the previous year. We expect LNG will remain an important part of the energy mix for many years to come because of its role in reducing emissions from power generation and transport.

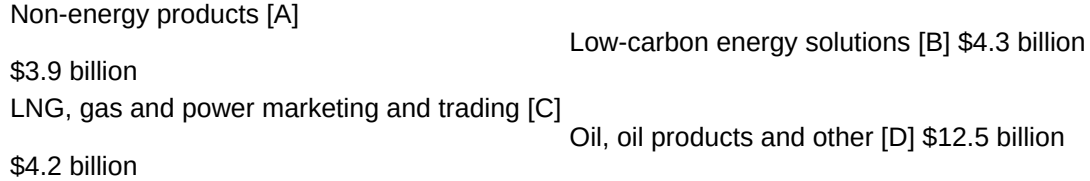
We also increased our investments in oil production and oil products by 30% to $12.5 billion. This includes investments of $8.1 billion in our Upstream business, helping maintain our assets and make up for the natural decline in oil and gas production. It also includes investments in refining and trading, as well as fuels marketing, which are important to maintain supplies of fuels for motorists, commercial road transport, aviation and industry.

[A] Please refer to the Annual Report and Accounts 2022 for the definition of cash capital expenditure.

[B] The $4.3 billion investment does not include the acquisition of Nature Energy for around $2 billion, which closed at the beginning of 2023.

Investing through the energy transition

Total cash capital expenditure of $25 billion in 2022



1. Products for which usage does not cause Scope 3, Category 11 emissions: Lubricants, Chemicals, Convenience Retailing, Agriculture & Forestry, Construction & Road.
2. E-Mobility and Electric Vehicle Charging Services, Low-Carbon Fuels (Biofuels/HEFA), Renewable Power Generation (Solar/Wind), Environmental Solutions, Hydrogen, CCUS. We define low-carbon energy products as those that have an average carbon intensity that is lower than conventional hydrocarbon products, assessed on a lifecycle basis (including emissions from production, processing, distribution and end use).
3. LNG Production & Trading, Gas & Power Trading, and Energy Marketing.

4. Upstream segment, GTL, Refining & Trading, Marketing fuel and hydrocarbon sales, Shell Ventures, Corporate segment.

Policies and governance

Read about our climate-related governance and policy engagement, and our disclosures linked to climate standards and benchmarks.

Climate policy engagement
Climate governance
A just transition
Climate standards and benchmarks

Climate policy engagement

National and international climate and energy transition policies play an increasingly important role in steering and enabling the energy transition. Shell engages with governments, regulators and policymakers in different ways to help shape policy, legislation and regulation.

We advocate directly to governments and policy makers, offering relevant information, views, and policy recommendations on new proposals. For example, Shell supports the European Union's Fit for 55 package, which aims to enable the EU's transition to climate neutrality by 2050. As part of our engagements with the EU institutions in 2022, we called for binding targets in the Renewable Energy Directive to accelerate the use of renewable hydrogen in hard-to-abate sectors such as industry and transport by 2030.

We engage governments and policymakers indirectly, for example through our participation in coalitions and industry associations. We recognise that industry associations may represent many members and sometimes we may have different views on a topic. We join coalitions where there is likely to be a common advocacy objective.

In the USA, for example, Shell supported the US Inflation Reduction Act, which was signed into law in 2022. We advocated different clean energy provisions, such as expanded tax credits for carbon capture utilisation and storage, and the creation of a tax credit for hydrogen production. We engaged with Members of Congress and the Biden Administration directly, as well as through advocacy coalitions, including the CEO Climate Dialogue, the Clean Hydrogen Future Coalition and the Carbon Capture Coalition.

In India, we continued to engage with the government, industry partners, think tanks and academic institutions to collectively find ways to promote low-carbon energy choices. In 2022, we launched a carbon capture utilisation and storage industry coalition with our partners. It aims to encourage the creation of government policies to support the development of carbon capture and storage projects in India.

We also aim to help shape the wider debate around the energy transition in other ways, including through speeches and articles. Ahead of a meeting of the EU Parliament in June 2022, for example, Shell published an opinion piece on the European news website Euractiv. We supported the proposal to ban the sale of new petrol and diesel cars and vans in the European Union from 2035, which was agreed a few months later.

We aim to be at the forefront of the drive for greater transparency around climate and energy-transition-related policy engagement. We set out our approach, policy and advocacy positions, and information about our industry association memberships, on our website.

In March 2023, we plan to publish our first Climate and Energy Transition Lobbying Report. This report reviews our lobbying in 2022 and our memberships of industry associations. We continue to work to ensure our memberships of industry associations support our climate and energy transition policy positions.

Read more at www.shell.com/advocacy

Climate governance

Our climate governance ensures our strategy, processes and incentives are aligned to drive our progress in the energy transition.

In 2022, the Board continued to consider energy transition matters throughout the year when reviewing and guiding the implementation of our Powering Progress strategy, assessing the risk management policies in place, and challenging and endorsing the business plans and budgets - including overseeing major capital expenditures, acquisitions and divestments.

To foster the delivery of our strategy, we have further aligned staff remuneration with progress in the energy transition, by making changes to the annual bonus scorecard, which helps determine bonus outcomes for most Shell employees, including Executive Committee members.

From 2022, we introduced new metrics to the measure called Shell's Journey in the Energy Transition (15% of the annual bonus scorecard). These are:

- Selling lower carbon products - we help customers to reduce their emissions by supplying low-carbon products. We measure our success by the earnings share of our Marketing activities from low-carbon energy products as well as non-energy products and convenience retail.
- Reducing operational emissions - our target is to achieve a 50% reduction by 2030; and this measure is based on reducing our Scope 1 and 2 operational emissions.
- Partnering to decarbonise - we seek to collaborate with our customers to help them reduce their emissions. In 2022, we measured success in this area in terms of our progress in rolling out our electric vehicle charging network.

We also introduced a customer excellence measure on the annual bonus scorecard, to emphasise the importance of building ever stronger customer relationships in the energy transition.

Our Long-term incentive plan (LTIP) and Performance share plan (PSP) tie pay for around 16,500 employees directly to achieving our strategic ambitions for the energy transition. From 2019 onwards, we have included an energy transition performance metric in our LTIP. This element vested for the second time in 2022, at 180% of target, based on performance between 2020 and the end of 2022, reflecting our progress in transforming Shell's business for a lower-carbon future. The weight of this metric will be increased from 20% to 25% for the most senior employees for the upcoming LTIP cycle (2023-2025).

For further details see "Governance of climate-related risk and opportunities" in our Annual Report and Accounts 2022.

A just transition

Shell supports the Paris Agreement on climate change, which recognises the importance of a just transition. A just transition means a fairer distribution of the costs and benefits of the world's transition to a net-zero emissions energy system.

Our aim is to contribute to a just transition by making a positive impact on the communities where we operate, our customers and our workforce. This is part of our strategic goal to power lives. In 2022, we pledged ?100 million to help communities in the UK develop skills and find jobs linked to the energy transition. This includes establishing educational skill centres, part of a wider aim to help 15,000 people find employment by 2030.

Shell continues to work with governments and our partners, such as Energy for a Just Transition, facilitated by Business for Social Responsibility (BSR), and Ipieca's Just Transition Taskforce.

We are committed to respecting human rights, as set out in the United Nations Universal Declaration of Human Rights and the International Labour Organization Declaration on Fundamental Principles and Rights

at Work.

We continue to help our own staff learn new skills needed for the energy transition. In 2022, around 4,000 Shell employees - up from 1,700 in 2021 - completed courses on a range of subjects, including hydrogen production, carbon capture and storage, and greenhouse gas and energy management.

You can read more about our approach at www.shell.com/justtransition

Climate standards and benchmarks

Climate standards and benchmarks play a key role in supporting Shell's efforts in the energy transition. They promote an ongoing dialogue between interested parties and highlight areas of progress against externally established criteria.

Task Force on Climate-related Financial Disclosures (TCFD)

Shell welcomes the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD is a global initiative to get companies across all sectors to assess climate-related risks and opportunities. The TCFD recommends disclosure of qualitative and quantitative information aligned to its four core elements: governance, strategy, risk management, and metrics and targets. Please refer to our Annual Report and Accounts 2022 for Shell's disclosures related to recommendations by the TCFD, in the "Our journey to achieving net zero" section.

Climate Action 100+ Net Zero Company Benchmark

Since the publication of Shell's Energy Transition Strategy in 2021, Shell has continued to engage with the Climate Action 100+ investor group. The table below shows how Shell was assessed in the October 2022 Climate Action 100+ Net Zero Company Benchmark.

Criteria	Assessment of Shell Plans - March 2022	Assessment of Shell Plans - O
Net zero by 2050	Meets all criteria	Meets all criteria
Long-term greenhouse gas reduction target	Partial, meets some criteria	Meets all criteria
Medium-term greenhouse gas reduction target	Partial, meets some criteria	Partial, meets some criteria
Short-term greenhouse gas reduction target	Partial, meets some criteria	Partial, meets some criteria
Decarbonisation strategy	Partial, meets some criteria	Partial, meets some criteria
Capital allocation alignment	Does not meet any criteria	Does not meet any criteria
Climate policy engagement	Meets all criteria	Meets all criteria
Climate governance	Meets all criteria	Meets all criteria
Just transition	n/a	n/a
TCFD disclosure	Partial, meets some criteria	Meets all criteria

The Climate Action 100+ (CA100+) benchmark uses assessments by the Transition Pathway Initiative (TPI). In its assessment, TPI highlights that it has recalculated Shell's net carbon intensity according to its own methodology. It also highlights that Shell has set further targets to reduce its net carbon intensity, but they were not included in this assessment as it was not possible to make them consistent with TPI's methodology.

We are pleased to see that our ratings have improved in two areas in the latest assessment, but we continue to be disappointed with certain key aspects of the assessment due to differences in the methodologies used. We will continue our engagement with CA100+ and TPI with the aim of ensuring that our current targets and disclosures are reflected in their Benchmark and hope we can continue to improve the outcome in their assessment.

Litigation and activism

Read about our position on climate litigation and activism.

Climate litigation and activism

Climate litigation and activism

During the past decade, environmental activists have increasingly used litigation to hold governments and companies accountable for the effects of climate change on individuals and communities around the world. Shell is involved in more than 20 such court cases worldwide.

In March 2022, we appealed a ruling by the District Court of The Hague in the Netherlands from May 2021, which requires Shell to reduce emissions further and faster than even the most ambitious energy scenarios published for the sectors in which we operate. As we wait for the outcome of the appeal, we are taking active steps to comply with the ruling. We believe the actions we are taking to deliver our energy transition strategy are consistent with the court ruling and its end of 2030 timeline. This includes the investments we are making in low-carbon fuels, renewable power, and hydrogen; in addition to making changes to our upstream and refinery portfolios.

In February 2023, environmental law group ClientEarth filed a claim with the High Court in England against Shell plc and the current Board of Directors challenging the board's decision-making regarding Shell's climate strategy. This is a derivative action brought by shareholders on behalf of the Company. The High Court must grant permission for ClientEarth to proceed with the claim. Investors representing less than 0.2% of Shell's total shareholder base have sent letters supporting the claim. We do not accept ClientEarth's allegations. We believe our directors have complied with their legal duties and have, at all times, acted in the best interests of the Company.

We agree there is an urgent need to change the world's energy system. We believe it is for governments to determine the right trade-offs for society and to put in place the policies that bring about fundamental changes in the way society consumes energy. Litigation does not enable the global cooperation required to change both supply and demand for energy, as well as the infrastructure supporting the use of energy.

Shell is determined to play its part in helping to change the world's energy system. We believe our climate targets are aligned with the more ambitious goal of the UN Paris Agreement on climate change: to limit the increase in the global average temperature to 1.5ºC above pre-industrial levels. Importantly, we have already delivered results: Shell reduced Scope 1 and 2 emissions under our operational control in 2022 by 30% compared with 2016.

Some shareholders, such as Follow This, have also called on us to set even more ambitious targets to reduce Scope 3 emissions. This is also a focus of some of the climate litigation against us.

Shell would, among other things, have to decrease its sales of oil products and gas to reduce its Scope 3 emissions in line with the Follow This resolution. Doing so, without changing demand and the way our customers use energy, would effectively mean handing over customers to competitors. This would materially affect Shell's financial strength and limits its ability to generate value for shareholders. It would also reduce our ability to play an important role in the energy transition by working with customers to reduce their emissions.

We are making progress in implementing our energy transition strategy, which we believe is the best for society, our customers and our shareholders. Read more about why Shell has appealed the District Court ruling (in Dutch and English) www.shell.nl/media/nieuwsberichten/2022/waarom-shell-in-hoger-beroep-gaat

Cautionary note

The companies in which Shell plc directly and indirectly owns investments are separate legal entities. In this Report "Shell", "Shell Group" and "Group" are sometimes used for convenience where references are made to Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities. "Subsidiaries", "Shell subsidiaries" and "Shell companies" as used in this Report refer to entities over which Shell plc either directly or indirectly has

control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations", respectively. "Joint ventures" and "joint operations" are collectively referred to as "joint arrangements". Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

Forward-looking statements

This Report contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "aim", "ambition", "anticipate", "believe", "could", "estimate", "expect", "goals", "intend", "may", "milestones", "objectives", "outlook", "plan", "probably", "project", "risks", "schedule", "seek", "should", "target", "will" and similar terms and phrases. There are a number of factors that could affect the future operations of Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this Report, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, judicial, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this Report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Shell plc's Form 20-F for the year ended December 31, 2022 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward-looking statements contained in this Report and should be considered by the reader. Each forward-looking statement speaks only as of the date of this Report, March 16, 2023. Neither Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this Report.

In the event of any discrepancy or inconsistency between this Report and Shell plc's Form 20-F for the year ended December 31, 2022, such discrepancy or inconsistency is unintended, and the information included in Shell's Form 20-F controls.

Shell's net carbon intensity

Also, in this Report we may refer to Shell's "net carbon intensity", which include Shell's carbon emissions from the production of our energy products, our suppliers' carbon emissions in supplying energy for that production and our customers' carbon emissions associated with their use of the energy products we sell. Shell only controls its own emissions. The use of the term Shell's "net carbon intensity" is for convenience only and not intended to suggest these emissions are those of Shell plc or its subsidiaries.

Shell's net-zero emissions target

Shell's operating plan, outlook and budgets are forecasted for a ten-year period and are updated every year.

They reflect the current economic environment and what we can reasonably expect to see over the next ten years. Accordingly, they reflect our Scope 1, Scope 2 and Net Carbon Intensity (NCI) targets over the next ten years. However, Shell's operating plans cannot reflect our 2050 net-zero emissions target and 2035 NCI target, as these targets are currently outside our planning period. In the future, as society moves towards net-zero emissions, we expect Shell's operating plans to reflect this movement. However, if society is not net zero in 2050, as of today, there would be significant risk that Shell may not meet this target.

Forward-looking non-GAAP measures

This Report may contain certain forward-looking non-GAAP measures such as [cash capital expenditure] and [divestments]. We are unable to provide a reconciliation of these forward-looking non-GAAP measures to the most comparable GAAP financial measures because certain information needed to reconcile those non-GAAP measures to the most comparable GAAP financial measures is dependent on future events some of\ which are outside the control of Shell, such as oil and gas prices, interest rates and exchange rates. Moreover, estimating such GAAP measures with the required precision necessary to provide a meaningful reconciliation is extremely difficult and could not be accomplished without unreasonable effort. non-GAAP measures in respect of future periods which cannot be reconciled to the most comparable GAAP financial measure are calculated in a manner which is consistent with the accounting policies applied in Shell plc's consolidated financial statements.

The contents of websites referred to in this Report do not form part of this Report.

We may have used certain terms, such as resources, in this Report that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website www.sec.gov.

Additional information

As used in this Report, "accountable"is intended to mean: required or expected to justify actions or decisions. The accountable person does not necessarily implement the action or decision (implementation is usually carried out by the person who is Responsible) but must organise the implementation and verify that the action has been carried out as required. This includes obtaining requisite assurance from Shell companies that the framework is operating effectively. "Responsible" is intended to mean: required or expected to implement actions or decisions. Each Shell company and Shell-operated venture is responsible for its operational performance and compliance with the Shell General Business Principles, Code of Conduct, Statement on Risk Management and Risk Manual, and Standards and Manuals. This includes responsibility for the operationalisation and implementation of Shell Group strategies and policies. CO_2 compensation does not imply that there is no environmental impact from the production and use of the product as associated emissions remain in the atmosphere. CO_2 compensation is not a substitute for switching to lower emission energy solutions or reducing the use of fossil fuels. Shell businesses focus first on emissions that can be avoided or reduced and only then, compensate the remaining emissions. "carbon neutral" or "CO_2 compensated" indicates that Shell will engage in a transaction where an amount of CO_2 equivalent to the value of the remaining CO_2e emissions associated with the raw material extraction, transport, production, distribution and usage /end-of-life (if Lubricants or other non-energy product) of the product are compensated through the purchase and retirement of carbon credits generated from CO_2 compensation projects. Although these carbon credits have been generated in accordance with international carbon standards, the compensation may not be exact. CO_2e (CO_2 equivalent) refers to CO_2, CH_4, N_2O.

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Classification: Additional Regulated Information required to be disclosed under the laws of the United Kingdom