

CDP Climate Change 2019 Information Request – Royal Dutch Shell plc

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C0. Introduction

(C0.1) Give a general description and introduction to your organization.

Shell's responses in this questionnaire are typically extracts from Shell's disclosures with case by case additions or limited redactions. This submission should not be considered comprehensive as responses aim to meet criteria defined by CDP, to answer CDP questions within the given space or to choose from the drop-down options offered by the questionnaire. Please refer to Shell's own disclosures for further information as available on www.shell.com.

On www.shell.com/ghg, our online CDP submission is available as a pdf document. This pdf contains a few additional comments complementing some of our responses as the online portal did not offer an opportunity to log those (sections: C8.1, C12.3a, C12.3c).

Annual Report 2018, from p12:

Royal Dutch Shell plc (the Company) is a public limited company registered in England and Wales and headquartered in The Hague, the Netherlands

BUSINESS MODEL

Shell is an international group of companies with expertise in the exploration, development, production, refining and marketing of oil and natural gas, as well as in the manufacturing and marketing of chemicals.

ORGANISATION

We describe below how our activities are organised. Integrated Gas, Upstream and Downstream focus on our seven strategic themes (see "Strategy and outlook" on p10). Our Projects & Technology organisation manages the delivery of Shell's major projects and drives research and innovation to develop new technology solutions.

INTEGRATED GAS INCLUDING NEW ENERGIES

This organisation covers two strategic themes: Integrated Gas, which is a cash engine; and New Energies, which is an emerging opportunity.

Integrated Gas manages LNG activities and the conversion of natural gas into GTL fuels and other products. It includes natural gas exploration and extraction, and the operation of upstream and midstream infrastructure necessary to deliver gas to market. It markets and trades natural gas, LNG, electricity and carbon-emission rights and also markets and sells LNG as a fuel for heavy-duty vehicles and marine vessels.

In New Energies, we are exploring emerging opportunities and investing in those where we believe sufficient commercial value is available. We focus on new fuels for transport, such as advanced biofuels, hydrogen and charging for battery-electric vehicles; and power, including from low-carbon sources such as wind and solar as well as natural gas.

UPSTREAM

Our Upstream organisation covers three strategic themes: Conventional Oil and Gas, which is a cash engine; Deep water, which is a growth priority; and Shales, which is an emerging opportunity.

It manages the exploration for and extraction of crude oil, natural gas and natural gas liquids. It also markets and transports oil and gas, and operates infrastructure necessary to deliver them to market.

DOWNSTREAM

Our Downstream organisation comprises two strategic themes: Oil Products, which is a cash engine; and Chemicals, which is a growth priority.

It manages different Oil Products and Chemicals activities as part of an integrated value chain, that trades and refines crude oil, and other feedstocks into a range of products which are moved and marketed around the world for domestic, industrial and transport use. The products we sell include gasoline, diesel, heating oil, aviation fuel, marine fuel, biofuel, lubricants, bitumen and sulphur. In addition, we produce and sell petrochemicals for industrial use worldwide. Our Downstream organisation also manages Oil Sands activities (the extraction of bitumen from mined oil sands and its conversion into synthetic crude oil).

PROJECTS & TECHNOLOGY

Our Projects & Technology organisation manages the delivery of our major projects and drives research and innovation to develop new technology solutions. It provides technical services and technology capability for our Integrated Gas, Upstream and Downstream activities. It is also responsible for providing functional leadership across Shell in the areas of safety and environment, contracting and procurement, wells activities and greenhouse gas management. (...)

SEGMENTAL REPORTING

Our reporting segments are Integrated Gas, Upstream, Downstream and Corporate. Upstream combines the operating segments Upstream (managed by our Upstream organisation) and Oil Sands (managed by our Downstream organisation), which have similar economic characteristics. Integrated Gas, Upstream and Downstream include their respective elements of our Projects & Technology organisation. The Corporate segment comprises our holdings and treasury organisation, self-insurance activities, and headquarters and central functions. See Note 4 to the “Consolidated Financial Statements” on pages 181-184.

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Row 1	January 1, 2018	December 31, 2018	No

(C0.3) Select the countries/regions for which you will be supplying data.

- Australia
- Canada

Germany
Malaysia
Netherlands
Nigeria
Singapore
United Kingdom of Great Britain and Northern Ireland
United States of America

(C0.4) Select the currency used for all financial information disclosed throughout your response.

USD

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?

Oil and gas value chain

Upstream
Downstream
Chemicals

Other divisions

Biofuels
Carbon capture and storage/utilization

C1. Governance

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board Chair	<p>(Annual Report 2018, p97) The Chair is responsible for the leadership and management of the Board and for ensuring that the Board and its committees function effectively. One way in which this is achieved is by ensuring Directors receive accurate, timely and clear information. He is also responsible for agreeing and regularly reviewing the training and development needs of each Director (see “Induction and training” below) which he does with the assistance of the Company Secretary.</p> <p>(AR 2018, p71) The Chair’s leadership role includes the Board Committees, such as the Corporate and Social Responsibility Committee (CSRC).</p> <p>The CSRC regularly discusses the Company’s approach to combatting climate change. In 2018, this included the energy transition, GHG emission targets (including advice to the Remuneration Committee), policy on methane, Shell’s Net Carbon Footprint ambition and nature-based solutions.</p> <p>More information on Board meeting discussions on p76ff.</p>
Board-level committee	<p>(Annual Report 2018, p101) Corporate and Social Responsibility Committee (CSRC)</p> <p>The role of the CSRC is to review and advise the Board on Shell’s strategy, policies and performance in the areas of safety, environment, ethics and reputation against the Shell General Business Principles, the Shell Code of Conduct, and the HSSE & SP Control Framework. Conclusions/recommendations made by the CSRC are reported directly to the Executive Committee and Board.</p> <p>The topics discussed in depth included personal and process safety, road safety, the energy transition and climate change, Shell’s Net Carbon Footprint ambition, the Company’s environmental and societal licence to operate, and its ethics programme.</p>
Chief Executive Officer (CEO)	<p>The Executive Committee operates under the direction of the CEO in support of his accountability for the overall management of Shell’s business. The CEO has final authority in all matters of management that are not reserved for the Board or the shareholders of Royal Dutch Shell plc.</p> <p>The CEO is the most senior individual with accountability for climate change. This includes the delivery of Shell’s strategy, e.g. through Shell’s plans – as announced in December 2018 – to set short-term targets for reducing the Net Carbon Footprint of the energy products it sells – a carbon intensity measure that includes our customers’ emissions when they use these products – and to link these targets to executive remuneration. This was an industry first.</p>

(C1.1b) Provide further details on the board’s oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Reviewing and guiding annual budgets</p> <p>Reviewing and guiding business plans</p> <p>Setting performance objectives</p> <p>Monitoring implementation and performance of objectives</p> <p>Overseeing major capital expenditures, acquisitions and divestitures</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>(Annual Report 2018, p71) Shell has a climate change risk management structure in place which is supported by standards, policies and controls. This includes the work of the Board, which discusses a number of regular agenda items, among them reporting on environmental topics. (AR 2018, p98) The Board generally meets eight times a year. However, in 2018, there were 10 meetings, nine of which were held in The Hague, the Netherlands and one in Florence, Italy. The agenda for each meeting included a number of regular items, including reports from each of the Board committees – see role with regard to climate change in C1.1a and below. Throughout 2018, the Board discussed, e.g., how the businesses should adapt in line with the Net Carbon Footprint ambition. In addition, some of the Non-executive Directors received dedicated updates from management and external experts on New Energies, the various business models, advantages and disadvantages of having positions along the power value chain, and the opportunities for Shell in the New Energies area. During the annual dedicated strategy meeting, the Board debated the longer-term challenges of the future of mobility and the changing mobility landscape in the context of climate change and energy transition. The Board committees (see “Corporate governance”, p100, Annual Report 2018) play an important role in assisting the Board with regard to governance and management of climate change risks and opportunities. In 2018, the CSRC held 5 meetings in Person and 1 meeting by conference call. One of the governance mechanisms that contributes to our Board’s oversight of climate issues is “reviewing and guiding strategy”. The role of the Corporate and Social Responsibility Committee (CSRC) is to review and advise the Board on Shell’s strategy, policies and performance in the areas of safety, environment, ethics and reputation. It regularly discusses the Company’s approach to combatting climate change. In 2018, this included the energy transition, GHG emission targets (including advice to the Remuneration Committee), policy on methane, Shell’s Net Carbon Footprint and nature-based solutions.</p>

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Our response to C1.2 is defined further as follows with regards to

- where in the organisational structure the position lies,
- why climate-change issues have been assigned to them, and
- what some of their responsibilities are with regards to assessment and management of those issues.

The CEO is the most senior individual with accountability for climate change risk and each Shell subsidiary has operational responsibility for implementing climate change policies and strategies (Annual Report 2018 (AR), p71).

The CEO has final authority in all matters of management that are not within the duties and authorities of the Board or of the shareholders' general meeting (AR, p101).

Rising climate change concerns are mentioned as one of the risk factors described in our AR (p16).

Shell organises its activities in four segments: Integrated Gas including New Energies, Upstream, Downstream and Projects & Technology. Each segment is led by a Director reporting to the CEO (AR, p13).

For more context information, please refer to our Annual Report 2018, p72, the section "Our governance and management of climate change risks and opportunities", with an illustrative organogram.

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Who is entitled to benefit from these incentives?

Chief Executive Officer (CEO)

Types of incentives

Monetary reward

Activity incentivized

Other, please specify: **GHG intensity management**

Comment

Sustainability Report 2018, p18:

In 2018, sustainable development continued to account for 20% of Shell's Executive scorecard, which is used to help determine the annual bonuses awarded to Royal Dutch Shell plc's Executive Directors.

The GHG metrics (weight 10%) in the 2018 scorecard evolved, with coverage increasing to around 90% of operated portfolio emissions.

LONG-TERM INCENTIVE PLAN (AR 2018, p76)

In 2017 we announced our ambition to reduce the Net Carbon Footprint of our energy products in step with society's drive to reduce GHG emissions. We aim to reduce the Net Carbon Footprint of the energy products we sell – expressed in grams of CO2 equivalent per megajoule consumed – by around half by 2050. As an interim step, by 2035, and predicated on societal progress, we aim for a reduction of around 20% compared with our 2016 level.

Our plans now include an energy transition condition in the performance conditions for the 2019 long-term incentive plan (LTIP) grant. This condition will include the first three-year target to reduce the Net Carbon Footprint of the energy products we sell and will also include other measures that will help us achieve our strategic ambitions in the long term, related to the growth of Shell's power business, commercialising opportunities in advanced biofuel technology and the development of systems to capture and store carbon. These measures are based on recommendations from the CSRC.

(AR 2018, p129) Extract about the new condition:

- Net Carbon Footprint: For the 2019 award, the target is a 2-3% reduction in NCF from the 2016 baseline NCF, which is disclosed in the 2018 Climate change section on p77.
- Growth of our power business: Growth in the use of electricity and continuing decarbonisation of electricity by shifting to renewables and gas-fired power generation is recognised as a key lever in all decarbonisation scenarios. Our ambition to grow the power business is based on selective investments in

generation, as well as in business models based on reselling power generated by others.

- Advanced biofuels technology: For society and for Shell, commercialisation of advanced biofuel technology is one of the most important steps in energy transition;

- Carbon capture and storage (CCS) and carbon sinks, such as nature-based solutions are required as part of the global response to climate change.

Who is entitled to benefit from these incentives?

Chief Financial Officer (CFO)

Types of incentives

Monetary reward

Activity incentivized

Other, please specify: **GHG intensity management**

Comment

Sustainability Report 2018, p18:

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- Advanced biofuels technology: For society and for Shell, commercialisation of advanced biofuel technology is one of the most important steps in energy transition;
- Carbon capture and storage (CCS) and carbon sinks, such as nature-based solutions are required as part of the global response to climate change.

Who is entitled to benefit from these incentives?

Other, please specify: **Senior management and other employees**

Types of incentives

Monetary reward

Activity incentivized

Other, please specify: **GHG intensity management**

Comment

Sustainability Report 2018, p18:

In 2018, sustainable development continued to account for 20% of Shell's Executive scorecard, which is used to help determine the annual bonuses awarded to Royal Dutch Shell plc's Executive Directors.

Targets are set each year by the Board's Remuneration Committee, based on recommendations from the Corporate Social Responsibility Committee (CSRC), and the relevant outcomes are reported retrospectively in the Annual Report. The same annual bonus scorecard approach applies to senior executives and most other employees.

The metrics on sustainable development in 2018 had equal weighting between Shell's safety (10%) and environmental (10%) performance. Since 2017, the environmental component has included greenhouse gas emissions management in specific business areas. The greenhouse gas emissions metrics in the 2018 scorecard evolved, with coverage increasing to around 90% of operated portfolio emissions. The refining metric remained unchanged, while the scope of the chemicals metric was adjusted to cover only steam cracker high value petrochemicals production. Emissions coverage in upstream and

midstream was also revised, meaning that it is now measured on an intensity basis and has been expanded beyond flaring. Scorecard measures for 2019 will remain the same.

C2. Risks and opportunities

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	1	3	<p>Note: CDP does not allow to quote our definition from our 2018 Annual Report: "up to 3 years" for this time period (page 75). Short term (up to three years): detailed financial projections are developed and used to manage performance and expectations on a three-year cycle. This three-year plan is shared with the Board.</p> <p>Shell has a rigorous approach to understanding, managing and mitigating climate risks to its facilities. Shell also requires each business and function to monitor, communicate and report changes in the risk environment and the effectiveness of actions taken to manage identified risks on an ongoing basis. This is outlined in a toolkit for risk management including our Risk Management Manual and complementary guidance documents that cover specific aspects such as climate risk.</p> <p>In December 2018, we also announced our intention to set shorter-term Net Carbon Footprint (NCF) targets of 3–5 year periods. In early 2019, we decided to set a Net Carbon Footprint target for 2021 of 2-3% lower than our 2016 Net Carbon Footprint of 79 grams of carbon-dioxide (CO₂) equivalent per megajoule.</p>
Medium-term	3	10	<p>Note: CDP does not allow to quote our definition from our 2018 Annual Report: "three years up to around 10 years" for this time period (page 75).</p> <p>Medium term (three years up to around 10 years): The majority of production and earnings expected to be generated in this period come from our existing assets. We aim to reduce the Net Carbon Footprint of the energy products we sell – expressed in grams of CO₂ equivalent per megajoule consumed – by around half by 2050. As an interim step, by 2035, and predicated on societal progress, we aim for a reduction of around 20% compared with our 2016 level.</p>
Long-term	10	30	<p>Note: CDP does not allow to quote our definition from our 2018 Annual Report: "beyond around 10 years" for this time period (p75).</p> <p>Long term (beyond around 10 years): for this period, it is expected for the current Shell portfolio to go through changes and evolution with the energy transition. Decision making and risk identification on the thematic structure of the future portfolio are guided by the pace of progression of society and in step with society as it moves toward the goals of Paris.</p> <p>We aim to reduce the Net Carbon Footprint of the energy products we sell – expressed in grams of CO₂ equivalent per megajoule</p>

			consumed – by around half by 2050. As an interim step, by 2035, and predicated on societal progress, we aim for a reduction of around 20% compared with our 2016 level.
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(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	<p>Shell has a global approach to climate change risk management, covering all regions worldwide where we operate or explore. Risk management procedures covering climate change risks and opportunities are reported to Board or individual/sub-set of the Board or committee appointed by the Board. Shell's approach to risk management includes a variety of processes. The Shell Control Framework is fundamental to these processes. Risks and opportunities are assessed at Group, business and asset levels.</p> <p>Throughout 2018, the Board discussed the businesses' Net Carbon Footprint ambition. In addition, some of the Non-executive Directors received dedicated updates from management and external experts on New Energies, the various business models, advantages and disadvantages of having positions along the power value chain, and the opportunities for Shell in the New Energies area.</p>

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

Climate change and risks resulting from GHG emissions have been identified as a significant risk factor for Shell and are managed in accordance with other significant risks through the Board and Executive Committee. Shell's processes for identifying, assessing, and managing climate-related issues are integrated into our overall multi-disciplinary company-wide risk identification, assessment and management process. Shell frequently monitors and assesses climate-related risks looking at different time horizons; short (up to 3 years), medium (three years up to around 10 years) and long term (beyond around 10 years). Shell has a climate change risk management structure in place which is supported by standards, policies and controls (Annual Report 2018, p71).

The dedicated Group Carbon team is accountable for monitoring and examining the strategic implications of climate change for Shell and the impact of developments in governmental policy and regulation. The Group Carbon team is responsible for preparing proposed policy positions based on analysis within Shell and external input. The team also provides advice to Shell companies to ensure consistency in application of our core principles and policy tasks in interactions with policymakers. Group Carbon also has oversight of Shell's GHG management programme and supports the different lines of business in embedding GHG management strategies. The team includes GHG project managers to advise the largest projects in managing GHG-related topics, from both a risk and an opportunity standpoint (Annual Report 2018, p72).

Our portfolio exposure is reviewed annually against changing GHG regulatory regimes and physical conditions to identify emerging risks. We test the resilience of our portfolio against externally published future pathways, including a low emissions pathway. In 2017, Shell announced a long-term ambition to reduce the Net Carbon Footprint of energy products it sells. This was followed by an announcement, in December 2018, of our intention to set shorter-term targets of 3-5 year periods in line with that ambition. To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. Consistent with our desire to stay in step with society's progress toward the goals of the Paris Agreement, in 2018, we moved away from using a flat project screening value (PSV) of \$40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. Accordingly, we believe they more accurately reflect society's current implementation of the Paris Agreement rather than a flat \$40/tonne PSV. By 2050, our estimates for some countries increase to \$85/tonne of GHG emissions (AR, p73).

Sensitivity analysis: We apply additional sensitivity tests for our high-emitting projects by using long-term carbon cost estimates consistent with limiting the average global temperature rise to well below two degrees Celsius. In addition, projects in the most GHG-exposed asset classes are benchmarked against GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-constrained future. These processes can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments commercially compelling. Our approach continues to evolve and become more sophisticated to reflect our increasing understanding of the shifting policy landscape and the differing pace of energy transitions underway in different regions.

Scenario Analysis: While monitoring emerging climate change plans, we consider the robustness of our activities against a range of scenarios, as referenced in the 2018 SET Report. We use multiple future scenarios to assess the resilience of our strategy. We believe our business strategy is resilient to the envisaged implementation of the Paris Agreement, which is now progressing through countries' development of individual plans in their NDCs. The emissions of energy consumers from their use of Shell energy products are for a large part covered by these NDCs.

Shell’s 2018 Annual Report (p71-73) provides further details on the organisation’s processes for identifying and assessing climate-related risks. The HSSE & SP Assurance and Reporting team is accountable for the delivery of Shell’s non-financial reporting and for auditing the businesses’ performance against our HSSE & SP Control Framework requirements, including climate change risk management.

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p>Rising climate change concerns have led and could lead to additional legal and/or regulatory measures which could result in project delays or cancellations, a decrease in demand for fossil fuels, potential litigation and additional compliance obligations. If we are unable to find economically viable, as well as publicly acceptable solutions that reduce our GHG emissions and/or GHG intensity for new and existing projects, we could experience additional costs or financial penalties, delayed or cancelled projects, and/or reduced production and reduced demand for hydrocarbons, which could have a material adverse effect on our earnings, cash flows and financial condition.</p> <p>Shell incorporates risk in its assessment process by carefully considering the potential environmental impact of its activities and how local communities might be affected during the lifetime of projects and operations in our risk assessment process. We seek to comply with environmental regulations, to continually improve our performance, and to prepare to respond to future challenges and opportunities. We use external standards and guidelines, such as those developed by the World Bank and International Finance Corporation, to inform our approach. We have global environmental standards, which we believe meet applicable regulatory requirements and often exceed them. Our standards cover our environmental performance, including managing emissions of GHGs, using energy more efficiently, flaring less gas during oil production, preventing spills and leaks of hazardous materials, using less fresh water and conserving biodiversity wherever we operate.</p>
Emerging regulation	Relevant, always included	<p>Several countries that are important operating areas for Shell are developing additional climate change legislation which may include the use of emissions trading systems and carbon taxes, which could potentially increase compliance costs. We expect that a growing share of our GHG emissions will be subject to regulation, resulting in increased compliance costs/operational restrictions. If our GHG emissions rise alongside our ambitions to increase the scale of our business, our regulatory burden will increase proportionally. We also expect that GHG regulation, as well as emission reduction actions by customers, will continue to focus more on suppressing demand for fossil fuels, either through taxes, fees, incentives to promote the sale of electric vehicles or even through the future prohibition of sales of new diesel or gasoline vehicles. This could result in lower revenue and, in the long term, potential impairment of certain assets.</p>

		<p>We risk-assess the resilience of new projects by considering potential cost associated with operational GHG emissions. Consistent with our desire to stay in step with society’s progress toward the goals of the Paris Agreement, in 2018, we moved away from using a flat project screening value (PSV) of \$40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. Accordingly, we believe they more accurately reflect society’s current implementation of the Paris Agreement rather than a flat \$40/tonne PSV. By 2050, our estimates for some countries increase to \$85/tonne of GHG emissions.</p> <p>Also, we apply additional sensitivity tests for our high-emitting projects by using long-term carbon cost estimates consistent with limiting the average global temperature rise to well below two degrees Celsius. In addition, projects in the most GHG-exposed asset classes are benchmarked against GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-constrained future.</p> <p>These processes considered in our risk assessment can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments commercially compelling.</p>
Technology	Relevant, always included	<p>Our future performance depends on the successful development and deployment of new technologies and new products. Technology and innovation are essential to our efforts to meet the world’s energy demands in a competitive way. If we do not develop the right technology and products, do not have access to such technology and products or do not deploy these effectively, there could be a material adverse effect on the delivery of our strategy and our licence to operate. We operate in environments where advanced technologies are utilised. In developing new technologies and new products, unknown or unforeseeable technological failures or environmental and health effects could harm our reputation and licence to operate or expose us to litigation or sanctions. The associated costs of new technology are sometimes underestimated, or delays occur. If we are unable to develop the right technologies and products in a timely and cost-effective manner, or if we develop technologies and products that adversely impact the environment or health of individuals, there could be a material adverse effect on our earnings, cash flows and financial condition.</p> <p>Shell incorporate risk in its technology assessment process by continuously looking for technologies and innovations of potential relevance to our business. Our Chief Technology Officer oversees the development and deployment of new and differentiating technologies and innovations across Shell, seeking to align business and technology requirements throughout our technology maturation process. In 2018, overall company research and development expenses across all businesses (Upstream, Downstream,</p>

		Integrated Gas/New Energies) were \$986 million, across all businesses and including low carbon and other technologies. Our main technology centres are in India, the Netherlands and the USA, with other centres in Brazil, China, Germany, Oman and Qatar. A strong patent portfolio underlies the technology that we employ in our various businesses. In total, we have around 10,325 granted patents and pending patent applications.
Legal	Relevant, always included	Rising climate change concerns have led and could lead to additional legal and/or regulatory measures which could result in project delays or cancellations, a decrease in demand for fossil fuels, potential litigation and additional compliance obligations. Shell operates in more than 70 countries that have differing degrees of political, legal and fiscal stability. This exposes us to a wide range of political developments that could result in changes to contractual terms, laws and regulations. In addition, we and our joint arrangements and associates face the risk of litigation and disputes worldwide. Developments in politics, laws and regulations can and do affect our operations. Potential impacts include: forced divestment of assets; expropriation of property; cancellation or forced renegotiation of contract rights; additional taxes including windfall taxes, restrictions on deductions and retroactive tax claims; antitrust claims; changes to trade compliance regulations; price controls; local content requirements; foreign exchange controls; changes to environmental regulations; changes to regulatory interpretations and enforcement; and changes to disclosure requirements. Any of these, individually or in aggregate, could have a material adverse effect on our earnings, cash flows and financial condition.
Market	Relevant, always included	We are exposed to fluctuating prices of crude oil, natural gas, oil products and chemicals. The prices of crude oil, natural gas, oil products and chemicals are affected by supply and demand, both globally and regionally. Government actions may also affect the prices of crude oil, natural gas, oil products and chemicals. Moreover, prices for oil and gas can move independently of each other. Factors that influence supply and demand include operational issues, natural disasters, weather, political instability, conflicts, economic conditions and actions by major oil and gas producing countries. Additionally, in a low oil and gas price environment, we would generate less revenue from our Upstream and Integrated Gas businesses, and, as a result, parts of those businesses could become less profitable, or could incur losses. Additionally, low oil and gas prices have resulted, and could continue to result, in the debooking of proved oil or gas reserves, if they become uneconomic in this type of price environment. Prolonged periods of low oil and gas prices, or rising costs, have resulted and could continue to result in projects being delayed or cancelled. In addition, assets have been impaired in the past, and there could be impairments in the future. Low oil and gas prices could also affect our ability to maintain our long-term capital investment programme and dividend payments. Prolonged periods of low oil and gas prices could adversely affect the financial, fiscal, legal, political and social stability of countries that rely significantly on oil and gas revenue. In a high oil and gas price environment, we could experience sharp increases in costs, and, under some production-sharing contracts, our entitlement to prove reserves would be reduced. Higher prices could also reduce demand for our products, which could result in lower profitability, particularly in our Downstream business. Accordingly, price fluctuations could have a material adverse effect on

		<p>our earnings, cash flows and financial condition.</p> <p>Portfolio stress testing, 2018 SET report: assuming we meet the conditions in our operational plans, especially with regards to production and costs, we estimate that to 2027, a \$10 per barrel change in oil prices would be expected to have a roughly \$6 billion impact per year on our cash flow from operations. This is an indicative estimate and not a prediction.</p>
Reputation	Relevant, always included	<p>An erosion of our business reputation could have a material adverse effect on our brand, our ability to secure new resources or access capital markets, and on our licence to operate. Our reputation is an important asset. The Shell General Business Principles (Principles) govern how Shell and its individual companies conduct their affairs, and the Shell Code of Conduct instructs employees and contract staff on how to behave in line with the Principles. Our challenge is to ensure that all employees and contract staff, more than 100,000 in total, comply with the Principles and the Code of Conduct. Real or perceived failures of governance or regulatory compliance could harm our reputation.</p> <p>This could impact our licence to operate, damage our brand, reduce consumer demand for our branded products, harm our ability to secure new resources and contracts, and limit our ability to access capital markets and attract staff. Many other factors, including the materialisation of the risks discussed in several of the other risk factors, could negatively impact our reputation and could have a material adverse effect on our earnings, cash flows and financial condition.</p> <p>Shell incorporates business reputation risk in our assessment is through the Principles. These Principles also define how Shell subsidiaries are expected to conduct their affairs and are underpinned by the Shell core values of honesty, integrity and respect for people. These Principles include, among other things, Shell’s commitment to support fundamental human rights in line with the legitimate role of business and to contribute to sustainable development. They are designed to mitigate the risk of damage to our business reputation and to prevent violations of local and international legislation. They can be found at www.shell.com/sGBP</p>
Acute physical	Relevant, always included	<p>The nature of our operations exposes us, and the communities in which we work, to a wide range of health, safety, security and environment risks. These risks to which we, and the communities in which we work, are potentially exposed cover a wide spectrum, given the geographic range, operational diversity and technical complexity of our operations. They include the effects of natural disasters (incl. weather events), earthquakes, social unrest, personal health/safety lapses, and crime. If a major risk materialises, such as an explosion or hydrocarbon spill, this could result in injuries, loss of life, environmental harm, disruption of business activities, and loss or suspension of our licence to operate or ability to bid on mineral rights. Accordingly, this would have a material adverse effect on our earnings, cash flows and financial condition. Our operations are subject to extensive HSSE regulatory requirements that often change and are likely to become more stringent over time.</p> <p>The potential, timing, and severity of the impact of the risks highlighted above are largely dependent on the geographical location and the asset type. For weather and/or climatic related risks, Shell employs existing procedures and processes such as the asset</p>

		<p>reference and other plans that guide their ongoing operations and maintenance schedules and response planning. In some instances, Shell may also deploy a risk assessment approach, some of the elements of which are described below:</p> <ul style="list-style-type: none"> • Shell employs a Metocean team that has the expertise and tools to analyse the physical impact of weather and climatic related issues and the associated adaptation aspects. This team has the capability to conduct assessments, as and when deemed appropriate, of potential weather and climatic related risks for existing assets and new projects. • Shell’s Project Metocean Design Standards for new projects are revised periodically to take account of a variety of risks, including weather and climatic influences. <p>Shell undertakes periodic assessments of existing asset types. For example, to better understand temperature impacts on plant efficiency, a case study was conducted to analyse the impacts of projected temperature increase on a subset of Shell’s LNG plants and refineries in the 2030s and 2050s.</p>
Chronic physical	Relevant, always included	<p>Increased local air temperatures could impact Shell’s plants’ efficiency. Global rising sea levels could also impact Shell’s coastal facilities (e.g. refineries, ports, terminals, etc.) and our offshore platforms. Global changes in the global hydrological cycle caused by climate change could impact Shell’s assets, for example by causing flooding, or making access to suitable quantities of water to run a particular facility problematic.</p> <p>Physical impacts of climate change tend to be location/asset type specific. Shell employs existing procedures and processes such as the asset reference and other plans that guide their ongoing operations and maintenance schedules and response planning. In some instances, Shell may also deploy risk assessment processes through the management methods highlighted below:</p> <ul style="list-style-type: none"> • Shell employs a Metocean team that has the expertise and tools to analyse the physical impact of weather and climatic related issues and the associated adaptation aspects. This team has the capability to conduct assessments, as and when deemed appropriate, of potential weather and climatic related risks for existing assets and new projects. • Shell’s Project Metocean Design Standards for new projects are revised periodically to take account of a variety of risks, including weather and climatic influences. <p>Shell undertakes periodic assessments of existing asset types. For example, to better understand temperature impacts on plant efficiency, a case study was conducted to analyse the impacts of projected temperature increase on a subset of Shell’s LNG plants and refineries in the 2030s and 2050s.</p>
Upstream	Relevant, always included	<p>We are exposed to fluctuating prices of crude oil, natural gas, oil products and chemicals. In a low oil and gas price environment, we would generate less revenue from our Upstream and Integrated Gas businesses, and, as a result, parts of those businesses could become less profitable, or could incur losses. Additionally, low oil and gas prices have resulted, and could continue to result, in the</p>

		<p>debooking of proved oil or gas reserves, if they become uneconomic in this type of price environment. Prolonged periods of low oil and gas prices, or rising costs, have resulted and could continue to result in projects being delayed or cancelled. The World Bank has also announced plans to stop financing upstream oil and gas projects in 2019. Similarly, according to press reports, other financial institutions also appear to be considering limiting their exposure to certain fossil fuel projects. Accordingly, our ability to use financing for future projects may be adversely impacted. This could also adversely impact our potential partners' ability to finance their portion of costs, either through equity or debt.</p> <p>As part of our risk assessment process in assessing impact in fluctuating prices, we stress test our portfolio by assessing financial resilience by looking at the sensitivity of our cash flow to changes in oil prices. As reported in our 2018 SET report, assuming we meet the conditions in our operational plans, especially with regards to production and costs, we estimate that to 2027, a \$10 per barrel change in oil prices would be expected to have a roughly \$6 billion impact per year on our cash flow from operations. This is an indicative estimate and not a prediction.</p>
Downstream	Relevant, always included	<p>Shell is exposed to fluctuating prices of crude oil, natural gas, oil products and chemicals. In a high oil and gas price environment, we could experience sharp increases in costs, and, under some production-sharing contracts, our entitlement to proven reserves would be reduced. Higher prices could also reduce demand for our products, which could result in lower profitability, particularly in our Downstream business. Accordingly, price fluctuations could have a material adverse effect on our earnings, cash flows and financial condition.</p> <p>For example, as part of our risk assessment process, we continually assess the competitiveness of Shell refineries. We have taken significant steps to improve the financial performance and competitiveness of our refineries to increase our resilience to potential changes in demand. As reported in our 2018 Shell Energy Transition report, over the past 15 years, we have reduced our refinery site interests from 51 sites with capacity of 4.4 million barrels per day, to 18 sites with equity refining capacity of nearly 3 million barrels per day. We sell more than 6 million barrels of products to our customers. We are reducing the CO2 intensity of some refineries. For example, by installing energy efficient equipment, improving heat integration and using higher efficiency electric motors. At our site in Fredericia, Denmark, we also sell excess heat to our neighbours, heating 21,000 homes.</p>

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Shell has a climate change risk management structure in place which is supported by standards, policies and controls (2018 Shell Annual Report, p16,71-78). Climate change and risks resulting from GHG emissions have been identified as significant risk factors for Shell and are managed in accordance with other significant risks through the Board and Executive Committee. The Board carries out a robust assessment of the Company's emerging risks, the procedures in

place to identify the emerging risks, and how the risks are being managed or mitigated to the achievement of Shell's objectives. This is regularly reviewed by the Board and accords with the FRC Guidance on Risk Management, Internal Control and Related Financial and Business Reporting.

A single overall control framework is in place for the Company and its subsidiaries that is designed to manage rather than eliminate the risk of failure to achieve business objectives. It therefore only provides a reasonable and not an absolute assurance against material misstatement or loss. The Company has developed a risk appetite framework that reflects three distinct lenses: Strategic Risk Appetite, Operational Risk Appetite and Conduct Risk Appetite. These three lenses aim to capture the range and variety of risks that the Company will be exposed to, with specific risk appetite parameters identified and monitored for each lens.

MANAGING TRANSITION RISK

Shell's Energy Transition Report (April 2018, p25-27) describes Shell's strategy, portfolio and strong financial framework which give us the sources of resilience to potential changes in the energy system to 2030.

The transition to lower-carbon energy presents opportunities, as well as risks. It requires major changes to industrial, commercial and residential infrastructure. This takes time and substantial investment. We are reshaping our company to provide the energy, and related products and services, that consumers need as society works to meet the goals of the Paris Agreement.

Our strategic ambitions are to be a world-class investment case, to thrive through the energy transition, and to maintain a strong societal license to operate. We aim to grow our business in areas that will be essential in the energy transition, and where we see growth in demand over the next decade. We expect these will include natural gas, chemicals, electricity, renewable power, and new fuels such as biofuels and hydrogen. We are also growing our oil business, including in deep water and shales, to meet continued demand.

We have a diverse portfolio – both geographically and across different parts of the energy industry. This means we are not dependent on any one country or sector. It also means we can respond to change. We assess portfolio decisions, including divestments and investments, against potential impacts from the transition to lower-carbon energy. These include higher regulatory costs linked to carbon emissions and lower demand for oil and gas.

At the same time, we plan to maintain a strong financial framework. This means growing free cash flow and creating the financial capacity to provide returns to investors, and to invest in new business models. It also means reducing costs in our businesses so that we can profitably produce the oil and gas that the world will need for decades to come, even if prices remain low for a long time.

These sources of resilience reduce the risk of stranded assets in our portfolio, a risk we see as low. We consider the resilience of our portfolio in the medium term by exploring potential ranges in oil prices, and their implications for Shell's cash flows. To ensure that we challenge our thinking, these ranges go beyond the prices implied by our three main scenarios – *Mountains*, *Oceans* and *Sky*.

After 2030, there is far more uncertainty. Here we use scenarios to consider how we could reshape Shell's portfolio of products to meet the changing needs of society, depending on how the pace of transition develops.

MANAGING TRANSITION OPPORTUNITIES

Our New Energies business explores emerging opportunities linked to the energy transition and invests in those where we believe sufficient value is available. Since setting up New Energies in 2016, we have invested around \$1.6 billion to date in Power and New Fuels. We could see an increase of our power cash capex, averaging \$2-3 billion per year from 2021 to 2025.

MANAGING PHYSICAL RISK

Physical impacts of climate change tend to be location/asset type specific. Shell employs existing procedures and processes such as the asset reference and other plans that guide their ongoing operations and maintenance schedules and response planning. In some instances, Shell may also deploy risk assessment processes through the management methods highlighted in C2.2c/Acute risk.

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

(Shell Energy Transition report, April 2018) Shell has long recognised the importance of government-led carbon pricing systems as an essential tool for reducing emissions.

We are supporting the World Bank’s Carbon Pricing Leadership Coalition that is made up of governments, businesses and organisations with the long-term objective of achieving a government-led carbon price throughout the global economy. We also participate in the International Emissions Trading Association (IETA), a non-profit business organisation created in June 1999 to establish an international framework for trading in GHG emission reduction credits.

We have long supported the European Union’s Emissions Trading Scheme and have worked with policymakers, industry groups and non-governmental organisations to support the recent reform of the system after 2020.

Several countries (e.g., South Africa, Canada) that are important operating areas for Shell are in the process of developing additional climate change legislation which may include the use of emissions trading systems and carbon taxes, which could potentially increase compliance costs for Shell. For example, in Europe, record prices for carbon dioxide (CO₂) allowances (EUAs) averaged €16/tCO₂ in 2018 compared to €6/tCO₂ in 2017.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

\$1,000,000,000

Explanation of financial impact figure

As reported in our 2018 Shell Energy Transition report (p37), sensitivity to government-led CO2 price analysis conducted by Shell indicates that at our current CO2 emission levels, we estimate that a \$10 per tonne increase in global CO2 prices would result in a reduction of about \$1 billion in Shell's pre-tax cash flows. By embedding a CO2 cost in our outlook for cash flow, we are reflecting potential changes and ensuring our cash flow is robust in the face of these changes.

To account for this risk in our business cycle plans, in 2017, we increased the CO2 costs reflected in our cash-flow projections as part of our planning process, with an impact of a reduction of around \$1 billion on a net present value basis.

To account for this risk in our business cycle plans, in 2017, we increased the CO2 costs reflected in our cash-flow projections as part of our planning process, with an impact of a reduction of around \$1 billion on a net present value basis.

Management method

Given that climate related issues are embedded in the work of Shell's functions and businesses, Shell considers the management costs associated with policy/legal risk (increased pricing of GHG) as not significant. Managing policy/legal risks is managed through regular activities.

Project Screening Value (PSV): To assess resilience of new projects, potential costs associated with operational GHG emissions are considered. In 2018, we moved away from using a flat PSV to country-specific estimates of future carbon costs. These estimates were developed using the current NDCs submitted by countries as part of the Paris Agreement. Accordingly, we believe they more accurately reflect society's current implementation of the Paris Agreement rather than a flat \$40/tonne PSV. By 2050, our estimates for some countries increase to \$85/tonne of GHG emissions.

Shell applies additional sensitivity tests for high-emitting projects by using long-term carbon cost estimates consistent with limiting the average global temperature rise to well below 2°C. Projects in the most GHG-exposed asset classes are benchmarked against GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-constrained future. These processes can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments commercially compelling.

Cost of management

\$25,000,000

Comment

Shell has a rigorous approach to understanding, managing and mitigating climate risks in our assets. Shell also employs a dedicated Group Carbon team, which, among other things, is accountable for monitoring and examining the strategic implications of climate change for Shell and the impact of developments in governmental policy and regulation.

Not every country would have carbon taxes in place, this is evident in IEA's reporting where there is a wide variation in CO2 price projections between advanced and developing countries under different scenarios. Shell embeds CO2 pricing in our cash-flow projections as part of our business planning process.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Mandates on and regulation of existing products and services

Type of financial impact

Increased costs and/or reduced demand for products and services resulting from fines and judgments

Company- specific description

(AR, p14) Rising climate change concerns have led and could lead to additional legal and/or regulatory measures which could result in project delays or cancellations, a decrease in demand for fossil fuels, potential litigation and additional compliance obligations.

Shell also expect that GHG regulation, as well as emission reduction actions by customers, will continue to focus more on suppressing demand for fossil fuels, either through taxes, fees, incentives to promote the sale of electric vehicles or even through the future prohibition of sales of new diesel or gasoline vehicles.

If Shell is unable to find economically viable, as well as publicly acceptable, solutions that reduce our GHG emissions and/or GHG intensity for new and existing projects or for the products we sell, we could experience additional costs or financial penalties, delayed or cancelled projects, and/or reduced production and reduced demand for hydrocarbons, which could have a material adverse effect on our earnings, cash flows and financial condition.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure – minimum (currency)

\$1,000,000,000

Potential financial impact figure – maximum (currency)

\$4,000,000,000

Explanation of financial impact figure

Additional regulatory measures could result in project delays /cancellations, decrease in demand for fossil fuels, potential litigation and additional compliance obligations. A preliminary internal risk assessment conducted indicates a financial risk of \$1-4 billion impact from demand destruction in the market by 2030. This will be driven by several factors such as regulation, changes in consumer preference, policy and market dynamics. Factors such as variation in regulatory cost due to low carbon fuel directives and targets, and policy differences (e.g., explicit/implicit GHG policies) in different countries introduces a certain degree of uncertainty (moderate to high level) in our analysis.

Management method

Until 2020, Shell plans to invest \$1-2 bln per year, on average, in New Energies (New Fuels/Power). This is expected to increase to \$2-3 bln per year from 2021 to 2025 in Power; the Power investment scale-up is subject to be on track to be self-funding by 2030, investments hitting agreed financial milestones, and on-stream integrated power business demonstrating 8-12% returns.

Our focus includes:

- supplying more natural gas to replace coal for power generation;
- progressing CCS;
- implementing energy-efficiency measures in our operations where reasonably practicable;
- developing new fuels for transport such as advanced biofuels and hydrogen;
- participating throughout the power value chain with a focus on natural gas and renewable electricity;
- working with nature-based solutions.

1. New Fuels: fast charging services for electric vehicles (EV) at 26 retail sites in the Netherlands, China and the UK and is working with IONITY, a joint

venture of automotive manufacturers, to offer 500 high-powered charging points across 10 European countries.

2. Power: interests in 5 onshore wind power projects in the USA and in one offshore wind power project in the Netherlands. In total, our share of the energy capacity from these projects is more than 400MW.

3. Natural Gas: according to IEA, NG emits 45 - 55% less GHG emissions than coal when used to generate electricity. Gas can also act as a partner for intermittent renewable energy. Our ambition is to increase NG shares from 50% to 75%.

Cost of management

\$1,000,000,000

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Rising mean temperatures

Type of financial impact

Increased capital costs (e.g., damage to facilities)

Company- specific description

Significantly changing local air temperatures could impact Shell's installations' efficiency. For example, temperature could impact LNG production and refinery earnings.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure – minimum (currency)

\$800,000,000

Potential financial impact figure – maximum (currency)

\$1,400,000,000

Explanation of financial impact figure

Increase in global average temperature especially in regions where we have Shell operating assets could affect the efficiency of our plants with some financial implications such as increased operating costs and decreased revenue from loss of efficiency. A preliminary internal risk assessment conducted indicates \$0.8-1,4 billion from physical climate change impact between 2030-2050. This will be driven by several factors such as temperature increase, water replacement cost and other factors such as damage from storms and flooding and production downtime. Given the inherent uncertainty associated with these factors, there is a level of uncertainty (moderate to high level) introduced in the financial risk estimates. Impact from temperature is mainly due to decreased in plant efficiency and impacts on cooling systems and equipment.

Management method

The potential, timing, and severity of the impact of physical risks are largely dependent on the geographical location and the asset type. For weather and/or climatic related risks, Shell employs existing procedures and processes such as the asset reference and other plans that guide their ongoing operations and maintenance schedules and response planning. In some instances, Shell may also deploy a risk assessment approach, some of the elements described below:

- Shell employs a Metocean team that has the expertise and tools to analyse the physical impact of weather and climatic related issues and the

associated adaptation aspects. This team has the capability to conduct assessments, as and when deemed appropriate, of potential weather and climatic related risks for existing assets and new projects.

- Shell’s Project Metocean Design Standards for new projects are revised periodically to take account of a variety of risks, including weather and climatic influences.

Shell undertakes periodic assessments of existing asset types. For example, to better understand temperature impacts on plant efficiency, a case study was conducted to analyse the impacts of projected temperature increase on a subset of Shell’s LNG plants and refineries in the 2030s and 2050s. See also C2.2c.

Cost of management

\$25,000,000

Comment

Explanation of cost of management: given that climate related issues are embedded in the work of Shell’s functions and businesses, Shell considers the management costs associated with policy/legal risk (increased pricing of GHG) as not significant. Managing policy/legal risks is managed through regular activities. Shell also employs a dedicated Group Carbon team, which, among other things, is accountable for monitoring and examining the strategic implications of climate change for Shell and the impact of developments in governmental policy and regulation.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Rising sea levels

Type of financial impact

Increased capital costs (e.g., damage to facilities)

Company- specific description

Rising sea levels, whether not related to climate change, could impact Shell’s coastal facilities (e.g. refineries, ports, terminals etc.) and our offshore platforms as events such as floods, related to storm surges, could become more frequent.

In recent years, storm surges associated with hurricanes have resulted in refinery shutdowns in the US Gulf Coast for some companies including Shell. Our Deer Park manufacturing complex located in Texas suffered continuing operational issues including industry shutdowns due to Hurricane Harvey.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure – minimum (currency)

\$800,000,000

Potential financial impact figure – maximum (currency)

\$1,400,000,000

Explanation of financial impact figure

Increase in global average temperature especially in regions where we have Shell operating assets could affect the efficiency of our plants with some financial implications such as increased operating costs and decreased revenue from loss of efficiency. A preliminary internal risk assessment conducted indicates \$0.8-1,4 billion from physical climate change impact between 2030-2050. This will be driven by several factors such as temperature increase, water replacement cost and other factors such as damage from storms and flooding and production downtime. Given the inherent uncertainty associated with these factors, there is a level of uncertainty (moderate to high level) introduced in the financial risk estimates. Impact from temperature is mainly due to decreased in plant efficiency and impacts on cooling systems and equipment.

Management method

The potential, timing, and severity of the impact of physical risks are largely dependent on the geographical location and the asset type. For weather and/or climatic related risks, Shell employs existing procedures and processes such as the asset reference and other plans that guide their ongoing operations and maintenance schedules and response planning. In some instances, Shell may also deploy a risk assessment approach, some of the elements described below:

- Shell employs a Metocean team that has the expertise and tools to analyse the physical impact of weather and climatic related issues and the associated adaptation aspects. This team has the capability to conduct assessments, as and when deemed appropriate, of potential weather and climatic related risks for existing assets and new projects.
- Shell's Project Metocean Design Standards for new projects are revised periodically to take account of a variety of risks, including weather and climatic influences.

Shell undertakes periodic assessments of existing asset types. For example, to better understand temperature impacts on plant efficiency, a case study was conducted to analyse the impacts of projected temperature increase on a subset of Shell's LNG plants and refineries in the 2030s and 2050s. See also C2.2c.

Cost of management

\$25,000,000

Comment

Explanation of cost of management: given that climate related issues are embedded in the work of Shell's functions and businesses, Shell considers the management costs associated with policy/legal risk (increased pricing of GHG) as not significant. Managing policy/legal risks is managed through regular activities. Shell also employs a dedicated Group Carbon team, which, among other things, is accountable for monitoring and examining the strategic implications of climate change for Shell and the impact of developments in governmental policy and regulation.

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Ability to diversify business activities

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Long-term incentive plan (Annual Report, p129, Sustainability Report, p18)

In 2017, Shell was the first international oil and gas company to set an ambition to reduce the Net Carbon Footprint (NCF) of the energy products we sell, taking into account their full life-cycle emissions, which include our customers' emissions associated with the energy products that we sell, in the period to 2050 in step with society as it moves toward the goals of Paris. A measure of the condition to contribute to Shell's strategic ambitions to thrive in the energy transition and support delivery of Shell's NCF ambition in the longer term is the commercialisation of advanced biofuel technology. Shell believes, biofuels and renewables are keystone energies for meeting mobility demands of the 21st-century. Instruments aimed at reducing emissions from the use of fuels/energy provide incentives to develop alternative lower carbon fuels, e.g. Shell investment in biofuels (through our non-operated joint venture Raízen); Shell is one of the largest blenders and distributors of biofuel, hydrogen and wind.

Example: Raízen, a non-operated Shell joint venture (Shell interest is 50%) was created from the union of parts of Shell and Cosan businesses. Raízen is one of the largest companies in terms of revenue in Brazil today. Shell, through Raízen, is the country's leading producer of sugarcane ethanol and the largest individual exporter of cane sugar in the international market, and one of the main players in the distribution and sale of fuels in Brazil. A fully integrated process is put into practice, operating in all stages of our production chain: sugarcane cultivation, sugar and ethanol production, internal and export logistics, distribution and sales. Brazilian sugar-cane ethanol can reduce CO₂ emissions by around 70% when compared with conventional gasoline. Raízen opened its first cellulosic ethanol plant at its Costa Pinto mill in Brazil in 2015, which produced almost 15.5 million litres in 2018. When fully operational, the mill is expected to produce around 40 million litres a year of advanced biofuels from sugar-cane residues.

Shell continue to invest in sustainable feedstocks for biofuel production. An example is the construction of a demonstration plant at the Shell Technology Centre Bangalore, which uses the IH2@ process that turns waste feedstock into transport fuel.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

\$310,000,000

Explanation of financial impact figure

Our joint venture Raízen in Brazil (non-operated, Shell interest 50%), produces ethanol from sugar cane, with an annual production capacity of more than 2 bln litres. Raízen reported a net profit of BRL2.311 bln for crop year 2017/2018. Potential financial implication \$310 mln estimated using the 2018 mid exchange rate of 3.7286 BRL/\$ (<https://www.poundsterlinglive.com/best-exchange-rates/best-us-dollar-to-brazilian-real-history-2018>), reflecting Shell interest 50%. Adjusted EBITDA for 2017/2018 crop year increased by 6% compared with the previous crop year (BRL3.554 bln and BRL3.338 bln, 50% Shell share, respectively) (Raízen 2017/2018 Annual Report, p15). Several investments have been made through Raízen to increase biofuel production. E.g., expenses for fuel/sugar carriers totalled approx. BRL1.35 bln during harvest (p55). In the past five years, Raízen invested over BRL1 bln in infrastructure improvements and programmes related to employee safety (p29).

Strategy to realize opportunity

At Shell, from 2019, a new condition is introduced for the 2019 incentive plan within the boundaries of the approved policy (see C1.1a). One of the measures of the condition to contribute to Shell's strategic ambitions in the longer term is the commercialisation of advanced biofuel technology as one of the most important steps in energy transition.

Activities at Raízen:

- **NEW OPERATIONS:** In 2017/2018, acquisition of the Santa Cândida and Paraíso biofuel production units (State of São Paulo). We began Operations began with a total installed crushing capacity of 73 mln tons of sugar cane per crop year.
- **BIOENERGY:** Raízen is one of the largest producers of electricity from biomass, with a capacity to supply a city with a population of up to 10 mln. Raízen is developing our biogas plant in Araraquara (SP), and promoting the expansion of cogeneration at the Caarapó unit in Mato Grosso do Sul, which will increase our current installed capacity from 940MW to 1,000MW.
- **TERMINALS:** Completion of a biofuel distribution terminal in Marabá (PA), with capacity to handle up to 500 mln litres per year. During installation and operation process, nearly BRL100 mln were invested.

Shell continues to invest in second generation biofuels – including sustainable feedstocks for biofuel production through the construction of a demonstration plant at the Shell Technology Centre Bangalore, India, which uses the IH2® process that turns waste feedstock into transport fuel.

Cost to realize opportunity

\$181,000,000

Comment

NOTE:

“Potential financial impact figure” of about \$310 mln is 50% of total, reflecting the Shell interest of 50%, see Raízen’s Annual Report 2017/2018 (BRL 2.311 bln).

“Cost to realise opportunity” figure of about \$181 mln is 50% of total, reflecting the Shell interest of 50%, see Raízen’s Annual Report 2017/2018 (BRL 1.350 bln).

Raízen is a non-operated Shell joint venture, Shell interest is 50%.

Brazilian sugar-cane ethanol can reduce CO2 emissions by around 70% when compared with conventional gasoline. Raízen opened its first cellulosic ethanol plant at its Costa Pinto mill in Brazil in 2015, which produced almost 15.5 million litres in 2018. When fully operational, the mill is expected to produce around 40 million litres a year of advanced biofuels from sugar-cane residues. We continue to invest in sustainable feedstocks for biofuel production, such as biofuels made from waste products or cellulosic biomass.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)

Company-specific description

Increasing growth in demand for products that improve insulation efficiency like styrene monomers and rigid polyols, which Shell is already producing is one opportunity Shell continues to explore.

Shell expect strong demand growth for chemicals in the medium term, mostly because of economic growth and demand for the everyday products that petrochemicals help produce.

For instance, efficient plastic insulation and lightweight plastic parts in cars and planes save energy, which helps to avoid CO2 emissions. Plastics are also integral in the construction of renewable energy infrastructure, such as wind turbines and solar panels. We share public concern about plastic waste and want to play an active role in finding lasting solutions to this challenge.

As physical changes in climate result in increases in mean and extreme temperatures, improving efficiency of cooling will become increasingly more important. This can potentially lead to greater demand for high quality insulation materials and related chemical feedstock.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure – minimum (currency)

\$1,000,000,000

Potential financial impact figure – maximum (currency)

\$4,000,000,000

Explanation of financial impact figure

As physical changes in climate result in increases in mean and extreme temperatures, improving efficiency of cooling will become increasingly more critical. This can potentially lead to greater demand for high quality insulation materials and related chemical feedstock. Shell's Chemicals earnings in 2018 were \$546 million lower than in 2017. Results were impacted by higher feedstock costs in the East, higher utility costs and cracker start-ups in the USA and operational issues in Europe. In an internally conducted preliminary risk assessment, we estimated a potential financial impact ranging from \$1-4 billion by 2030 because of demand destruction due to drivers such as regulations, consumer preference drive exposure, policy and changing market dynamics. The inherent uncertainty associated with variation in regulatory cost and policy differences in different countries introduces a certain degree of uncertainty (moderate to high level) in our analysis.

Strategy to realize opportunity

Shell plans to increase organic free cash flow in our Chemicals business from around \$1 billion in 2017 to \$3-4 billion by end of 2025.

- Our petrochemicals complex in Pennsylvania, USA, will use a co-generation facility to produce both heat/electricity for the plant, as well as surplus electricity (exported to the grid at a lower CO2 intensity than regional average).
- We have recently started up the fourth alpha olefins, or AO unit, at our Geismar facility in Louisiana, USA. This new unit was built using Shell proprietary technology.
- The official start-up of the second ethylene cracker at the Nanhai petrochemicals complex in Huizhou, China, increases its ethylene capacity by around 1.2 mln tonnes/a.
- Circular economy of plastics: We are exploring process technologies to make better use of plastics after consumers have finished using them by turning them into liquids that could be used as a source of energy, as chemicals or new products.
- Emission reduction: Our Moerdijk Chemicals site in the Netherlands has installed a solar power plant with a peak capacity of around 27MW from solar panels.

Until 2020, Shell plans to invest \$1-2 bln/y, on average, in New Energies (New Fuels/Power). This is expected to increase to \$2-3 bln/y from 2021 to 2025

in Power; the Power investment scale-up is subject to be on track to be self-funding by 2030, investments hitting agreed financial milestones, and on-stream integrated power business demonstrating 8-12% returns.

Cost to realize opportunity

\$2,000,000,000

Comment

Shell continuously monitor market developments and evaluates opportunity and associated costs / revenues for opportunity realization. Our petrochemicals complex in Pennsylvania, USA will use a co-generation facility to produce both heat/electricity for the plant, as well as surplus electricity that will be exported to the grid at a lower CO2 intensity than the regional average. The plant will have a highly efficient ethylene cracker which will result in top quartile CO2 intensity, according to benchmarking specialists Solomon. We expect the plant to begin commercial production early in the next decade. We also continued to grow selected parts of our portfolio.

For example, the China National Offshore Oil Corporation and Shell Nanhai B.V. (Shell) announced the official start-up of the second ethylene cracker at their Nanhai petrochemicals complex in Huizhou, Guangdong Province. The new ethylene cracker increases ethylene capacity at the complex by around 1.2 million tonnes per year.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Technology and innovation are essential to our efforts to meet the world's energy needs in a competitive way. Shell invests in carbon capture and storage (CCS) projects, which use a combination of technologies to capture and store carbon dioxide (CO₂) deep underground. Shell believes CCS must play a significant role in the global climate response. CCS projects are happening around the world and the technology is proven but more projects need to be built. The Intergovernmental Panel on Climate Change (IPCC) has said in its latest report in 2018 that the early scaling up of industry CCS is essential to achieving the stringent global warming target of 1.5 degrees Celsius. CCS technology can capture CO₂ from existing power infrastructure and heavy, energy-intensive industries like cement and steel. In cooperation with the Canadian government and with our joint-venture partners, Shell Energy Canada operates the Quest CCS project in Alberta (Shell interest 10%) that captures and stores CO₂ from the Scotford Upgrader. The Upgrader turns bitumen into synthetic crude oil using hydrogen. Since 2015, Quest has captured and safely stored about 4 million tonnes of CO₂. CCS technology developed by Shell Cansolv, a subsidiary of Shell, is used at the power station Boundary Dam in Saskatchewan, Canada. It is SaskPower's largest coal-fired power station and a significant source of power for the region. Both sulphur dioxide and CO₂ are captured from the power station. We continue to support SaskPower to improve the application of the technology. Shell is working with our partners to develop new ways to capture CO₂ from exhaust gases from industrial facilities.

In 2018, Shell helped launch a pilot project at a biomass power plant in Austria to separate CO₂ from flue gases in a lower-cost way. Once captured, the CO₂ can be used as, for example, a fertiliser in agriculture. We are working on the project with Wien Energie, the utility that operates the power plant; TU Wien, which developed and ran the pilot project; the University of Natural Resources and Life Sciences; and Bertsch, which built the project.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure – minimum (currency)

\$400,000,000

Potential financial impact figure – maximum (currency)

\$1,000,000,000

Explanation of financial impact figure

According to Research and Markets (https://www.researchandmarkets.com/research/fj8hh5/global_carbon?w=12), the CCUS market is valued at \$2.98 in 2017. In 2017 the CCS capacity was approximately 30 mtpa (Global CCS Institute), if this grew to 200 mtpa in 2030, the 2017 market value translates to \$19 billion by 2030. If, for example, Shell was to aim for 2-5% of the market, this could result in \$0.4-1 billion. The CCUS market is impacted by market forces such as demand and supply will be highly dependent on how CO2 storage and decarbonized products are valued in the market place.

In 2018, overall research and development (R&D) expenses were \$986 million across all businesses. Our main technology centres are in India, the Netherlands and the USA, with other centres in Brazil, China, Germany, Oman and Qatar. A strong patent portfolio underlies the technology that we employ in our various businesses. In total, we have around 10,325 granted patents and pending patent applications.

Strategy to realize opportunity

In 2018, Shell spent \$986 million on research and development across all businesses (Upstream, Downstream, Integrated Gas/New Energies), including investments to improve the efficiency of our products, processes and operations, and to commercialise technologies for the transition to a low-carbon energy future.

Shell is, for example, progressing several CCS activities:

- At the Technology Centre Mongstad (TCM), Shell, together with the Norwegian government, Equinor and Total – is undertaking R&D into CCS to help reduce the technology's costs. Shell and its TCM partners are also working on a full-scale project that includes the capture of CO2 from industrial facilities in Norway and transporting the CO2 would then be transported by ship to an onshore receiving plant before being injected into an offshore saline aquifer.
- In 2018, the Oil and Gas Climate Initiative (OGCI) investment arm announced that it is entering into a strategic partnership with Shell and other oil and gas companies to analyse the potential development of the UK's first commercial full-chain CCUS project in Teesside.
- Shell is involved in the Gorgon CO2 injection project (not Shell operated, Shell interest 25%) in Australia, which will be the world's largest CCS operation when completed. The project plans to separate and inject between 3.4-4 million tonnes of reservoir CO2 each year. Over the life of the project, it is expected that around 100 million tonnes of reservoir CO2 will be captured and stored.

Cost to realize opportunity

\$986,000,000

Comment

Shell place a premium on developing effective technologies that are safe for the environment. In addition to CCS, carbon sinks, such as nature-based solutions (NBS) are required as part of the global response to climate change. Shell also believe that nature will play an important role in the transition to a lower-carbon world. Using nature to capture carbon from the atmosphere presents an immediate opportunity. It can help to bridge the gap until other low-carbon solutions are deployed at scale, or to compensate for emissions which cannot be avoided. Nature-based projects typically involve the protection or redevelopment of natural ecosystems such as forests and wetlands, allowing those ecosystems to capture and store more carbon on our behalf. These projects, which also support local communities and conserve biodiversity, generate carbon-emission rights that then can be bought by energy consumers around the world.

Identifier

Opp4

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Natural gas is expected to play a key role in the transition to a lower-carbon global energy system over the next few decades, with liquefied natural gas (LNG) shipments playing an increasingly important part. Strong demand for cleaner-burning fuel in Asia continued to drive rapid growth in LNG use in 2018, with global demand rising by 27 million tonnes to 319 million tonnes.

2018 Sustainability Report, p53: Natural gas – the cleanest-burning hydrocarbon–comprises about half of Shell’s total production and is key to our aim to provide more and cleaner energy. Using natural gas for power generation, for example, can play a key role in developing a cleaner global energy system. Gas is one of the few energy sources that can be used across all sectors of the global economy. It can be used to generate electricity, provide heat for essential industrial processes and homes, as well as fuel for heavy-duty road transport, shipping and rail. Acc. to IEA, natural gas emits between 45 and

55% less greenhouse gas emissions than coal when used to generate electricity, according to the International Energy Agency. Gas can also act as a partner for intermittent renewable energy, such as solar and wind, by helping to maintain a steady supply of electricity, because gas-fired plants can start and stop relatively quickly.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Explanation of financial impact figure

Increased revenue from increased demand for gas and LNG is reflected in Shell's annual reporting of cash flow from operating activities (CFFO).

Cash flow from operating activities excluding working capital movements for Shell's Integrated Gas business increased from \$8.7 billion in 2017 to \$16.3 billion in 2018. Some of this increase is driven by Shell's increased LNG sales.

Our total LNG sales volume in 2018 was 71 million tonnes – up 8% from 2017, driven by our increased LNG purchases from third parties and higher LNG liquefaction volumes. (More information in our 2014-2018 Investor Handbook, p18 - source: <https://reports.shell.com/investors-handbook/2018/servicepages/download-centre.html>).

Strategy to realize opportunity

Shell is a world-wide leader in gas, LNG and GTL and aiming to expand and diversify this position. This happens through developing new demand and sourcing competitive supply, while leveraging the optionality in the portfolio to create additional value through optimisation. In Shell's operated Integrated Gas assets, a strong focus is put on operational excellence to generate superior cash flow. Shell is aiming to create new advantage positions in LNG and GTL through development of competitive opportunities that are resilient through the energy transition.

Cost to realize opportunity

Comment

Our Integrated Gas business manages liquefied natural gas (LNG) activities and the conversion of natural gas into gas-to-liquids (GTL) fuels and other products, as well as our New Energies portfolio. It includes natural gas exploration and extraction, and the operation of upstream and midstream infrastructure necessary to deliver gas to market. It markets and trades natural gas, LNG, electricity and carbon-emission rights and also markets and sells LNG as a fuel for heavy-duty vehicles and marine vessels.

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	<p>We are adjusting our businesses to meet changing demand in different countries by adapting the products we offer to match the different needs of our customers.</p> <p>For example, we are offering hydrogen and electric-vehicle charging, in addition to liquefied natural gas (LNG) and biofuels, in European markets such as Germany where we see a faster transition to lower-carbon energy.</p> <p>Also, we are investing in areas such as wind power generation in the Netherlands and the supply of power to retail customers in the UK taking advantage of our existing gas and power trading capabilities while building new business models for the future. Shell expects the power sector to shift toward lower CO2 electricity generated by gas and renewables. Shell uses scenarios to stretch our thinking and consider events that may only be remotely possible. It is impossible to predict with precision how future energy systems will evolve, because there are too many unknowns. Unknowns about how technologies will develop, about the types of energy consumers will choose, about the energy policies governments will implement. Shell develops scenarios (www.shell.com/scenarios) to navigate such uncertainty and to inform and test our business decisions. They are no forecasts or business plans. They describe what could happen, under certain circumstances. Please also refer to our Shell Energy Transition Report, 2018, p17ff.</p>
Supply chain and/or value chain	Impacted	<p>Various national, regional and state based low carbon fuel directives and targets such as: Low Carbon Fuel Standards (LCFS) and Renewable Fuel mandates in the European Union and USA mean that new fuels must be developed and brought to market to comply with a variety of programmes. Such developments may introduce new CO2 costs to our businesses, for example, the costs of LCFS credit and average price for December 2017 was \$188.10 per MT. This may also change the cost structure of Shell’s operations against uncertainty in fuel prices.</p>
Adaptation and mitigation activities	Impacted	<p>Shell assesses and manages the potential social impact of our projects as part of integrated environmental, social and health impact assessments. Our engagement is essential to identifying how we might impact people and to helping us design and apply impact monitoring and mitigation measures. In Alberta, Canada, at the Shell Scotford complex, we consult local people who may be affected</p>

		by our activities and find ways to address their specific issues. For example, in 2017 the Scotford team discussed with a local farmer how to minimise unwanted snow melt and rainwater that were running off a Shell well pad at our carbon capture facility. These discussions led to a project that will divert the water and ensure the landowner’s crops do not get water-logged.
Investment in R&D	Impacted	Technology and innovation are essential to our efforts to meet the world’s energy needs in a competitive way. If we do not develop the right technology, do not have access to it or do not deploy it effectively, this could have a material adverse effect on the delivery of our strategy and our licence to operate. In 2018, our overall research and development expenses were \$986 million. Our main technology centres are in India, the Netherlands and the USA, with other centres in Brazil, China, Germany, Oman and Qatar. As an example of an impact on Shell R&D strategy is the strength of our patent portfolio. A strong patent portfolio underlies the technology that we employ in our various businesses. In total, we have around 10,325 granted patents and pending patent applications.
Operations	Impacted	<p>The energy system will evolve differently in different countries and economic sectors, and the business risks and opportunities will vary significantly. Our global business has operations in more than 70 countries, giving us a wide geographic reach. This exposure is spread across countries at different stages in their economic development and transition to lower-carbon energy, reducing our exposure to potential rapid changes in any one country. These businesses range from the primary extraction of energy and its processing, to the eventual sale to customers, giving us flexibility to manage risk and returns as the energy system evolves. As an example, in Canada, we have included measures to reduce carbon intensity at our Groundbirch asset, a tight shale gas operation in British Columbia. These include using electricity instead of natural gas for the processing plant, using gas instead of diesel to power drilling and using solar energy to power pumps.</p> <p>Our resilience is strengthened by having operations in many parts of the energy system, as demonstrated by our seven strategic themes: Conventional Oil and Gas, Deep Water, Shales, Integrated Gas, Oil Products, Chemicals and our recently created New Energies business, that focuses on power and new fuels. We actively consider the use of carbon capture and storage (CCS) to reduce emissions from our projects. Where CCS is not economically feasible at current CO2 prices, we design some projects to be available for CCS retrofits in the future. Shell-operated facilities and proposed projects that generate more than 50,000 tonnes of GHG emissions per year are required to produce a GHG and energy management plan with annual updates. These plans provide clarity on investment options to reduce CO2 intensity in each of our assets and have allowed us to identify and prioritise opportunities across our portfolio.</p>
Other, please specify		

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

Relevance	Description
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Revenues	Impacted	<p>Upstream earnings in 2018 were \$6,798 million, compared with \$1,551 million in 2017. The increase was mainly driven by higher realised oil and gas prices, lower impairment charges, the absence of a charge as a result of US tax reform legislation in 2017, and lower well write-offs.</p> <p>As reported in the Shell Energy Transition Report (p36), assuming we meet the conditions in our operational plans, especially with regards to production and costs, we estimate that to 2027, a \$10 per barrel change in oil prices would be expected to have a roughly \$6 billion impact per year on our cash flow from operations. This is an indicative estimate and not a prediction. Based on this assumption, if the oil price fell from around \$65 per barrel today to \$40 per barrel money of-the-day, our cash flow from operations would be expected to decrease by \$15 billion per year. Similarly, if the oil price rose to \$100 per barrel money-of-the-day, our cash flow from operations would be expected to rise by \$21 billion per year.</p> <p>Finally, the impact of CO2 has been embedded in our financial planning. For example, in the Shell Energy Transition Report (p37), we reported that at the current CO2 emission levels, we estimated that a \$10 per tonne increase in global CO2 prices would result in a reduction of about \$1 billion in Shell’s pre-tax cash flows. By embedding a CO2 cost in our outlook for cash flow, we are reflecting potential changes and ensuring our cash flow is robust in the face of these changes.</p>
Operating costs	Impacted	<p>The transition to lower-carbon energy requires major changes to industrial, commercial and residential infrastructure. This takes time and substantial investment. It also means reducing costs in our businesses so that we can profitably produce the oil and gas that the world will need for decades to come, even if prices remain low for a long time. Specific to Shell Upstream business, since 2015, we have reduced costs by more than 20%, while increasing production by 20%. For example, in the Shell Energy Transition Report (April 2018 - p39), we reported that at our Permian basin in the USA, we have reduced direct field expenses in our shales business by 33% in the last year, and by 60% since 2015.</p>
Capital expenditures / capital allocation	Impacted	<p>Transition to lower-carbon energy requires major changes to industrial, commercial and residential infrastructure and it takes time and substantial investment. Shell’s capital discipline gives us greater flexibility for investments in the future. For example, we have reduced annual capital investment by \$22 billion, from \$46 billion in 2013 to \$24 billion in 2017. We will maintain our annual capital investment range of between \$25 billion and \$30 billion until 2020, with the option to go below the lower end of the range but with the communicated commitment to not go above the higher end.</p> <p>Discretionary capital spending provides us with the flexibility to respond to volatility in energy markets. In the remaining period to 2020, we expect around 30% of our capital spending to be discretionary, meaning that we have flexibility in how we spend it; whether to grow the value of our existing businesses, or to invest in new businesses. Also, the capital investment levels included in our business plan offer sufficient flexibility to be reduced by \$5-10 billion per year, without materially impacting the long-term</p>

		<p>sustainability of our business.</p> <p>In one project, the Vito deep-water project in the Gulf of Mexico, we reduced overall capital investment costs by 70% compared to our initial concept. Finally, we expect our capital investment in New Energies to be between \$1 billion to \$2 billion a year, on average, until 2020. Beyond 2020, Shell plan to invest 2-3 billion of total capex between 2021-2025 in projects with target returns of 8-12% for emerging on-stream integrated power business. We expect the largest part of our investments to be in power, where we will invest to gain access to customers, and in generation powered by solar, wind and gas.</p>
Acquisitions and divestments	Impacted	<p>We have reshaped and refined our portfolio through our divestment programme. Our \$30 billion divestment programme for 2016-18 made good progress in 2017 and finally completed in 2018 with investments made in a disciplined manner. Divestments included oil sands interests in Canada, onshore upstream operations in Gabon, a number of assets in the UK North Sea, and our shares in Woodside in Australia. Shell's interest in a petrochemicals joint venture in Saudi Arabia and the separation of assets of the Motiva joint venture in the USA have been divested.</p> <p>By the end of 2020, Shell plans to complete its \$25 billion share buyback programme (subject to further progress with debt reduction and oil price conditions) in combination with reaching a gearing level of 25% (20% pre-IFRS16) and delivering \$28-33 billion of organic free cash flow (\$25-30 billion pre-IFRS16) at \$60 per barrel (real terms, 2016). Our operating expenses have been reduced by approx. \$10 billion in the 2016-2018 period with the BG synergies having been delivered which demonstrates the success of the combination.</p> <p>One impact of divestment on our financial planning is that, in certain divestment transactions, liabilities related to dismantling and restoration are de-recognised upon transfer of these obligations to the buyer. For certain of these obligations Shell has issued guarantees to third parties and continues to be liable in case that the primary obligator is not able to meet its obligation. These potential obligations arising from issuance of these guarantees are assessed to be remote.</p> <p>Finally, we assess our portfolio decisions, including divestments and investments, against potential impacts from the transition to lower-carbon energy. These include higher regulatory costs linked to carbon emissions and lower demand for oil and gas. The portfolio changes we are making reduce the risk of having assets that are uneconomic to operate, or oil and gas reserves that are uneconomic to produce because of changes in demand or CO2 regulations.</p>
Access to capital	Impacted	<p>Shell's financial strength and access to capital give us the ability to reshape our portfolio and to lead and respond as demand changes. It also allows us to withstand volatility in oil and gas markets. This strong financial framework is based on growing free</p>

		<p>cash flow, continued capital discipline and capital flexibility, and a strong balance sheet.</p> <p>Shell satisfies its funding and working capital requirements from the cash generated from its operations, the issuance of debt and divestments. In 2018, access to the international debt capital markets remained strong, with our debt principally financed from these markets through central debt programmes consisting of:</p> <ul style="list-style-type: none"> • a \$10 billion global commercial paper (CP) programme, with maturities not exceeding 270 days; • a \$10 billion US CP programme, with maturities not exceeding 397 days; • an unlimited Euro medium-term note (EMTN) programme (also referred to as the Multi-Currency Debt Securities Programme); and • an unlimited US universal shelf (US shelf) registration. <p>In 2018, we issued \$3 billion of bonds under our US shelf registration. Periodically, for working capital purposes, we issued CP. We believe our current working capital is sufficient for our present requirements. While our subsidiaries are subject to restrictions, such as foreign withholding taxes on the transfer of funds in the form of cash dividends, loans or advances, such restrictions are not expected to have a material impact on our ability to meet our cash obligations.</p> <p>In 2018, we issued \$3 billion of bonds under our US shelf registration. Periodically, for working capital purposes, we issued CP. We believe our current working capital is sufficient for our present requirements. While our subsidiaries are subject to restrictions, such as foreign withholding taxes on the transfer of funds in the form of cash dividends, loans or advances, such restrictions are not expected to have a material impact on our ability to meet our cash obligations.</p>
Assets	Impacted	<p>We consider the resilience of our assets/portfolio medium term by exploring potential ranges in oil prices, and their implications for Shell's cash flows.</p> <p>The following is quoted from our Shell Energy Transitions report, published April 2018 (p37): Assuming we meet the conditions in operational plans, especially with regards to production/costs, we estimate that by 2027, a \$10/ barrel change in oil prices would be expected to have a roughly \$6 bln impact per year on our cash flow from operations. This is an indicative estimate, not a prediction.</p> <p>...</p> <ul style="list-style-type: none"> • Scenario analysis: To ensure that we challenge our thinking, these ranges go beyond prices implied by our 3 main scenarios: Mountains, Oceans and Sky. Longer term, after 2030, there is far more uncertainty. Here we use scenarios to consider how we could reshape Shell's portfolio of products to meet the changing needs of society, depending on how the pace of transition

		<p>develops.</p> <ul style="list-style-type: none"> • Proved reserves: we report that around 76% of our proved plus probable oil and gas reserves, known as 2P, will be produced by 2030, and only 24% after that time. Today (time of publication April 2018), we hold around 8.8 years (y) of proved reserves and 13y of 2P reserves. We hold between 20 and 26y of resources (2P plus 2C). As a result, we believe we have the potential to sustain our Upstream business into the 2030s. • Stranding Analysis: In addition, we rank the break-even prices of our assets in the Upstream and Integrated Gas businesses to assess their resilience against low oil and gas prices. These assessments indicate that the risk of stranded assets in the current portfolio is low. <p>Alongside our existing assets, we are improving cost competitiveness of our future supply projects. Over the last few years, we have lowered unit cost of supply of the investment options we hold in our portfolio. For example, in one project, the Vito deep-water project in the Gulf of Mexico, we reduced overall capital investment costs by 70% compared to our initial concept. We also aim to reduce costs to a level that makes any project we execute able to produce and deliver LNG at a price that is competitive in relevant gas markets. This is a necessary condition for any further investments in LNG supply.</p>
Liabilities	Impacted	<p>In the Shell Energy Transition Report (April 2018, p37), we report that at our current CO2 emission levels, we estimate that a \$10 per tonne increase in global CO2 prices would result in a reduction of about \$1 billion in Shell's pre-tax cash flows. In 2017, we increased the CO2 costs reflected in our cash-flow projections as part of our planning process, with an impact of a reduction of around \$1 billion on a net present value basis. Between now and 2030, we are confident that our current portfolio is resilient in Sky, our most rapid transition scenario. By embedding a CO2 cost in our outlook for cash flow, we are reflecting potential changes and ensuring our cash flow is robust in the face of these changes. For Shell, this means that we will still produce and sell the oil and gas that society needs, while preparing our portfolio to move more into lower-carbon energy, where this makes commercial sense.</p>
Other		

C3. Business Strategy

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative and quantitative

(C-OG3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

Yes

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

Climate-related issues are integrated into our business objectives and strategy with the same principal process as other issues are. Our Annual Report (AR) 2018, p15-20, discusses risks that could have a material adverse effect separately, or in combination, on our earning, cash flows and financial condition. One of those risks relates to climate change (p16).

Since 2017, we had three forward looking strategic ambitions to guide us in pursuing our purpose:

- provide a world-class investment case;
- thrive in the energy transition by responding to society's desire for more and cleaner, convenient and competitive energy;
- sustain a strong societal licence to operate and contribute to society through a shared value approach to our activities

Business decisions are typically influenced by a number of factors and may address more than one strategic ambition.

Examples for climate-related business decisions which were taken considering also other factors, and which relate to our strategic ambitions as outlined above:

- Shell's Net Carbon Footprint (NCF) Ambition:

In Nov 2017, Shell announced its ambition to reduce the net carbon footprint of the energy products it sells by around 20% by 2035, compared to the 2016 value, and around 50% by 2050, in pace with society. This approach will cover the total emissions associated with the consumption of the energy products Shell sells, across their full lifecycle. Shell will express this as a Net Carbon Footprint in grams of CO2 equivalent per megajoule consumed. This includes emissions directly from Shell operations, those caused by third parties who supply energy for that production and those caused by end-users when consuming these products.

Meeting the Net Carbon Footprint ambition requires evolving our portfolio over the medium to longer term, to reduce the carbon intensity of the products that we sell. We plan for this by developing future aspired portfolio shapes that would meet our ambition and use these to guide investment decisions. Within the selected portfolio shapes, individual projects are developed to be as resilient to the future scenarios as possible.

- Remuneration policy (AR 2018, p71)

The Remuneration Committee (REMCO) is responsible for determining the Directors' Remuneration Policy in alignment with our business strategy. In 2018, activities for REMCO included setting annual bonus performance measures and targets, for example, by continuing to include GHG intensity metrics in the scorecard following recommendations by the CSRC embedding the energy transition into the Chief Executive Officer (CEO) and Chief Financial Officer's (CFO) personal performance goals, and discussing the incorporation of energy transition measures into long-term incentives. In 2018, Shell took a major step forward in delivering our strategy by announcing plans to link shorter-term targets of 3 or 5 years periods to reduce the Net Carbon Footprint of energy products we sell

to executive remuneration. In 2019, REMCO decided to include an energy transition condition into the 2019 Long-Term Incentive Plan (LTIP) based on recommendations from CSRC. This condition will include our first three-year target towards achieving our Net Carbon Footprint ambition along with other measures that will help us to achieve our strategic ambitions in the long term, related to growth of Shell’s power business, commercialising opportunities in advanced biofuel technology and the development of sinks to capture and store carbon.

- Details on this new energy transition condition (AR 2018, p129)

This is a new condition introduced for the 2019 award within the boundaries of the approved policy. The energy transition condition is focussed on Shell’s strategic ambition to thrive in the energy transition and supports delivery of Shell’s NCF ambition. The condition will consist of a mix of measures that Shell believes will set the foundations to contribute to Shell’s strategic ambitions in the longer term:

- o Net Carbon Footprint: a target for reducing the NCF of the energy products Shell sells (a carbon intensity measure that takes into account their full life-cycle emissions, including customers’ emissions associated with using them). For the 2019 award, the target is a 2-3% reduction in NCF from the 2016 baseline NCF (Annual Report, p77, Climate change section). This target is aligned with the trajectory of our NCF ambition set out in November 2017;
- o The growth of our power business: Growth in the use of electricity and continuing decarbonisation of electricity by shifting to renewables and gas-fired power generation is recognised as a key lever in all decarbonisation scenarios. Our ambition to grow the power business is based on selective investments in generation, as well as in business models based on reselling power generated by others.
- o Advanced biofuels technology: Biofuels are expected to play a valuable role in the changing energy mix and Shell believes are likely to be a key decarbonisation levers for sectors that need to continue to use liquid fuels in the foreseeable future, such as some segments of transport and industry. For society and for Shell, commercialisation of advanced biofuel technology is one of the most important steps in energy transition.
- o The development of systems to capture and absorb carbon: Carbon capture and storage (CCS) and carbon sinks, such as nature-based solutions are required as part of the global response to climate change.

More specific details of the organization’s low-carbon transition plan are covered in section C-OG3.1e, specifically Natural Gas shift, New Energies business, renewable power, biofuels, electric mobility, Nature-based solutions and CCS.

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
Other, please specify Shell SKY, 2018, https://www.shell.com/energy-and-innovation/the-energy-future/scenarios.html	Shell has developed scenarios to deepen our strategic thinking and consider the future. We share/regularly test our thinking and modelling with expert institutes, incl. International Energy Agency (IEA), Massachusetts Institute of Technology (MIT) Joint Program on the Science and Policy of Global Change (USA), Energy Information Administration (USA). We consider scenarios developed by these and other organisations as well.

It is impossible to predict with precision how future energy systems will evolve, as there are too many unknowns about: how technologies will develop, the types of energy consumers will choose, the energy policies governments will implement. Shell develops scenarios to navigate such uncertainty and to inform/test our business decisions. They are not forecasts or business plans. They describe what could happen, under certain circumstances. Today, our 3 main scenarios are Mountains, Oceans and Sky (2018). One of the variables they explore is the type and level of collaboration between governments, businesses and energy users and the impact this has on the energy system. In Sky, the world reaches net-zero CO2 emissions from the energy system by 2070 and achieves the goal of the Paris Agreement to limit the rise in temperatures to well below 2°C. Unlike Shell's Mountains and Oceans scenarios which unfolded in an open-ended way based upon plausible assumptions and quantifications, the Sky Scenario was specifically designed to reach the Paris Agreement's goal in a technically possible manner.

Conclusion: Our long-term ambition is to reduce the Net Carbon Footprint of our energy products to be in line with that of society as a whole by 2050, a stretching aspiration that aims to ensure that Shell continues to develop a resilient and relevant portfolio over the coming decades. While this is a long-term aspiration that will need periodic recalibration in line with the pace of change in broader society and the wider energy system, it is intended to help ensure that we remain relevant and are competitively positioned in the energy transition. This means supplying energy products/services that our customers need, now and in the future, and developing a resilient portfolio in line with our purpose of providing more and cleaner energy to society.

(AR, p73) We seek to contribute to reducing global GHG emissions by:

- supplying more natural gas to replace coal for power generation;
- progressing CCS;
- implementing energy-efficiency measures in our operations where reasonably practicable;
- developing new fuels for transport such as advanced biofuels and hydrogen;
- participating throughout the power value chain with a focus on natural gas and renewable electricity (AR, p129: Our ambition to grow the power business is based on selective investments in generation, as well as in business models based on reselling power generated by others); and
- working with nature-based solutions.

A few examples:

- We are offering hydrogen and electric-vehicle charging, in addition to liquefied natural gas (LNG) and biofuels, in European

markets such as Germany where we see a faster transition to lower-carbon energy.

- We are investing in areas such as wind power generation in the Netherlands and the supply of power to retail customers in the UK taking advantage of our existing gas and power trading capabilities while building new business models for the future.
- We completed the acquisition of First Utility, a leading independent UK household energy and broadband provider.
- We completed the acquisition of a 43.8% interest in Silicon Ranch Corporation, a developer, owner and operator of solar energy assets in the USA.
- We formed 50/50 joint ventures with EDF Renewables and EDP Renewables to build wind farms off the US East coast.

More information on Portfolio and Business Development is available in our Annual Report 2018 (e.g. pages 30, 37, 55), and Management Day (4 June 2019) presentation (New Energies information from slide 74).

(C-OG3.1e) Disclose details of your organization’s low-carbon transition plan.

We are adjusting our businesses to meet changing demand in different countries by adapting the products we offer to match the different needs of our customers. Meeting our Net Carbon Footprint ambition requires evolving our portfolio over the medium to longer term. The following are examples for business opportunities and solutions for managing and reducing GHG emissions:

Natural Gas shift

AR 2018, p13: Shell’s Integrated Gas (IG) business covers two strategic themes: Integrated Gas, which is a cash engine; and New Energies, which is an emerging opportunity. Integrated Gas manages LNG activities and the conversion of natural gas into GTL fuels and other products. It includes natural gas exploration and extraction, and the operation of upstream and midstream infrastructure necessary to deliver gas to market. It markets and trades natural gas, LNG, electricity and carbon-emission rights and also markets and sells LNG as a fuel for heavy-duty vehicles and marine vessels.

New Energies (NE) business

NE explores emerging opportunities linked to the energy transition and invests in those where we believe sufficient value is available.

Until 2020, Shell plans to invest \$1-2 bln per year, on average, in New Energies (New Fuels/Power). This is expected to increase to \$2-3 bln per year from 2021 to 2025 in Power; the Power investment scale-up is subject to be on track to be self-funding by 2030, investments hitting agreed financial milestones, and on-stream integrated power business demonstrating 8-12% returns.

We focus on new fuels for transport, such as advanced biofuels, hydrogen and charging for battery-electric vehicles; and power, incl. from low-carbon sources such as wind and solar as well as natural gas.

AR 2018, p63: Between 2018 and 2017, Shell maintained a capital investment level at below the \$25-\$30 bln range. Capital investment in 2016 included \$52.9 bln relating to the acquisition of BG. In 2018, we invested \$4,460 mln in Shell’s Integrated Gas business. Cash flow from operating activities excluding working capital movements for Shell Integrated Gas business was estimated to be \$16.3 bln for 2018.

Renewable Power

AR 2018, p33:

- Interests in 5 onshore wind power projects in the USA and in 1 offshore wind power project – NoordzeeWind (Shell interest 50%) in the Netherlands (NL). In total, our share of the energy capacity from these projects is more than 400 megawatts (MW). 2018, the final investment decision was taken on the Borssele III and IV offshore wind farm projects in NL (Shell interest 20%). These wind farms are designed to have a total installed capacity of 731.5MW.
- In 2018, we formed 50/50 joint ventures with EDF Renewables and EDP Renewables to build wind farms off the US East coast as our entry into the US offshore wind market.
- In 2018, we completed the acquisition of a 43.8% interest in Silicon Ranch Corporation, a developer, owner and operator of solar energy assets in the USA. A solar park started at Shell Moerdijk, NL, providing power to our Chemicals plants. We completed the acquisition of First Utility, a leading independent UK household energy and broadband provider.

Biofuels

AR 2018, p74: In 2018, we used around 9.5 bln litres biofuel in our gasoline/diesel blends worldwide to comply with applicable mandates and targets in the markets where we operate. Through our own long-established sustainability clauses in supply contracts, we request that the biofuels we buy are produced in a way that is environmentally and socially responsible across the life cycle of the production chain.

Electric mobility

SR 2018, p60: We are stepping up our investments in lower-carbon options, from battery electric vehicle charging to liquefied natural gas and hydrogen. E.g., in Europe, customers can now access 100,000 electric vehicle charge points through New Motion, a Shell company. We announced to invest in 200 new rapid electric vehicle charge-points, powered by renewable energy, on our forecourts in the Netherlands, in partnership with IONITY.

Nature Based Solutions (NBS)

SR 2018, p51: NBS are expected to be one of Shell's tools to reduce the Net Carbon Footprint of our energy products.

Shell plans to invest \$300 million over the next 3 years in forests, wetlands and other natural ecosystems around the world, to reduce emissions and capture more CO2 while benefitting biodiversity and local communities.

Projects:

- In NL, Shell and the Dutch state forestry service, will plant more than 5 mln trees over the next 12 years;
- In Spain, Shell and Land Life Company have agreed to create a 300-hectare reforestation project.

Carbon Capture and Storage

SR 2018, p50: In 2015, we launched our Quest CCS project in Canada (Shell operated, Shell interest 10%). We are involved in a CO2 capture test centre in Mongstad; the Northern Lights CCS project for capturing and storing industrial CO2, both Norway; and the development of the Gorgon CO2 injection Project, Australia, due to start up in 2019.

C4. Targets and performance

(C4.1) Did you have an emissions target that was active in the reporting year?

Both absolute and intensity targets

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1 - CCS QUEST

Scope

Scope 1

% emissions in Scope

5

Targeted % reduction from base year

25

Base year

2014

Start year

2015

Base year emissions covered by target (metric tons CO2e)

3,400,000

Target year

2025

Is this a science-based target?

No, but we are reporting another target that is science-based

% of target achieved

100

Target status

Underway

Please explain

CCS QUEST

The Quest Carbon Capture and Storage (CCS) facility captures and stores about one third of the CO2 emissions from the Shell-operated Scotford Upgrader near Fort Saskatchewan, Alberta, Canada which turns oil sands bitumen into synthetic crude that can be refined into fuel and other products. The CO2 is transported through a 65-kilometre pipeline and injected more than two kilometres underground below multiple layers of impermeable rock formations. It is designed to capture, transport and store over one million tonnes of CO2 annually.

Shell operates the Quest CCS project (Shell interest 10%) which captures and stores CO2 from the Scotford Upgrader.

The target year 2025 is based on a 10-year contract starting at the time of the project launch in 2015. We have put 100% of target achieved as the facility is storing over one million tonnes of CO2 annually.

Quest has a robust measurement, monitoring and verification programme verified by a third party (Det Norske Veritas (DNV)) to ensure the CO2 is permanently stored.

As of May 23rd, 2019, in less than four years of operation, the Quest CCS facility has captured and safely stored about four million tonnes of CO2, ahead of schedule and at a lower cost than anticipated. Four million tonnes of CO2 are equal to the annual emissions from about one million cars. By May 2019, Quest had stored underground the most CO2 of any onshore CCS facility in the world with dedicated geological storage.

https://www.shell.ca/en_ca/media/news-and-media-releases/news-releases-2019/quest-ccs-facility-reaches-major-milestone.html

Target reference number

Abs 2 - WORLD BANK ZERO ROUTINE FLARING BY 2030 INITIATIVE

Scope

Scope 1

% emissions in Scope

10

Targeted % reduction from base year

100

Base year

2015

Start year

2015

Base year emissions covered by target (metric tons CO2e)

7,400,000

Target year

2030

Is this a science-based target?

No, but we are reporting another target that is science-based

% of target achieved

74

Target status

Underway

Please explain

WORLD BANK ZERO ROUTINE FLARING BY 2030 INITIATIVE

As a signatory to the World Bank's "Zero Routine Flaring by 2030" initiative, Shell continues to actively pursue its 2015 commitment to eliminate associated gas flaring at its operations by 2030. Shell is disclosing progress on this commitment to the World Bank. Shell's flaring and venting policy, as set out in our Health, Safety, Security, Environment and Social Performance (HSSE&SP) Control Framework, calls for facilities to meet strict performance criteria, including being designed to export, use or reinject associated gas. Our policy also aims to minimise all types of flaring, managed through annually updated greenhouse gas and energy management plans.

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1 - NET CARBON FOOTPRINT AMBITION

Scope

Scope 1+2 (market-based) + 3 (upstream and downstream)

% emissions in Scope

100

Targeted % reduction from base year

2

Metric

Other, please specify

Grams CO₂e per megajoule consumed

Base year

2016

Start year

2019

Normalized base year emissions covered by target (metric tons CO₂e)

1,645,000,000

Target year

2021

Is this a science-based target?

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

% of target achieved

0

Target status

New

Please explain

NET CARBON FOOTPRINT AMBITION - 3rd party assured

In 2017, Shell set an ambition to reduce the Net Carbon Footprint (NCF) of the energy products we sell (AR 2018, p76/77), taking into account their full life-cycle emissions including our customers' emissions associated with the energy products that we sell, by around 20% by 2035 and by around 50% by 2050 in step with society as it moves toward the goals of Paris. By 2050, our ambition is to align Shell's NCF with the footprint of the energy mix in the global energy system. We aim to reduce the NCF of the energy products we sell (in grams of CO2 equivalent per megajoule consumed) by around 50% by 2050.

Early 2019, Shell decided to set a NCF target for 2021 of 2-3% lower than our 2016 NCF of 79 grams of CO2 equivalent per megajoule. This energy transition condition is included in performance conditions for the 2019 long-term incentive plan grant. It will include the first three-year target to reduce the NCF of the energy products we sell and will also include other measures that will help us achieve our strategic ambitions in the long term, related to the growth of Shell's Power business, commercialising opportunities in advanced biofuel technology and development of systems to capture and store carbon.

The energy transition condition applies to Executive Directors, Executive Committee members and around 150 of Shell's senior executives in 2019.

NOTE:

- Non-energy products outside of NCF scope include chemical feedstocks or products, lubricants and bitumen.
- The “% of emissions in scope” is estimated based on our total emissions including full life cycle emissions from them. Their end-of-life assumptions align with description in sector “End of life treatment of sold products” category.

- In the box “% change anticipated in absolute Scope 1/2/3 emissions”, we reflect on our NCF intensity target of a 2-3% reduction by 2021 (not absolute emissions). Our NCF Ambition is not an absolute emission target. The "Net Carbon Footprint" is also not a mathematical derivation of total emissions divided by total energy. It is a weighted average aggregation of lifecycle CO2 intensities of different energy products normalizing them to the same point relative to their final end-use.

Please find details at: <https://www.shell.com/energy-and-innovation/the-energy-future/what-is-shells-net-carbon-footprint-ambition/faq.html>

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

Target reference number

Int 2 - UPSTREAM/INTEGRATED GAS GHG INTENSITY

Scope

Scope 1 +2 (market-based)

% emissions in Scope

41

Targeted % reduction from base year

1.2

Metric

Metric tons CO2e per unit of production

Base year

2017

Start year

2018

Normalized base year emissions covered by target (metric tons CO2e)

33,800,000

Target year

2018

Is this a science-based target?

No, but we are reporting another target that is science-based

% of target achieved

100

Target status

Achieved

Please explain

UPSTREAM/INTEGRATED GAS GHG INTENSITY (SCORECARD)

Upstream/midstream greenhouse gas (GHG) intensity is a measure of GHG emissions (direct and indirect GHG emissions associated with imported energy, excluding emissions from exported energy), expressed in metric tonnes of carbon dioxide (CO2) equivalent, emitted into the atmosphere per metric tonne of hydrocarbon production available for sale.

For 2018, our target for our Upstream and Integrated Gas facilities was to achieve a GHG intensity of 0.164 tonnes or below of CO2 equivalent per tonne of hydrocarbon production available for sale.

Our Upstream and Integrated Gas intensity was 0.158 tonnes CO2 equivalent per tonne of hydrocarbon production available for sale in 2018 compared to 0.166 in 2017.

We continue to link staff bonuses to the management of greenhouse gas emissions. The Upstream and Integrated Gas GHG intensity target accounts for up to 4% of the annual bonus scorecard of our Executive Directors and around 55,000 employees.

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

0

Target reference number

Int 3 - REFINING GHG INTENSITY

Scope

Scope 1 +2 (market-based)

% emissions in Scope

33

Targeted % reduction from base year

7.9

Metric

Other, please specify: Metric tons CO₂e per Solomon's Utilised Equivalent Distillation Capacity [UEDC]

Base year

2017

Start year

2018

Normalized base year emissions covered by target (metric tons CO₂e)

27,300,000

Target year

2018

Is this a science-based target?

No, but we are reporting another target that is science-based

% of target achieved

100

Target status

Achieved

Please explain

REFINING GHG INTENSITY (SCORECARD)

Refining GHG intensity is a measure of GHG emissions (direct and indirect GHG emissions associated with imported energy, excluding emissions from exported energy), expressed in metric tonnes of CO2 equivalent, emitted into the atmosphere per unit of Utilized Equivalent Distillation Capacity [UEDCTM].

UEDCTM is a proprietary metric of Solomon Associates. It is a complexity weighted normalisation parameter that reflects the operating cost intensity of a refinery based on size and configuration of its particular mix of process and non-process facilities.

For 2018, Shell's target for our refineries was to reduce GHG intensity to 1.05 tonnes or below of CO2 equivalent per Solomon's Utilised Equivalent Distillation Capacity [UEDC]. Refinery GHG intensity in 2018 was 1.05 tonnes CO2e per UEDC compared to 1.14 in 2017.

We continue to link staff bonuses to the management of greenhouse gas emissions. The Refining GHG intensity target accounts for up to 4% of the annual bonus scorecard of our Executive Directors and around 55,000 employees.

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

0

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Other, please specify: Methane emissions intensity

KPI – Metric numerator

Methane emissions in Nm³

KPI – Metric denominator (intensity targets only)

Gas available for sale in Nm³

Base year

2018

Start year

2018

Target year

2025

KPI in baseline year

0.08

KPI in target year

0.2

% achieved in reporting year

0

Target Status

New

Please explain

METHANE EMISSIONS INTENSITY

In September 2018, Shell announced a target to maintain Shell's methane emissions intensity below 0.20% by 2025.

This target covers all Upstream and Integrated Gas oil and gas assets for which Shell is the operator. The intensity baseline and target are presented as percentage figures, which represent the estimated amount of methane emissions for Shell's operated oil and gas assets as a percentage of the amount of the total gas marketed or, for those assets that have no marketed gas, the amount of marketed oil and condensate (e.g. assets that re-inject produced gas). Methane emissions include those from unintentional leaks, venting and incomplete combustion, for example, in flares and turbines. In 2018, our overall methane intensity was 0.08% for assets with marketed gas and 0.01% for assets without marketed gas. Asset level intensities ranged from below 0.01% to 0.9%. Our methane emissions are calculated using the best methods currently available: a combination of industry standard emission factors (established emissions rates per throughput or per piece of equipment), engineering calculations and some actual measurements. There are uncertainties associated with methane emissions quantification. To reduce these uncertainties, our Upstream and Integrated Gas businesses are rolling

out methane improvement programmes that focus on further improving data quality and reporting, and on continued implementation of leak detection and repair programmes and methane abatement opportunities.

By 2025, all Shell-operated assets are expected to have implemented more robust quantification methodologies. Externally, we continue to work on new technologies and improved quantification methods through partnerships and several other initiatives.

Part of emissions target

N.a.

Is this target part of an overarching initiative?

Other, please specify:

The target is not part of a particular initiative but based on work of an industry coalition which developed the Methane Guiding Principles (Shell Sustainability Report 2018, p48/49).

(C-OG4.2a) If you do not have a methane-specific emissions reduction target for your oil and gas activities or do not incorporate methane into your target(s) reported in C4.2 please explain why not and forecast how your methane emissions will change over the next five years.

N.a.

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	52	221,000
To be implemented*	240	4,456,000
Implementation commenced*	124	1,948,000
Implemented*	21	978,100
Not to be implemented	78	1,027,000

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

5,100

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1,300,000

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

16-20 years

Comment

Operational excellence initiative: increase pressure of high-pressure steam system (Integrated Gas)

Initiative type

Process emissions reductions

Description of initiative

New equipment

Estimated annual CO2e savings (metric tonnes CO2e)

13,700

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

50,000

Payback period

<1 year

Estimated lifetime of the initiative

Comment

Implementation of advanced process control (Integrated Gas)

Initiative type

Energy efficiency: Processes

Description of initiative

Other, please specify
Power export

Estimated annual CO2e savings (metric tonnes CO2e)

9,000

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

16-20 years

Comment

Power export (Integrated Gas)

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

7,500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

<1 year

Estimated lifetime of the initiative

16-20 years

Comment

Excess steam reduction (Integrated Gas)

Initiative type

Process emissions reductions

Description of initiative

New equipment

Estimated annual CO2e savings (metric tonnes CO2e)

5,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

83,000

Payback period

Estimated lifetime of the initiative

16-20 years

Comment

Flaring reduction projects (Integrated Gas)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

6,500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

300,000

Investment required (unit currency – as specified in C0.4)

728,000

Payback period

1-3 years

Estimated lifetime of the initiative

16-20 years

Comment

Increase flash gas compressor make up, gas flaring reduction (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

88,700

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

3,900,000

Investment required (unit currency – as specified in C0.4)

737,000

Payback period

4 - 10 years

Estimated lifetime of the initiative

16-20 years

Comment

Production rerouting from flow station to reduce flaring (Upstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

4,800

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

155,000

Investment required (unit currency – as specified in C0.4)

10,000

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Switch to fuel gas on FPSO for inert gas generator (Upstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Waste water treatment

Estimated annual CO2e savings (metric tonnes CO2e)

5,200

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

85,000

Investment required (unit currency – as specified in C0.4)

400,000

Payback period

4 - 10 years

Estimated lifetime of the initiative

16-20 years

Comment

Revamp water injection plant (Upstream)

Initiative type

Process emissions reductions

Description of initiative

New equipment

Estimated annual CO2e savings (metric tonnes CO2e)

15,800

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

750,000

Investment required (unit currency – as specified in C0.4)

3,000,000

Payback period

4 - 10 years

Estimated lifetime of the initiative

16-20 years

Comment

Commissioning of associated gas compressor at flowstation for flaring reduction (Upstream)

Initiative type

Process emissions reductions

Description of initiative

New equipment

Estimated annual CO2e savings (metric tonnes CO2e)

5,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Plunger lift installation to reduce emissions from well liquid unloadings / installation of electric pump for glycol dehydrator (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

70,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Implementation of several abatement projects at onshore and offshore installations, closure of sour gas treatment facility, and improvements in operational performance (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

285,500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Implementation of flowback flaring reductions in unconventional oil production asset (Upstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

61,500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Energy usage optimization at one gas plant, compressor energy reduction schemes at two other gas plants (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

17,500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Improved low pressure gas recovery compressor reliability at offshore gas asset (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

178,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Commissioning associated gas compressor and LPG unit in conventional oil/gas onshore asset (Upstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

9,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

Compressor service, reduction of purge gas to flare and stripping gas reduction at offshore conventional oil installation (Upstream)

Initiative type

Process emissions reductions

Description of initiative

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)

103,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period

Estimated lifetime of the initiative

Comment

(Upstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

30,000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

3,000,000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Cost associated with this process optimisation is operational expenditure rather than a capital expenditure. It was operational improvements in running the facility. (Downstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)

9,700

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

950,000

Investment required (unit currency – as specified in C0.4)

1,000,000

Payback period

1-3 years

Estimated lifetime of the initiative

21-30 years

Comment

Replacing economiser on CO boiler (Downstream)

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

7,400

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1,800,000

Investment required (unit currency – as specified in C0.4)

3,100,000

Payback period

1-3 years

Estimated lifetime of the initiative

16-20 years

Comment

Product purity relaxation reducing required energy (Downstream)

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Internal price on carbon	<p>Shell Annual Report 2018, p72/73: Meeting the Net Carbon Footprint ambition requires evolving our portfolio over the medium to longer term, to reduce the carbon intensity of the products that we sell. We plan for this by developing future aspired portfolio shapes that would meet our ambition and use these to guide investment decisions. Within the selected portfolio shapes, individual projects are developed to be as resilient to the future scenarios as possible. To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. Consistent with our desire to stay in step with society’s progress toward the goals of the Paris Agreement, in 2018, we moved away from using a flat project screening value (PSV) of \$40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. Accordingly, we believe they more accurately reflect society’s current implementation of the Paris Agreement rather than a flat \$40/tonne PSV. By 2050, our estimates for some countries increase to \$85/tonne of GHG emissions.</p> <p>In addition, projects in the most GHG-exposed asset classes are benchmarked against GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-constrained future. These processes can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments</p>

	<p>commercially compelling. Our approach continues to evolve and become more sophisticated to reflect our increasing understanding of the shifting policy landscape and the differing pace of energy transitions underway in different regions.</p>
<p>Internal incentives/recognition programs</p>	<p>For example: Sustainability Report 2018, p18</p> <p>LONG-TERM INCENTIVE PLAN In 2017, we were the first international oil and gas company to set an ambition to reduce the Net Carbon Footprint of the energy products we sell, taking into account their full life-cycle emissions, which include our customers' emissions associated with the energy products that we sell, around 20% by 2035 and around 50% by 2050, in pace with society.</p> <p>We took a big step forward in delivering our strategy in 2018 by announcing plans to link shorter-term NCF specific targets of 3 or 5 year periods to reduce the Net Carbon Footprint of the energy products we sell to executive remuneration.</p> <p>We have accelerated our plans by including an energy transition condition in the performance conditions for the 2019 long-term incentive plan (LTIP) grant. This condition will include the first three-year target to reduce the Net Carbon Footprint of the energy products we sell and will also include other measures that will help us achieve our strategic ambitions in the long term, related to the growth of Shell's power business, commercialising opportunities in advanced biofuel technology and the development of systems to capture and store carbon. These measures are based on recommendations from the CSRC.</p> <p>The energy transition condition will apply to the Executive Directors, Executive Committee members and around 150 of Shell's senior executives in 2019. From 2020, subject to any required staff consultation, we intend to incorporate the energy transition condition into the performance share awards made to around 16,000 employees globally.</p> <p>Please refer to our Sustainability Report 2018 and our corporate webpage www.shell.com for more information.</p>

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Product

Description of product/Group of products

Production and distribution of biofuels

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

Biofuels are liquid or gaseous transport fuels such as biodiesel and bioethanol which are made from biomass, a renewable energy source.

% revenue from low carbon product(s) in the reporting year

Comment

Taxonomy: <https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels>

Sustainability Report 2018, p58/59

Shell, through our joint venture Raízen (not operated by Shell, Shell interest 50%) is one of the largest blenders and distributors of biofuels. In 2018, we used around 9.5 billion litres of biofuels in the petrol and diesel we sold worldwide in order to meet specific regulations. Raízen, our joint venture in Brazil, produces ethanol from sugar cane, with an annual production capacity of more than 2 billion litres. In addition to understanding blended biofuel emissions, we want to ensure that other environmental impacts from biofuel production are well managed – such as the effect on soil, air and water – and that there are benefits for the livelihoods of local communities.

Key developments in biofuels

When purchasing biofuels, we require that they are produced in a way that is environmentally and socially responsible. Where possible, we source biofuels that have been certified against internationally recognised sustainability standards.

We support the adoption of international sustainability standards including the Round Table on Responsible Soy (RTRS), the Roundtable for Sustainable Palm Oil (RSPO) and Bonsucro, an organisation for the certification of sugar cane. We also support the Roundtable for Sustainable Biomaterials and the International Sustainability and Carbon Certification (ISCC) for feedstocks.

Raízen

Our joint venture Raízen in Brazil (non-operated, Shell interest 50%), produces ethanol from sugar cane, with an annual production capacity of more than

2 billion litres; exports sugar, with an annual production of about 4.2 million tonnes; and manages a retail network.

Advanced biofuels

We have a demonstration plant at the Shell Technology Centre Bangalore, India, which features an advanced biofuel process called IH2®, a technology that can turn waste into transport fuel.

More sustainable fuel for aviation

We are exploring long-term opportunities for lower carbon fuels in aviation. In 2018, Shell Aviation (Shell International Petroleum Co. Ltd) and SkyNRG announced a long-term strategic collaboration to promote and develop the use of more sustainable fuel in aviation supply chains. SkyNRG blends and distributes sustainable aviation fuel as well as developing regional supply chains.

Level of aggregation

Product

Description of product/Group of products

Solar power generation and marketing

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify: Solar energy is produced from a renewable energy source.

% revenue from low carbon product(s) in the reporting year

Comment

Sustainability Report 2018, p56

In 2018, we acquired a 44% interest in Silicon Ranch Corporation, a US developer, owner and operator of solar assets; this includes about 1.4 GW capacity of operational or contracted projects.

Shell has also acquired a 49% interest in Cleantech Solar, which provides solar power to commercial and industrial customers across South East Asia

and India. This Singapore-based solar developer owns more than 120 solar power projects, with most in operation and the rest under construction or development. In total, its installations, once fully built, represent up to 200 MW of power.

We have also invested in the Sunseap Group through our corporate venturing arm Shell Ventures. Sunseap has around 160 MW of distributed solar contracts, an electricity retailer licence in Singapore and large-scale solar projects.

In the UK, we increased our position in renewable power in 2018 after Shell Energy Europe signed a five-year deal with British Solar Renewables to buy all the electricity generated by the Bradenstoke solar power plant in Wiltshire. The plant generates around 65 mega-watt hours a year.

ShellEnergy Europe also signed a five-year deal with Octopus to buy electricity from its 70.5 MW portfolio of Italian solar assets.

In the USA, Shell Energy North America signed a 15-year agreement to purchase solar power from EDF Renewables North America in California and a 12-year agreement to purchase solar power from the Phoebe solar photovoltaic project in Texas.

We are starting to deploy solar photovoltaic in our own operations, including offices, retail sites, distribution terminals, refineries and offshore installations. In California, USA, for example, we have delivered a photovoltaic project to provide on-site solar power to the Stockton fuels distribution terminal. Shell is also developing a solar power plant at its Moerdijk chemicals site in the Netherlands.

Level of aggregation

Product

Description of product/Group of products

Wind power generation and marketing

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify: Wind energy is produced from a renewable energy source.

% revenue from low carbon product(s) in the reporting year

Comment

Sustainability Report 2018, p56

We first entered the wind business in 2001, in the USA. Today, we have five onshore wind farms in operation in the USA, and one offshore wind farm in operation in the Netherlands. We also have interests in three wind projects under development – two in the USA and one in the Netherlands. Once built, these projects will have a total installed capacity of more than 5 gigawatts (GW).

The Netherlands wind project is led by the Blauwwind consortium (Shell interest 20%), which will build and operate Borssele III and IV wind farms. These wind farms are designed to have a total installed capacity of 731.5 MW, enough to power around 825,000 Dutch households. Half of the electricity generated from this wind farm will be marketed by Shell Energy Europe Limited to supply customers with renewable power.

In 2018, we made a move into US offshore wind, announcing two joint ventures to develop wind farms off New Jersey and Massachusetts, both 50% Shell-owned, which would have a total installed capacity of 4 gigawatts.

Level of aggregation

Product

Description of product/Group of products

Producing fuel saving lubricants, providing service for optimised application

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

% revenue from low carbon product(s) in the reporting year

Comment

Sustainability Report 2018, p61

Energy-efficient products

Shell PurePlus Technology converts natural gas into a pure base oil – which can form up to 90% of a finished motor oil – to improve and protect an engine's performance. For example, the technology is used in the Shell Helix 0W range of lubricants and can help to reduce CO2 emissions from a car's

operation by up to 3%. The Shell Advance motorcycle oil range, which also uses the technology, can minimise the build-up of engine deposits, allowing for more efficient power transmission. This can lead to better fuel economy, with some motorcycles travelling up to five kilometres more per litre of fuel. For heavy transport journeys, we helped pioneer a new vehicle to show how trucks can be more fuel efficient. We collaborated with AirFlow Truck Company to build and test a hyper-efficient concept truck. The Starship Initiative truck explores what is possible in truck design, fuel economy and CO2 reduction.

On completion of a trial drive in the USA from the east coast to the west coast, the truck recorded a 248% improvement in freight tonne efficiency compared to the average North American truck. If all 2 million trucks in the USA reached the overall fuel economy and freight tonne efficiency performance of the Starship Initiative, they would emit an estimated 229 million tonnes of CO2 less each year.

Level of aggregation

Product

Description of product/Group of products

Supply of LNG for shipping and trucks

Are these low-carbon product(s) or do they enable avoided emissions?

Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

% revenue from low carbon product(s) in the reporting year

Comment

www.shell.com/energy-and-innovation/natural-gas/lng-for-transport.html

In Europe and North America, environmental regulations introduced in 2015 require shipping operators to reduce local emissions. LNG fuel, which is virtually free of sulphur and particulates, can help them meet these requirements.

LNG has the potential to be used by cruisers, ferries, barges and tug boats. It is already used as a fuel for vessels on inland waterways, such as ferries in Norway, where our company Gasnor is a leading supplier of LNG to industrial and marine operators.

In the Gulf of Mexico, Shell has chartered three special LNG-powered offshore supply vessels for its deep-water operations.

To deliver LNG to customers in north-west Europe, Shell built and recently took delivery of Cardissa, a state-of-the-art LNG bunker vessel with capacity to hold around 6,500 m³ of LNG fuel. The vessel will deliver fuel from the Gate terminal in Rotterdam and in locations throughout Europe.

Shell has also finalised a long-term agreement to charter an LNG bunker barge with a capacity to carry 3,000 m³ of LNG fuel. Operating out of Rotterdam, the LNG bunker barge will be able to refuel vessels operating on Europe's inland waterways. The Gate terminal in Rotterdam will boost the availability of LNG as a marine fuel.

In the USA, Shell has finalised a similar agreement for an LNG bunker barge with a 4,000 m³ fuel capacity. This is the first ocean-going barge of its kind to be based there. It will supply LNG to marine customers along the southern East Coast and support growing cruise-line demand for LNG marine fuel.

LNG for trucks

Used in trucks delivering goods, LNG has the potential to offer fuel cost savings when compared to conventional diesel. It can also reduce sulphur emissions, particulates and nitrogen oxides, and help reduce greenhouse gas emissions from production to use.

Burning LNG in spark-ignited engines is quieter than burning diesel in combustion engines. It means LNG-fuelled trucks can operate longer under noise restrictions, for example when delivering to supermarkets in residential areas.

Shell has also developed engine oils to meet the specific operating conditions of trucks and buses that run on natural gas. Shell Rimula R5 NG and Shell Rimula R3 NG effectively lubricate and clean the engine by promoting thermal stability and detergency control, (...) for best performance.

(C-OG4.6) Describe your organization's efforts to reduce methane emissions from your activities.

Shell has a range of technologies and work practices in place to help find and address unintended – or fugitive – methane emissions in our operations. This includes next-generation technologies like drones and implementing flaring and venting reduction programmes.

These activities/programmes relate to our overall strategy for managing methane:

They help Shell meet its methane intensity target by improving methane emissions detection, or quantification, or prevention, or mitigation. It means to keep our own methane emissions intensity, for both oil and gas, below 0.20% by 2025. This target covers all Upstream and Integrated Gas oil and gas facilities for which Shell is the operator.

Shell's methane intensity target complements our ambition to cut the Net Carbon Footprint of our energy products by around 20% by 2035 and around 50% by 2050, in pace with society, which we announced in 2017 (see C4.1 for details). Such efforts are a critical part of Shell's strategy to thrive during the global energy transition by providing more and cleaner energy.

Examples of activities, programmes, outcomes:

We use LDAR programmes, for instance, in Australia, Canada, the Netherlands, Trinidad and Tobago, Tunisia, and the USA, and we plan to extend this approach across Shell globally.

A Shell installation has identified and is currently using a novel 3rd party technology called EcoVapor that removes excess O₂ to meet pipeline export gas specifications for O₂. The EcoVapor system removes excess O₂ with no emissions or waste streams to manage. This technology can also be used to remove O₂ from flash gas emissions from aboveground storage tanks or flash gas separators so that this gas can be recovered and sent to the gas pipeline as opposed to combusted or flared.

As part of the EDF Methane Detectors Challenge trial, we are piloting the Quanta3 technology in Canada. In June 2017, the QM3000 was installed near the town of Rocky Mountain House and tested for 14 months. While operational for a large majority of the time, despite harsh winter weather conditions, the unit's self-sustained, autonomous monitoring and detection proved reliable. Additionally, its cloud monitoring and cloud computing capabilities were compatible with existing infrastructure and technology. Since the trial ended in October 2018, results have been analysed and Shell is sharing the high-level findings with others, including operators, regulators and academia.

Methane abatement project at Shell venture QGC Pty Limited in Queensland, Australia: the project involved redirecting the TEG (triethylene glycol) regeneration stripping gas, which was originally vented, to flare, thereby reducing Greenhouse Gas (GHG) emissions. The project was implemented in one of QGC's Central Processing Plants in Nov 2017. In 2018, methane benefits accrued were 564 tonnes (14.1 ktonnes CO₂e). Further abatement will result from implementing the same project at other Processing Plants in late 2019 and 2020.

Collaboration across and beyond industry:

We also collaborate with technology developers, civil society groups and academia to test and develop new detection technologies that can provide more accurate and continuous data and enable quicker repair of leaks. In July 2018, Shell launched a project with Avitas Systems to test drone-based remote inspection of facilities in the Permian Basin.

Shell has formed an industry coalition, supported by organisations like the Environmental Defense Fund, UN Environment, leading universities and the World Bank, to develop a set of methane guiding principles. In Nov 2017, eight companies, including Shell, signed up to these principles. In 2018, we succeeded in encouraging a further 10 companies to sign up. The principles focus on ways to reduce emissions throughout the gas industry – from production to the final consumer.

Methane Detectors Challenge: In 2014, Shell became one of the founding members of the Methane Detectors Challenge, a multi-stakeholder initiative and partnership between the Environmental Defense Fund, oil and gas companies, US government agencies and technology developers to test next generation methane detection technologies. The initiative works to reduce methane emissions by finding ways to more quickly detect and repair leaks. - In following our global operating principles to develop shale resources safely and responsibly, we have existing voluntary leak detection and repair programs across all Shell shale gas sites. The Methane Detectors Challenge helps accelerate our emissions reduction journey through collaboration. Since the Challenge was launched, more than 20 technologies in early stages of development have been screened and tested.

We continue to work with others such as the Oil and Gas Climate Initiative (OGCI); its billion dollar plus investment arm, OGCI Climate Investments, aims to combine the expertise and reach of 13 oil and gas majors with the potential of ground breaking start-ups (e.g., on topic methane emissions).

(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?

Yes

(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.

Sustainability Report 2018, p49

In 2018, Shell also announced a target to keep our own methane emissions intensity, for both oil and gas, below 0.20% by 2025. This target covers all Upstream and Integrated Gas oil and gas facilities for which Shell is the operator.

The intensity baseline and target are presented as percentage figures, which represent the estimated amount of methane emissions for Shell's operated gas and oil assets as a percentage of the amount of the total gas marketed or, for those assets that have no marketed gas, the amount of marketed oil and condensate (e.g. assets that reinject produced gas).

The methane emissions include those from fugitives, venting and incomplete combustion, for example in flares and turbines. In 2018, our methane intensity was 0.08% for assets with marketed gas and 0.01% for assets without marketed gas. Shell's methane emissions intensity in 2018 ranged from below 0.01% to 0.9%. Our methane emissions are calculated using the best currently available methods: a combination of standard emission factors (established emissions rates per throughput or per piece of equipment), engineering calculations and some actual measurements. There is data uncertainty associated with methane emissions data quantification, and these figures may change based on data reporting.

To reduce these uncertainties, our Upstream and Integrated Gas businesses are rolling out methane improvement programmes that focus on further improving data quality and reporting, and on our continued implementation of leak detection and repair programmes (LDAR) and methane abatement opportunities. By 2025, all Shell-operated assets are expected to have implemented more robust quantification methodologies.

LDAR Recommended Practice:

To support our assets with their methane improvement programmes in 2019, we have updated our guidelines for LDAR programmes.

These LDAR guidelines cover the following key areas:

- Planning: Design and document the LDAR programme to address the specific business risks, requirements and commitments applicable to the asset or group of assets.
- Roles & Responsibilities: Develop roles and responsibilities to establish accountability for all aspects of the LDAR programme. Ensure staff or contractors conducting LDAR surveys are adequately trained.

- Methodology: Emission detection for LDAR surveys should be performed via Optical Gas Imaging (OGI) cameras (unless regulation such as EPA Method 21 applies).
- Component Inventory: Provide each component with a unique identifier and keep the inventory up to date in accordance with the Shell Management of Change process.
- Frequency: For LDAR using handheld OGI cameras, conduct LDAR surveys at the following minimum frequencies: Semi-annually during initial phase for Major Installations and annually during initial phase for other installations. Additionally, within 60 days of commissioning/start-up and turnaround.
- Estimation & Reporting: Determine fugitive emissions at the component-level and distinguish between leaking and non-leaking components, whether through measurement or estimation using 'leak/'no leak' emission factors.
- Data Quality, Records & Audits: Incorporate quality assurance and quality control practices into the LDAR programme.
- Continuous Improvement: Pair LDAR programme with preventative/predictive maintenance and equipment selection programmes.

We use LDAR programmes, for example, in Australia, Canada, the Netherlands, Trinidad and Tobago, Tunisia, and the USA, and this approach will be extended across Shell globally.

(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization's efforts to reduce flaring, including any flaring reduction targets.

We continue to work hard to reduce flaring associated with oil and gas production. Flaring is used to safely dispose of hydrocarbons that could otherwise pose a hazard to workers, nearby residents and facility equipment during non-routine occurrences. These occurrences include start-ups, process upsets, maintenance turnarounds, and equipment or power failures where production system pressure must be safely relieved.

In some situations, gas that is produced alongside oil (associated gas) may also be flared when there are insufficient or no facilities to gather the gas. As a signatory to the World Bank's "Zero Routine Flaring by 2030 initiative, Shell continues to actively pursue its 2015 commitment to eliminate associated gas flaring at its operations by 2030. Shell's flaring and venting policy, as set out in our Health, Safety, Security, Environment and Social Performance Control Framework, calls for facilities to meet strict performance criteria, including being designed to export, use or reinject associated gas.

Flaring minimization is a key consideration of our greenhouse gas (GHG) and energy management plans for new projects and existing assets. These plans, which are integrated into annual business plans, identify and document potential ways to reduce GHG emissions, influencing Shell investment decisions (see C4.1).

PERFORMANCE

Flaring of gas in our Upstream and Integrated Gas businesses contributed around 7% of our overall direct greenhouse gas emissions in 2018. More than 40% of this flaring took place at facilities where there was no infrastructure in place to capture the associated gas.

Our upstream flaring decreased to 5.2 mln tonnes of CO₂ equivalent in 2018 from 8.2 mln tonnes in 2017. Reductions in the emissions from flaring were primarily a result of the divestment of the Majnoon asset in Iraq, and our continuing focus to bring additional gas-gathering facilities online in Nigeria to reach our goal of zero routine flaring by 2030. The result was a reduction in associated gas flaring of over 40% from 2017.

Across our Integrated Gas projects and plants, where flaring occurs only for operational reasons, greenhouse gas emissions from flaring have decreased by more than 30% since the start of 2016. This has primarily been due to reduced flaring in our Pearl gas-to-liquids plant (Qatar Shell GTL Ltd, QSGTL), which continues to deliver a multiyear flare reduction programme. Shell affiliate QGC Pty Limited has also implemented upstream flare reduction projects.

IRAQ

In 2018, Shell completed the divestment of the Majnoon facilities (Shell interest 45%). Prior to divestment, direct greenhouse gas emissions were reduced roughly 8% from 2017 due to continuing flaring and venting reduction programmes that have captured around 52% of the associated gas that would have been flared in the past. The gas was exported to a local power plant for electricity generation.

Basrah Gas Company (BGC, Shell interest 44%), is a non-operated joint venture with Iraq's South Gas Company and Japan's Mitsubishi.

NIGERIA

In Nigeria, the levels of hydrocarbons flared from Shell Petroleum Development Company's joint-venture (SPDC JV – Shell interest 30%) facilities have fallen by 90% since start of the programme in 2002. This decrease is mainly due to investing in facilities that capture the associated gas and commercialise it through domestic and export markets. Divestments also provided further reduction.

Flaring at SPDC JV facilities decreased by around 9% to 0.5 mln tonnes in 2018 from 0.6 mln tonnes in 2017, mainly due to improved compressor availability and facility outages in the Western Delta.

The Shell Nigeria Exploration and Production Company (SNEPCo) significantly reduced its direct greenhouse gas emissions in 2018 (>50% from 2017) through (1) recovering from 2017 start-up flaring issues where an associated gas export line was blocked and (2) Installation of the Inert Gas Flaring Unit.

QATAR

In Qatar, at QSGTL's Pearl gas-to-liquids plant, flaring takes place for operational reasons. In 2018, further enhancements have been made to the plant to limit the amount of operational flaring as part of a multi-year flare reduction programme. Pearl has reduced its total flaring year on year since 2015 with flaring in 2018 nearly 50% lower than in 2015.

USA

We continued to take steps to reduce flaring at the SWEPI LP (a subsidiary of the Shell Oil Company) Permian unconventional oil asset in the USA in 2018. E.g., we are investing in operational upgrades that remove flares from well pad design and in new technologies to improve the reliability of our vapour recovery

systems. Since 2017, we have invested around \$10 mln in operational improvements to reduce flaring at Permian. In 2018, we achieved a reduction in the volume of gas flared per total gas production of more than 80% compared to the 2017 levels.

C5. Emissions methodology

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2017

Base year end

December 31, 2017

Base year emissions (metric tons CO2e)

73,000,000

Comment

For the reporting year 2018, our base year was 2017.

Our base year 2017 direct GHG emissions did not change by more than 5%; therefore, the base year has not been recalculated in 2018.

Scope 2 (location-based)

Comment

We have not recalculated our base year using location-based approach. Based on assessment of our 2016 - 2018 data, the difference in emissions between the two approaches for our assets was not material.

Scope 2 (market-based)

Base year start

January 1, 2017

Base year end

December 31, 2017

Base year emissions (metric tons CO2e)

12,000,000

Comment

For 2018 reporting year, our base year was 2017. Our base year 2017 scope 2 GHG emissions did not change by more than 5%; therefore, the base year has not been recalculated in 2018.

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009

Australia - National Greenhouse and Energy Reporting Act

IPIECA's Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011

ISO 14064-1

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

US EPA Mandatory Greenhouse Gas Reporting Rule

Other, please specify: Shell's Performance Monitoring and Reporting Specification

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

Shell assets are required to comply with Shell's Performance Monitoring and Reporting Specification, which sets out the scope of what is to be reported. This is part of our HSSE & SP (Health, Safety, Security, Environment & Social Performance) Control Framework. It requires assets to use local regulated methods where they exist. Where there are no local regulated methods, assets use the 2009 API Compendium. The following provides examples of the requirements in the province of Alberta, Canada, and the USA.

Alberta, Canada: What needs to be reported and how GHG emissions are to be calculated is outlined in the Carbon Competitiveness Incentive Regulation (Alberta regulation 255/2017).

USA: The Code of Federal Regulations Title 40 Chapter I Subchapter C Part 98 contains the requirements. There are several subparts to the rule that apply to our facilities. Examples that apply to our assets are:

- Subpart A General Provisions
- Subpart C General Stationary Fuel Combustion Sources
- Subpart P Hydrogen Production
- Subpart W Petroleum and Natural Gas Systems
- Subpart X Petrochemical Production
- Subpart Y Petroleum Refineries

C6. Emissions data

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

71,000,000

Start date

January 1, 2018

End date

December 31, 2018

Comment

Our GHG emissions have been rounded to the nearest million tonnes CO2 equivalent.

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

We track and report our scope 2 emissions using both location-based and market-based methods.

(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

11,000,000

Scope 2, market-based (if applicable)

11,000,000

Start date

January 1, 2018

End date

December 31, 2018

Comment

We calculated our scope 2 emissions from imported electricity and steam/heat using both methods. The difference between two methods for 2018 was immaterial (<1%). The numbers have been rounded to the nearest million tonnes.

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source

Some non-material sources

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions excluded

Relevance of market-based Scope 2 emissions from this source (if applicable)

No emissions excluded

Explain why this source is excluded

We have reported emissions for all businesses including offices. Some non-material sources have not been included. For example, we do not collect the fugitive emissions from domestic scale air conditioning units; a materiality assessment for our industrial sources has shown the industrial sources to be non-material. We continue to report the emissions of HFCs and PFCs but we use a single Global Warming Potential (GWP) factor for these gases. The emissions from some maintenance activities like welding are not included for all operations. We also do not estimate the fugitive emissions of CO2 from CO2 fire extinguishers in all operations.

Source

Country grid factors

Relevance of Scope 1 emissions from this source

No emissions excluded

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why this source is excluded

Some country electricity grid factors are only available in CO2 and not CO2e. Where both are available the difference between them is immaterial (about 1%).

(C6.5) Account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

12,000,000

Emissions calculation methodology

In 2010, an analysis was undertaken to look at the contracting and procurement spent in various categories. Supplier data were taken from either the CDP data base or industry averages were calculated from intensities of comparable companies. In 2019, the analysis was refreshed to estimate 2018 emissions. This includes the emissions associated with the generation of imported hydrogen used in our refineries.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

These numbers do not include emissions from production of purchased 3rd party crude oil processed by our refineries. Those emissions are captured separately below in Other (Upstream) category.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

600,000

Emissions calculation methodology

These emissions were derived as a result of an analysis undertaken in 2019 to look at the contracting and procurement spent in various categories in 2018. Supplier data were taken from either the CDP data base or industry averages were calculated from intensities of comparable companies. Some of the numbers are provided by our suppliers and the remainder are calculated using factors from the API Compendium 2009.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2,000,000

Emissions calculation methodology

These emissions represent:

- 1) Emissions resulted from transmission & distribution losses from electricity imported by our operated assets. T&D factors were taken from DEFRA.
- 2) Emissions from Well-to-Tank (WTT) electricity generation (upstream emissions of purchased electricity). WTT emission factors were taken from DEFRA.
- 3) Emissions from electricity Well-to-Tank (WTT) electricity transmission and distribution. WTT emission factors were taken from DEFRA.
- 4) Emissions from steam & heat Well-to-Tank (WTT). WTT emission factors were taken from DEFRA.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

6,000,000

Emissions calculation methodology

This category includes emissions from transport of crude oil and feedstocks to our refineries. Emissions were estimated from total amount of crude oil and feedstock processed by the refineries (see Shell Annual Report 2018, p57), and emission factors derived from our own modelling, some assumptions and a number of sources (e.g. IMO, GREET).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

200,000

Emissions calculation methodology

The estimation is based on the mass of hazardous and non-hazardous waste disposed and DEFRA emission factors for waste disposal to landfill. The number reported does not include the emissions from wastewater treatment plants operated by the company. These emissions are accounted for in our Scope 1 emissions. It does not include waste generated onsite, but not disposed of in 2018. It also excludes waste disposal through deep well injection.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

200,000

Emissions calculation methodology

Our 2018 calculations are based on the DEFRA guidelines provided under section “International To/From Non-UK without RF”. The total figure includes travel for all GTAP countries as reported in our corporate travel system. The calculation is done separately for each of the ticket class: Business, Economy, First Class and Premium Economy using multiplication factors without RF.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

The number reported does not represent 100% of business travel. The number reported does not include travel undertaken on other forms of public transport like trains and buses. Business travel in company vehicles is reported under Scope 1 emissions. Business travel in contractor operated vehicles is reported under the Scope 3 Purchased Goods and Services category in this section.

Employee commuting

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

250,000

Emissions calculation methodology

The maximum contribution is estimated to be less than 250,000 tonnes. This was estimated on the basis of assuming that all employees drive a total of 50 km per working day. In many work locations the majority of employees travel to work by public transport hence the number shown is a maximum estimated for evaluation purposes only.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Upstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

170,000

Emissions calculation methodology

This category includes Scope 1 and 2 emissions from our share of capacity rights in LNG regasification terminals that are neither owned nor operated by us and are not reported as capital leases. Emissions were estimated from our capacity rights and emission factors derived from LNG regasification terminals where we have access to raw data.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

The emissions do not include the direct and indirect emissions that come from our capacity rights in LNG terminals that are reported as capital leases on our books - these emissions are reported as Scope 1 and 2 under the equity boundary. The emissions from the Shell Trading operated leased vessels are also excluded because they are included under our Scope 1 operational control boundary.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

24,000,000

Emissions calculation methodology

The activity data was taken from Shell’s 2018 Annual Report. Emission factors were generally taken from a number of sources (e.g. IMO, GREET). Emissions were estimated from the mass of products (e.g. natural gas and LNG production etc.) multiplied by the appropriate emission factor for each freight mode (sea, pipeline, road or rail) and average distance travelled based on our modelling and some assumptions.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not track the destination of all products through the processing, conversion, distribution, use and disposal by customers.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

We do not track the destination of sold products that undergo further processing; therefore, it is not possible for us to estimate our Scope 3 emissions in this category. We believe that these emissions are going to be immaterial compared to emissions from use of products (Category 11).

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

599,000,000

Emissions calculation methodology

The activity data is taken from Shell's 2018 Annual Report and includes natural gas available for sale (p50) and refinery outturn (p57).

The boundary used to report refinery products and natural gas production are those used for financial reporting and do not align with the traditional GHG boundaries defined by the GHG Protocol.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

End of life treatment of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

25,000,000

Emissions calculation methodology

The methodology is based on the amount of our chemical and lubricant products, the carbon content and assumptions taken from reports like ICCA's 2009 Innovations for Greenhouse Gas Reductions.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

We do not track the destination of all products through the processing, conversion, distribution, use and disposal by customers. Primary product data are taken directly from

our own sources but the assumptions come from external sources like the one referenced in the methodology. No allowance has been included for the emission reductions due to the production of insulation, use of advanced lubricants or displacement of alternate fuel sources.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

We have not identified any downstream leased assets in 2018.

Franchises

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,650,000

Emissions calculation methodology

This number includes the indirect emissions from the operation of Shell branded sites excluding those that are company owned / operated or operate under a license only. The number reported for 2018 includes non-operated locations. The average electricity data were collected from survey data in several countries. The CO2 /CO2e electricity factors for each country were used.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Investments

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

700,000

Emissions calculation methodology

The data are collected via our investments in major facilities. These are typically investments that report under the cost dividend accounting method. The numbers are reported to us by the facilities or estimated.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

The numbers reported are for our investments in major facilities only. Data from our own facilities indicate that other investments will not be material. The Scope 1 & 2 data reported in other parts of this document relate to facilities that we operate. Our equity emissions are published on our public website and do not include emissions from investments.

Other (upstream)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

25,000,000

Emissions calculation methodology

This category includes emissions from production of purchased 3rd party crude oil used by our refineries for further processing (estimated from the difference between crude oil available for sale (as reported by our Upstream and Integrated Gas businesses) and refinery crude oil intake to avoid double-counting Scope 1 and 2 GHG emissions). The boundary used for reporting these emissions is consistent with the boundary used in the Annual Report 2018.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Other (downstream)

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

464,000

Emissions calculation methodology

Metered quantities of CO2 sold.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Amount of CO2 gas sold as product to third parties.

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.00027

Metric numerator (Gross global combined Scope 1 and 2 emissions)

106,000,000

Metric denominator

unit total revenue

Metric denominator: Unit total

388,379,000,000

Scope 2 figure used

Market-based

% change from previous year

24

Direction of change

Decreased

Reason for change

This was partly - mainly - due to higher revenue, and partly due to implemented emission reduction activities as outlined, e.g., in section C4.3b.

NOTE: Shell does not report emissions intensity in relation to financial performance.

In our view, such measures potentially risk misleading readers because:

a) Emissions volumes and financial performance (for example, revenue, EBITDA or net income) are not necessarily reported on the same basis - particularly where emissions volumes are reported on the basis of operational control - therefore measures that combine them do not compare like-with-like in the ratio. It is not possible to report revenue on an operated basis.

The ratio shown was determined using verified direct and indirect equity emissions. If operated GHG data were used the result would be 0.00021 tonne/\$ revenue and a 24% change from 2017.

b) Even where emissions volumes and financial performance are reported on a consistent basis (for example, on the basis of financial control), the different factors underlying emissions volumes and financial performance are often unrelated. A key driver underlying revenue, for example, is the price of oil and gas, which fluctuates regardless of an entity's volumes of emissions. The oil and gas price moved by more than 5% from 2017 to 2018. EBITDA and net income additionally reflect the financial effects of activities that have no impact on emissions volumes.

We believe that only activity-related measures provide readers with more relevant and reliable information.

(C-OG6.12) Provide the intensity figures for Scope 1 emissions (metric tons CO2e) per unit of hydrocarbon category.

Unit of hydrocarbon category (denominator)

Other, please specify: Tonnes hydrocarbon production available for sale

Metric tons CO2e from hydrocarbon category per unit specified

0.16

% change from previous year

5

Direction of change

Decreased

Reason for change

GHG intensity decreased in 2018 compared to 2017 in part due to divestments, for example in the UK, Canada, Malaysia, Gabon and Iraq.

Comment

GHG emissions used to calculate upstream and midstream GHG intensity comprise Scope 1 and 2 emissions. We do not calculate intensity for Scope 1 GHG emissions only.

Unit of hydrocarbon category (denominator)

Other, please specify: Solomon's UEDC

Metric tons CO2e from hydrocarbon category per unit specified

1.05

% change from previous year

8

Direction of change

Decreased

Reason for change

Refining: GHG intensity decreased in 2018 in part due to inclusion of two refineries previously operated by Motiva joint venture in our data from May 2017 and inclusion of an upgrader in the intensity calculations from Jan 2018.

Comment

GHG emissions used to calculate refining GHG intensity comprise Scope 1 and 2 emissions. We do not calculate intensity for Scope 1 GHG emissions only.

Unit of hydrocarbon category (denominator)

Other, please specify: Tonnes of high value chemicals

Metric tons CO₂e from hydrocarbon category per unit specified

0.96

% change from previous year

1

Direction of change

Increased

Reason for change

Chemicals: the intensity changed by 1% compared to 2017.

Comment

GHG emissions used to calculate chemicals GHG intensity comprise Scope 1 and 2 emissions. We do not calculate intensity for Scope 1 GHG emissions only.

(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.

Oil and gas business division

Upstream

Midstream

Estimated total methane emitted expressed as % of natural gas production or throughput at given division

0.08

Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division

0.04

Comment

The methane emissions intensity (0.08%) represents the estimated amount of methane emissions for Shell’s operated gas and oil assets as a percentage of the amount of the total gas marketed. In 2018, our overall methane intensity was 0.08% for assets with marketed gas and 0.01% for assets without marketed gas (for the assets that have no marketed gas, we used the amount of marketed oil and condensate (e.g. assets that re-inject produced gas)). Asset level intensities ranged from below 0.01% to 0.9%. There are uncertainties associated with methane emissions quantification. To reduce these uncertainties, our Upstream and Integrated Gas businesses are rolling out methane improvement programmes that focus on further improving data quality and reporting, and on continued implementation of leak detection and repair programmes and methane abatement opportunities.

The estimated total methane emitted as % of total hydrocarbon production (0.04%) reflects the total methane emissions per total hydrocarbon production available for sale in our Upstream and Integrated Gas businesses.

C7. Emissions breakdowns

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	68,000,000	IPCC Fourth Assessment Report (AR4 - 100 year) The number is rounded to the nearest million tonnes CO2 equivalent.
CH4	2,300,000	IPCC Fourth Assessment Report (AR4 - 100 year) The number has been rounded.
N2O	260,000	IPCC Fourth Assessment Report (AR4 - 100 year) The number has been rounded.
HFCs	44,000	IPCC Fourth Assessment Report (AR4 - 100 year) The number has been rounded.
PFCs	0	IPCC Fourth Assessment Report (AR4 - 100 year)

SF6	700	IPCC Fourth Assessment Report (AR4 - 100 year) The number has been rounded.
NF3	0	IPCC Fourth Assessment Report (AR4 - 100 year)

(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.

Emissions category

Combustion (excluding flaring)

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

20,400,000

Gross Scope 1 methane emissions (metric tons CH4)

8,000

Total gross Scope 1 emissions (metric tons CO2e)

20,600,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Flaring

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

4,600,000

Gross Scope 1 methane emissions (metric tons CH4)

15,000

Total gross Scope 1 emissions (metric tons CO2e)

5,000,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Fugitives

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

14,000

Gross Scope 1 methane emissions (metric tons CH4)

15,000

Total gross Scope 1 emissions (metric tons CO2e)

400,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Venting

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

620,000

Gross Scope 1 methane emissions (metric tons CH4)

33,000

Total gross Scope 1 emissions (metric tons CO2e)

1,500,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Process (feedstock) emissions

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

2,000

Gross Scope 1 methane emissions (metric tons CH4)

9,000

Total gross Scope 1 emissions (metric tons CO2e)

200,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Combustion (excluding flaring)

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

33,000,000

Gross Scope 1 methane emissions (metric tons CH4)

5,000

Total gross Scope 1 emissions (metric tons CO2e)

33,100,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Flaring

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

1,020,000

Gross Scope 1 methane emissions (metric tons CH4)

2,000

Total gross Scope 1 emissions (metric tons CO2e)

1,100,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Venting

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

10,000

Gross Scope 1 methane emissions (metric tons CH4)

2,000

Total gross Scope 1 emissions (metric tons CO2e)

60,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Fugitives

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

5,000

Gross Scope 1 methane emissions (metric tons CH4)

1,000

Total gross Scope 1 emissions (metric tons CO2e)

30,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Process (feedstock) emissions

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

7,790,000

Gross Scope 1 methane emissions (metric tons CH4)

400

Total gross Scope 1 emissions (metric tons CO2e)

7,800,000

Comment

Total gross scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

Emissions category

Combustion (excluding flaring)

Flaring

Venting

Fugitives

Process (feedstock) emissions

Value chain

Upstream

Midstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

0

Gross Scope 1 methane emissions (metric tons CH4)

0

Total gross Scope 1 emissions (metric tons CO2e)

100,000

Comment

Includes total N2O, HCF and SF6 emissions in CO2 equivalents. The numbers have been rounded.

Emissions category

Combustion (excluding flaring)

Flaring

Venting

Fugitives

Process (feedstock) emissions

Value chain

Downstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

0

Gross Scope 1 methane emissions (metric tons CH4)

0

Total gross Scope 1 emissions (metric tons CO2e)

200,000

Comment

Includes total N2O, HCF and SF6 emissions in CO2 equivalents. The numbers have been rounded.

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America - Emissions have been rounded.	19,500,000
Middle East - Emissions have been rounded.	9,700,000
Netherlands - Emissions have been rounded.	7,400,000
Canada - Emissions have been rounded.	6,000,000
Singapore - Emissions have been rounded.	6,500,000
Nigeria - Emissions have been rounded.	4,000,000
Germany - Emissions have been rounded.	3,500,000
Malaysia - Emissions have been rounded.	2,900,000
Australia - Emissions have been rounded.	3,500,000
United Kingdom of Great Britain and Northern Ireland - Emissions have been rounded.	2,400,000
Other, please specify: International Waters - Emissions have been rounded.	1,800,000
Other, please specify: Rest of World - Emissions have been rounded.	3,800,000

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Upstream	14,800,000
Integrated Gas	13,000,000
Downstream	42,200,000

(C-OG7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Comment
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Oil and gas production activities (upstream)	27,800,000	Includes Upstream and Integrated Gas
Oil and gas production activities (downstream)	42,200,000	

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America Emissions have been rounded.	3,400,000	3,100,000	14,200,000	0
Canada Emissions have been rounded.	2,000,000	2,000,000	6,000,000	0
Australia Emissions have been rounded.	2,400,000	2,400,000	5,600,000	0
Netherlands Emissions have been rounded.	1,700,000	1,800,000	8,300,000	30,000
Germany Emissions have been rounded.	300,000	400,000	1,400,000	0
Singapore Emissions have been rounded.	500,000	500,000	2,400,000	0
Other, please specify: Rest of World Emissions have been rounded.	400,000	400,000	2,800,000	0

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
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Upstream	1,200,000	1,400,000
Integrated Gas	2,400,000	2,400,000
Downstream	6,800,000	6,800,000

(C-OG7.7) Break down your organization’s total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Oil and gas production activities (upstream)	3,600,000	3,800,000	Includes Upstream and Integrated Gas businesses
Oil and gas production activities (downstream)	6,800,000	6,800,000	Includes our Downstream business (including Shipping)

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	We did not track changes in renewable energy consumption as a separate metric in 2018.
Other emissions reduction activities	1,200,000	Decreased	1.4	In 2018, 1.2 million tonnes of GHG emissions were reduced by our emission reduction projects, which translates to a reduction of 1.4% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO2e). We arrived at 1.4% through $(1.2/85)*100$. Note that this number does not include 1 million tonnes of CO2 captured and sequestered by our Quest

				CCS project in Canada in 2018 because this question only compares changes year-on-year, so CCS would only get recognized as a reduction during the first year of operations. Quest is operated by Shell, with an interest of 10%.
Divestment	3,700,000	Decreased	4.4	In 2018, our emissions decreased by 3.7 million tonnes of GHG emissions due to divestments, which translates to a decrease of 4.4% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 4.4% through $(3.7/85)*100$.
Acquisitions	1,430,000	Increased	1.7	In 2018, our emissions increased by 1.43 million tonnes of CO ₂ equivalents due to acquisitions, which translates to an increase of 1.7% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 1.7% through $(1.43/85)*100$.
Mergers	0	No change	0	There were none in 2018 or 2017.
Change in output	1,900,000	Increased	2.2	In 2018, our emissions increased by 1.9 million tonnes of CO ₂ equivalents due to change in output, which translates to an increase of 2.2% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 2.2% through $(1.9/85)*100$.
Change in methodology	600,000	Decreased	0.7	In 2018, our emissions decreased by 0.6 million tonnes of CO ₂ equivalents due to changes in methodology, which translates to a decrease of 0.7% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 0.7% through $(0.6/85)*100$.
Change in boundary	1,200,000	Decreased	1.4	In 2018, our emissions decreased by 1.2 million tonnes of CO ₂ equivalents due to changes in boundary, which translates to a decrease of 1.4% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 1.4% through $(1.2/85)*100$.
Change in physical operating conditions	400,000	Decreased	0.5	In 2018, our emissions decreased by 0.4 million tonnes of CO ₂ equivalents due to changes in physical operating conditions, which translates to a decrease of 0.5% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 0.5% through $(0.4/85)*100$.
Unidentified	0		0	
Other	860,000	Increased	1	In 2018, our emissions increased by 0.86 million tonnes of CO ₂ equivalents due to other reasons, which translates to an increase of 1.0% of our total scope 1 and 2 GHG emissions for 2017 (85 million tonnes CO ₂ e). We arrived at 1.0% through $(0.86/85)*100$.

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 5% but less than or equal to 10%

NOTE: This is an estimate of Shell’s spend on purchased energy, such as electricity across a number of countries where our procurement organisation purchases power. This does not reflect total energy related spend.

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	240,000,000	240,000,000
Consumption of purchased or acquired electricity		30,000	25,850,000	26,000,000
Consumption of purchased or acquired steam		0	15,000,000	15,000,000

Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		30,000	280,850,000	281,000,000

(C8.2b) Select the applications of your organization’s consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

33,000,000

MWh fuel consumed for self-generation of electricity

33,000,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

We do not track fuel consumption by application at global level. The number included under MWh fuel consumed for self-generation of electricity includes generation of electricity, steam and heat for internal use and export because we are unable to split them. The numbers have been rounded.

Fuels (excluding feedstocks)

Other, please specify: Own energy

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

198,000,000

MWh fuel consumed for self-generation of electricity

198,000,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

We do not track fuel consumption by application at global level. The number included under MWh fuel consumed for self-generation of electricity includes generation of electricity, steam and heat for internal use and export because we are unable to split them. The numbers have been rounded.

Fuels (excluding feedstocks)

Other, please specify: Marine transport fuel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

8,000,000

MWh fuel consumed for self-generation of electricity

8,000,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

We do not track fuel consumption by application at global level. The number included under MWh fuel consumed for self-generation of electricity includes generation of electricity, steam and heat for internal use and export because we are unable to split them. The numbers have been rounded.

Fuels (excluding feedstocks)

Other, please specify: Road transport fuel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

100,000

MWh fuel consumed for self-generation of electricity

100,000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

The numbers have been rounded.

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Natural Gas

Emission factor

0.059

Unit

metric tons CO2 per million Btu

Emission factor source

2009 API Compendium, table 4-3

Comment

The above emission factor is provided for illustrative purposes. Shell assets are required to comply with Shell's Performance Monitoring and Reporting Specification, which sets out the scope of what is to be reported. This is part of our HSSE & SP (Health, Safety, Security, Environment & Social Performance) Control Framework. It requires assets to use local regulated methods and factors where they exist. Where there are no local regulated methods, assets are required to use the highest practicable tier when it comes to the choice of emission factors with the lowest tier using default/standard emission factors from the 2009 API Compendium.

Other

Emission factor

0.0746

Unit

metric tons CO2 per million Btu

Emission factor source

2009 API Compendium, table 4-3 for motor gasoline (petrol)

Comment

The above emission factor is provided for illustrative purposes. Shell assets are required to comply with Shell's Performance Monitoring and Reporting Specification, which sets out the scope of what is to be reported. This is part of our HSSE & SP (Health, Safety, Security, Environment & Social Performance) Control Framework. It requires assets to use local regulated methods and factors where they exist. Where there are no local regulated methods, assets are required to use the highest practicable tier when it comes to the choice of emission factors with the lowest tier using default/standard emission factors from the 2009 API Compendium.

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity				
Heat				
Steam				

Cooling				
---------	--	--	--	--

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

Energy attribute certificates, Guarantees of Origin

Low-carbon technology type

Wind

Region of consumption of low-carbon electricity, heat, steam or cooling

Europe

MWh consumed associated with low-carbon electricity, heat, steam or cooling

30,000

Emission factor (in units of metric tons CO2e per MWh)

0

Comment

C9. Additional metrics

(C9.1) Provide any additional climate-related metrics relevant to your business.

(C-OG9.2a) Disclose your net liquid and gas hydrocarbon production (total of subsidiaries and equity-accounted entities).

	In-year net production	Comment

Crude oil and condensate, million barrels	638.51	Shell Annual Report 2018, p49 Footnote A applies: Reflects 100% of production of subsidiaries except in respect of production sharing contracts (PSCs), where the figures shown represent the entitlement of the subsidiaries concerned under those contracts. NOTE: we report crude oil and natural gas liquids as a sum total (sum total of 600,186 (Shell subsidiaries) + 38,326 (Shell share of joint ventures and associates) thousand barrels). Due to this difference between Shell’s reporting and CDP way of requesting, we are providing the same figure as in line below.
Natural gas liquids, million barrels	638.51	Shell Annual Report 2018, p49 Footnote A applies: Reflects 100% of production of subsidiaries except in respect of production sharing contracts (PSCs), where the figures shown represent the entitlement of the subsidiaries concerned under those contracts. NOTE: we report crude oil and natural gas liquids as a sum total (sum total of 600,186 (Shell subsidiaries) + 38,326 (Shell share of joint ventures and associates) thousand barrels). Due to this difference between Shell’s reporting and CDP way of requesting, we are providing the same figure as in line above.
Oil sands, million barrels (includes bitumen and synthetic crude)	19.51	Shell Annual Report 2018, p49 (only synthetic crude)
Natural gas, billion cubic feet	3,944.05	Shell Annual Report 2018, p50 (sum total of 3,241,721 (Shell subsidiaries) + 702,330 (Shell share of joint ventures and associates) million standard cubic feet)

(C-OG9.2b) Explain which listing requirements or other methodologies you use to report reserves data. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries, please explain this.

Shell Annual Report 2018, p44/45 and 215

The information set out on pages 215-236 is referred to as “unaudited” as a means of clarifying that it is not covered by the audit opinion of the independent registered public accounting firm that has audited and reported on the “Consolidated Financial Statements”.

PROVED RESERVES

Proved reserves estimates are calculated pursuant to the US SEC Rules and the Financial Accounting Standard Board’s Topic 932. Proved reserves can be either developed or undeveloped. The definitions used are in accordance with the SEC Rule 4-10 (a) of Regulation S-X. We include proved reserves associated with future production that will be consumed in operations.

Proved reserves shown are net of any quantities of crude oil or natural gas that are expected to be (or could be) taken as royalties in kind. Proved reserves outside North America include quantities that will be settled as royalties in cash. Proved reserves include certain quantities of crude oil or natural gas that will be produced under arrangements that involve Shell subsidiaries, joint ventures and associates in risks and rewards but do not transfer title of the product to those entities.

Proved reserves cannot be measured exactly because estimation of reserves involves subjective judgement (see “Risk factors” on page 16 and our “Proved reserves assurance process” below). These estimates remain subject to revision and are unaudited supplementary information.

PROVED RESERVES ASSURANCE PROCESS

A central group of reserves experts, who on average have around 30 years’ experience in the oil and gas industry, undertake the primary assurance of the proved reserves bookings. This group of experts is part of the Resources Assurance and Reporting (RAR) organisation within Shell. A Vice President with 33 years’ experience in the oil and gas industry currently heads the RAR organisation. He is a member of the Society of Petroleum Engineers, Society of Petroleum Evaluation Engineers and holds a BA in mathematics from Oxford University and an MEng in Petroleum Engineering from Heriot Watt University. The RAR organisation reports directly to an Executive Vice President of Finance, who is a member of the Upstream Reserves Committee (URC). The URC is a multidisciplinary committee consisting of senior representatives from the Finance, Legal, Projects & Technology and Upstream organisations. The URC reviews and endorses all major (larger than 20 million barrels of oil equivalent) proved reserves bookings and endorses the total aggregated proved reserves. Final approval of all proved reserves bookings remains with Shell’s Executive Committee, and where all proved reserves bookings are reviewed by Shell’s Audit Committee. The Internal Audit function also provides secondary assurance through audits of the control framework.

SHELL SUBSIDIARIES

Before taking production into account, Shell subsidiaries’ proved reserves increased by 1,337 million boe in 2018. This comprised of increases of 786 million barrels of oil and natural gas liquids, 519 million boe (3,011 thousand million scf) of natural gas and 32 million barrels of synthetic crude oil. The 1,337 million boe increase is the net effect of a net increase of 997 million boe from revisions and reclassifications, an increase of 42 million boe from improved recovery, an increase of 474 million boe from extensions and discoveries, and a net decrease of 175 million boe related to purchases and sales of minerals in place. After taking into account production of 1,222 million boe (of which 43 million boe were consumed in operations), Shell subsidiaries’ proved reserves increased by 117 million boe in 2018 to 10,294 million boe. In 2018, Shell subsidiaries’ proved developed reserves (PD) decreased by 126 million boe to 8,054 million boe, and proved undeveloped reserves (PUD) increased by 242 million boe to 2,239 million boe.

SHELL SHARE OF JOINT VENTURES AND ASSOCIATES

Due to character limitation in the CDP online format, please refer for more information to our Annual Report 2018, p45.

PROVED UNDEVELOPED RESERVES

Due to character limitation in the CDP online format, please refer for more information to our Annual Report 2018, p45.

(C-OG9.2c) Disclose your estimated total net reserves and resource base (million boe), including the total associated with subsidiaries and equity-accounted entities.

	Estimated total net proved + probable reserves (2P) (million BOE)	Estimated total net proved + probable + possible reserves (3P) (million BOE)	Estimated net total resource base (million BOE)	Comment
Row 1	11,578			We do not disclose probable reserves only proved. Also, we do not disclose net total resource base. See Annual Report 2018, p44, table, at 31 December 2018.

(C-OG9.2d) Provide an indicative percentage split for 2P, 3P reserves, and total resource base by hydrocarbon categories.

	Net proved + probable reserves (2P) (%)	Net proved + probable + possible reserves (3P) (%)	Net total resource base (%)	Comment
Crude oil / condensate / Natural gas liquids				We do not disclose probable reserves only proved. Also, we do not disclose net total resource base. See Annual Report 2018, p44, table, at 31 December 2018.
Natural gas				We do not disclose probable reserves only proved. Also, we do not disclose net total resource base. See Annual Report 2018, p44, table, at 31 December 2018.
Oil sands (includes bitumen and synthetic crude)				We do not disclose probable reserves only proved. Also, we do not disclose net total resource base. See Annual Report 2018, p44, table, at 31 December 2018.

(C-OG9.2e) Provide an indicative percentage split for production, 1P, 2P, 3P reserves, and total resource base by development types.

Development type

Other, please specify

In-year net production (%)

Net proved reserves (1P) (%)

Net proved + probable reserves (2P) (%)

Net proved + probable + possible reserves (3P) (%)

Net total resource base (%)

Comment

Column "In-year net production (%)": only disclosed in geographical region, see Annual Report 2018, p46/48.

(C-OG9.3a) Disclose your total refinery throughput capacity in the reporting year in thousand barrels per year.

	Total refinery throughput capacity (Thousand barrels per day)
Capacity	2,913

(C-OG9.3b) Disclose feedstocks processed in the reporting year in million barrels per year.

	Throughput (Million barrels)	Comment
Oil	888.4	2018 Investor Handbook, p104 (Refinery Processing Intake), 2,434 Kboe/d = 888.4 MMboe
Other feedstocks	78	2018 Investor Handbook, p104 (Refinery Processing Intake), 214 Kboe/d = 78 MMboe
Total	966.5	2018 Investor Handbook, p104 (Refinery Processing Intake), 2,648 Kboe/d = 966.5 MMboe

(C-OG9.3c) Are you able to break down your refinery products and net production?

Yes

(C-OG9.3d) Disclose your refinery products and net production in the reporting year in million barrels per year.

Product produced	Refinery net production (Million barrels) *not including products used/consumed on site
Gasolines	352.6
Kerosenes	117.2
Diesel fuels	352.2
Fuel oils	103.7
Other, please specify: Cannot be specified further	117.2

(C-OG9.3e) Please disclose your chemicals production in the reporting year in thousand metric tons.

Product	Production, Thousand metric tons	Capacity, Thousand metric tons
Other, please specify Base chemicals - We only disclose SALES VOLUMES but not production volumes. We do not disclose full chemical plant capacity.	10,051	
Other, please specify Intermediates and others - We only disclose SALES VOLUMES but not production volumes. We do not disclose full chemical plant capacity.	7,593	

(C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

Investment start date

January 1, 2018

Investment end date

December 31, 2018

Investment area

R&D

Technology area

Other, please specify: 2018 total investment in R&D (Upstream, Downstream, Integrated Gas, New Energies)

🗨 Note: Regarding columns “start” and “end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018.

Note regarding column “Investment Maturity”: this is not limited to:

- applied research and development
- ...but includes other activities such as
- basis academic/theoretical research.

Investment maturity

Applied research and development

Investment figure

\$986,000,000

Low-carbon investment percentage

Please explain

Note: regarding columns “start” and “end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018.

Note: regarding column “Investment Maturity”: this is not limited to:

- applied research and development
-but includes other activities such as
- basis academic/theoretical research.

\$986 million is the sum of our overall R&D spend. This covers work for low carbon as well as any other technology categories across all our businesses (Upstream, Downstream, Integrated Gas/New Energies).

2018 Sustainability Report, p62, section Developing Technology

Shell invests in research and development to improve the quality of our products and efficiency of our projects, processes and operations, and to commercialise new technologies for the transition to a low-carbon energy future.

We have a global technology-development network, with major centres in the USA, the Netherlands and India. We also have R&D sites in countries such as China and Germany. Hundreds of scientists work at our facilities, running R&D projects that seek to, among other things, turn natural gas into cleaner fuels and energy saving lubricants; to bring crude oil up from under the sea safely, economically and efficiently; and to reduce the Net Carbon Footprint of the energy products we sell.

In 2018, we spent \$986 million on R&D, compared with \$922 million in 2017.

Our R&D projects often involve collaborations with public or private entities, including business partners, universities, government laboratories, technology start-ups and incubators.

Investment start date

April 1, 2018

Investment end date

March 31, 2019

Investment area

Products

Technology area

Renewable energy

 Note: Regarding columns “start and end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018/2019 (Brazil).

Investment maturity

Large scale commercial deployment

Investment figure

\$181,000,000

Low-carbon investment percentage

Please explain

Note: Regarding columns “start” and “end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018, in this case April - March.

<https://www.raizen.com.br/en/about-raizen/raizen-numbers> (1.35 Billion BRL Investment - see section 2.4a, Opportunity 1 - equals about \$181 mln)

Raízen, our joint venture in Brazil (non-operated, Shell interest 50%), produces ethanol from sugar cane, with an annual production capacity of more than 2 billion litres; exports sugar, with an annual production of about 4.2 million tonnes; and manages a retail network.

2018 Sustainability Report, p58, section Lower-carbon energy: Biofuels, incl. advanced biofuels

Through our non-operated joint venture Raízen in Brazil (Shell interest 50%), Shell is one of the largest blenders and distributors of biofuels. In 2018, we used around 9.5 billion litres of biofuels in the petrol and diesel we sold worldwide in order to meet specific regulations. Raízen produces ethanol from sugar cane, with an annual production capacity of more than 2 billion litres. In addition to understanding blended biofuel emissions, we want to ensure that other environmental impacts from biofuel production are well managed – such as the effect on soil, air and water – and that there are benefits for the livelihoods of local communities.

Read more on our approach to biofuels at www.shell.com/biofuels.

Developing advanced biofuels

We continue to invest in new ways to produce advanced biofuels from sustainable raw materials, such as waste and cellulosic biomass from non-foodplants.

We have a demonstration plant at the Shell Technology Centre Bangalore, India, which features an advanced biofuel process called IH2@, a technology that can turn waste into transport fuel. The plant can process around five tonnes a day of feedstock, such as agricultural waste, and aims to demonstrate the technology for possible scaling up and commercialisation.

Investment start date

January 1, 2018

Investment end date

December 31, 2018

Investment area

Services

Technology area

Other, please specify: Distributing energy

Investment maturity

Large scale commercial deployment

Investment figure

Low-carbon investment percentage

Please explain

Note: Regarding columns “start” and “end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018.

2018 Sustainability Report, p57, section Lower-carbon energy:

DISTRIBUTED AND HOUSEHOLD ENERGY

In 2018, we started supplying energy to residential customers directly in the UK for the first time when we acquired First Utility, now Shell Energy Retail, an energy provider that supplies around 720,000 homes. It is also active in Germany.

The residential market is changing fast, with new technologies such as smart meters, smart thermostats and other intelligent appliances. These devices allow people to monitor and control their consumption better – for instance, by programming large appliances to run at a time when electricity is cheaper. This helps to balance the electricity grid at peak times when supplies are most stressed.

One further trend is known as distributed energy. This is when customers, big and small, begin to generate their own on-site power through solar panels or wind turbines, store it and potentially redistribute it back into the grid.

In 2018, Shell acquired a majority interest in GI Energy, a US company that focuses on the integration of distributed energy resources. GI Energy builds microgrids and on-site energy systems for commercial and industrial customers. In February 2019, we acquired sonnen, which provides smart energy storage systems and innovative energy services for households.

Investment start date

January 1, 2018

Investment end date

December 31, 2018

Investment area

Products

Technology area

Renewable energy

Investment maturity

Large scale commercial deployment

Investment figure

Low-carbon investment percentage

Please explain

Note: Regarding columns “start” and “end date of investment”: The timeline indicated for this investment links to the investment in the financial year 2018. 2018 Sustainability Report, p56, section Electricity

We first entered the wind business in 2001, in the USA. Today, we have five onshore wind farms in operation in the USA, and one offshore wind farm in operation in the Netherlands. We also have interests in three wind projects under development – two in the USA and one in the Netherlands. Once built, these projects will have a total installed capacity of more than 5 gigawatts (GW).

The Netherlands wind project is led by the Blauwwind consortium (Shell interest 20%), which will build and operate Borssele III and IV wind farms. These wind farms are designed to have a total installed capacity of 731.5 MW, enough to power around 825,000 Dutch households. Half of the electricity generated from this wind farm will be marketed by Shell Energy Europe Limited to supply customers with renewable power.

In 2018, we made a move into US offshore wind, announcing two joint ventures to develop wind farms off New Jersey and Massachusetts, both 50% Shell-owned, which would have a total installed capacity of 4 gigawatts.

Investment start date

October 1, 2015

Investment end date

September 30, 2025

Investment area

Equipment

Technology area

Carbon capture and storage/utilisation

Investment maturity

Large scale commercial deployment

Investment figure

Low-carbon investment percentage

Please explain

NOTE: Regarding column investment end date, this may not be the final end date, but this reflects current contractual agreements – see also C-4.1a. 2018 Sustainability Report, p50/51

Shell invests in carbon capture and storage (CCS) projects, which use a combination of technologies to capture and store carbon dioxide (CO₂) deep underground. We also work with partners to find new ways of using CO₂ once it has been captured.

We believe CCS must play a significant role in the global climate response. CCS projects are happening around the world and the technology is proven but more projects need to be built.

We operate the Quest CCS project (Shell interest 10%) in Canada, which captures and stores CO₂ from the Scotford Upgrader.

(See also C4.1a, Abs1: As of May 23rd, 2019, in less than four years of operation, the Quest CCS facility has captured and safely stored about four

million tonnes of CO₂, ahead of schedule and at a lower cost than anticipated.)

We are working with our partners to develop new ways to capture CO₂ from exhaust gases from industrial facilities. In 2018, we helped launch a pilot project at a biomass power plant in Austria to separate CO₂ from flue gases in a lower-cost way. Once captured, the CO₂ can be used as, for example, a fertiliser in agriculture. We are working on the project with Wien Energie, the utility that operates the power plant; TU Wien, which developed and ran the pilot project; the University of Natural Resources and Life Sciences; and Bertsch, which built the project.

We are involved in the Gorgon CO₂ injection project (Shell interest 25%) in Australia, which is due to start up in 2019. It will be the world's largest CCS operation when completed. The project plans to separate and inject between 3.4 million and 4 million tonnes of reservoir CO₂ each year. Over the life of the project, it is expected that around 100 million tonnes of reservoir CO₂ will be captured and stored. During the pre-start up and commissioning checks of the injection project, some issues were identified that are being rectified before injection begins.

Investment start date

January 1, 2012

Investment end date

January 1, 2020

Investment area

Services

Technology area

Carbon capture and storage/utilisation

Investment maturity

Pilot demonstration

Investment figure

Low-carbon investment percentage

Please explain

2018 Sustainability Report, p50

At the Technology Centre Mongstad (TCM), Shell – together with the Norwegian government, Equinor and Total –is undertaking further research and development into CCS to help reduce the technology's costs. In 2017, we reaffirmed our involvement in continued testing at TCM until 2020. Shell and its TCM partners are also working on a full-scale project that includes the capture of CO2 from industrial facilities in Eastern Norway. The CO2 would then be transported by ship to an onshore receiving plant before being injected into an offshore saline aquifer.

Investment start date

January 1, 2018

Investment end date

December 31, 2018

Investment area

Products

Technology area

Infrastructure

Investment maturity

Large scale commercial deployment

Investment figure

Low-carbon investment percentage

Please explain

NOTE: Regarding column investment end date, this does not reflect a final end date but only activities in the 2018 Reporting year - see explanation below.

2018 Sustainability Report, p61

Hydrogen

In Germany, through our participation in the H2 Mobility Germany joint venture, we are working with the government to develop a national network of around 400 hydrogen-electric fuelling stations across the country by 2023 – with 54 currently open, 20 of which are located at Shell retail sites. We are working on this project with our joint-venture partners French gas supplier Air Liquide, German car manufacturer Daimler, Austrian oil and gas company OMV, German engineering firm Linde and French oil and gas company Total.

In 2018, we opened the first retail hydrogen fuelling station in Vancouver, Canada, and our third in California, USA. As part of a consortium led by the Port of Los Angeles to develop the first hydrogen refuelling network for trucks in California, we will also develop three new large capacity heavy-duty hydrogen truck refuelling stations. One of these will produce hydrogen from 100% renewable biogas. Together, they are being designed to support a fleet of 12 trucks each day.

We are also assessing the potential for similar projects in other parts of the USA as well as in Belgium, France, Luxembourg, the Netherlands, Switzerland, the UK and China.

Hydrogen also has many possible applications beyond the transport sector as a versatile and clean energy carrier. For example, it has a role to play in reducing emissions as a fuel for power plants and as a feedstock for industry, as well as to store energy for longer and at much greater scale than is currently possible with rechargeable batteries.

In 2018, Shell started building an electrolyser, the largest of its kind, to produce hydrogen from water for our Rhineland refinery in Germany. We are also working with our partners to build and operate the world's first liquid hydrogen ship, which will deliver hydrogen to international markets.

(C-OG9.7) Disclose the breakeven price (US\$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.

(C-OG9.8) Is your organization involved in the sequestration of CO2?

Yes

(C-OG9.8a) Provide, in metric tons CO2, gross masses of CO2 transferred in and out of the reporting organization (as defined by the consolidation basis).

	CO2 transferred – reporting year (metric tons CO2)
CO2 transferred in	0
CO2 transferred out	464,000

(C-OG9.8b) Provide gross masses of CO2 injected and stored for the purposes of CCS during the reporting year according to the injection and storage pathway.

Injection and storage pathway	Injected CO2 (metric tons CO2)	Percentage of injected CO2 intended for long-term (>100 year) storage	Year in which injection began	Cumulative CO2 injected and stored (metric tons CO2)
CO2 injected into a geological formation or saline formation for long-term storage	1,070,000	100	August 23, 2015	3,700,000

(C-OG9.8c) Provide clarification on any other relevant information pertaining to your activities related to transfer and sequestration of CO2.

Sustainability Report 2018, p50:

CARBON CAPTURE AND STORAGE

Shell invests in carbon capture and storage (CCS) projects, which use a combination of technologies to capture and store carbon dioxide (CO2) deep underground. We also work with partners to find new ways of using CO2 once it has been captured.

CCS IN CANADA

We operate the Quest CCS project (Shell interest 10%) in Canada, which captures and stores CO2 from the Scotford Upgrader. In its first four years of operations, Quest captured and safely stored about 4 million tonnes of CO2, and achieved this ahead of schedule.

Technology developed by Shell Cansolv is used to capture both sulphur dioxide and CO2 at SaskPower’s Boundary Dam power station in Saskatchewan, Canada. We continue to support SaskPower to improve the application of the technology.

DEVELOPING CCS

We are working with our partners to develop new ways to capture CO2 from exhaust gases from industrial facilities. In 2018, we helped launch a pilot project at a biomass power plant in Austria to separate CO2 from flue gases in a lower-cost way. Once captured, the CO2 can be used as, for example, a fertiliser in agriculture. We are working on the project with Wien Energie, the utility that operates the power plant; TU Wien, which developed and ran the pilot project; the University of Natural Resources and Life Sciences; and Bertsch, which built the project.

At the Technology Centre Mongstad (TCM), Shell – together with the Norwegian government, Equinor and Total –is undertaking further research and development into CCS to help reduce the technology's costs. In 2017, we reaffirmed our involvement in continued testing at TCM until 2020. Shell and its TCM partners are also working on a full-scale project that includes the capture of CO2 from industrial facilities in Eastern Norway. The CO2 would then be transported by ship to an onshore receiving plant before being injected into an offshore Saline aquifer.

In 2018, the Oil and Gas Climate Initiative Investment arm, Climate Investments, announced that it is entering into a strategic partnership with Shell and other oil and gas companies to analyse the potential development of the UK's first commercial full-chain carbon capture utilisation and storage (CCUS) project in Teesside. Climate Investments also invested in three innovative companies involved in CCUS, including Solidia Technologies, which has developed systems for producing lower-emissions cement and concrete cured with CO2 rather than water.

We also announced we will provide a monetary contribution to support the work of the International Energy Agency over the next three years to enable the agency to increase its focus on partnerships, and more specifically, work with its partner countries to identify how to accelerate CCUS deployment.

We are involved in the Gorgon CO2 injection project (not Shell operated, Shell interest 25%) in Australia, which is due to start up in 2019. It will be the world's largest CCS operation when completed. The project plans to separate and inject between 3.4 million and 4 million tonnes of reservoir CO2 each year. Over the life of the project, it is expected that around 100 million tonnes of reservoir CO2 will be captured and stored. During the pre-start up and commissioning checks of the injection project, some issues were identified that are being rectified before injection begins.

C10. Verification

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 LRQ4004543_Shell_Int_Group_14064_2018_Op_C_ASt_Feb19_Final V1-ASRauthorized.pdf

Page/ section reference

The attachment is a 2-page standalone assurance statement for GHG emissions. The tonnes assured match CC6.1 and cover 100% of the inventory. The assertion confirms that the verification covers direct (Scope 1) emissions for 2018. The section “LRQA’s approach” on page 1 references the standard and level of assurance. The opinion is on page 2.

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 LRQ4004543_Shell_Int_Group_14064_2018_Op_C_ASt_Feb19_Final V1-ASRauthorized.pdf

Page/ section reference

The attachment is a 2-page standalone assurance statement for GHG emissions. The tonnes assured match CC6.3 and cover 100% of the inventory. The assertion confirms that the verification covers energy indirect (Scope 2) emissions (location-based and market-based figures) for 2018. The section “LRQA’s approach” on page 1 references the standard and level of assurance. The opinion is on page 2.

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 LRQ4004543_Shell_Int_Group_14064_2018_Op_C_ASt_Feb19_Final V1-ASRauthorized.pdf

Page/ section reference

The attachment is a 2-page standalone assurance statement for GHG emissions. The tonnes assured match CC6.3 and cover 100% of the inventory. The assertion confirms that the verification covers energy indirect (Scope 2) emissions (location-based and market -based figures) for 2018. The section “LRQA’s approach” on page 1 references the standard and level of assurance. The opinion is on page 2.

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope

Scope 3 - all relevant categories

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Attach the statement

 LRQ4004543_Shell_Int_14064_2018_Sc 3_ASt_Feb19_FINAL V1-ASRauthorized.pdf

Page/section reference

The attachment is a 2-page standalone assurance statement for part of our scope 3 GHG emissions. The section “LRQA's approach” on page 1 references the level of assurance and the relevant standard.

Relevant standard

ISO14064-3

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

 LRQ4004543_Shell_Int_Group_14064_2018_Op_C_ASt_Feb19_Final V1-ASRauthorized.pdf

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C5. Emissions performance	Change in Scope 1 emissions against a base year (not target related)	ISO 14064-3	Our assurance statement also covers the base year.  1
C5. Emissions performance	Change in Scope 2 emissions against a base year (not target related)	ISO 14064-3	Our assurance statement also covers the base year.  1

C6. Emissions data	Change in Scope 3 emissions against a base year (not target related)	ISO 14064-3	Our scope 3 assurance statement also covers the base year.  ²
C4. Targets and performance	Other, please specify	<p>The Net Carbon Footprint (NCF) is determined by first estimating the emissions intensity for each of the energy product supply chains in Shell’s portfolio; this is done using established lifecycle analysis principles and includes both the emissions associated with the production and processing of energy products and the emissions associated with their use. The individual intensities are then aggregated into a single value, with the weighting for each product determined by its sales volume, emissions captured in sinks are deducted to give the final net value. Shell’s Net Carbon Footprint values for 2016, 2017 and 2018 are shown in the assurance statements below. We express our Net Carbon Footprint as the grams of CO2 equivalent per megajoule (gCO2e/MJ) produced for each unit of energy delivered to, and used by, a consumer.</p> <p>We undertake external verification of our Net Carbon Footprint values to a level of limited assurance at the Shell Group level.</p>	<p>Limited assurance of Shell’s 2018 Net Carbon Footprint.</p>  ³

 ¹LRQ4004543_Shell_Int_Group_14064_2018_Op_C_ASt_Feb19_Final V1-ASRauthorized.pdf

 ²LRQ4004543_Shell_Int_14064_2018_Sc 3_ASt_Feb19_FINAL V1-ASRauthorized.pdf

 ³Limited assurance of the 2018 Net Carbon Footprint.pdf

C11. Carbon pricing

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Alberta SGER

EU ETS

NOTE: These are only two of the regulations that impact our operations by way of example.

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

Alberta SGER

% of Scope 1 emissions covered by the ETS

8

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

6,091,650

Allowances purchased

121,659

Verified emissions in metric tons CO₂e

5,687,035

Details of ownership

Other, please specify: Facilities we operate

Comment

The above numbers reflect emissions and allowances under the new Alberta Carbon Competitiveness Incentive Regulation (CCIR). Allowances allocated = output-based allocations. Verified emissions = total regulated emissions. Allowances purchased numbers reflect the total amount of fund credits purchased.

EU ETS

% of Scope 1 emissions covered by the ETS

19

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

10,199,702

Allowances purchased

3,294,187

Verified emissions in metric tons CO₂e

13,493,889

Details of ownership

Other, please specify: Facilities we operate

Comment

The amount of allowances purchased was calculated as a difference between the allowances allocated and verified emissions.

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Dedicated Shell subsidiaries provide compliance balancing services to all Shell companies who have obligations under the above emissions trading systems. As an organisation that proactively supports emissions trading as a mechanism to deliver a price on CO₂ which allows installations to manage emission levels down in an economically efficient manner, we are supporting the development of emissions trading schemes through active participation, for example, in the Regional Greenhouse Gas Initiative (RGGI).

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

Other, please specify: Carbon Capture and Storage (CCS)

Project identification

The purpose of this offset project is to quantify emission reductions generated under the Alberta Offset System from Shell Canada Limited's (Shell) Quest CCS Project (Quest). The Quest CCS project captures approximately one third of greenhouse gas emissions at the Scotford Upgrader located at Scotford Complex, northeast of Edmonton, Alberta. The opportunity for generating carbon offsets with this project arises from the direct greenhouse gas emission reductions resulting from the geological sequestration of CO₂ in saline aquifers located approximately 2 km under the surface in the Basal Cambrian Sands Formation. This activity is considered a permanent sequestration of CO₂.

Verified to which standard

Other, please specify: Alberta Carbon Offset System Standards

Number of credits (metric tonnes CO₂e)

414,809

Number of credits (metric tonnes CO₂e): Risk adjusted volume

Credits cancelled

No

Purpose, e.g. compliance

Compliance

 Comment:

The amount of credits shown above reflects base credits generated between April 1, 2017 and September 30, 2017 (5th reporting period) plus additional credits serialized in 2019 from the 2nd reporting period

(C11.3) Does your organization use an internal price on carbon?

Yes

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Drive low-carbon investment
Stress test investments
Identify and seize low-carbon opportunities

GHG Scope

Scope 1, Scope 2

Application

Annual Report 2018, p73:

To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. Consistent with our desire to stay in step with society's progress toward the goals of the Paris Agreement, in 2018, we moved away from using a flat project screening value (PSV) of \$40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. Accordingly, we believe they more accurately reflect society's current implementation of the Paris Agreement rather than a flat \$40/tonne PSV.

Actual price(s) used (Currency /metric ton)

85

Variance of price(s) used

Annual Report 2018, p73:

Country and time varied, max 85 USD/tonne of GHG emissions by 2050.

These are the first NDCs to implement the Paris Agreement and they are scheduled to be revised at regular intervals. Therefore, as countries update their NDCs, we expect to update our estimates as well. The United Nations believes the current NDCs are consistent with limiting the average global temperature rise to around three degrees Celsius above pre-industrial levels. In coming decades, we expect countries to tighten these NDCs in order to

meet the goal of the Paris Agreement. Also, we apply additional sensitivity tests for our high-emitting projects by using long-term carbon cost estimates consistent with limiting the average global temperature rise to well below two degrees Celsius.

Type of internal carbon price

Other, please specify: Shadow price, country and time varied (Annual Report 2018, p73)

Impact & implication

Annual Report 2018 page 73:

Projects in the most GHG-exposed asset classes are benchmarked against GHG intensity targets that reflect standards sufficient to allow them to compete and prosper in a more GHG-constrained future.

These processes can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would make these investments commercially compelling. Our approach continues to evolve and become more sophisticated to reflect our increasing understanding of the shifting policy landscape and the differing pace of energy transitions underway in different regions.

Sustainability Report 2018, p47:

GHG and energy management plans must include the sources of GHG emissions, as well as a forecast of expected emissions at the site for at least 10 years.

Projects under development that are expected to have a material GHG footprint must meet carbon intensity performance standards or industry benchmarks.

C12. Engagement

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Compliance & onboarding

Details of engagement

Other, please specify: Contract Management Process

% of suppliers by number

100

% total procurement spent (direct and indirect)

100

% Scope 3 emissions as reported in C6.5

100

Rationale for the coverage of your engagement

Same performance and compliance expectations apply to all suppliers.

The Shell Supplier Principles are generally referenced in contracts and purchase orders for goods and services from Shell, hence the % of coverage provided above.

2018 Shell Sustainability Report, page 77:

Shell aims to work with contractors and suppliers that behave in an economically, environmentally and socially responsible manner.

Our approach to suppliers and contractors is clearly set out in our Shell General Business Principles and Shell Supplier Principles. These principles cover requirements such as business integrity, health and safety, and human rights. Working with suppliers and contractors in this way is central to maintaining a strong societal licence to operate.

In 2018, Shell spent \$42.7 billion on goods and services from around 32,000 suppliers globally.

Our suppliers and contractors are critical to our ability to run our business. They are involved in almost every step of our operations – and are often key to achieving successful outcomes and having a positive impact on the community.

Ensuring we have robust and healthy supply chains is essential to our financial strength and resilience. Our supply chains also represent important commercial and

employment opportunities for the countries and communities in which we operate. At the same time, suppliers and contractors have a key contribution to make to Shell's response to the energy transition. Their skills and innovation are part of what can make it possible for us to adapt for a lower-carbon future.

Impact of engagement, including measures of success

Performance of suppliers is measured at individual level within the asset that the contract supports. For example, our work on logistics that focuses on asset utilisation delivers fuel efficacy and concomitant emissions reductions. Data as requested by CDP are not globally aggregated on this topic because we do not find it meaningful, e.g., in context of differing local environments.

Through our Shell Supplier Principles we expect that: “Contractors and suppliers have a systematic approach to HSSE management, designed to ensure compliance with all applicable laws and regulations and to achieve continuous performance improvement.

Contractors and suppliers:

- are committed to protect the environment in compliance with all applicable environmental laws and regulations;
- use energy and natural resources efficiently;
- continually look for ways to minimise waste, emissions and discharge of their operations, products and services.”

Find more information on our webpage: <https://www.shell.com/businesscustomers/shell-forsuppliers.html>

Comment

Through our Shell Supplier Principles we expect that: “Contractors and suppliers have a systematic approach to HSSE management, designed to ensure compliance with all applicable laws and regulations and to achieve continuous performance improvement.

Contractors and suppliers:

- are committed to protect the environment in compliance with all applicable environmental laws and regulations;
- use energy and natural resources efficiently;
- continually look for ways to minimise waste, emissions and discharge of their operations, products and services.”

Find more information on our webpage: <https://www.shell.com/businesscustomers/shell-forsuppliers.html>

Type of engagement

Information collection (understanding supplier behaviour)

Details of engagement

Other, please specify: Data analysis

% of suppliers by number

1

% total procurement spent (direct and indirect)

20

% Scope 3 emissions as reported in C6.5

20

Rationale for the coverage of your engagement

In scope are suppliers that are in the purchase categories with the highest CO2 emissions as that is where we believe the greatest opportunity for impact lies.

We use CDP data to identify companies in our supply chain that report CO2 emissions.

Impact of engagement, including measures of success

We use CDP company data to identify companies in our supply chain that report CO2 emissions. We know that companies that already report to CDP are the first ones that will be able to track changes in their emissions. We actively engage directly with a number of selected suppliers. These engagements include discussions on pathways to measure and reduce supplier CO2 emissions.

Comment

These data are used to estimate the total CO2 in our supply chains for purchased goods and services and capital equipment.

Type of engagement

Engagement & incentivization (changing supplier behaviour)

Details of engagement

Other, please specify: Risks based contractor management

% of suppliers by number

1

% total procurement spent (direct and indirect)

20

% Scope 3 emissions as reported in C6.5

20

Rationale for the coverage of your engagement

In scope are suppliers that are in the purchase categories with the highest CO2 emissions as that is where we believe the greatest opportunity for impact lies.

We use CDP data to identify companies in our supply chain that report CO2 emissions.

Impact of engagement, including measures of success

Through our Shell Supplier Principles we expect that:

“Contractors and suppliers have a systematic approach to HSSE management, designed to ensure compliance with all applicable laws and regulations and to achieve continuous Performance improvement.

Contractors and suppliers:

- are committed to protect the environment in compliance with all applicable environmental laws and regulations;
- use energy and natural resources efficiently;
- continually look for ways to minimise waste, emissions and discharge of their operations, products and services.”

We actively engage directly with a number of selected suppliers. These engagements include discussions on pathways to measure and reduce supplier CO2 emissions.

Performance of suppliers is measured at individual against level within the asset that the contract support. Data as requested by CDP are not globally aggregated on this topic because we do not find it meaningful, e.g., in context of differing local environments.

Comment

Through our Shell Supplier Principles we expect that: “Contractors and suppliers have a systematic approach to HSSE management, designed to ensure compliance with all applicable laws and regulations and to achieve continuous performance improvement.

Contractors and suppliers:

- are committed to protect the environment in compliance with all applicable environmental laws and regulations;
- use energy and natural resources efficiently;

-continually look for ways to minimise waste, emissions and discharge of their operations, products and services.”

Find more information on our webpage: <https://www.shell.com/businesscustomers/shell-forsuppliers.html>

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Other, please specify: Offer carbon offsetting to business customers

Details of engagement

% of customers by number

% Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

Nature-based projects typically involve the protection or redevelopment of natural ecosystems such as forests and wetlands, allowing those ecosystems to capture and store more carbon on our behalf. These projects, which also support local communities and conserve biodiversity, generate carbon emission rights – each right representing one tonne of carbon dioxide not emitted – that then can be bought by energy consumers around the world.

We offer carbon offsetting to our business customers in some countries including Belgium, France, Germany, Luxembourg, the Netherlands and Hong Kong.

Nature will play an important role in the transition to a lower-carbon world. Using nature to capture carbon from the atmosphere is an immediate opportunity to help bridge the gap until other low-carbon solutions are deployed at scale, or to compensate for emissions which cannot be avoided. Nature-based solutions are expected to be one of Shell's tools to reduce the Net Carbon Footprint of our energy products by around half by the middle of the century.

See also Sustainability Report 2018, p51.

Impact of engagement, including measures of success

Most nature-based projects we work with are certified by the Verified Carbon Standard, currently the largest voluntary greenhouse gas certification programme, and the Climate, Community & Biodiversity Standard, which verifies that projects not only address climate change, but also support local communities and conserve biodiversity. One project we are involved with is the Cordillera Azul National Park project in Peru, which is supported and financed by the natural capital investment fund, the Althelia Climate Fund, and protects 1.5 million hectares of threatened forest.

Over the last decade, we have worked with The Nature Conservancy to find new ways to address global and local environmental challenges. This includes using the organisation's research on nature-based solutions to help us develop business strategies that reduce the Net Carbon Footprint of our products.

See also section C9.6.

Type of engagement

Other, please specify

Net Carbon Footprint ambition - inclusion of customer emissions in company emissions management ambition; please refer to C3.1c for the definition of Shell's NCF ambition.

Details of engagement

% of customers by number

% Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

Lower-carbon options will take time to spread across the planet. Products that can be quickly adopted in one country or region will take longer to take hold in others due to existing infrastructure, wealth and other factors.

This holds true even for rapidly growing innovations like electric cars.

For some uses like planes, ships and heavy trucks, the lower-carbon answers are especially challenging and so oil will still be needed for decades to come. But we want to bring down our Net Carbon Footprint, even as we continue to sell fuels for these uses.

To do this, we will find ways to help nature act as a sponge to soak up excess emissions. Planting forests is an example. We will also use technology, for example by capturing greenhouse gases and storing them underground.

Please find more Information on our Net Carbon Footprint Ambition, and how customer emissions are considered:

<https://www.shell.com/energy-and-innovation/the-energy-future/what-is-shells-net-carbon-footprint-ambition.html>

On 8 April 2019, Shell announced a programme to invest in natural ecosystems as part of its strategy to act on global climate change, including addressing carbon dioxide (CO₂) emissions GENERATED BY CUSTOMERS when using its products. Shell plans to invest \$300 million over the next three years.

This programme will contribute to Shell's three-year target, beginning in 2019, to reduce its Net Carbon Footprint by 2% – 3%.

“There is no single solution to tackling climate change. A transformation of the global energy system is needed, from electricity generation to industry and transport,” said Ben van Beurden, Chief Executive Officer of Royal Dutch Shell.

“Shell will play its part. Our focus on natural ecosystems is one step we are taking today to support the transition towards a low-carbon future. This comes in addition to our existing efforts, from reducing the carbon intensity of oil and gas operations to investments in renewable sources of energy.”

More information at: <https://www.shell.com/media/news-and-media-releases/2019/shell-invests-in-nature-to-tackle-co2-emissions.html>

Impact of engagement, including measures of success

For customers who drive internal combustion engine vehicles, Shell is making it simpler for them to reduce their carbon footprint through low-carbon biofuels and carbon neutral driving.

From 17 April 2019, customers at Shell service stations in the Netherlands will be able to drive carbon neutral through the use of nature-based carbon credits. This will be done at no extra cost for customers who choose Shell V-Power petrol or diesel, while those who fill up with regular Shell petrol or diesel can participate for an additional 1 cent a litre.

Shell will roll out similar choices to customers in other countries (e.g. UK later in 2019). This complements Shell's existing programme to help business customers avoid or reduce emissions, including supplying lower emission fuels and electric vehicle charging. Shell also offers businesses the opportunity to drive carbon neutral by compensating the CO₂ emitted from their fleet.

CO₂ emissions generated by participating motorists – as well as from the extraction, refining and distribution of the fuel – will be offset by carbon credits. As one of the most established traders of carbon credits in the world, Shell buys these credits from a global portfolio of nature-based projects, including Cordillera Azul National Park Project in Peru, Katingan Peatland Restoration and Conservation Project in Indonesia and GreenTrees Reforestation

Project in the USA. Each carbon credit is subject to a third-party verification process and represents the avoidance or removal of 1 tonne of CO₂.
Example from the Netherlands: Shell and Staatsbosbeheer (independent Dutch state forestry service) will plant more than 5 million trees over the next 12 years in NL.

NOTE: The terms “carbon neutral”, “carbon off-set” or “carbon off-set compensation” are applied in a non-technical way to indicate that Shell has engaged in a transaction to ensure that an amount of carbon dioxide equivalent to that associated with the production, delivery and usage of the fuel is removed from the atmosphere through a nature based process or emissions saved through avoided deforestation.

More examples about our investment in Spain, Australia and Malaysia:
www.shell.com/media/news-and-media-releases/2019/shell-invests-in-nature-to-tackle-co2-emissions.html

Type of engagement

Other, please specify: Offer energy efficient products to customers

Details of engagement

% of customers by number

100

% Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

Shell offers a range of products to customers to support energy efficiency and avoiding of emissions; therefore, the “% of customers by number” is assumed 100%.

NOTE: not all Shell products are available to Shell customers everywhere.

Sustainability Report 2018, p61:

Energy efficiency can deliver up to 35% of what is needed to keep global warming below two degrees Celsius by 2050, according to the International

Energy Agency.

We offer customers products that can help boost the efficiency of their engines by burning fuels more cleanly and reducing friction and wear. We also supply lower carbon fuels such as liquefied natural gas, compressed natural gas, liquefied petroleum gas and hydrogen, along with electric vehicle charging points.

Examples of Shell's products:

For heavy transport journeys, we helped pioneer a new vehicle to show how trucks can be more fuel efficient. We collaborated with AirFlow Truck Company to build and test a hyper-efficient concept truck. The Starship Initiative truck explores what is possible in truck design, fuel economy and CO2 reduction.

On completion of a trial drive in the USA from the east coast to the west coast, the truck recorded a 248% improvement in freight tonne efficiency compared to the average North American truck. If all 2 million trucks in the USA reached the overall fuel economy and freight tonne efficiency performance of the Starship Initiative, they would emit an estimated 229 million tonnes of CO2 less each year.

We are actively seeking to make road surfaces smarter and the products used in their construction, such as bitumen, more energy efficient and cleaner. Using our clear bitumen in a light coloured asphalt, for example, we can reduce the need for lighting in tunnels by up to 40% without affecting driver visibility.

We are also helping to ensure the efficiency of wind power through products and digital services so that its contribution to the energy mix can continue to grow.

Impact of engagement, including measures of success

Example of impact:

Sustainability Report 2018, p61:

Today (2019), we serve more than 30 million customers every day at 44,000 Shell-branded service stations and by 2025 we plan for 40 million customers daily at 55,000 stations.

A measure of success is if we meet our strategic ambitions with our business activities such as the above mentioned.

One of our strategic ambitions is to thrive in the energy transition by responding to society's desire for more and cleaner, convenient and competitive energy.

The execution of our strategy is founded on becoming a more customer-centric and simpler organisation, focused on growing returns and free cash flow.

By investing in competitive projects, driving down costs and selling noncore businesses, we are continuously reshaping our portfolio to become more resilient and focused.

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

Shell 2018 Sustainability Report extracts

p46, Section Net Carbon Footprint ambition

By 2050, our ambition is to align Shell's Net Carbon Footprint with the footprint of the energy mix in the global energy system. We aim to reduce the Net Carbon Footprint of the energy products we sell – expressed in grams of CO₂ equivalent per megajoule consumed - by around 50% by 2050. As an interim step, by 2035, and predicated on societal progress, we aim for a reduction of around 20% compared with our 2016 level.

Our approach to calculating the Net Carbon Footprint covers:

- emissions directly from Shell operations (including from the extraction, transportation and processing of raw materials, and transportation of products);
- emissions generated by third parties who supply energy to us for production; and
- our customers' emissions from their use of our energy products.

Also included are emissions from elements of this life cycle not owned by Shell, such as oil and gas processed by Shell but not produced by Shell, or from oil products and electricity marketed by Shell that have not been processed or generated at a Shell facility. The calculation also includes biofuels, as well as emissions that we offset by using carbon capture and storage or natural carbon sinks, such as forests and wetlands.

Chemicals and lubricants products, which are not used to produce energy, are excluded from the scope of this ambition.

Shell has a Non-Disclosure Agreement in place with the World Resources Institute (WRI) who have undertaken assessments of Shell's Net Carbon Footprint ambition. We are also looking to undertake other pieces of work with WRI.

p48/49, Section Methane emissions

Shell has formed an industry coalition, supported by organisations like the Environmental Defense Fund, UN Environment, leading universities and the World Bank, to develop a set of methane guiding principles. In November 2017, eight companies, including Shell, signed up to these principles. In 2018, we succeeded in encouraging a further 10 companies to sign up. The principles focus on ways to reduce emissions throughout the gas industry – from production to the final consumer.

Shell is one of 13 members of the Oil and Gas Climate Initiative (OGCI), a CEO-led initiative to lead the industry's response to climate change. One of OGCI's focus areas is methane management. In September 2018, OGCI announced a target to reduce the collective average methane intensity of its members' aggregated upstream gas and oil operations by one fifth to below 0.25% by 2025, with an ambition to achieve 0.20%, corresponding to a reduction of one-third.

p78, Section Non-operated ventures

Shell often works in joint ventures with national and other international energy companies. These organisations bring important skills and experience to a Joint venture.

In 2018, we continued to work with our partners on adoption of our greenhouse gas and energy management processes. For example, we supported Badr Petroleum Company in Egypt (Bapetco, Shell interest 50%) to assess its greenhouse gas emissions to a reasonable level of assurance as well as to identify several solar and gas-saving opportunities.

Petroleum Development Oman (PDO, Shell interest 34%) has just awarded a contract to build a 100-megawatt solar photovoltaic independent power producer project. The plant will provide power for PDO's own operations and be the first of its kind in Oman.

We also helped build capability within PDO to conduct carbon and energy benchmarking of their assets and collaborated on the implementation of the energy efficiency surveillance software, resulting in annual energy and cost savings to their processes. A deployment of the software has also recently been initiated in Karachaganak Petroleum Operating B.V. (KPO, Shell interest 29.25%).

p75, Section Social partners

Improving living standards: Our work with Pact in Myanmar aims to increase access to cleaner and reliable energy, establish local governance systems and implement savings and livelihood programmes. These efforts have helped to improve the living standards of around 35,000 people in the central dry zone and Thanintharyi region. By September 2018, more than 8,000 households had purchased solar systems for their homes and community areas, giving around 20,000 people access to renewable energy.

p76, Section Environmental partners

Nature-based Solutions: we work with The Nature Conservancy to better understand how investing in natural climate solutions can help address the global climate challenge. This includes exploring how nature-based projects, such as large-scale reforestation, can reduce CO2 levels in the atmosphere while improving the livelihoods of local communities and preserving biodiversity and wildlife.

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Funding research organizations
- Other

(C12.3a) On what issues have you been engaging directly with policy makers?

Note: the topics listed below are not exhaustive but a selection.

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support	<p>Actively engaged in revision of the EU-ETS. Shell position is to strengthen the ETS through stronger carbon price mechanisms together with 100% carbon leakage protection at benchmark for industry.</p> <p>In support of the carbon price from the EU ETS, we actively engaged to support a carbon criterion for capacity remuneration mechanisms under the Electricity Market Reform.</p> <p>Actively engaged in the Innovation Fund under the EU ETS to support emerging low carbon technologies.</p> <p>We have participated in a number of business to business missions with IETA’s Business Partnership for Market Readiness (BPMR) supporting the World Bank’s PMR.</p> <p>Shell is active in both compliance and voluntary markets globally through our four regional desks in London, San Diego, Singapore and Shanghai.</p> <p>We manage the global CO2 Compliance obligations for all the assets owned by the Royal Dutch Shell Group, which covers over 50 installations worldwide and provides us with an understanding of the challenges faced by our customers and the opportunities that the markets afford them.</p> <p>Shell completed the first trade on the European Union Emissions Trading Scheme (EU ETS) in 2003 and has been an active participant in the European CO2 market for the past 16 years.</p> <p>With a focus on supporting the development of emerging markets, Shell Energy (China) Limited was one of the first foreign companies to</p>	<p>- Introduction of a carbon criterion of 550g/kWh for capacity remuneration mechanisms under the Electricity Regulation.</p> <p>- Support a design of the Innovation Fund under the EU ETS to enable large-scale demonstration of emerging energy technologies in Europe.</p>

		<p>trade allowances in the Chinese pilots. In 2017, Shell Energy (China) Ltd were nominated for the “Most Innovative Product” award by the Shanghai Environmental and Energy Exchange and was also awarded the “Most Contribution” award by the Guangdong Environment Exchange.</p> <p>Shell is active in the EU ETS, Western Climate Initiative (WCI), Regional Greenhouse Gas Initiative (RGGI), the Chinese pilot markets in Shanghai, Beijing & Guangdong, South Korean ETS, New Zealand ETS and the Australian Safeguard Mechanism.</p>	
Other, please specify Global Carbon Market	Support	<p>Shell provided detailed input to IETA’s proposals for developing the rules and procedures for implementation of Article 6 of the Paris Agreement.</p> <p>Shell supported and provided expert input over several years based on our experience in other jurisdictions into the South African Government’s considerations around the introduction of a carbon tax which came into force in June 2019.</p> <p>Shell has actively supported and provided input into the range of Government led carbon pricing mechanisms in Canada at provincial and national level.</p> <p>We have also supported efforts for the development of a carbon pricing mechanism at US federal and in several states.</p>	<p>Development of government led carbon pricing frameworks in key markets to provide incentives for emission reduction activities (COP21 Decision paragraph 137).</p> <p>Linked carbon markets through development of internationally traded mitigation outcomes (ITMOs) and emissions mitigation mechanisms (EMM) (Paris Agreement; Article 6).</p> <p>In South Africa, Shell supported a tax with a credit based system that would allow for future expansion into a cap and trade type system and linkages with other regional carbon pricing mechanisms.</p>
Other, please specify Carbon Capture, Utilisation & Storage	Support	<p>Through the Oil and Gas Climate Initiative (OGCI) country-based teams are leading engagement with governments, industries and other stakeholders on how to catalyse CCUS deployment and help to create clean-industry clusters. The teams have worked with the governments of the UK and Netherlands and are expanding to additional regions including the Arabian Gulf and China.</p> <p>(https://oilandgasclimateinitiative.com/wp-content/uploads/2018/09/OGCI_Report_2018.pdf, p23)</p>	<p>Enabling the construction of a series of demonstration projects globally with the objective of having CCUS commercially viable in the 2030s.</p>

		<p>Working through various associations including Zero Emissions Platform, Carbon Capture & Storage Association, the WBCSD and Global Carbon Capture & Storage Institute to see CCUS deployed more widely and recognised in country's Nationally Determined Contributions.</p> <p>Shell Canada has engaged with federal and provincial governments on the status and lessons learned from the Quest CCS Project.</p>	
<p>Other, please specify EU Climate Policy</p>	<p>Support</p>	<p>Engaging through the Commission's outreach process on the "Clean Planet for All".</p> <p>Revision of Renewable Energy Directive (RED II): Details of engagement: Actively engaged on revision of Renewable Energy Directive (RED II) as Shell and via various trade associations and informal coalitions.</p> <p>Proposed legislative solution:</p> <ul style="list-style-type: none"> • Deliver investment certainty for advanced biofuels via a dedicated sub target and a fixed feedstock list. • Create opportunities for renewable gas/biomethane via suitable feedstock lists and cross border trading of transport certificates. • Ensure hydrogen is put on equal footing with electricity used in road transport (BEVs) and the use of green hydrogen in refineries to be used for compliance under RED II is incentivized. • Continuation of support schemes for renewable power in form of market based tenders. • Ensure a European market for Guarantees of Origin (GoOs) for both renewable electricity and renewable gas, including cross border transfers. GoOs should be directly allocated to producers. 	<p>EU Commission vision for a climate neutral Europe.</p>

<p>Other, please specify USA: Renewable Fuel Standard-Methane Regulation</p>	<p>Support</p>	<p>Shell continues to take advantage of multiple avenues to talk with policymakers and stakeholders on limitations of the RFS in its current form and the need to protect consumers and maintain the framework of the RFS. The RFS has been in place for over 10 years and the US energy mix has changed in that time period.</p> <p>Regarding methane, Shell has been an industry leader in engaging with EPA to inform a fit for purpose rule for new/modified onshore sources. We have also been influential in modifying API's position and encouraging the trade association to work productively with EPA. And we took a lead role in promoting fit-for-purpose rules with industry. We have met repeatedly with EPA and the White House over the past few years as Shell only, with industry cohorts and with API. Shell has worked with API and others to propose improvements to the regulation, such as accelerating the use of new technologies to detect methane emissions.</p> <p>In March 2019, Shell urged the EPA to continue to directly regulate methane from new and modified onshore oil and gas sources and, time permitting, to propose a rule for existing sources. We continue to work with API and other members to contribute to the development of API's positions.</p> <p>In addition to EPA, we also collaborate across geographic regions including state environmental agencies on emission reduction rules as well as voluntary initiatives which may evolve into regulatory requirements.</p>	<p>EPA continues to improve technical elements of the new/modified source rule with prescriptive requirements and providing on ramps for new emerging technologies. EPA is also considering regulating only VOCs and removing methane as the regulated pollutant. Shell is opposed to the removal of methane and supportive of extending regulated sources beyond new/modified to include existing sources as well. EPA continues to make administrative adjustments to the mandated levels to maintain program feasibility. EPA is beginning to work on resetting the mandated levels longer term.</p>
<p>Other, please specify CAN: Output Based Performance Standards (OBPS)</p>	<p>Support</p>	<p>Shell engages directly with government through the Canadian Association of Petroleum Producers and the Canadian Fuels Association.</p>	<p>Under the Greenhouse Gas Pollution Pricing Act (GGPPA), the federal carbon pollution pricing system has two parts:</p> <ul style="list-style-type: none"> • a regulatory charge on fuel (federal fuel charge), and

			<ul style="list-style-type: none"> • a regulatory trading system for large industry – the federal Output-Based Pricing System (OBPS). The Canadian Federal Government OBPS is a backstop policy designed to ensure there is a price incentive for large industrial emitters to reduce their greenhouse gas (GHG) emissions and spur innovation while maintaining competitiveness and protecting against carbon leakage. The federal OBPS came into effect on 1 January 2019 in provinces where the federal OBPS applies and 1 July 2019 in Nunavut and Yukon. The federal OBPS regulation has not yet been finalized, despite being effective January 2019. <p>On the fuel charge, starting in April 2019, the fuel charge component of the federal carbon pollution pricing system came into effect in Ontario, New Brunswick, Saskatchewan, and Manitoba; and in July 2019, in Nunavut and Yukon and will generally apply to fuel producers and distributors.</p>
<p>Regulation of methane emissions Canada</p>	<p>Support with minor exceptions</p>	<p>Shell engages directly with government and through the Canadian Association of Petroleum Producers. In 2018, Shell actively supported CAPP's development of their "Upstream Methane Management Principles". https://www.capp.ca/responsible-development/air-and-climate/methane-emissions</p>	<p>In April 2018, the Government of Canada published federal methane regulations to reduce methane emissions from the oil and gas sector by 40 to 45 percent from 2012 levels by 2025. The first federal requirements come into force in 2020, with the rest of the requirements coming into force in 2023. Provinces and territories can put in place methane regulations that make sense for their circumstances, provided they can clearly demonstrate emission reductions equivalent to the federal measures.</p>

<p>Regulation of methane emissions Alberta Province, Canada</p>	<p>Support</p>	<p>Alberta provincial methane regulations: Shell engages directly with the Alberta government and through the Canadian Association of Petroleum Producers. In 2018, Shell actively supported CAPP’s development of their “Upstream Methane Management Principles”. https://www.capp.ca/responsible-development/air-and-climate/methane-emissions</p>	<p>In 2018, the Alberta government finalized methane regulations which require a 45% reduction in methane emissions from oil and gas operations by 2025. Two regulatory requirements were developed, one coming into effect Dec 2018 and the other to come into effect Jan 2020. The requirements address the primary sources of methane emissions from Alberta’s upstream oil and gas industry: fugitive emissions and venting, which includes emissions from compressors, pneumatic devices, and glycol dehydrators. The requirements also focus on improved measurement, monitoring, and reporting of methane emissions. Equivalency with the Federal Regulation has not yet been determined.</p>
<p>Other, please specify Canada: Clean Fuel Standard</p>	<p>Support</p>	<p>Shell engages directly with government and through the Canadian Fuels Association.</p>	<p>The Canadian government is developing a policy to deliver a 30MT reduction in GHG emissions by 2030. The CFS framework considers GHG emission reductions from liquid, gaseous and solid fossil fuels used in buildings, industrial and transport sectors. Draft regulations for the Liquid stream are expected before the end of 2019 with final regulation in 2020, coming into force in 2022. The gaseous and solid fuel stream draft regulation is expected in 2020, final in 2021 and into force in 2023.</p>
<p>Other, please specify Canada: Alberta Province Carbon Competitiveness Incentive</p>	<p>Support</p>	<p>Shell engages directly with government and through the Canadian Association of Petroleum Producers & Canadian Fuels Association.</p>	<p>The Alberta government finalized its CCIR regulations in 2018 which set a performance standard for industrial facilities. This regulation applies to facilities that emit 100,000 tonnes GHG or more per year. CCIR determines the volume of CO2 which will be subject to</p>

Regulation (CCIR) / TIER Program			<p>a carbon price mechanism.</p> <p>With the election of a new Alberta Government in 2019, a new Technology Innovation and Emissions Reductions (TIER) regime for large industrial emitters in Alberta will come into effect 1 January 2020. Under this new system, facilities with emissions above 100,000 tonnes of carbon dioxide (or equivalent), other than electricity generators, will have to meet an emissions performance target of reducing their emissions intensity by 10% (increasing by 1% per year). Full details are still being developed.</p>
Other, please specify Carbon pricing	Support	<p>Broad engagement through many channels including speeches, workshops, Shell Scenario presentations, World Bank initiatives, local advocacy groups, civil society groups, social media (blogs, Twitter etc.). In 2015 we became members of the World Bank Carbon Pricing Leadership Coalition (CPLC). In mid-2015, our CEO joined with other oil and gas industry CEOs to call for increased use of carbon pricing mechanisms/frameworks. The call has resulted in an initiative for the industry to work closely with CPLC (amongst others), whom we are a board member of, to progress adoption of government led carbon pricing mechanisms.</p>	<p>Government led carbon pricing mechanisms are an essential policy tool to drive system-wide efficiencies and incentivise the extension of low carbon electrification and other low carbon technological development.</p>
Carbon tax	Support with minor exceptions	<p>Shell's preference remains for emissions trading schemes (ETS) including cap and trade. Shell supports government led carbon pricing instruments such as a carbon tax where an ETS is not favoured by the government. This includes South Africa and Singapore.</p>	<p>Continue support and advocacy of implementation of a carbon tax.</p>
Regulation of methane emissions	Support	<p>Shell engages directly with government and through the Canadian Association of Petroleum Producers.</p>	<p>In Jan 2019, new regulations to reduce methane emissions from upstream oil and gas operations to</p>

British Columbia Province, Canada		In 2018, Shell actively supported CAPP's development of their "Upstream Methane Management Principles". https://www.capp.ca/responsible-development/air-and-climate/methane-emissions	meet or exceed federal and provincial methane emission reduction targets were announced and will come into effect in Jan 2020. An Agreement on the Equivalency of Federal and British Columbia Regulations was published for comment March 2019.
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(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Note: the topics listed below are not exhaustive but a selection.

Trade association

IETA

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Using market based instruments such as cap-and-trade to effectively drive the mitigation of GHG emissions.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Active participation in working groups. A Shell representative is currently a Board Member. Shell has supported IETA's events at COP24 and throughout 2018 as implementation of the Paris Agreement was discussed. We strongly supported the IETA's view that carbon market architecture should result from implementation of Article 6 of the Paris Agreement and continue to do so as this aspect of the Paris 'rule-book' is negotiated in 2019.

Trade association

WBCSD

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Paris Agreement: WBCSD, like Shell, supports the goal of the Paris Agreement and is actively involved in lobbying activities on international climate issues. It is also active at conferences of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC).

Government-led carbon pricing: Shell and WBCSD are aligned in our views on the importance of carbon pricing.

Policy frameworks for low-carbon technologies: WBCSD endorses subsidies for low-carbon technologies and recognises they should not undermine carbon pricing, views that Shell shares.

the role of natural gas: Shell's and WBCSD's views on the role of gas in the energy system are aligned. WBCSD has no detailed policy position on methane emissions. Shell supports government regulations to address methane emissions.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell derives benefit from our membership of WBCSD. It is an important platform for Shell to exchange information and views with businesses around the world on issues relating to sustainability. Shell also recognises the importance of WBCSD's observer status with the UNFCCC. Shell is aligned with Shell derives benefit from our membership of WBCSD. It is an important platform for Shell to exchange information and views with businesses around the world

on issues relating to sustainability. Shell also recognises the importance of WBCSD's observer status with the UNFCCC. Shell is aligned with WBCSD on climate-related policy positions and we will continue to engage with the association on climate-related topics. on climate-related policy positions and we will continue to engage with the association on climate-related topics.

Shell is a member of the WBCSD executive committee.

Trade association

European Round Table of Industrialists

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

ERT pledges to collaborate with policymakers to ensure Europe sets the right policies to encourage low carbon investments at the scale required to enable an energy transition aligned with the goals of the Paris Agreement.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Active participation to ensure ERT develops clear policy recommendations to enable a role for industry consistent with the objectives of the Paris Agreement.

Shell contributed to ERT's statement ahead of COP 24 in support of international cooperation to deliver net zero greenhouse gas emissions to meet the goals of the Paris Agreement.

Trade association

European Petroleum Refiners Association (FuelsEurope/Concawe)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

FuelsEurope recognises that climate change is real and warrants action. FuelsEurope supports the efforts of the international community to address the risks of climate change and believes that effective measures must be undertaken by all significant world economies under an effective and clear international agreement.

At the same time, the growing global demand of secure, reliable and affordable energy must be addressed in order to fight poverty in several regions of the world and to allow access to higher living standards to a rising middle class in many developing countries.

FuelsEurope supports the EU ETS as the EU's 'flagship instrument' within its energy and climate policy framework, as a cost-effective market mechanism for emissions reduction in the power and industry sector.

Within the ETS FuelsEurope main advocacy is to ensure 100% carbon leakage protection at benchmark for industry at risk of carbon leakage. It does not support policy interference to raise the cost of carbon in ETS.

In 2018, FuelsEurope produced its Vision 2050 document that shows the EU refining industry is committed to contribute to the EU's decarbonisation agenda by continuing to reduce its CO2 emissions and providing the economy and citizens with low-carbon fuels and other products that society needs.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Active participation in FuelsEurope Information Groups and Scientific Committee and Issues Management Committee to ensure the Association positions are aligned with the Shell approach on climate change or are not opposed to it.

Shell is a member of the EPRA board of directors.

Trade association

IOGP

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

IOGP welcomes the Paris Agreement as an important global step in addressing climate change and its challenges.

IOGP supports economy-wide policies which will incentivize the most cost-efficient solutions to reduce GHG emissions, including carbon pricing mechanisms.

IOGP members have some divergence on how to reduce GHG emissions in a way to favour gas power generation: through EPS, Carbon tax or a meaningful cost of carbon through ETS.

IOGP's position heading into the ETS reform a few years ago was that "the ETS is the principal delivery mechanism of the EU28 climate and energy policy, and will deliver, from the traded sectors, a reduction of 43% in 2030 (vs 2005) corresponding to a reduction of ~85% in 2050 with no further change in the LRF of -2.2% and with no need for any further market interventions or distortions however well-meaning".

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell has influenced IOGP to focus on advocacy to keep oil and gas upstream installations (gas processing and offshore platforms) on carbon leakage list. We had a successful outcome for the oil installations.

Shell has strong influence within IOGP:

- Shell is a member of the board of directors;
- Shell has two representatives on the EU Committee board;
- Shell chairs the EU Upstream sub-committee;
- Shell chairs the EU Energy Market sub-committee;
- Shell has representatives in all other EU sub-committees/workgroups including Gas Advocacy and Air Quality;
- Deputy Director of IOGP office in Brussels is a Shell secondee.

Trade association

API

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

API considers climate change an important issue, but expressed concerns regarding the U.S. approach to the Paris Climate Negotiations. API advocated for an approach that reduced emissions while protecting economic growth. API advocates the advancement of technologies to reduce emissions. API notes the role of natural gas in reducing GHG emissions in the U.S. power sector. API opposed the Clean Power Plan, which the Obama Administration said would reduce CO2 emission from the stationary power sector 32 percent by 2030 relative to 2005 levels. API supported the Affordable Clean Energy rule, which has a narrower scope and more modest environmental ambitions. For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell has and will continue to join like-minded companies in encouraging the association to lean forward on climate policy.

In 2016, API opposed the need for new regulation when the Environmental Protection Agency announced regulation to reduce methane emissions. Shell supported the regulation.

In 2017, when a new EPA considered repealing the 2017 rule, API and Shell shared the view that EPA should reform and not repeal the 2016 standards. Shell recognizes API's leading role in creating the Environmental Partnership, which aims to reduce the industry's methane emissions.

Trade association

Canadian Association of Petroleum Producers (CAPP)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

CAPP states that climate change is an important global issue requiring action across industries and around the globe. Shell and CAPP are aligned in support of Canada's climate targets. CAPP focuses on policies that are collaborative, efficient and predictable, that encourage technology and innovation, and that are globally competitive.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell has found some differences in climate-related policy positions with CAPP, such as our public support for carbon pricing, and instances where our positions have diverged on specific climate policies. Taking into account the broader value of our membership, we remain a committed member of CAPP. We will continue to engage with the association and closely monitor our alignment on climate-related topics.

Trade association

Canadian Fuels Association (CFA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Canadian Fuels Association and its members support policy approaches that minimize the overall cost to society of reducing climate risks. Broad-based carbon pricing mechanisms that are transparent, uniform and predictable are useful tools to send clear price signals across the economy that can effectively and efficiently reduce Canada's carbon footprint.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Active participation in leadership forums and working groups.

Trade association

USA: C2ES

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Provide pragmatic solutions and realistic energy pathways forward to lower emissions.

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

As a strategic partner we have influence over the work programme, but not over the findings and resultant policy positions.
A Shell representative is a C2ES Board Member.

Trade association

Australian Industry Greenhouse Network (AIGN)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

AIGN supports the Paris Agreement. AIGN advocates for a national, economy wide emission reduction policy rather than sector-specific or state targets.

AIGN's climate change policy principles include that Australia should develop a strategic national approach to responding to climate change which:

- is consistent with the principles of sustainable development ;
- is consistent with other national policies including on economic growth, population growth, international trade, energy supply and demand and environmental and social responsibility; and
- takes a long-term perspective;
- maintains the competitiveness of Australian export and import competing industries;
- distributes the cost burden equitably across the community;
- adopts a consultative approach to the development of new politics;
- is consistent and effectively coordinated across all jurisdictions throughout Australia.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

We influence through attendance and engagement in meetings, input into submission processes and one-on-one advocacy.

Trade association

Business Council of Australia (BCA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The BCA supports the goals of the Paris Agreement.

The BCA supports the development of an integrated, national and bipartisan energy and climate change policy framework that can deliver the following four key goals:

- secure and reliable energy supply;
- affordable energy supply;
- strong, internationally competitive economy; and
- meet current and future absolute emission reduction targets.

The BCA advocates for economy-wide lowest cost sources of abatement, building on the existing regulatory frameworks while developing specific policies in key sectors. It believes in order to reach emission reduction goals, Australia will need a suite of durable climate change policies that are integrated with broader energy policy and are capable of delivering Australia's emissions reduction targets, at lowest possible cost, while maintaining competitiveness and growing Australia's future economy

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

We influence through attendance and engagement in meetings, input into submission processes and one-on-one advocacy.

Trade association

Australian Petroleum Production and Exploration Association (APPEA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

APPEA supports the goal of the Paris Agreement. APPEA's Climate Change Policy Principles set out the association's views on what must underpin Australia's emissions reduction efforts. APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions, in line with our Paris Agreement targets, at least cost and which facilitates long-term, broad-based investment decisions consistent with an international price on carbon.

APPEA advocates for an appropriately designed mechanism that provides an economy-wide transparent price signal on carbon to shape business and consumer plans and investments.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

We influence through attendance and engagement at meetings, input into submission process and active participation in working groups. Shell Australia's Country Chair is the Chair of the APPEA Board. Public speeches – for example, at the annual APPEA Conference – provide opportunities to highlight the importance of the Energy Transition.

Shell is chair of the Board.

Trade association

USA: Western States Petroleum Association (WSPA)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

WSPA does not have a position on, and does not lobby for, achieving the goals of the Paris Agreement. WSPA supports a workable carbon price and successfully contributed to the implementation of a comprehensive cap-and-trade programme in California. WSPA supports market-based policies and carbon capture and storage (CCS) as a low-carbon technology. WSPA does not actively advocate natural gas and has not taken a public position on the reduction of methane emissions.

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

WSPA advocates on behalf of Shell and other member companies on issues such as:

hydro fracking, fuel specifications, refinery safety, tax issues, pipeline safety, air quality, environmental remediation, water, lubricants, crude by rail, oil spill response and climate change (specifically in California: AB 32 and Low Carbon Fuel Standard).

WSPA supports market based policies to deal with carbon.

WSPA developed and adopted a carbon tax policy that is aligned with Shell's position.

Trade association

European Chemical Industry Council (CEFIC)

Is your position on climate change consistent with theirs?

Mixed

Please explain the trade association's position

CEFIC, like Shell, supports the goal of the Paris Agreement.

As to Government-led carbon pricing, CEFIC supports carbon pricing mechanisms to achieve cost-effective reductions in emissions. CEFIC's position on the EU Emissions Trading System (ETS) has evolved towards greater support for reform, having previously opposed short-term reforms of the ETS because of concerns about regulatory risk and higher energy costs for European companies.

In 2017, CEFIC welcomed the reform of the EU ETS to reach the agreed emission reductions at the lowest cost, to stimulate innovation and to protect industrial competitiveness. CEFIC also stated concerns and made proposals to address the impact of additional carbon costs on industries.

From 2011 to 2017, Shell supported reforms of the EU ETS that were intended to rebalance the market and deliver a meaningful carbon price signal, such as the introduction and strengthening of the market Stability Reserve.

Shell considered the EU ETS reforms that were adopted to be a fair balance between measures aimed at a recovery of the carbon price and safeguards to protect industries exposed to international competition.

As to policy frameworks for low-carbon technologies, CEFIC and Shell have aligned policy positions. CEFIC supports the principles of fair competition and technology neutrality as set out in its position paper on the EU's clean energy Package of May 2017.

The role of natural gas: CEFIC highlights the importance of access to affordable natural gas for the chemical industry and notes that affordable natural gas could contribute to the chemical industry's greenhouse gas emission reductions. CEFIC focuses on the chemical sector and has not taken a position on the reduction of upstream methane emissions. Shell supports the use of natural gas in helping society transition to low-carbon energy as well as government regulations to address methane emissions.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell derives benefit from our membership of CEFIC, in particular through CEFIC's advocacy on issues that impact the chemical sector such as emissions (air, water and waste) and regulations related to chemical health and safety, energy and climate. Shell has found some past differences in climate-related policy positions with CEFIC on the approach to EU ETS reform. We recognise a convergence in positions in recent years. Taking into account the broader value of our membership, we remain a committed member of CEFIC. We will continue to engage with the association and closely monitor our alignment on climate-related topics.

Shell is a member of the CEFIC board of directors and the executive committee.

Trade association

IPIECA

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

IPIECA, like Shell, supports the goal of the Paris agreement.

IPIECA has not taken strong public positions in support of carbon pricing but recognises its importance. IPIECA and Shell are aligned on key elements of policy design.

With regards to policy frameworks for low-carbon technologies IPIECA supports market-based regulatory approaches.

The role of natural gas: Shell and IPIECA have aligned positions on the role of natural gas in the energy system and the management of methane emissions. IPIECA is an associate signatory of the methane Guiding Principles, which Shell helped to launch.

Please refer also to our Industry Association Climate Report: https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

For detailed and comprehensive information please refer to the organisation's own disclosures such as their website.

How have you influenced, or are you attempting to influence their position?

Shell derives benefit from our membership of IPIECA, an effective platform to exchange experiences and good practices across a wide range of themes.

Shell is aligned with IPIECA on climate-related policy positions and we will continue to engage with the association on climate-related topics.

Shell chairs the board of directors.

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

(C12.3e) Provide details of the other engagement activities that you undertake.

Shell's work with organisations around the world helps us learn from others and share our knowledge and experience.

The challenge of tackling climate change can only be met through unprecedented collaboration. Shell is working in close partnership with governments, other companies, our customers and wider society. We aim to learn from others and help inform and accelerate the policy, technology and societal changes that will be necessary to achieve a successful transition.

TCFD

The publication of this report follows our discussions with the Task Force on Climate-related Financial Disclosures (TCFD) about increasing transparency to help investors understand climate-related risks and opportunities.

We continue to work with the TCFD to help develop best practices for reporting linked to climate change. To that end, we have joined the Oil and Gas Preparer Forum, initiated by the TCFD and convened by the World Business Council for Sustainable Development, an advocacy association. The forum's objectives include encouraging companies to consider the use of scenarios in an uncertain world, and to recognise a range of possible outcomes and trajectories.

Collaborating with countries

We work with some governments to explore pathways that can help them move towards a prosperous, low-carbon future.

In the Netherlands, for example, we are working with policymakers and industry representatives to help the government meet its target of reducing GHG emissions by 80-95% by 2050. This will require significant shifts in the way energy is produced and consumed across the economy.

In 2016, Dutch energy company Eneco, the Port of Rotterdam, German engineering group Siemens, Dutch contracting company Van Oord and Shell initiated a coalition to accelerate the energy transition in the Netherlands.

Together, we called on the Dutch government to prioritise the international climate goals set during the climate summit in Paris in 2015 and decide on a long-term policy framework to support them. Today, this coalition has more than 50 member companies. Together with China's Development Research Centre of the State Council, Shell has also been looking at how natural gas could boost economic development, improve air quality and help China's progress towards the commitments it made in Paris.

World Resource Institute

We are working with the World Resources Institute (WRI), a global research organisation, to review and further develop our GHG aspirations. We have also recently joined the WRI's Corporate Consultative Group to learn from and share best sustainability practices with other members.

European power

In 2017, Shell joined a coalition of renewables, natural gas and technology organisations calling for the introduction of an emission performance standard (EPS) linked to capacity remuneration mechanisms in the European Commission's Clean Energy for All Europeans package. This EPS would exclude coal from capacity payments across the European Union and send a signal to investors to switch from coal to gas and renewables.

Carbon pricing

Shell has long recognised the importance of government-led carbon pricing systems as an essential tool for reducing emissions.

We are supporting the World Bank's Carbon Pricing Leadership Coalition that is made up of governments, businesses and organisations with the long-term objective of achieving a government-led carbon price throughout the global economy. We also participate in the International Emissions Trading Association (IETA), a non-profit business organisation created in June 1999 to establish an international framework for trading in GHG emission reduction credits.

We have long supported the European Union's Emissions Trading Scheme and have worked with policymakers, industry groups and non-governmental organisations to support the recent reform of the system after 2020.

Climate Leadership Council

Launched in 2017, the Climate Leadership Council is an international policy institute that promotes a government-led strategy to lower emissions by returning the income from a nation's carbon taxes directly to its citizens through "carbon dividends". Shell is a founding member along with other companies incl. ExxonMobil, Total, BP, Unilever and P&G, and non-governmental organisations Conservation International and The Nature Conservancy.

Energy Transitions Commission

In 2015, Shell helped establish the Energy Transitions Commission (ETC) which aims to accelerate change towards low-carbon energy systems that enable robust economic development and limit the rise in global temperature to well below 2°C. Our Board Chair, Chad Holliday, serves as Shell's Commissioner.

Oil and Gas Climate Initiative

We are a member of the Oil and Gas Climate Initiative (OGCI), which aims to increase the ambition, speed and scale of companies' individual initiatives to reduce their greenhouse gas footprint and explore new business models and technologies. We actively engage in all working groups.

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

We do have a process in place that oversees that all direct and indirect activities are consistent with our overall climate change strategy.

The CEO is the most senior individual with accountability for climate change risk. We have set up several dedicated climate change and GHG-related forums at different levels of the organisation where climate change issues are addressed, monitored and reviewed, and each Shell subsidiary has operational responsibility for implementing climate change policies and strategies.

Shell also employs a dedicated Group Carbon team, which, among other things, is accountable for monitoring and examining the strategic implications of climate change for Shell and the impact of developments in governmental policy and regulation.

A high-level working group called the Policy Forum – chaired by an EC member (includes businesses' and / or functions' representatives depending on topics discussed) - is responsible for proposing policy and for communicating policy externally, and it reviews and approves the high-level policy framework and key policy decisions and advocacy positions.

Delivery of these policy and advocacy positions, and external input and engagement is aligned via:

- Government Relations team in respect of political and government processes, to inform development of positions adapted to local circumstances. The Government Relations team also coordinates the relevant advocacy, ensuring alignment with other Shell advocacy goals at local and national level.
- Investor Relations team in respect of investor perspectives, especially Socially Responsible Investors. The Investor Relations team also manages responses to investor questions on this topic and provides periodic briefings to interested investors.
- External Relations team in respect of media and wider public questions.

Please also refer to our Annual Report 2018, p71/72, section Climate change and energy transition, paragraph "Our governance and management of climate change risks and opportunities".

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports, incorporating the TCFD recommendations

Status

Complete

Attach the document

 2018 Shell Annual Report.pdf

Page/Section reference

Shell Annual Report 2018, pages 16/17 (risk factors), 28 (Performance indicators, 66-78 (Environment and Society, Climate Change and energy Transition), 101 (Corporate and Social Responsibility Committee), 128/129 (remuneration), 133 (annual Bonus Outcome)

TCFD mapping table: <https://www.shell.com/sustainability/sustainability-reporting-and-performance-data/performance-data/greenhouse-gas-emissions.html#vanity-aHR0cHM6Ly93d3cuc2h1bGwuY29tL2doZw>

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

https://reports.shell.com/annual-report/2018/servicepages/downloads/files/shell_annual_report_2018.pdf

Publication

In voluntary sustainability report

Status

Complete

Attach the document

 2018 Shell Sustainability Report.pdf

Page/Section reference

Shell Sustainability Report 2018

In particular, sections Climate change and energy transition, Business ethics, transparency and corporate governance, environmental impacts, and local communities and socio-economic impacts.

Content elements

- Governance
- Strategy
- Risks & opportunities
- Emissions figures
- Emission targets
- Other metrics

Comment

https://reports.shell.com/sustainability-report/2018/servicepages/downloads/files/shell_sustainability_report_2018.pdf

Publication

In voluntary communications

Status

Complete

Attach the document

 2019 April Shell Responsible Investment Annual Briefing.pdf

Page/Section reference

Socially Responsible Investors Briefing London, 9 April 2019
Presentation - all pages

Content elements

- Governance

Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

<https://www.shell.com/investors/news-and-media-releases/investor-presentations/2019-investor-presentations/responsible-investment-briefing-april-11-2019.html>

Publication

In voluntary communications

Status

Complete

Attach the document

 2018 Shell SKY Scenario.pdf

Page/Section reference

Attached the Sky Scenario itself - as only document can be attached and no corporate webpages linked.

Shell Webpage:

Sky Scenario - interactive tool

[https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/shell-scenario-sky/interactive-](https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/shell-scenario-sky/interactive-tool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVytool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVy)

[tool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVytool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVy](https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/shell-scenario-sky/interactive-tool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVytool.html#iframe=L1dIYkFwcHMvU0tZX2Fzc2V0cy9pbmRleC5odG1s3JIYWQtbW9yZS1kaXNjbGFpbWVy)

Content elements

Other, please specify

This interactive data tool allows users to learn about Sky, its highlights and detailed quantification and to explore signposts and timelines as well as visualise global and regional data.

Comment

Publication

In voluntary communications

Status

Complete

Attach the document

 2019 Shell Industry Associations Climate Review.pdf

Page/Section reference

Industry Associations Climate Review, April 2019

This report assesses alignment with 19 industry associations on climate-related policy.

It will serve as the basis for further conversations with industry associations, investors and civil society so that we can continue to work constructively together.

Content elements

Governance

Strategy

Risks & opportunities

Comment

Our advocacy

We aim to share our knowledge, experience and understanding of the energy system with policymakers. We have, for example, presented our Sky Scenario to governments and international institutions.

The Sky Scenario is a technically possible, but challenging pathway for society to achieve the goals of the Paris Agreement. Our Business Principles encourage us to contribute to debates on policy issues that affect our business, our employees or the local communities where we operate. These prohibit payments by Shell companies to political parties.

https://www.shell.com/sustainability/transparency/public-advocacy-and-political-activity/_jcr_content/par/textimage.stream/1554466210642/0a46ab13e36e99f8762ebb021bd72decec2f47b2/final-industry-association-climate-review-april-2019.pdf

Publication

In voluntary communications

Status

Complete

Attach the document

 2019 June Shell Management Day Presentation.pdf

Page/Section reference

Shell Management Day, London, 04/05 June 2019

Press release

<https://www.shell.com/investors/news-and-media-releases/investor-presentations/2019-investor-presentations/management-day-2019.html>

Presentation slides 26/27

https://www.shell.com/investors/news-and-media-releases/investor-presentations/2019-investor-presentations/management-day-2019/_jcr_content/par/textimage_af3b.stream/1559638644079/9400a0105d2ef50269b7c002ac8140263aff0182/shell-management-day-2019-webcast-presentation-slides.pdf

Content elements

Strategy

Comment

C14. Signoff

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

DEFINITIONS AND CAUTIONARY NOTE:

Capital investment comprises capital expenditure, exploration expense excluding well write-offs, new investments in joint ventures and associates, new finance leases and investments in Integrated Gas, Upstream and Downstream equity securities, all of which on an accruals' basis. Divestments comprises proceeds from sale of property, plant and equipment and businesses, joint ventures and associates, and other Integrated Gas, Upstream and Downstream investments, reported in "Cash flow from investing activities (CFFI)", adjusted onto an accruals basis and for any share consideration received or contingent consideration recognised upon divestment, as well as proceeds from the sale of interests in entities while retaining control (for example, proceeds from sale of interest in Shell Midstream Partners, L.P.).

Free Cash Flow is defined as the sum of "Cash flow from operating activities" and "Cash flow from investing activities".

Operating expenses comprise the following lines of the Statement of Income: production and manufacturing expenses, selling, distribution and administrative expenses and research and development expenses.

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this report, "Shell", "Shell Group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to Royal Dutch 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 Royal Dutch 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. 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.

Shell subsidiaries data include their interests in joint operations.

We also refer to "Shell's Net Carbon Footprint" in this report. This includes 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. But, to support society in achieving the Paris Agreement goals, we aim to help such suppliers and consumers to likewise lower

their emissions. The use of the term “Shell’s Net Carbon Footprint” is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

This submission contains forward-looking statements (within the meaning of the US Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Royal Dutch 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 Royal Dutch 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”, “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 Royal Dutch 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, 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; and (m) 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 Royal Dutch Shell’s Form 20-F for the year ended December 31, 2018 (available at www.shell.com/investorandwww.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, July 30, 2019. Neither Royal Dutch 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.

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. US 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.

Sky Scenario Disclaimer

This submission contains data and analysis from Shell’s new Sky Scenario. Unlike Shell’s previously published Mountains and Oceans exploratory scenarios, the Sky Scenario is based on the assumption that society reaches the Paris Agreement’s goal of holding the rise in global average temperatures this century to well below two degrees Celsius (2°C) above pre-industrial levels. Unlike Shell’s Mountains and Oceans scenarios, which unfolded in an open-ended way based upon plausible assumptions and quantifications, the Sky Scenario was specifically designed to reach the Paris Agreement’s goal in a technically possible manner. These scenarios are a part of an ongoing process used in Shell for over 40 years to challenge executives’ perspectives on the future business environment. They are designed to stretch management to consider even events that may only be remotely possible. Scenarios, therefore, are not intended to be predictions of likely future events or outcomes and investors should not rely on them when making an investment decision with regard to Royal Dutch Shell plc securities.

Additionally, it is important to note that Shell’s existing portfolio has been decades in development. While we believe our portfolio is resilient under a wide range of outlooks, including the IEA’s 450 scenario (World Energy Outlook 2016), it includes assets across a spectrum of energy intensities including some with above average intensity. While we seek to enhance our operations’ average energy intensity through both the development of new projects and divestments, we have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10-20 years. Although, we have no immediate plans to move to a net-zero emissions portfolio, in November of 2017, we announced our ambition to reduce our Net Carbon Footprint in step with society towards the Paris Agreement’s goal of holding global average temperature to well below 2°C above pre-industrial levels. Accordingly, assuming society aligns itself with the Paris Agreement’s goals, we aim to reduce our Net Carbon Footprint, which includes not only our direct and indirect carbon emissions associated with producing the energy products which we sell, but also our customers’ emissions from their use of the energy products that we sell, by around 20% in 2035 and by around 50% in 2050. The use of the term Shell’s “Net Carbon Footprint” is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Executive Officer	Chief Executive Officer (CEO)