C0. Introduction

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

For the purposes of the present submission Shell aims to follow the definitions and structure used by CDP as much as reasonably feasible. The comprehensive list of disclosures by Shell is available on www.shell.com. On www.shell.com/ghg, our CDP Climate Change submission is available as a pdf document.

(Annual Report 2019, p17)
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 Leading Transition theme; and New Energies, which includes the Emerging Power theme.
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 natural gas and low-carbon sources such as wind and solar.

**UPSTREAM**
Our Upstream organisation covers the core Upstream themes: Conventional Oil and Gas, Deep Water and Shales. 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 and Chemicals, both of which are Leading Transition themes. 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. We also 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 206-208 (2019 Annual Report).

With effect from 2020, our reporting segments were amended with the change in the way the CEO reviews and assesses performance of the group and consist of Integrated Gas, Upstream, Oil Products, Chemicals and Corporate.

Note: From 1 Jan 2020, Downstream is split in Oil Products and Chemicals; and Oil Sands is part of Oil Products.
(C0.2) State the start and end date of the year for which you are reporting data.

<table>
<thead>
<tr>
<th>Reporting year</th>
<th>Start date</th>
<th>End date</th>
<th>Indicate if you are providing emissions data for past reporting years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>January 1, 2019</td>
<td>December 31, 2019</td>
<td>No</td>
</tr>
</tbody>
</table>

(C0.3) Select the countries/areas for which you will be supplying data.
(extract) 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 chosen approach for consolidating your GHG 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 (Note: Biofuels and Carbon Capture and Storage/Utilisation are not considered “divisions” in Shell’s organisation.)
  - 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.
OVERVIEW
The Committee assesses Shell’s overall sustainability performance and provides input into Shell’s annual reporting and disclosures on sustainability. It also advises the Remuneration Committee on metrics relating to sustainable development and energy transition that apply to the Executive Committee scorecard and incentive programme.
The Committee also endorses Shell’s annual HSSE&SP assurance plan and reviews execution of the plan and audit outcomes. In addition, it reviews and considers external stakeholder perspectives in relation to Shell’s business, and reviews how Shell addresses issues of public concern that could affect its reputation and licence to operate. Examples include plastic waste, human rights, and ethical conduct and culture.

In line with the strategic importance of the Committee’s agenda, the Chair and the Chief Executive Officer regularly attend the Committee meetings for discussions on specific topics. The Committee appreciated the assistance throughout the year from the Projects & Technology Business Director, who continues to be a strong champion for sustainability within Shell.
The overall accountability for sustainability within Shell is with the Chief Executive Officer and the Executive Committee. They are assisted by the HSSE&SP executive team.

ACTIVITIES
The topics discussed in greater depth included personal and process safety, Shell’s Net Carbon Footprint Ambition and the energy transition, and Shell’s ethics programme.
(SR 2019, p17) SESCo also advises the Remuneration Committee on metrics relating to sustainable development and energy transition that apply to the Executive committee scorecard and incentive programme (metrics relating to the energy transition include, e.g., Shell’s Net Carbon Footprint).

FOCUS FOR 2020

<table>
<thead>
<tr>
<th>Position of individual(s)</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board-level committee</td>
<td>(Annual Report 2019, p128) Safety, Environment and Sustainability Committee (SESCo) The SESCo assists the Board in reviewing the practices and performance of the Shell Group of companies, primarily with respect to Safety, Environment including Climate Change, and Sustainability.</td>
</tr>
</tbody>
</table>
In 2020, the Committee will continue with the sharpened focus areas established last year. It will use site visits to examine Shell’s approach and performance across these focus areas. The Committee will also review Shell’s response to developments regarding climate change and the energy transition.

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

<table>
<thead>
<tr>
<th>Frequency with which climate-related issues are a scheduled agenda item</th>
<th>Governance mechanisms into which climate-related issues are integrated</th>
<th>Please explain</th>
</tr>
</thead>
</table>
| Scheduled – all meetings | • Reviewing and guiding strategy  
• Reviewing and guiding major plans of action  
• Reviewing and guiding risk management policies  
• Reviewing and guiding annual budgets  
• Reviewing and guiding business plans  
• Setting performance objectives  
• Monitoring implementation and performance of objectives  
• Overseeing major capital expenditures, acquisitions and divestitures  
• Monitoring and overseeing progress against goals and targets for addressing climate-related issues | (Annual Report 2019, p91) 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 discussed a number of matters over the year, including environmental topics and investments in new business areas, for example, in New Energies. In addition, some of the Non-executive Directors received dedicated updates from management and external experts on the various business models, opportunities and risks 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 reviewed Shell’s Integrated Power strategy from first principles, set against the context of the energy transition and the external environment, and to see how power can create value for Shell.  

(AR 2019, p120) Board activities  
A rolling Board agenda is reviewed at Board meetings, providing effective forward management of meetings and focused discussions. The agenda for each Board meeting includes a number of regular and important items, including reports from the Chief Executive Officer, the Chief Financial Officer, other Executive Committee members and from each Board Committees. Further updates are provided from the various business functions and other key functions, including Investor Relations; Health and Safety, Security and Environment; HR; and Legal, as well as the Company Secretary. The Board also |
considers and approves the quarterly, half-year and full-year financial results and dividend announcements and, at most meetings, considers investment, divestment and/or financing proposals.

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

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

(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).

Rising climate change concerns are mentioned as one of the Risk Factors described in our Annual Report (p29).

The risk of rising climate change concerns is actively monitored and reviewed by the Executive Committee. These regular reviews lead to actions designed to address all the different components of the risk.

Overall, the mitigation of this risk is addressed through our strategy to thrive in the energy transition. This is one of our three strategic ambitions and is made up of three components:
- reducing the GHG emissions intensity of our operations;
- demonstrating resilience by adopting the guidance on disclosure by the Task Force on Climate-related Financial Disclosures; and
- working towards our ambition to reduce the Net Carbon Footprint of the energy products we sell, in step with society’s drive to reduce GHG emissions.

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 2019, p118).

(AR 2019, p92) 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. Each Shell entity and each Shell-operated venture are responsible for implementing climate change policies and strategies.

(p94) Shell is also a member of the Oil and Gas Climate Initiative (OGCI), a CEO-led effort to lead the industry’s response to climate change. One of OGCI’s focus areas is methane management. In 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 0.2%, corresponding to a reduction of one third.

(p92) The Executive Vice President Safety & Environment, a senior manager who reports directly to the Projects & Technology Director, is accountable for the oversight of GHG issues. This manager’s department includes the dedicated Group Carbon team, which 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 the 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 project managers who advise the projects on the risks and opportunities of GHG-related issues. Risk management at an asset or project level is a structured process of identifying and assessing risks; planning and implementing responses; and monitoring, improving and closing out action items that have an impact on projects’ and assets’ objectives and performance. Shell policy requires these projects to obtain approval on abatement plans and targets from the Executive Vice President Safety & Environment at defined project phases.

Reporting to the same manager is the HSSE & SP Assurance and Reporting team, which is accountable for the delivery of Shell’s nonfinancial reporting and for auditing the businesses’ performance against our HSSE & SP Control Framework requirements, which include climate change risk management. See “Environment and society” on pages 84-90 in 2019 Annual Report.

Further support for embedding GHG management is provided by a global risk support team for GHG and energy management. This team is a network of subject-matter experts in GHG topics working globally across our lines of business. Team members are experts in their relevant disciplines, defining improvement areas and sharing good practices and experience.

The above-mentioned teams and experts have provided their input to shape a set of mandatory manuals and complementary guidance documents which are ultimately based on our HSSE & SP Control Framework. These documents provide guidance on how to monitor, communicate and report changes in the risk environment, and how to review the effectiveness of actions taken to manage the identified risks, including ways to:

■ ensure consistent assessment of climate risk across Shell;
■ clarify expectations for risk management and reporting, including roles and responsibilities;
■ strengthen decision-making through better visibility and understanding of the climate risk by line of business; and
■ enable integration of Shell’s reporting.

For more context information, please refer to our Annual Report 2019, p92, the section “Our governance and management or climate change risks and opportunities”, with the climate change management organogram.

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

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

In 2019, sustainable development continued to account for 20% of Shell’s Executive Scorecard, which helps to determine the annual bonuses awarded to Royal Dutch Shell plc’s Executive Directors. The metrics had equal weighting between Shell’s safety (10%) and environmental (10%) performance. Scorecard measures for 2020 will remain the same.

Targets are set each year by the Board’s Remuneration Committee, with outcomes reported retrospectively in the Annual Report.

See more information regarding our "Long-term incentive plan" in C1.3a.

NOTE: 30 April 2020, 1st quarter 2020 results webcast (quote CEO, Ben van Beurden): “Given the unprecedented and intense economic headwinds and the impact these will have on results. Board and Management have announced that no Group performance bonuses will be paid to anyone in Shell for this financial year.” (https://www.shell.com/investors.html)

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

<table>
<thead>
<tr>
<th>Entitled to incentive</th>
<th>Type of incentive</th>
<th>Activity incentivized</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer (CEO)</td>
<td>Monetary reward</td>
<td>Emissions reduction target</td>
<td>Shell’s emission reduction targets are intensity based and targets are set for the short term. In addition to the targets, Shell has also established its medium and long-term emission reduction ambitions, which are also intensity based. Annual Report 2019, p146 Remuneration (extract): Energy Transition The energy transition condition is focused on Shell’s strategic ambition to thrive in the energy transition and supports delivery of Shell’s Net Carbon Footprint (NCF) ambition. This measure was introduced to the LTIP in 2019 under the existing remuneration policy, in advance of the 2020</td>
</tr>
</tbody>
</table>
policy vote. The condition consists of a mix of leading and lagging measures that set the foundations to contribute to Shell’s strategic ambitions in the longer term. These will comprise:

Lagging measure – a measure of our progress in meeting our ambition
- Net Carbon Footprint ambition (see details in section 4)

Leading measures – the levers we will use to drive future NCF reduction
- 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, and in business models based on reselling power generated by others;
- Advanced biofuels technology: biofuels are expected to play a valuable role in the changing energy mix and are likely to be the 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; and
- 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.

NOTE: 30 April 2020, 1st quarter 2020 results webcast (quote CEO, Ben van Beurden): “Given the unprecedented and intense economic headwinds and the impact these will have on results. Board and Management have announced that no Group performance bonuses will be paid to anyone in Shell for this financial year.” (https://www.shell.com/investors.html)

<table>
<thead>
<tr>
<th>Chief Financial Officer (CFO)</th>
<th>Monetary reward</th>
<th>Emissions reduction target</th>
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<td></td>
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Lagging measure – a measure of our progress in meeting our ambition
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■ 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.

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weighting between Shell’s safety (10%) and environmental (10%) performance. Scorecard measures for 2020 will remain the same.

Targets are set each year by the Board’s Remuneration Committee, based on recommendations from the Safety, Environment and Sustainability Committee, with outcomes reported retrospectively in the Annual Report.

Long-term incentive plan

In 2017, we were the first international oil and gas organisation to set the ambition to reduce the Net Carbon Footprint (NCF) of the energy products we sell (a carbon intensity measure that takes into account their full life-cycle emissions including customers’ emissions associated with using them) in the period to 2050. We aim to do that in step with society’s drive to meet the goals of the Paris Agreement on climate change (see NCF). We announced plans in 2018 to link executive remuneration to short-term targets to reduce the NCF of the energy products we sell, including our customers’ emissions from their use of our energy products. We accelerated our plans by including an energy transition condition in the performance conditions for the 2019 long-term incentive plan. The condition includes the first three-year target to reduce the Net Carbon Footprint of the energy products we sell, as well as other measures that we consider will help us achieve our strategic ambitions in the long term, such as growing Shell’s power business, commercialising advanced biofuel technologies and developing carbon capture and storage. These measures are based on recommendations from the Board's Safety, Environment and Sustainability Committee.

The energy transition condition applied to the Executive Directors, Executive Committee members and around 150 of Shell’s senior executives in 2019. From 2020, we will incorporate the energy transition condition into the performance share awards made to around 16,500 employees globally.

C2. Risks and opportunities

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities? Yes

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

<table>
<thead>
<tr>
<th>From (years)</th>
<th>To (years)</th>
<th>Comment</th>
</tr>
</thead>
</table>
Short-term 0 3 In Shell, short term is defined as the period of up to three years from present. Shell develops detailed financial projections and uses them to manage performance and expectations in three-year cycles. The three-year plans are shared with the Board.

Medium-term 3 10 In Shell, medium term is defined as the period from 3 years up to around 10 years. Our annual business planning exercise spans across the short and medium term time horizon.

Long-term 10 Beyond 10 In Shell, “long-term” is defined as the period beyond around 10 years. For this time horizon, 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 in the long term are guided by the pace of progress of society and in step with society as it moves towards the goals of the Paris Agreement.

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

We define substantial financial or strategic impact as an event that could have a large adverse or positive effect separately, or in combination, on our earnings, cash flows and/or financial condition or which could have an impact on the company’s Strategic Outlook as reflected in our Annual Report (p19). The event may influence the annual results of the company, the (longer-term) outlook, the free cash flow, as well as the obtained credit rating. Examples of events that may have a substantive impact on our business are shared in the Annual report as Risk Factors (Annual Report, p27). The impact of these events cannot be generalised as it depends on the specific circumstances once a potential risk materialises which will determine if an outcome of an event is to be assessed as low, medium or high. Many of the risks have in common that they exceed the scope of individual businesses and cover multiple years, hence have an extended impact on a longer term and on multiple areas of our company.

The risk “Rising climate change concerns”, as reflected in the Annual Report (p29), describes the widespread elements and potential consequences of this risk, which may have a substantial financial impact, like: increased compliance costs and operational restrictions, increase of regulatory burden, and suppression of demand for fossil fuels, either through taxes, fees and/or incentives to promote the sale of lower-carbon electric vehicles or even through the future prohibition of sales of new diesel or gasoline vehicles, such as the prohibition in the United Kingdom (UK) beginning in 2035. This could result in lower revenue and, in the long term, potential impairment of certain assets. In addition, changes in weather and other environmental conditions such as, but not limited to, rise in temperature, sea-level rise and fluctuations in water levels could adversely impact both our operations and supply chains.

In some countries, governments, regulators, organisations and individuals have filed lawsuits seeking to hold fossil fuel companies liable for costs associated with climate change. While we believe these lawsuits to be without merit, losing any of these lawsuits could have a material adverse effect on our earnings, cash flows and financial condition.
Additionally, certain investors may feel urged by stakeholders to divest their investments in fossil fuel companies. If this were to occur, it could have a material adverse effect on the price of our securities and our ability to access capital markets. Also, commercial and investment banks may feel urged by stakeholders to limit financing fossil fuel companies. 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.

If we are unable to keep pace with society’s energy transition or we are unable to provide the desired low-GHG-emissions products needed to facilitate society’s energy transition, it could have a material adverse effect on our earnings, cash flows and financial condition.

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
- Direct operations
- Upstream
- Downstream

Risk management process
- Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
- More than once a year

Time horizon(s) covered
- Short-term
- Medium-term
- Long-term

Description of process
**Governance and management of climate change risks and opportunities**

Shell uses a single company-wide Control Framework to manage, rather than eliminate, the risk of failure to achieve business objectives. We have standards and a clear governance structure in place to help manage potential impacts that our projects could have on the surrounding environment and local communities. The standards for Health, Safety, Security, Environment and Social Performance (HSSE&SP) and the scope for application of each
of these standards is specified in the Shell HSSE&SP Control Framework (CF). The HSSE&SP CF defines standards at each level of the organisation and sets out the procedures and processes people are required to follow. As part of the HSSE&SP Control Framework, we have a climate change risk management structure which is supported by standards, policies and controls. Climate change and risks resulting from GHG emissions are managed in accordance with other significant risks by the Board and the Executive Committee. The Board carries out a robust assessment of emerging risks, procedures to identify them, and how they are being managed or mitigated. This process is reviewed by the Board on a regular basis. Our Board committees, such as the Safety, Environment and Sustainability Committee (SESCo), play an important role in assisting the Board with managing and controlling climate change risks and opportunities. During 2019, SESCo met regularly (8 times in total) to review and discuss a range of prioritised topics. These included the safe and responsible operation of Shell's facilities, environmental protection and greenhouse gas emissions, major incidents that impact safety and environmental performance, progress towards meeting Shell’s long-term Net Carbon Footprint ambition and short-term targets, and climate change and the energy transition. The regular reviews by the Executive Committee lead to actions designed to address all the different components of the risk.

Identification of climate-related risks and opportunities
All businesses and functions are required to monitor, communicate and report changes in the risk environment and the effectiveness of actions taken on an ongoing basis. Besides, we have several dedicated climate change and GHG-related forums at different levels of the organisation where these issues are addressed, monitored and reviewed. Our 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. We review our portfolio annually to identify emerging risks from changing GHG regulatory regimes and physical conditions. We continuously assess and monitor the external environment for potential risks to our reputation.

Assessment of climate-related risks and opportunities
Risks and opportunities are assessed via the Shell Risk Assessment Matrix that identifies consequences to people, assets, environment and reputation. The severity bands range from “no damage/effect” to “massive damage/effect” and the likelihood ranges from “never heard of in the industry” to “has happened more than once per year at the location”. To assess our financial resilience in the short and medium term, we look at the sensitivity of our cash flow to changes in oil prices and the cost of CO2 emissions.

Responding to climate-related risks and opportunities
All businesses and functions are required to monitor, communicate and report changes in the risk environment and the effectiveness of actions taken on an ongoing basis. Each Shell business unit needs to consider the adequate management of climate-related risks in their portfolio. Our 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, which include climate change risk management. We have mitigation plans in place for identified brand and reputation risks at the Group, country and line of business level. Overall, the mitigation of this risk is addressed through our strategy to thrive in the energy transition which is one of our three strategic ambitions and is made up of three components:
- reducing the GHG emissions intensity of our operations;
- demonstrating resilience by adopting the guidance on disclosure by the TCFD; and
- working towards our ambition to reduce the Net Carbon Footprint of the energy products we sell, in step with society’s drive to reduce GHG emissions.

Case study on management of transition related risks:
Our Net Carbon Footprint (NCF) ambition serves all three strategic ambitions of the Group including the license to operate. In November 2017, we announced our long-term NCF ambition which was followed up by short-term NCF specific targets of 3 or 5 years. In 2018, Shell announced plans to link executive remuneration to short-term NCF targets. In 2019, following discussions with major shareholders and based on recommendations from SESCo, Remuneration Committee (REMCO) decided to add an energy transition condition to the 2019 Long-Term Incentive Plan (LTIP) award.
Later, in April 2020, we significantly raised our long-term ambitions in line with increasing societal expectations. Our new ambition is to be a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. This includes the ambition to reduce the NCF of the energy products we sell by 30% by 2035 and 65% by 2050 (baseline 2016), in step with society, net-zero emissions from our operations, and working with our customers to reduce the emission from energy use to net-zero. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition. Our medium to long term ambitions are planned to be reviewed and calibrated once every five years, based on Shell’s assessment of society’s collective progress towards the Paris Agreement goals. Besides, our short-term targets are unconditional and are planned to be set annually.

Case study on management of transition related opportunities:
On Management Day 2019, Shell’s Executive Committee announced that we refreshed the way we group the strategic themes to better communicate our portfolio strategy. This included the introduction of an Emerging Power theme which will capture value from the growth in electricity consumption. The Power theme will focus on creating business models to support the evolving customer demands for more electricity through the Energy Transition.
(C2.2a) Which risk types are considered in your organization’s climate-related risk assessments?

<table>
<thead>
<tr>
<th>Relevance &amp; inclusion</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current regulation</strong></td>
<td>Relevant, always included</td>
</tr>
<tr>
<td></td>
<td>Explanation of risk relevance</td>
</tr>
<tr>
<td></td>
<td>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. In December 2015, 195 nations adopted the Paris Agreement. As a result, we expect continued and increased attention to climate change from all sectors of society. This attention has led, and we expect it to continue to lead, to additional regulations designed to reduce greenhouse gas (GHG) emissions. 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 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. This could have a large adverse effect on our earnings, cash flows and financial condition. Hence, this risk is relevant to us and included in our assessment.</td>
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<td>Example: Existing carbon pricing schemes that reflect the Paris ambition are expected to lead to higher carbon costs, such as the European Union and the UK.</td>
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<td>Inclusion in risk identification and assessment processes</td>
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<td>To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020). Our Group Carbon team monitors and examines the impact of developments in governmental policy and regulation. We actively monitor the GHG emissions of all our assets, as well as the lifecycle of our products, to quantify future regulatory costs related to GHG or other climate-related policies.</td>
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<tr>
<td><strong>Emerging regulation</strong></td>
<td>Relevant, always included</td>
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<tr>
<td></td>
<td>Explanation of risk relevance</td>
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<td>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. We operate 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 December 2015, 195 nations adopted the Paris Agreement. As a result, we expect continued and increased attention to climate change from all sectors of society. This attention has led, and we expect it to continue to lead, to additional regulations designed to reduce greenhouse gas (GHG) emissions. We expect that a growing share of our GHG emissions will be subject to regulation, resulting</td>
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In increased compliance costs and 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 result in suppression of demand for fossil fuels, either through taxes, fees and/or incentives to promote the sale of lower-carbon electric vehicles or even through the future prohibition of sales of new diesel or gasoline vehicles, such as the prohibition in the United Kingdom (UK) beginning in 2035. This could result in lower revenue and, in the long term, potential impairment of certain assets. Hence, this risk is relevant to us and included in our assessment.

Example: Potential increase in operating costs in several locations like Brazil, Brunei, UAE, USA (federal) etc. due to introduction of carbon pricing mechanisms in the future.

Inclusion in risk identification and assessment processes

To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020). Our Group Carbon team monitors and examines the impact of developments in governmental policy and regulation. We actively monitor the GHG emissions of all our assets, as well as the lifecycle of our products, to quantify future regulatory costs related to GHG or other climate-related policies.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Relevant, always included</th>
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<tr>
<td>Explanation of risk relevance</td>
<td>Our future performance depends on the successful development and deployment of new technologies and new products. If we do not continue to develop or deploy technology and new products, or fully leverage our data effectively in a timely and cost-effective manner, there could be a material adverse effect on the delivery of our strategy and our licence to operate. Also, we operate in environments where advanced technologies are utilised. We continue to invest in long-range research and carbon-abatement technologies to provide technical solutions to address these challenges. As a member of the Oil and Gas Climate Initiative (OGCI), Shell is participating in its Kickstarter initiative to unlock large-scale investment in CCUS. 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 technology 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. Hence, this risk is relevant to us and included in our assessment.</td>
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<tr>
<td>Legal</td>
<td>Relevant, always included</td>
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| | | Inclusion in risk identification and assessment processes |
| | | We continuously monitor geopolitical developments and societal issues relevant to our interests. Our Legal and Tax functions are organised globally and support the business lines in ensuring compliance with local laws and fiscal regulations. Our |

Example: Failure to deploy CCUS and advanced biofuels at scale due to lack of economic feasibility.

Inclusion in risk identification and assessment processes
Shell’s Technology organisation and the relevant lines of business work together to determine the content, scope and budget for developing new technology that supports our activities. 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. During development, projects are expected to evaluate relevant low-carbon technologies and options to remove GHG emissions.
Government Relations department engages with governments in countries where we operate to understand and influence local policies and to advocate Shell’s position on topics relevant to our industry.

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<tr>
<th>Market</th>
<th>Relevant, always included</th>
<th>Explanation of risk relevance</th>
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<td></td>
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<td>We are exposed to macroeconomic risks including fluctuating prices of crude oil, natural gas, oil products and chemicals. The prices of these products are affected by supply and demand, both globally and regionally. We use a range of oil and gas price assumptions, reviewed on a periodic basis, to evaluate projects and commercial opportunities. If our assumptions prove to be incorrect, it could have a material adverse effect on our earnings, cash flows and financial condition. Besides, macroeconomic risks can also affect demand for our products. We also expect that GHG regulation, as well as emission reduction actions by customers, will continue to result in suppression of demand for fossil fuels. Additionally, government actions may affect the prices of our products. In a low oil and gas price environment, we would generate less revenue from our Upstream and IG businesses, and as a result, parts of those businesses could become less profitable, or could incur losses In a high oil and gas price environment, we could experience sharp increases in costs, and under some production-sharing contracts, our entitlement to proved reserves could be reduced. Higher prices could also reduce demand for our products, which could result in lower profitability, particularly in our Downstream business. Hence, this risk is relevant to us and included in our assessment. Example: When considering the impact of the macroeconomic climate during early 2020 on our organisation, and the risks of a prolonged period of economic uncertainty, weaker commodity prices, higher volatility, and weaker demand in all our businesses, the Board did not consider that maintaining the existing level of distributions is in the best interest of the company and its shareholders. The Board decided to reduce the amount we pay as dividends to our shareholders.</td>
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</table>

| Inclusion in risk identification and assessment processes |
| We test the resilience of our projects and other opportunities against a range of prices of crude oil and natural gas, and margins in oil products and chemicals. Additionally, to assess our financial resilience in the short and medium term, we look at the sensitivity of our cash flow to changes in oil prices and the cost of CO2 emissions. In 2019, we considered a range of between $40 and $100 per barrel of oil to 2030. |

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<tr>
<th>Reputation</th>
<th>Relevant, always included</th>
<th>Explanation of risk relevance</th>
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<td>Our reputation is an important asset. Real or perceived failures of governance or regulatory compliance or a perceived lack of understanding of how our operations affect surrounding communities could harm our reputation. There is increasing focus on the role of oil and gas in the context of climate change and energy transition. This could negatively affect our brand, reputation and licence to operate. Without trust and a strong societal licence to operate, we cannot and will not be a world-class investment</td>
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</table>
Inclusion in risk identification and assessment processes
In general, we incorporate business reputation risk in our assessment through the Shell General Business Principles (Principles). Also, our Group Carbon team monitors and examines the strategic implications of climate change for Shell including our commitments to address climate change. This team reviews our short-term targets and long-term ambitions related to climate change and analyses the company’s progress against the same as well as the societal development over time. In April 2020, we significantly raised our long-term ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. As a part of this overall ambition, we have recalibrated our Net Carbon Footprint ambition so that it is in step with the large sections of society that want to achieve a 1.5°C Celsius future. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition.

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<tr>
<th>Acute physical</th>
<th>Relevant, always included</th>
<th>Explanation of risk relevance</th>
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<tr>
<td>Relevant risk exposures us and the communities in which we work, to a wide range of health, safety, security and environment (HSSE) risks. These HSSE risks cover a wide spectrum, given the geographic range, operational diversity and technical complexity of our operations. The potential, timing, and severity of the impact of these risks are largely dependent on the geographical location and the asset type. If a major risk materialises, such as a natural disaster (including weather events), it can present physical and operational risks. Accordingly, this could potentially have an effect on our earnings, cash flows and financial condition. Hence, this risk is relevant to us and included in our assessment. Example: This includes natural disasters such as floods, droughts, and severe tropical cyclones.</td>
<td>Inclusion in risk identification and assessment processes</td>
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</table>
Our operations are subject to extensive HSSE regulatory requirements that often change and are likely to become more stringent over time. Shell undertakes periodic assessments of existing asset types. In certain cases, Shell may take additional steps, for example deploy a team of experts such as the Metocean team which has the expertise and tools to analyse the physical impact on existing assets and new projects as well as the associated adaptation aspects.

<table>
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<tr>
<th>Chronic physical</th>
<th>Relevant, always included</th>
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<tr>
<td>Explanation of risk relevance</td>
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</tbody>
</table>
| The nature of our operations exposes us and the communities in which we work, to a wide range of health, safety, security and environment (HSSE) risks. These HSSE risks cover a wide spectrum, given the geographic range, operational diversity and technical complexity of our operations. The potential, timing, and severity of the impact of these risks are largely dependent on the geographical location and the asset type. Increased local air temperatures could potentially impact Shell’s plants’ efficiency. Global rising sea levels could potentially impact Shell’s coastal facilities (e.g. refineries, ports, terminals, etc.) and our offshore platforms. Changes in the global hydrological cycle caused by climate change could potentially impact Shell’s assets, for example by causing flooding, or making access to suitable quantities of water to run a particular facility problematic. The physical effects of climate change such as, but not limited to, rise in temperature, sea-level rise and fluctuations in water levels could potentially impact both our operations and supply chains. Hence, this risk is relevant to us and included in our assessment.
| Example: This includes increasing water and air temperatures, rising sea level etc. |

Inclusion in risk identification and assessment processes

Our operations are subject to extensive HSSE regulatory requirements that often change and are likely to become more stringent over time. Shell undertakes periodic assessments of existing asset types. In certain cases, Shell may take additional steps, for example deploy a team of experts such as the Metocean team which has the expertise and tools to analyse the physical impact on existing assets and new projects as well as the associated adaptation aspects.

(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- Carbon pricing exposure for Refining business

**Where in the value chain does the risk driver occur?**
- Direct operations

**Risk type & Primary climate-related risk driver**
- Emerging regulation
- Carbon pricing mechanisms

**Primary potential financial impact**
- Increased direct costs

**Company-specific description**
- Risk: Carbon pricing exposure for Refining business

Overall, 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. We believe that smart policies from governments, such as applying a cost to emissions through measures such as carbon-pricing mechanisms, supported by effective steps to reduce emissions from businesses including ours and from wider society, are the best ways to reach solutions and drive progress. We continue to advocate the introduction of effective government-led carbon pricing mechanisms. Some governments such as the European Union, Canada etc. have already introduced carbon pricing mechanisms. However, a significant portion of the emissions from our Downstream business are in countries (or jurisdictions) with limited or no pricing mechanisms at present such as the United States (federal), Philippines, Argentina etc. This could possibly change in the future. Moreover, we expect that a growing share of our GHG emissions will be subject to such regulations, resulting in increased compliance costs for Shell. If our GHG emissions rise alongside our ambitions to increase the scale of our business, our regulatory burden will increase proportionally. These might lead to higher operating costs and have a significant negative impact on our free cash flow.

**Time horizon**
- Short-term

**Likelihood**
- Likely
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)
456,000,000

Explanation of financial impact figure
The financial impact figure represents the estimated net present value of regulatory CO2 costs over the next decade for our Refining business assets in Europe. It is currently expected to be around $456 million. It has been determined by adjusting the anticipated gross CO2 costs over a decade with relaxation from expected free allowances. The uncertainty around this estimate is high. The actual costs could turn out to be higher or lower than this estimate due to the possibility of higher or lower CO2 prices being realized in future as compared to those considered in this estimation.

Cost of response to risk
14,500,000

Description of response and explanation of cost calculation
Response to manage the risk
We have developed short, medium and long-term estimates of future carbon costs which are reviewed and updated on an annual basis. To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. We further test the robustness of our high-emitting projects by using long-term carbon cost estimates that are consistent with limiting the average global temperature rise to well below two degrees Celsius.

Case study: In 2018, to help us stay in step with society’s progress toward the goals of the Paris Agreement, we switched from using a flat project screening value (PSV) of $40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates of future carbon costs are reviewed and updated on an annual basis. As per the latest update in 2020, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions by 2050. These estimates were developed by our Group Carbon team, leveraging the expertise of our internal in-country government relations focal points. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. As countries update their NDCs, we expect to update our estimates too. Accordingly, we believe they are a
more accurate reflection of society’s current implementation of the Paris Agreement. The UN 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 to meet the goals of the Paris Agreement.

Explanation of cost calculation
Given that climate related issues are embedded in the work of Shell’s functions and businesses, we consider the management costs associated with
policy/legal risks such as emerging carbon pricing mechanisms as not significant. On the other hand, our 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. This team has broad expertise and supports all the businesses across Shell. The annual budget of this team has been used as the basis
of cost of response to this risk.

Comment

Identifier
Risk 2- Carbon pricing exposure for Integrated Gas business

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver
Emerging regulation
Carbon pricing mechanisms

Primary potential financial impact
Increased direct costs

Company-specific description
Risk: Carbon pricing exposure for Integrated Gas business
Overall, 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. We believe that smart policies from governments,
such as applying a cost to emissions through measures such as carbon-pricing mechanisms, supported by effective steps to reduce emissions from businesses including ours and from wider society, are the best ways to reach solutions and drive progress. We continue to advocate the introduction of effective government-led carbon pricing mechanisms. Some governments such as the European Union, UK, Mexico, etc. have already introduced carbon pricing mechanisms. However, a significant portion of the emissions from our Integrated Gas business are in countries (or jurisdictions) with limited or no pricing mechanisms at present such as the USA (federal), India etc. This could possibly change in the future. Moreover, we expect that a growing share of our GHG emissions will be subject to such regulations, resulting in increased compliance costs for Shell. If our GHG emissions rise alongside our ambitions to increase the scale of our business, our regulatory burden will increase proportionally. These might lead to higher operating costs and have a significant negative impact on our free cash flow.

**Time horizon**
Short-term

**Likelihood**
Likely

**Magnitude of impact**
Medium

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
235,000,000

**Explanation of financial impact figure**
The financial impact figure represents the estimated net present value of regulatory CO2 costs over the next decade for our Integrated Gas business assets in Australia. It is currently expected to be around $235 million. The uncertainty around this estimate is high. The actual costs could turn out to be higher or lower than this estimate due to the possibility of higher or lower CO2 prices being realized in future as compared to those considered in this estimation.

**Cost of response to risk**
14,500,000
Description of response and explanation of cost calculation
Response to manage the risk
We have developed short, medium and long-term estimates of future carbon costs which are reviewed and updated on an annual basis. To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. We further test the robustness of our high-emitting projects by using long-term carbon cost estimates that are consistent with limiting the average global temperature rise to well below two degrees Celsius.

Case study: In 2018, to help us stay in step with society’s progress toward the goals of the Paris Agreement, we switched from using a flat project screening value (PSV) of $40/tonne of GHG emissions, to country-specific estimates of future carbon costs. These estimates of future carbon costs are reviewed and updated on an annual basis. As per the latest update in 2020, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions by 2050. These estimates were developed by our Group Carbon team, leveraging the expertise of our internal in-country government relations focal points. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. As countries update their NDCs, we expect to update our estimates too. Accordingly, we believe they are a more accurate reflection of society’s current implementation of the Paris Agreement. The UN believes the current NDCs are consistent with limiting the average global temperature rise to around 3.0°C above pre-industrial levels. In coming decades, we expect countries to tighten these NDCs to meet the goals of the Paris Agreement.

Explanation of cost calculation
Given that climate related issues are embedded in the work of Shell’s functions and businesses, we consider the management costs associated with policy/legal risks such as emerging carbon pricing mechanisms as not significant. On the other hand, our 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. This team has broad responsibilities and supports all the businesses across Shell. The annual budget of this team has been used as the basis of cost of response to this risk.

Comment

Identifier
Risk 3 - Rising mean temperatures on land and in air
Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver
Chronic physical
Rising mean temperatures

Primary potential financial impact
Increased direct costs

Company-specific description
Risk: Rising mean temperatures on land and in air Shell has long recognised that greenhouse gas emissions from human activity, including the use of fossil fuels are contributing to the warming of the climate system. As mentioned in IPCC’s 2013 report on climate change, the climate models show a high level of agreement on the rise of projected air temperature, which is one of the primary output parameters of a climate model. This temperature increase is not the same over the whole world. In general, in polar areas, the increase is much higher. Also, over land the projected temperature increase is higher than above seawater. The report further states that on time scales of 20 to 40 years from now, the projected air temperature rise relative to the present level is typically between 0.5° and 1.5°C, depending on location and selected RCP (Recommended Concentration Pathway) scenario. At the same time, the relative humidity is also projected to go up for most locations. However, there is an inherent uncertainty associated with temperature rise globally. The increased global air and sea temperatures and resulting effects could have potentially major consequences for the society, including Shell. Such changes in ambient conditions could potentially impact the efficiency of, e.g., LNG plants and refineries in general. Other potential impacts of temperature rise include increase in corrosion of equipment, decreased capacity of gas pipeline, etc. This potentially extends the risk exposure to assets, e.g., offshore drilling and production assets, gas pipelines, etc. Shell has a wide variety of assets located all over the world and each of them is potentially exposed to this risk to some degree. These factors could also potentially result in financial implications for Shell such as increased operating costs and decreased revenue from loss of efficiency.

Time horizon
Medium-term

Likelihood
About as likely as not
Magnitude of impact
   Medium-low

Are you able to provide a potential financial impact figure?
   Yes, an estimated range

Potential financial impact figure – minimum (currency)
   9,000,000

Potential financial impact figure – maximum (currency)
   14,000,000

Explanation of financial impact figure
   For example, a high-level estimate of the impact of rising mean temperatures on the annual earnings from our Chemicals business could be around $9 million and $14 million in 2030s and 2050s respectively. Given the inherent uncertainty associated with temperature rise globally, there is a moderate to high level of uncertainty in these estimates.

Cost of response to risk
   300,000

Description of response and explanation of cost calculation
   Response to manage the risk
   The potential, timing, and severity of the impact of physical risks are largely dependent on the geographical location and the asset type. To manage these risks, Shell employs existing procedures and processes such as the asset reference plan and other plans that guide the assets’ ongoing operations and maintenance schedules and response planning. In certain cases, Shell may take additional steps, for example deploy a team of experts such as our Metocean team which, as and when deemed appropriate, analyses the physical impact of potential weather and climate related issues on existing assets and new projects. It also provides guidance on the associated adaptation aspects to address those issues. This may include considerations around the Project Metocean Design Standards for new projects which are reviewed every 3-4 years to take account of a variety of risks, including weather and climatic influences. The reviews could potentially include weather and climate change related hazards, such as higher water and air temperatures, flooding and droughts, sea level rise, changes in the intensity of tropical cyclones, that could potentially be relevant to a variety of assets in our portfolio. With regards to temperature increase, potential impacts may include changes in cooling efficiency in exposed LNG assets, equipment design and maintenance requirements for some assets and reduced working window in hot locations.
Explanation of cost calculation
The overall costs associated with responding to potential climate related physical risks could include personnel related costs for risk assessment and analysis, facility upgrades, equipment design and maintenance activities. A high-level estimate of the personnel related costs for this risk assessment and analysis could range between $0.3 to 0.5 million a year.

Comment
Cost of response to risk/explanation of cost calculation: as the CDP template does not allow to provide a range but only a single figure, we inserted the lower level of our estimated range ($0.3-0.5 million a year).

(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
Op1 - Growth of power business

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Primary potential financial impact
Increased revenues resulting from increased demand for products and services
Company-specific description

Opportunity: Growth of power business
As the world moves forward on the path of decarbonisation and the demand for low-carbon energy increases, Shell aims to adapt accordingly and establish itself as an integrated power player. We aim to make power the fourth business for Shell that could sit alongside upstream, IG and downstream. We have the brand, global presence, retail and marketing expertise that’s needed for buying and selling electricity products and interacting with customers. On the other hand, power sector offers the scale and longevity for Shell to remain relevant in the global energy system. Growing a power business will enhance our portfolio resilience to withstand volatility in oil prices as the power prices are largely delinked from oil prices.
Shell already has a decades long experience in parts of the power value chain. Our Shell Energy North America business has more than 20 years of experience in power trading and has been in the top three wholesalers in the USA for past 10 years. We have also had stakes in few onshore wind power assets in the USA for a few years now. The higher push for clean power is expected to come initially from more advanced economies such as those in the North-Western Europe, USA, Australia, etc.
In line with the observed and anticipated growth in these markets, Shell has made investments in multiple parts of the power value chain, including solar and offshore wind power generation, power trading, B2C and B2B retail power supply, power storage, electrical vehicle charging, smart home solutions etc. At the end of 2019, Shell’s share of installed renewable generation capacity was 414 MW for solar and 290 MW for onshore and offshore wind combined. The growing demand for clean power is expected to expand in other regions as well in the long-term. Shell has a strong existing customer base in majority of the advanced economies mentioned above, and therefore, developing a power business initially focused on those markets could have a positive impact on our revenue and cash flows. We expect that the growth of power business will aid the decarbonization of our product mix, and therefore, help us progress on the path to achieve our long-term climate ambition to be a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition.

Time horizon
Medium-term

Likelihood
Likely

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)**
1,100,000,000

**Explanation of financial impact figure**
The financial impact figure represents the revenue from our Shell Energy Retail business (renamed from First Utility post acquisition) in 2019. Note: In addition to revenues and operating expenses, other items like purchases, depreciation and tax determine the earnings of business activities. – An audit is progressing at the time of this CDP submission; figures cannot be considered to antedate any certificated information.

**Cost to realize opportunity**
174,000,000

**Strategy to realize opportunity and explanation of cost calculation**

*Strategy to realise opportunity*
We aim to make power the fourth business for Shell that could sit alongside Upstream, IG and Downstream. Our Emerging Power strategic theme, which aims to capture value from the growth in power business, is mapped to our New Energies business within IG. The New Energies portfolio is being built through a combination of organic growth and acquisitions.

We plan to establish our presence across the power value chain. Currently, we see the potential for higher returns at the customer end, helped by new capital-light business models such as EV charging. Hence, trading will sit at the heart of our integrated approach and be an important source of value. We will be involved in generating electricity, with assets, where this adds portfolio value and where the returns meet our criteria, with a preference to be asset-light and buy the balance from other producers.

E.g., in 2019, we:
- acquired electricity suppliers including Hudson Energy Supply UK Limited (UK),
- acquired battery storage systems provider sonnen (Germany),
- acquired stake in renewables developer Cleantech Solar (South-East Asia, India), and
- submitted bid to acquire Dutch sustainable energy provider Eneco, in partnership with PGGM.

The core markets for our power business include Northwest Europe, USA, Australia and select growth markets. We have also set an ambition to provide a reliable electricity supply to 100 million people, primarily in Africa and Asia, by 2030.

*Case study: With the acquisition of First Utility in 2018, Shell began supplying power to residential customers in the UK for the first time. We rebranded First Utility to Shell Energy Retail in 2019. In November 2019, Shell Energy Retail completed the acquisition of Hudson Energy Supply UK*
Limited, which trades as Green Star Energy for consumers and Hudson Energy for businesses. Shell Energy Retail supplies 100% renewable electricity via purchase of certificates, as well as natural gas and smart home technology to more than 900,000 homes in the UK.

Explanation of cost calculation
The operating expenses in our Shell Energy Retail business (formerly First Utility) in 2019 were used as the basis of cost to realize this opportunity. Note: In addition to revenues and operating expenses, other items like purchases, depreciation and tax determine the earnings of business activities.
An audit is progressing at the time of this CDP submission; figures cannot be considered to antedate any certificated information.

Comment

Identifier
Opp2 - Growth of biofuels business

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

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Opportunity: Growth of biofuels business
Biofuels are expected to play an important role in the decarbonisation of aviation, marine and heavy-duty road transport sectors, which makes them a major opportunity for Shell. Going forward, they could be one the key products that Shell will produce and sell either via blending with the existing
products such as petrol and diesel or as independent offerings such as sustainable aviation fuels. Regulatory schemes like CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) are expected to provide a major push to the demand of low carbon fuels across the world. With a sizeable biofuels business in its portfolio, Shell could be very well positioned to respond to this demand. We believe that having a robust biofuels business can have a positive impact on our revenues and market share in the long-term.

In Apr 2020, we announced our new long-term climate ambition of being a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Two out of the three elements of this ambition are: reduction in the Net Carbon Footprint of energy products we sell and working with our customers to reduce the emissions from energy use to net-zero. Currently, Shell’s operating plans and budgets do not reflect the net-zero emissions ambition. Biofuels can contribute significantly to both of these in medium to long term. Currently, Shell has successful first generation (1G) biofuels operations and active second generation (2G) biofuels R&D activities. We are one of the world’s largest producers of lower-carbon biofuels through our Raízen joint venture (Shell interest 50%, not Shell-operated) in Brazil which produces approximately 2 billion litres of ethanol from sugar cane annually. We are also one of the largest blenders and distributors of biofuels worldwide. In 2019, we blended more than 10 billion litres of biofuels into our petrol and diesel worldwide to comply with applicable mandates and targets in the markets where we operate.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
305,000,000

Explanation of financial impact figure
The financial impact figure represents the estimated Shell share (50%) of net income (R$2396 Mn total) from our Raízen joint venture in FY 2019-20. 2019 mid exchange rate of 3.9333 R$ per USD has been used for currency conversion (https://www.poundsterlinglive.com/best-exchange-rates/best-us-dollar-to-brazilian-real-history-2019).
Raízen Energia S.A. and its subsidiaries are mainly engaged in producing, trading sugar, ethanol and pellets, including abroad through its subsidiaries Raízen Trading LLP and Raízen International Universal Corporation, and co-generating energy produced from sugarcane bagasse at its 26 mills located in Brazil's Center-Southern Region and trading business of electricity. The financial impact figure corresponds to entire Raízen group activities, not just the biofuels business.

Cost to realize opportunity

550,000,000

Strategy to realize opportunity and explanation of cost calculation

Strategy to realise opportunity

Biofuels are a part of our New Energies business however their reporting is mapped to Downstream. Our strategy for biofuels growth includes leading the development and deployment of advanced biofuel projects. Firstly, we are investing in new ways to produce advanced biofuels using alternative feedstocks such as forestry, agricultural and municipal waste. We are also looking for opportunities to invest in third-party technologies and to collaborate in scaling these up for commercialisation.

Examples/case studies:
In 2015, Raízen opened its first advanced biofuels plant in Brazil which produced 19.5 million litres of cellulosic ethanol from sugar-cane residues during 2019.
In 2019, we became an equal equity partner in a commercial-scale waste-to-chemicals project called W2C Rotterdam. Our partners plan to build Europe’s first commercial-scale facility for producing chemicals and biofuels from waste materials which cannot otherwise be recycled.

Secondly, we are focusing on building a market for sustainable aviation fuels. We are partnering with fuel suppliers, airports and airlines to support a reliable supply of sustainable aviation fuel.
Examples/case studies:
We plan to support SkyNRG in developing Europe’s first dedicated sustainable aviation fuel production plant.
In 2019, Shell companies signed agreements with airlines including Lufthansa to supply sustainable aviation fuel.
We are also investing in renewable natural gas (RNG) for use in natural-gas-fuelled vehicles in the USA and Europe.

Explanation of cost calculation
The Shell share (50% - not operated by Shell) of operating expenses (Selling, General & Administrative expenses - R$4326 Mn total) in our Raízen joint venture in FY 2019-20 have been used as the basis of cost to realize this opportunity. 2019 mid exchange rate of 3.9333 R$ per USD has been
Raízen Energia S.A. and its subsidiaries are mainly engaged in producing, trading sugar, ethanol and pellets, including abroad through its subsidiaries Raízen Trading LLP and Raízen International Universal Corporation, and co-generating energy produced from sugarcane bagasse at its 26 mills located in Brazil’s Center-Southern Region and trading business of electricity. The cost to realize opportunity figure corresponds to entire Raízen group activities, not just the biofuels business.

Comment

Identifier
Opp3 - Growth of Nature-based Solutions business

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

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Opportunity: Growth of Nature-based Solutions business
As the customers and society are getting more and more inclined towards using low-carbon products and services, Nature-Based Solutions (NBS) are becoming an increasingly attractive option for emissions offsetting for a range of industries and players. Shell is developing low-carbon customer value propositions (CVP) for the customers of our various existing products such as motor fuels, chemicals, LNG., which are supported by nature-based carbon credits. The demand for such CVPs is expected to grow, particularly in more advanced economies such as those in the North-Western Europe, USA, Australia etc.
NBS are expected to play a significant role in offsetting emissions in sectors where these cannot be avoided until the alternative low-carbon solutions and associated technologies are ready for deployment at scale.

Shell has the opportunity to be an early mover in this space by developing its own portfolio of nature-based projects and securing supply positions for high-quality nature-based carbon credits. Currently, we are one of the most established traders of carbon credits in the world. We are offering nature-based carbon credits to our customers in the UK and Netherlands to offset the CO2 emissions generated by the extraction, refining, distribution and use of the Shell fuel they buy.

**Time horizon**
- Medium-term

**Likelihood**
- About as likely as not

**Magnitude of impact**
- Unknown

**Are you able to provide a potential financial impact figure?**
- No, we do not have this figure

**Explanation of financial impact figure**
- We expect that our Nature-based Solutions (NBS) business will primarily have an indirect financial impact on Shell (in form of increased revenue from sale of NBS-enabled low carbon products), rather than a direct financial impact. It is difficult to quantify the indirect financial impact at this point.

**Cost to realize opportunity**
- 350,000,000

**Strategy to realize opportunity and explanation of cost calculation**
- Strategy to realize opportunity
  - One of our New Energies business activities is market development and portfolio growth of nature-based solutions (NBS). Additionally, our Environmental Products Trading Business is responsible for trading and retirement of NBS credits. We believe that accelerating the deployment of NBS requires collaboration between governments, industry, investors and wider society. Hence, we are calling on governments to recognise and ensure the eligibility of these nature-based emission reductions in their carbon pricing mechanisms, including under the Paris Agreement, to support
this emerging and necessary market. To generate demand and establish customer willingness to pay for NBS credits, we are developing robust CVPs under which emissions are mitigated in a 3-step approach: avoid, reduce and compensate. NBS carbon credits are used for the last step i.e. to compensate the remaining emissions for associated products. Also, we are selling standalone NBS credits to customers who want to mitigate their own emissions (there’s no association with Shell products in this case).

We buy our carbon credits from a global portfolio of nature-based projects which are certified to standards, such as the Verified Carbon Standard. For example:
- In the UK, we are working with the government in Scotland to generate carbon credits by helping to plant or regenerate around 1 million trees over the next 5 years.
- In the Netherlands, we are working with the Dutch state forestry service to plant more than 5 million trees over the next 12 years.
- In Spain, we plan to reforest 300 hectares of degraded land as part of an agreement with Land Life Company.

Case study: In 2019, we started to offer customers nature-based carbon credits to offset the CO2 emissions generated by the extraction, refining, distribution and use of the Shell fuel they buy. We launched the programme at around 400 service stations in the Netherlands, and about 1,000 service stations in the UK.

An overview of other activities where we use these NBS credits is as follows:
- We are offering NBS credits to business customers operating heavy-duty and light-duty fleets in 10 countries across Europe and Asia.
- We delivered the world’s first carbon-neutral LNG cargoes to Tokyo Gas and GS Energy.

Explanation of cost calculation
Shell’s ambition is to invest around $350 million in our NBS business during 2020-22. This figure is based on our expectations at the end of 2019.

**Comment**

**Identifier**

Opp4 - Sustenance and growth of Integrated Gas business

**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

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Opportunity: Sustenance and growth of Integrated Gas business
Natural gas is expected to be the transition fuel during ongoing transformation of the energy system. It is expected to meet around 40% of additional energy demand up to 2040. 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, in addition to our New Energies portfolio. Shell is a world-wide leader in LNG. Currently, it provides around 3% of the world's natural gas.

In 2019, gas accounted for around half of our total production. Our aim is to expand the role of natural gas as a cleaner burning fuel. We expect that, in combination with renewables and the use of CCS, natural gas will be critical in significantly lowering our own as well as our customers' greenhouse gas emissions. Switching from diesel and heavy-fuel oil to LNG would be an effective way to reduce GHG emissions from trucks and ships.

Hence, we are producing cleaner-burning LNG for use as maritime and land transport fuel known as Downstream LNG (DLNG). Our IG business is very well positioned to cater to the existing and anticipated growth of gas demand all across the world. It already provides a significant and resilient free cash flow to the group and we expect it to continue to do so in future as well.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

**Potential financial impact figure (currency)**
96,000,000

**Explanation of financial impact figure**
The financial impact figure represents the revenue from our subsidiary Gasnor in 2019.
Note: In addition to revenues and operating expenses, other items like purchases, depreciation and tax determine the earnings of business activities.

**Cost to realize opportunity**
31,000,000

**Strategy to realize opportunity and explanation of cost calculation**

**Strategy to realise opportunity**
We intend to grow our IG business and deliver substantial cash and returns, with natural gas helping Shell thrive in the transition to a cleaner energy system. To make sure this business achieves its full potential, our strategy for natural gas rests on 3 pillars:
1) We want to maintain our market leading position in LNG. We are building on a position of strength which is based on an unmatched LNG supply portfolio, a top-notch trading, marketing and optimisation organisation, and 22% share of worldwide LNG sales. We plan to lead in creating new pockets of demand by accessing currently unserved geographies, creating new global markets such as fuelling ships and trucks, and mining the adjacency to our growing Power business.
2) We want to run the IG engine and deliver superior cash flows enabled by operational excellence. We plan to invest in our existing assets and to replace declining assets in order to sustain the high levels of cash flow.
3) We want to grow the IG engine. We plan to make investments to create free cash flow growth from new advantaged positions during the second half of the coming decade. We plan to pursue the most competitive projects emerging from our healthy funnel of LNG projects, and to complement these with inorganic opportunities and options to grow our GTL footprint.

We plan to further improve the carbon footprint of our own operations. Our LNG Canada project, which we sanctioned in 2018, is designed to achieve the lowest carbon intensity of any LNG project currently in operation around the world. Some other examples include:
- Reshaping of our portfolio with the acquisition of BG Group (2016),
- Acquisition of Gasnor, a Norwegian company which provides LNG fuel for ships and industrial customers (2012).
Case study: Prelude FLNG in Australia (67.5% Shell interest) is one of our flagship IG projects, with production capacity of at least 5.3 mtpa of liquids (including LNG, condensate and LPG). During 2019, the facility progressed through the start-up ramp-up phase, with the first condensate offtake in March 2019, followed by the first LNG offtake in June 2019 and the first NGL offtake in July 2019.

Explanation of cost calculation
The operating expenses in our subsidiary Gasnor in 2019 have been used as the basis of cost to realize this opportunity.
Note: In addition to revenues and operating expenses, other items like purchases, depreciation and tax determine the earnings of business activities.

Comment

C3. Business Strategy

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?
Yes, and we have developed a low-carbon transition plan

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?
Yes, qualitative and quantitative

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

<table>
<thead>
<tr>
<th>Other, please specify</th>
<th>Details</th>
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<tbody>
<tr>
<td>IPCC Special Report 1.5°C (SR 1.5) scenarios</td>
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<tr>
<td><a href="https://data.ene.iiasa.ac.at/iamc-1.5c-explorer/#/login">https://data.ene.iiasa.ac.at/iamc-1.5c-explorer/#/login</a></td>
<td>Shell’s Net Carbon Footprint (NCF) is a measure of the emissions intensity of the portfolio of energy products sold by Shell. The intended use of the metric is to track progress in reducing the overall emissions intensity of Shell’s energy products portfolio. We have used the database developed for the IPCC Special Report on Global Warming of 1.5°C (SR 1.5) to recalibrate our NCF ambition. The scenarios in this database are categorised according to their temperature outcome and degree of overshoot (refers to the extent to which a scenario exceeds an emissions budget and subsequently relies on sinks</td>
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</tbody>
</table>
to compensate for the excess emissions. The time horizon considered in this exercise extends in the long-term. As Shell wants to move forward in alignment with the Paris goals, having this long-term horizon in our consideration is important as it helps to stretch management thinking. We have selected the 1.5°C scenarios which focused on earlier action and placed less reliance on the use of sinks. We calculated the footprint of the energy mix in each of the individual scenarios in a similar way that we calculate the footprint of the mix of energy products sold by Shell. Having established the NCF of both Shell and the mix of energy products in a range of scenarios using a comparable measure, we were able to compare how both Shell and the global energy product-mix might need to change to meet the goal of the Paris Agreement. This showed that by 2050, the footprint of the energy-mix in the global energy system needs to reduce by around 50% to 80%. Hence, in April 2020, we significantly raised our long-term ambition to reduce the NCF of the energy products we sell by 65% relative to the 2016 baseline by 2050, placing us within the range defined by the 1.5°C scenarios from SR 1.5. We aim to reduce our NCF by around 30% by 2035 as an interim measure. In this way Shell’s ambition is designed to be consistent with the Paris Agreement. This is part of our new long-term climate ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition. The next strategy update, detailing some of the next steps including the revision of business plans, is planned for later in 2020.

Shell Sky, 2018

Shell’s current scenarios
Shell has been developing scenarios for over 40 years to challenge executives’ perspectives on the future business environment. Today, our three main scenarios are called Mountains (2013), Oceans (2013) 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 Mountains, strong governments and powerful economic actors work together to create stability and maintain their own interests. In contrast, in Oceans, competitive markets and a strong private sector are the main engines of change. Both Mountains and Oceans scenarios unfolded in an open-ended way based upon plausible assumptions and quantifications and fall short of the temperature goal of the Paris Agreement. Hence, in 2018, we published Sky scenario which was specifically designed to reach the Paris Agreement’s goal of holding the global average temperature rise in this century to well below 2°C, in a technically possible manner. Sky scenario explores the various aspects of the global energy system and therefore, by definition, covers Shell’s entire energy products portfolio. The time horizon considered in our scenario exercise extends very much in the long-term i.e. up to the end of 21st century. As Shell wants to move forward in alignment with the Paris Agreement goals, having this long-term horizon in our consideration is important as it helps to stretch management thinking.
Outcome of Sky scenario analysis
In addition to the supply and demand of different energy sources, Sky scenario provides a view of how technology, consumers preferences and regulatory environment could evolve along the way. Under the Sky scenario, changes in energy demand emerge in the 2020s, and significantly impact the energy system in the 2030s and beyond. The demand for oil starts to decline globally after 2025 but still grows in some countries, including India and China until the middle of the century. The demand for gas peaks around the middle of the 2030s and falls by 0.5% per year for the rest of the decade. The demand for electric vehicles rises quickly in the next few decades. Electricity exceeds 50% of end-use energy consumption by 2070. And finally, the world reaches net-zero CO2 emissions from the energy system by 2070.

Shell’s Net Carbon Footprint (NCF) is a measure of the emissions intensity of the portfolio of energy products sold by Shell. The intended use of the metric is to track progress in reducing the overall emissions intensity of Shell’s energy products portfolio. In 2017, we used Sky and IEA’s ETP 2017 to determine the reduction in the NCF of the energy system needed to achieve a reasonable chance of limiting global warming to well below 2°C. This was used to establish our previous long-term NCF ambition.

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

<table>
<thead>
<tr>
<th>Have climate-related risks and opportunities influenced your strategy in this area?</th>
<th>Description of influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products and services</td>
<td>Yes</td>
</tr>
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</table>

Influence on strategy for business area
Our strategic ambition of thriving in the energy transition is directly related to this business area. This ambition is about remaining relevant and resilient in a changing global energy system. It is also about finding the business value in the energy transition. It influences our actions for our traditional businesses as well as for our ‘emerging’ energy transition opportunities such as power, biofuels, hydrogen, NBS etc. As indicated in our responses to C2.3a and C2.4a questions of this document, for thriving in the energy transition, our product mix needs to transform in the
medium to long-term. As a company, we are adjusting our businesses to meet changing demand in different countries and adapting our products to match the needs of our local customers. 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. It is likely to mean more renewable power, biofuels, EV charging points; more natural gas for power, industry and transport; helping further advance technology to capture and store carbon safely underground; and helping develop natural carbon sinks to help compensate for those emissions that society will find harder to avoid.

For example, through our Shell Energy Retail business, we supply renewable electricity as well as natural gas and smart home technology. We blend biofuels with other fuels such as petrol and diesel. We are expanding our charging network worldwide. We are taking early steps to grow a network of hydrogen fuelling stations in Europe and North America, where we are part of several initiatives to encourage the adoption of hydrogen in transport.

Influence on strategic decision

One of our major strategic decisions that was influenced by climate-related risks and opportunities was the acquisition of First Utility in 2018. It helped us in extending the range of products we offer to our customers whereby renewable electricity is now offered as standard to all existing and new Shell customers in the UK, along with discounts at Shell service stations. The outcome of our Sky scenario analysis, which shows that electricity could exceed 50% of end-use energy consumption by 2070, has influenced our decision to grow the power business.

Supply chain and/or value chain

Yes

Influence on strategy for business area

In November 2017, Shell announced its Net Carbon Footprint ambition (NCF) to reduce the carbon intensity of the energy products we sell by around 50% by 2050. NCF is a carbon intensity measure that takes into account the estimated full lifecycle emissions, including those related to imported energy and use of our products. Also included are emissions from elements of this lifecycle that are not owned by Shell. It was calibrated to the Paris Agreement’s goal of restricting global warming to well-below 2 °C. Shell stands within a section of society that needs to move faster. Furthermore, regulators in some advanced economies such as the EU and the UK have already started pushing for net-zero emissions. In order to maintain our societal licence to operate, we need to meet the expectations of our customers and society. Also, for thriving in the energy transition, our product mix needs to transform in the medium to long-term. Hence, in April 2020, we raised our long-term ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition. One of the three elements of this new ambition is to work with our customers to decarbonise energy use, by helping them reduce emissions from their use of our energy products to
<table>
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<tr>
<th>Investment in R&amp;D</th>
<th>Yes</th>
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**Influence on strategy for business area**

Technology and innovation are essential to our efforts to meet the world’s energy demands in a competitive way. In order to thrive in the energy transition, we need to continue to develop or deploy technology and new products. We continue to invest in research and development (R&D) to improve the efficiency of our products, processes and operations, and to commercialise technologies for the transition to a low-carbon energy future.

In 2019, our R&D expenses across all businesses (Upstream, Downstream, Integrated Gas/New Energies) were $962 million. We started work on over 220 R&D projects with universities. Many of these projects focus on areas that are crucial for low-carbon energy systems, such as biomass, renewable power and electrochemical batteries. For example, we successfully completed a one-year pilot project to separate carbon dioxide (CO2) from the exhaust gases of a biomass power plant in Vienna, Austria. Also, we successfully produced chemicals using a liquid feedstock made from plastic waste. For Shell, measuring the level of CO2 absorbed by natural carbon sinks such as forests, grasslands and wetlands, is an essential tool that’ll help us in measuring the carbon uptake of our nature-based solutions so that we can offer carbon credits to our customers transparently. Together with the University of Exeter, UK, we are developing and field-testing advanced measuring equipment that continuously monitors the carbon uptake in a natural ecosystem.

**Influence on strategic decision**

One of our major strategic decisions that was influenced by climate-related risks and opportunities was the acquisition of ERM Power in 2019. ERM Power is one of Australia’s leading commercial and industrial electricity retailers. This acquisition builds on Shell Energy Australia’s existing gas marketing and trading capability. Our focus on extending our presence within power value chain is influenced by the outcome of our Sky scenario analysis which shows that oil and gas would comprise a smaller share of the energy consumption in the long-term whereas electricity will emerge as a major source of energy for end-use.
One of our major strategic decisions that was influenced by climate-related risks and opportunities was the investment in development of CCUS technology. In Norway, we are a partner in the Northern Lights project which aims to develop ways to transport and store CO2 for industry across Europe. Our Cansolv technology has been selected for the CO2 capture at an energy-from-waste plant as part of this project. We also work with the Oil and Gas Climate Initiative (OGCI), a voluntary CEO-led group that focuses on this technology among others. Our focus on developing and maturing this technology has been reinforced by the outcome of climate change scenarios produced by organisations such as IEA, IPCC and Shell which show that a large component of CCS is required to achieve the goals of the Paris Agreement.

<table>
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<tr>
<th>Operations</th>
<th>Yes</th>
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Influence on strategy for business area
We need to meet the increasing expectations of our customers and society at large. Failure to do so exposes us to various legal, regulatory and reputational risks. In particular, the risk of evolving carbon pricing mechanisms can lead to a negative impact on our operational costs. Today, we operate in more than 70 countries. The energy system is expected to evolve differently in different countries and economic sectors, and the business risks and opportunities are expected to vary significantly.

In April 2020, we significantly raised our long-term ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition. One of the three elements of this new ambition is to be net-zero on all the emissions from the manufacture of all our products (Scope 1 & 2) by 2050 at the latest. It includes the emissions created by our operations and also those associated with the energy we consume. We are monitoring our electricity use, making our equipment more efficient through regular and smart scheduling of maintenance and by seeking opportunities to use renewable energy sources. For example, in Upstream, we have reduced fuel consumption by about 40% and air emissions by around 20-25% at our Appomattox platform in the Gulf of Mexico, USA. We actively consider the use of CCS to reduce emissions from our projects.

We use our framework for GHG management in projects to evaluate options to drive our GHG intensity performance. Our planning process helps to guide our decisions on technology and whether to move ahead with a project. Projects and facilities that produce more than 50,000 tonnes of GHG emissions a year are required to have a GHG and energy management plan.

Influence on strategic decision
One of our major strategic decisions that was influenced by climate-related risks and opportunities was aiming to use more renewable power at our own sites. This includes offices, retail sites, distribution terminals, refineries and offshore platforms. For example, we opened one of the largest on-site solar parks (20 MW peak capacity) at our Moerdijk chemicals plant in Netherlands and installed solar panels at seven lubricant plants worldwide.

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

<table>
<thead>
<tr>
<th>Financial planning elements that have been influenced</th>
<th>Description of influence</th>
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<tbody>
<tr>
<td>Revenues</td>
<td>Capital expenditures and allocation</td>
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<tr>
<td>Direct costs</td>
<td>The transition to lower-carbon energy requires major changes to industrial, commercial and residential infrastructure. This takes time and substantial investment. Our annual planning cycle and periodic portfolio reviews aim to ensure that our levels of capital investment and operating expenses are appropriate in the context of a volatile price environment. Our capital discipline gives us greater flexibility for investments in the future. We assess opportunities against a breadth of strategic, financial and non-financial criteria, which drives consistency and discipline in our capital allocation. Out of the expected total cash capital expenditure during 2021-25, we plan to spend a significant portion in clean energy related strategic themes, i.e. Integrated Gas and Power. The scale-up of power investment during 2021-25 is subject to the conditions of being on track to be self-funded by 2030, investments hitting agreed financial milestones, and demonstrating 8-12% returns in the on-stream integrated power business.</td>
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<tr>
<td>Indirect costs</td>
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<tr>
<td>Capital expenditures</td>
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<td>Capital allocation</td>
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<td>Acquisitions and divestments</td>
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<td>Access to capital</td>
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<td>Assets</td>
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<td>Liabilities</td>
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<tr>
<td>Direct and indirect costs</td>
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<tr>
<td>As mentioned earlier, our annual planning cycle and periodic portfolio reviews aim to ensure that our levels of capital investment and operating expenses are appropriate in the context of a volatile price environment. To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. We use short, medium and long-term estimates of country-specific future carbon costs which are reviewed and updated on an annual basis. By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020).</td>
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<tr>
<td>Acquisitions and divestments</td>
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We assess our portfolio decisions, including divestments and investments, against potential impacts from the transition to lower-carbon energy. 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. Following the successful delivery of our $30 billion divestment programme during 2016-18, divestments are expected to amount to more than $10 billion over the 2019-2020 period. So far, we have high-graded our portfolio through divestment of oil sands in Canada, Martinez refinery in California, interest in refining JV SASREF in Saudi Arabia, onshore oil and gas interests in Gabon, and simplified our operations in many other countries. On the other hand, we have made several acquisitions in our Integrated Gas and New Energies businesses. This includes BG, electricity retailers like First Utility, Hudson Energy Supply UK Limited and ERM Power, renewable developers like Cleantech Solar, power storage company sonnen and EV charging players like NewMotion and Greenlots.

Assets and liabilities
We consider the resilience of our portfolio in the medium term by exploring potential ranges of oil prices and their implications for our cash flows. These ranges go beyond the prices implied by our three main scenarios – Mountains, Oceans and Sky. 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.

In our sector, it is essential to have a resilient balance sheet to manage volatility. When industry conditions are favourable, we plan to reduce gearing to build resilience, so we can use this flexibility during the trough of the business cycle to retain a resilient balance sheet or make counter-cyclical investments if the right opportunities surface. This way we remain competitive through the cycle and ensure strong sustainable shareholder distributions.

Case study
Post the acquisition of BG in 2016, we sought to reduce our cost base and achieve group synergies. At this point, we also sought to reduce internal complexity. This has had a number of effects. We reduced the number of people required to do the same work and we gave people larger roles and greater accountability. At the same time, we built more capability with our Business Operation Centres in Manila, Kuala Lumpur, Chennai, Bangalore and Krakow. Combined, our support functions, such as HR, IT and Finance, together with our Projects & Technology organisation, lowered their costs by almost $5.5 billion during 2016-19.
(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

**Business decision**
In April 2020, Shell announced its new long-term climate ambition to become a net zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, Shell’s operating plans and budgets do not reflect the net-zero emissions ambition. Global society, overall, may have until around 2060 to reach net zero emissions. But Shell recognises that it stands within a section of society that needs to move faster. And so that is what we intend to do.

Our new ambition comprises of three elements and we aim to:
1) be net-zero on all emissions from the manufacture of all our products (scope one and two) by 2050 or sooner;
2) reduce the Net Carbon Footprint of the energy products we sell by 30% by 2035 and 65% by 2050 compared with our 2016 level, in step with society’s progress to align with the goals of the Paris Agreement;
3) work with our customers to decarbonise energy use, by helping them reduce emissions from their use of our energy products to net-zero by 2050 or sooner.

**What does it mean for Shell?**
To achieve our ambition, Shell must pivot towards serving the businesses and sectors that, by 2050, are net zero emissions themselves. It means that Shell’s business might undergo a shift over the next 30 years. Our recalibrated climate ambitions are yet to be incorporated in our business plans. The next strategy update, detailing some of the next steps including the revision of business plans, is planned for later in 2020.

**Influence of climate related risks and opportunities**
Shell recognizes that society’s attitude towards climate change is shifting fast and that Shell itself stands within a section of society that needs to move faster. Hence, it has decided to go further with its own climate ambitions, aligning itself with a 1.5° Celsius scenario. Furthermore, regulators in some advanced economies such as the EU and the UK have already started pushing for net-zero emissions. Going forward, potential similar developments in other key locations might lead to similar or more stringent regulatory conditions on Shell’s operations and products. Alongside these risks, climate change also presents opportunities for Shell to capitalize on the expected growth in demand for low-carbon products. Together, these and other relevant climate related risks and opportunities have highly influenced Shell’s decision to set a net-zero emissions energy business ambition.

**Alignment with company strategy**
Our new climate ambition strongly supports our strategic ambitions of thriving in the energy transition and maintaining a strong societal license to operate. Firstly, thriving in the energy transition is about remaining relevant and resilient in a changing global energy system and creating business value as the world transitions to a low-carbon future. With this ambition in place, our strategy and business plans will be directed more towards cleaner energy.
next strategy update, detailing some of the next steps, is planned for later in 2020. Secondly, by recalibrating our Net Carbon Footprint ambition such that it is in step with the large sections of society that want to achieve a 1.5°C future, we have reemphasised our strong commitment towards achieving Paris Agreement’s progressive goals. This could have a positive impact on our societal license to operate.

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**

**Year target was set**
2014

**Target coverage**
Site/facility

**Scope(s) (or Scope 3 category)**
Scope 1

**Base year**
2015

**Covered emissions in base year (metric tons CO2e)**
3,400,000

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**
4.7
Target year
2025

Targeted reduction from base year (%)
25

Covered emissions in target year (metric tons CO2e) [auto-calculated]
2,550,000

Covered emissions in reporting year (metric tons CO2e)
2,570,908

% of target achieved [auto-calculated]
97.54023529411765

Target status in reporting year
Achieved

Is this a science-based target?
No, but we are reporting another target that is science-based

Please explain (including target coverage)
Abs1 - 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 captured and safely stored more than 1.1 million tonnes of carbon dioxide from the Scotford Upgrader in 2019. 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. In its first four years of operations, Quest captured and safely stored more than 4 million tonnes of CO2, ahead of schedule.

Target reference number Abs 2: WORLD BANK ZERO ROUTINE FLARING BY 2030 INITIATIVE

Year target was set
2015

Target coverage
Company-wide

Scope(s) (or Scope 3 category)
Scope 1

Base year
2015

Covered emissions in base year (metric tons CO2e)
7,400,000

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)
10.28

Target year
2030

Targeted reduction from base year (%)
100

Covered emissions in target year (metric tons CO2e) [auto-calculated]
0

Covered emissions in reporting year (metric tons CO2e)
1,400,000

% of target achieved [auto-calculated]
81.0810810811
Target status in reporting year
Underway

Is this a science-based target?
No, but we are reporting another target that is science-based

Please explain (including target coverage)
Abs2 - World Bank Zero Routine Flaring by 2030 initiative
(Annual Report 2019, p98) In 2015, we signed up to the World Bank's Zero Routine Flaring by 2030 initiative. This is an important initiative to ensure that all stakeholders, including governments and companies, work together to address routine flaring. Flaring, or burning off, of gas in our Upstream and Integrated Gas businesses contributed around 8% of our overall direct GHG emissions in 2019. Around 25% of this flaring took place at facilities where there was no infrastructure to capture the gas produced with oil, known as associated gas. Around 35% of flaring in our Upstream and Integrated Gas facilities in 2019 took place in assets operated by The Shell Petroleum Development Company of Nigeria Limited (SPDC). Flaring from SPDC-operated facilities fell by around 20% between 2015 and 2019. Flaring intensity levels in SPDC in 2019 increased by around 10% compared to 2018. SPDC continues to make progress in close collaboration with its joint-venture partners and the Federal Government of Nigeria towards the objective of ending the continuous flaring of associated gas. Two new gas-gathering projects (Adibawa and Otumara) came on stream at the end of 2017, followed by two more (the Forcados Yokri Integrated Project and Southern Swamp Associated Gas Gathering Solutions) in 2019."

Target reference number Abs 3: Net Zero Emissions, Scope 1 + 2, market-based

Year target was set
2020

Target coverage
Company-wide

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)

Base year
2019
| **Covered emissions in base year (metric tons CO2e)** | 80,000,000 |
| **Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)** | 100 |
| **Target year** | 2050 |
| **Targeted reduction from base year (%)** | 100 |
| **Covered emissions in target year (metric tons CO2e) [auto-calculated]** | 0 |
| **Covered emissions in reporting year (metric tons CO2e)** | 80,000,000 |
| **% of target achieved [auto-calculated]** | 0 |
| **Target status in reporting year** | New |
| **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 |
| **Please explain (including target coverage)** | Abs3 – Net Zero Emissions, Scope 1 + 2, market-based |
| | Although this is not a target, in April 2020, Shell announced its new long-term climate ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. This includes the ambition to be net-zero on all the emissions from the manufacture of all our products (Scope 1 and 2) by 2050 at the latest. |
Shell aims to be net-zero on all the emissions from the manufacture of all our products, including non-energy products. That includes our operational emissions (Scope 1) and the emissions associated with the energy we consume through those operations (Scope 2). Shell will track and report on progress towards achieving net-zero emissions from its operations. Currently, Shell’s operating plans and budgets do not reflect the net-zero emissions ambition.

Note: The methodology for assessing Science Based Targets for O&G does not exist yet. Shell is part of the technical working group for development of the same.

**Target reference number Abs 4: NZE ENERGY BUSINESS AMBITION**

**Year target was set**

2020

**Target coverage**

Company-wide

**Scope(s) (or Scope 3 category)**

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

**Base year**

2019

**Covered emissions in base year (metric tons CO2e)**

1,646,000,000

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**

100

**Target year**

2050

**Targeted reduction from base year (%)**

100

**Covered emissions in target year (metric tons CO2e) [auto-calculated]**
Covered emissions in reporting year (metric tons CO2e)
1,646,000,000

% of target achieved [auto-calculated]
0

Target status in reporting year
New

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

Please explain (including target coverage)
Abs4 - Net Zero Emissions (NZE) Energy Business ambition
Although this is not a target, in April 2020, Shell announced its new long-term climate ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, Shell’s operating plans and budgets do not reflect the net-zero emissions ambition. Global society, overall, may have until around 2060 to reach net-zero emissions. But Shell recognises that it stands within a section of society that needs to move faster. And so that is what we intend to do.
Our new ambition comprises of three elements and we aim to:
1) be net-zero on all emissions from the manufacture of all our products (Scope 1 and 2) by 2050 or sooner;
2) reduce Net Carbon Footprint (NCF) of the energy products we sell by 30% by 2035 and 65% by 2050 compared with our 2016 level, in step with society’s progress to align with the goals of the Paris Agreement;
3) work with our customers to decarbonize energy use, by helping them reduce emissions from their use of our energy products to net-zero by 2050 or sooner.
Shell will track and report on progress in achieving both the aim to reduce the NCF of the energy products it supplies, as well as progress towards achieving net-zero emissions from its operations.
Shell will also work to develop a method for tracking and reporting emission reduction by its customers, this will require the development of appropriate accounting methodologies and frameworks.
While the NCF is an intensity measure and not an inventory of absolute emissions, a notional estimate of the amount of CO2e emissions covered by the scope of the NCF calculation can be derived from the final Net Carbon Footprint value for any year. The 'covered emissions in base year' value presented is the total CO2e emissions estimated using Shell's NCF value and the estimate of total delivered energy, currently estimated as 1646 million metric ton CO2e for Reporting year 2019, which is taken as the base year CO2e emissions estimated for NZE Energy Business ambition.

Note that this estimated value is calculated from the portfolio average intensity value, which is determined in Shell's NCF calculation. It is only intended to give an indication of the scope of the emissions included within Shell's NCF; it does not represent an inventory of emissions.

(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 (NCF) TARGET 2021

Year target was set
2019

Target coverage
Company-wide

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

Intensity metric
Other, please specify: Grams of CO2 equivalent per megajoule

Base year
2016

Intensity figure in base year (metric tons CO2e per unit of activity)
79

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
100
Target year
2021

Targeted reduction from base year (%)
2

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
77.42

% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
78

% of target achieved [auto-calculated]
63.29113924050633

Target status in reporting year
Underway

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

Please explain (including target coverage)
Int1 - Net Carbon Footprint (NCF) target 2021
Intensity metric: Grams CO2e per megajoule consumed
In November 2017, Shell announced its NCF ambition.
This was the first time any oil and gas company had announced an ambition that included not only its operational emissions, but also the emissions of its customers when they use its energy products.
This was followed up by introducing short-term targets for our NCF and by linking those targets to the pay of executives. We are already on the way to achieving our first short-term target. The first short term target was to reduce our NCF by 2-3% by 2021. In 2019, Shell’s energy products had a NCF of 78 grams of CO2-equivalent per megajoule of energy consumed, compared to 79 grams previously. This is a reduction of more than 1%. In April 2020, we significantly raised our long-term ambition to become a net-zero emissions energy business by 2050 or sooner, in step with society and together with our customers. Currently, our operating plans and budgets do not reflect the net-zero emissions ambition. As a part of this overall ambition, we have recalibrated our NCF ambition so that it is in step with the large sections of society that want to achieve a 1.5°C Celsius future. To achieve this ambition Shell intends to reduce the NCF of the energy products we supply by 30% by 2035 and by 65% by 2050.

In short, our 2017 NCF ambition meant seeking to radically transform Shell to establish new business opportunities. It meant finding new ways of running a financially sustainable business. Our new ambition still means all of this. But it means moving much faster.

Shell has three strategic ambitions: to be a world-class investment case, to thrive in the energy transition to a lower-carbon future and to maintain a strong societal license to operate.

All of them are of equal importance to the future of Shell. Our NCF ambition serves Shell’s three strategic ambitions.

NCF Methodology – high level description:
Shell’s NCF is a measure of the emissions intensity of the portfolio of energy products sold by Shell. The intended use of the metric is to track progress in reducing the overall emissions intensity of Shell’s energy products portfolio, as described in Shell’s NCF ambition.

For more detailed information on the NCF Methodology, see 4.1b, target Int2, part of this CDP submission.

<table>
<thead>
<tr>
<th>Target reference number</th>
<th>Int 2: Net Carbon Footprint (NCF) target 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year target was set</td>
<td>2020</td>
</tr>
<tr>
<td>Target coverage</td>
<td>Company-wide</td>
</tr>
<tr>
<td>Scope(s) (or Scope 3 category)</td>
<td>Scope 1+2 (location-based) + 3 (upstream and downstream)</td>
</tr>
<tr>
<td>Intensity metric</td>
<td></td>
</tr>
</tbody>
</table>
Other, please specify: Grams of CO2e per megajoule

**Base year**
2016

**Intensity figure in base year (metric tons CO2e per unit of activity)**
79

**% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure**
100

**Target year**
2022

**Targeted reduction from base year (%)**
3

**Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]**
76.63

**% change anticipated in absolute Scope 1+2 emissions**
0

**% change anticipated in absolute Scope 3 emissions**
0

**Intensity figure in reporting year (metric tons CO2e per unit of activity)**
78

**% of target achieved [auto-calculated]**
42.19409282700422

**Target status in reporting year**
Underway
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.

Please explain (including target coverage)
Int2 - Net Carbon Footprint (NCF) target 2022
In early 2020, we decided to set a NCF target for 2022 of 3-4% lower than our 2016 NCF of 79 grams of CO2 equivalent per megajoule. In addition, from 2020, some 16,500 staff at Shell will have their remuneration linked to these short-term targets.

NCF Methodology - details:
The calculation of the NCF includes:
- emissions directly from Shell operations associated with the production and processing of energy products;
- emissions generated by third parties who supply energy to us;
- our customers’ emissions from their use of our energy products; and
- carbon offsets such as reforestation as well as carbon capture and storage (CCS) emissions reduction.
Also included are emissions from elements of this life cycle not owned by Shell, such as oil and gas that we process but do not produce, or from oil products and electricity marketed by Shell that have not been processed or generated at a Shell facility.
A detailed description of Shell’s NCF methodology is available on our website:

For more detailed information on the NCF announcements, see 4.1b, target Int1, part of this CDP submission.

Additional notes (applicable to intensity targets INT1 and INT2):
- LRQA Assurance statement: For the 2019 reporting year, NCF 78 gCO2/MJ, Carbon offsets equivalent to 2.2 million tonnes CO2 were included in the 2019 NCF calculation. Estimated GHG emissions covered by the NCF calculation in 2019: 1,646 M CO2e, the estimated proportion of the 2019 NCF outcome is 2.2/ 1,646 = 0.13%
- 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 3-4% reduction by 2022 (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.
Target reference number Int 3: Refining GHG intensity

Year target was set
2019

Target coverage
Business activity

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)

Intensity metric
Other, please specify: Tonnes of CO2 equivalent per Solomon's Utilised Equivalent Distillation Capacity (UEDC)

Base year
2018

Intensity figure in base year (metric tons CO2e per unit of activity)
1.05

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
39.14

Target year
2019

Targeted reduction from base year (%)
0

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
1.05
% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
1.06

Target status in reporting year
Achieved

Is this a science-based target?
No, but we are reporting another target that is science-based

Please explain (including target coverage)
Int3 – Refining GHG intensity
This is an annual target covering the calendar year 01/01/2019 to 31/12/2019.
(Sustainability Report 2019) For our refineries, our 2019 target was to reduce GHG intensity to 1.06 tonnes or below of CO2 equivalent per Solomon’s Utilised Equivalent Distillation Capacity (UEDC). Refinery GHG intensity in 2019 was 1.06 tonnes CO2e per UEDC compared with 1.05 in 2018.

Target reference number Int 4: Chemicals GHG intensity

Year target was set
2019

Target coverage
Business activity

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)
Intensity metric

Other, please specify: Tonnes CO2 equivalent per tonne of petrochemicals produced

Base year

2018

Intensity figure in base year (metric tons CO2e per unit of activity)

0.96

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

9.61

Target year

2019

Targeted reduction from base year (%)

0

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.96

% change anticipated in absolute Scope 1+2 emissions

0

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

1.04

Target status in reporting year

Expired

Is this a science-based target?
No, but we are reporting another target that is science-based

Please explain (including target coverage)
Int4 - Chemicals GHG intensity
This is an annual target covering the calendar year 01/01/2019 to 31/12/2019. (Sustainability Report 2019) For our chemical plants, our 2019 target was to reduce GHG intensity to 1.00 tonnes or below of CO2 equivalent per tonne of high-value petrochemicals produced. Chemicals GHG intensity was 1.04 tonnes CO2 equivalent per tonne of high-value petrochemicals produced in 2019 compared with 0.96 in 2018.

Target reference number Int 5: Upstream / Integrated Gas GHG intensity

Year target was set
2019

Target coverage
Business activity

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)

Intensity metric
Other, please specify: Tonnes CO2 equivalent per tonne of product

Base year
2018

Intensity figure in base year (metric tons CO2e per unit of activity)
0.158

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
37.24
Target year
2019

Targeted reduction from base year (%)
0

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
0.158

% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
0.168

Target status in reporting year
Achieved

Is this a science-based target?
No, but we are reporting another target that is science-based

Please explain (including target coverage)
Int5 - UPSTREAM / INTEGRATED GAS, GHG INTENSITY
This is an annual target covering the calendar year 01/01/2019 to 31/12/2019.
(Sustainability Report 2019) For our Upstream and Integrated Gas facilities, our 2019 target was to achieve a GHG intensity of 0.168 tonnes or below of CO2 equivalent per tonne of hydrocarbon production available for sale. Our Upstream and Integrated Gas GHG intensity was 0.168 tonnes CO2 equivalent per tonne of hydrocarbon production available for sale in 2019 compared with 0.158 in 2018.

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Target(s) to reduce methane emissions

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number Oth 1: Methane emissions intensity

Year target was set
2018

Target coverage
Business activity

Target type: absolute or intensity
Intensity

Target type: category & Metric (target numerator if reporting an intensity target)
Methane reduction target: Total methane emissions in m³

Target denominator (intensity targets only)
Other, please specify: Gas available for sale in m³

Base year
2018

Figure or percentage in base year
0.09

Target year
2025

Figure or percentage in target year
0.2
Figure or percentage in reporting year
0.08

% of target achieved [auto-calculated]
-9.090909090909092

Target status in reporting year
Underway

Is this target part of an emissions target?
n.a.

Is this target part of an overarching initiative?
Other, please specify: Target is based on the work of an industry coalition which developed the Methane Guiding Principles (Sustainability Report 2019, p44/45).

Please explain (including target coverage)
Methane emissions intensity
Annual Report 2019: In 2018, Shell announced a target to maintain its methane emissions intensity below 0.2% by 2025. This target covers all Shell-operated Upstream and Integrated Gas oil and gas facilities. The baseline and target intensities are expressed as percentage figures, representing estimated methane emissions from Shell-operated gas and oil facilities as a percentage of the total amount of gas marketed, or the quantity of marketed oil and condensate where facilities have no marketed gas (e.g. those that re-inject produced gas). Methane emissions include those from unintentional leaks, venting and incomplete combustion, for example in flares and turbines. In 2019, our overall methane intensity was 0.08% for facilities with marketed gas and 0.01% for facilities without marketed gas. Intensities at facility level ranged from below 0.01% to 1.3%. We believe our methane emissions are calculated using the best methods currently available: a combination of industry standard emission factors (established emission 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 to further enhance data quality and reporting, continue implementation of leak detection and repair programmes, and make use of methane abatement opportunities. By 2025, all Shell-operated facilities 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.
(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.

<table>
<thead>
<tr>
<th>Initiative Status</th>
<th>Number of Initiatives</th>
<th>Total Estimated Annual CO2e Savings in Metric Tonnes CO2e (only for rows marked *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under investigation</td>
<td>160</td>
<td>6,147,400</td>
</tr>
<tr>
<td>To be implemented*</td>
<td>72</td>
<td>1,019,410</td>
</tr>
<tr>
<td>Implementation commenced*</td>
<td>98</td>
<td>1,256,030</td>
</tr>
<tr>
<td>Implemented*</td>
<td>55</td>
<td>907,670</td>
</tr>
<tr>
<td>Not to be implemented</td>
<td>12</td>
<td>11,348,000</td>
</tr>
</tbody>
</table>

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

**Initiative category & Initiative type**
- Energy efficiency in production processes
- Process optimization

**Estimated annual CO2e savings (metric tonnes CO2e):** 158,600

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 21,000,000

**Investment required (unit currency – as specified in C0.4):** 0

**Payback period:** No payback
**Estimated lifetime of the initiative:** 6-10 years

**Comment**
(Integrated Gas)
Operational improvements in QSGTL including
1) upgrade of catalyst reducing generation and subsequent combustion of Heavy Paraffin Synthesis Offgas,
2) efficiency due to commissioning of new Natural Gas heaters,
3) commenced lower emissions mode associated with ethane extraction from process.

**Initiative category & Initiative type**
Energy efficiency in production processes
Other, please specify
Flare abatement projects in QSGTL, including: 1) Purge reduction in sour and HP flare systems 2) Nitrogen purge measurement in flare headers implemented 3) Operational excellence improvements on site

**Estimated annual CO2e savings (metric tonnes CO2e):** 69,900

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 0

**Investment required (unit currency – as specified in C0.4):** 7,600,000

**Payback period:** No payback

**Estimated lifetime of the initiative:** 16-20 years

**Comment**
(Integrated Gas)
Flare abatement projects in QSGTL, including:
1) Purge reduction in sour and HP flare systems,
2) Nitrogen purge measurement in flare headers implemented,
3) Operational excellence improvements on site.

Initiative category & Initiative type
Energy efficiency in production processes
Other, please specify: Routing TEG (dehydration units) stripping gas vents to flare system in QGC Upstream. Multi-year programme across central processing plants

Estimated annual CO2e savings (metric tonnes CO2e): 102,300
Scope(s): Scope 1
Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 0
Investment required (unit currency – as specified in C0.4): 150,000
Payback period: No payback
Estimated lifetime of the initiative: 11-15 years

Comment
(Integrated Gas)
Routing TEG (dehydration units) stripping gas vents to flare system in QGC Upstream. Multi-year programme across central processing plants

Initiative category & Initiative type
Energy efficiency in production processes
Other, please specify: Target Zero Flaring during turnarounds for QGC Upstream
Estimated annual CO2e savings (metric tonnes CO2e): 47,900

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 0

Investment required (unit currency – as specified in C0.4): 0

Payback period: No payback

Estimated lifetime of the initiative: 11-15 years

Comment
(Integrated Gas)
Target Zero Flaring during turnarounds for QGC Upstream

Initiative category & Initiative type
Energy efficiency in production processes
Other, please specify: Well workover duration optimisation at QGC Upstream

Estimated annual CO2e savings (metric tonnes CO2e): 613,000

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 0

Investment required (unit currency – as specified in C0.4): 0

Payback period: No payback
**Estimated lifetime of the initiative:** 11-15 years

**Comment**

(Integrated Gas)
Well workover duration optimisation at QGC Upstream

**Initiative category & Initiative type**

Energy efficiency in production processes
Other, please specify: GTG spinning reserves optimization; Ensuring adherence to the GK operating philosophy of running two GTG’s and have one on standby to provide a reduction of fuel gas.

**Estimated annual CO2e savings (metric tonnes CO2e):** 114,923.58

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 227,778

**Investment required (unit currency – as specified in C0.4):** 2,700,000

**Payback period:** 16-20 years

**Estimated lifetime of the initiative:** 16-20 years

**Comment**

(Upstream)
GTG spinning reserves optimization; Ensuring adherence to the asset’s operating philosophy of running two GTG’s and have one on standby to provide a reduction of fuel gas.

**Initiative category & Initiative type**
Other, please specify: Flaring reductions

**Estimated annual CO2e savings (metric tonnes CO2e):** 43,200

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 2,571,429

**Investment required (unit currency – as specified in C0.4):** 0

**Payback period:** No payback

**Estimated lifetime of the initiative:** 16-20 years

**Comment**

(Upstream)

Flaring reductions

---

**Initiative category & Initiative type**

Energy efficiency in production processes

Other, please specify: Project optimizes gas lift process, reduces time to complete the activity and increases production

**Estimated annual CO2e savings (metric tonnes CO2e):** 29,200

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 3,153,864

**Investment required (unit currency – as specified in C0.4):** 9,000,000
Payback period: 1-3 years

Estimated lifetime of the initiative: 11-15 years

Comment
(Upstream)
Project optimizes gas lift process, reduces time to complete the activity and increases production.

Initiative category & Initiative type
Other, please specify: Flaring reduction

Estimated annual CO2e savings (metric tonnes CO2e): 27,300

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 1,275,862

Investment required (unit currency – as specified in C0.4): 8,200,000

Payback period: 4-10 years

Estimated lifetime of the initiative: 21-30 years

Comment
(Upstream)
Flaring Reduction; installation of eco vapor oxygen catalyst to ensure sales gas meets gas specification.

Initiative category & Initiative type
Other, please specify: Project reduces flaring through routine maintenance of equipment
**Estimated annual CO2e savings (metric tonnes CO2e):** 16,900

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 50,000

**Investment required (unit currency – as specified in C0.4):** 100,000

**Payback period:** 1-3 years

**Estimated lifetime of the initiative:** 11-15 years

**Comment**
- (Upstream)
  - Project reduces flaring through routine maintenance of equipment.

**Initiative category & Initiative type**
- Energy efficiency in production processes
- Other, please specify: Improves carbon competence of employees

**Estimated annual CO2e savings (metric tonnes CO2e):** 15,700

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 10,333,333

**Investment required (unit currency – as specified in C0.4):** 0

**Payback period:** No payback
**Estimated lifetime of the initiative:** 11-15 years

**Comment**
(Upstream)
Improves carbon competence of employees

**Initiative category & Initiative type**
Other, please specify: Flaring reduction

**Estimated annual CO2e savings (metric tonnes CO2e):** 15,300

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 538,095

**Investment required (unit currency – as specified in C0.4):** 100,000

**Payback period:** <1 year

**Estimated lifetime of the initiative:** 21-30 years

**Comment**
(Upstream)
This project reduces flaring across various projects.

**Initiative category & Initiative type**
Energy efficiency in production processes
Other, please specify: Project optimizes choke system on wells
Estimated annual CO2e savings (metric tonnes CO2e): 14,000

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 3,500,000

Investment required (unit currency – as specified in C0.4): 0

Payback period: No payback

Estimated lifetime of the initiative: 11-15 years

Comment
(Upstream)
Project optimizes choke system on wells.

Initiative category & Initiative type
Energy efficiency in production processes
Other, please specify: Various projects that increase energy efficiencies

Estimated annual CO2e savings (metric tonnes CO2e): 13,433.33

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 231,250

Investment required (unit currency – as specified in C0.4): 3,400,000

Payback period: 11-15 years
**Estimated lifetime of the initiative:** 16-20 years

**Comment**
(Upstream)
Various projects that increase energy efficiencies.

**Initiative category & Initiative type**
Energy efficiency in production processes
Other, please specify: Project implements energy efficiency systems

**Estimated annual CO2e savings (metric tonnes CO2e):** 12,700

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 161,538

**Investment required (unit currency – as specified in C0.4):** 200,000

**Payback period:** 1-3 years

**Estimated lifetime of the initiative:** 11-15 years

**Comment**
(Upstream)
Project implements energy efficiency systems.

**Initiative category & Initiative type**
Other, please specify: Upgrade of equipment
Estimated annual CO2e savings (metric tonnes CO2e): 12,403.71

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 123,810

**Investment required (unit currency – as specified in C0.4):** 200,000

**Payback period:** 1-3 years

**Estimated lifetime of the initiative:** 21-30 years

**Comment**

(Upstream)

Project reduces emissions from processing systems, power generation and fired heaters due to decommissioning of equipment.

**Initiative category & Initiative type**

Energy efficiency in production processes

Other, please specify: Reduce waterflood manifold injection pressure to reduce energy required for injection pumps, thereby reducing fuel gas consumption

Estimated annual CO2e savings (metric tonnes CO2e): 12,262

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 438,462

**Investment required (unit currency – as specified in C0.4):** 0
Payback period: No payback

Estimated lifetime of the initiative: 11-15 years

Comment
(Upstream)
Reduce waterflood manifold injection pressure to reduce energy required for injection pumps, thereby reducing fuel gas consumption.

Initiative category & Initiative type
Other, please specify: Conversion of low-pressure vent to flare.

Estimated annual CO2e savings (metric tonnes CO2e): 9,348.26

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 0

Investment required (unit currency – as specified in C0.4): 7,500,000

Payback period: No payback

Estimated lifetime of the initiative: 16-20 years

Comment
(Upstream)
This project sends low pressure gas to flare.

Initiative category & Initiative type
Other, please specify: Project corrects various venting across operated ventures.
Estimated annual CO2e savings (metric tonnes CO2e): 8,300

Scope(s): Scope 1
Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 82,310,526
Investment required (unit currency – as specified in C0.4): 700,000
Payback period: <1 year
Estimated lifetime of the initiative: 16-20 years

Comment
(Upstream)
Project reduces venting across throughout operates areas.

Initiative category & Initiative type
Other, please specify: Project reduces operational flaring at an asset through operational changes.

Estimated annual CO2e savings (metric tonnes CO2e): 7,700
Scope(s): Scope 1
Voluntary/Mandatory: Voluntary
Annual monetary savings (unit currency – as specified in C0.4): 0
Investment required (unit currency – as specified in C0.4): 0
Payback period: No payback
Estimated lifetime of the initiative: 16-20 years
Comment
(Upstream)
Project reduces operational flaring through operational changes.

Initiative category & Initiative type
Other, please specify: Project provides vent to flare projects and installs compressor at an asset.

Estimated annual CO2e savings (metric tonnes CO2e): 6,400
Scope(s): Scope 1
Voluntary/Mandatory: Voluntary
Annual monetary savings (unit currency – as specified in C0.4): 11,300,000
Investment required (unit currency – as specified in C0.4): 700,000
Payback period: <1 year
Estimated lifetime of the initiative: 16-20 years
Comment
(Upstream)
Project provides vent to flare projects and installs compressor to reduce flaring.

Initiative category & Initiative type
Other, please specify: Multiple projects that reduce venting across unconventional assets

Estimated annual CO2e savings (metric tonnes CO2e): 6,300
Scope(s): Scope 1
Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 681,081

Investment required (unit currency – as specified in C0.4): 500,000

Payback period: 1-3 years

Estimated lifetime of the initiative: 16-20 years

Comment
(Upstream)
This project focuses reducing venting across multiple projects across multiple assets.

Initiative category & Initiative type
Other, please specify: This project encompasses several flare reduction projects across the operated ventures.

Estimated annual CO2e savings (metric tonnes CO2e): 6,300

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 0

Investment required (unit currency – as specified in C0.4): 100,000

Payback period: No payback

Estimated lifetime of the initiative: 16-20 years

Comment:
(Upstream)
Project encompasses several flare reduction projects across operated ventures.

**Initiative category & Initiative type**
Other, please specify: Project cleans tanks to improve diesel quality based on suspected diesel contamination.

**Estimated annual CO2e savings (metric tonnes CO2e):** 5,800

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 2,200,000

**Investment required (unit currency – as specified in C0.4):** 500,000

**Payback period:** 4-10 years

**Estimated lifetime of the initiative:** 11-15 years

**Comment**
(Upstream)
Project cleans tanks to improve diesel quality based on suspected diesel contamination.

**Initiative category & Initiative type**
Energy efficiency in production processes
Other, please specify: Automation of processes

**Estimated annual CO2e savings (metric tonnes CO2e):** 3,900

**Scope(s):** Scope 1
Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 500,000

Investment required (unit currency – as specified in C0.4): 0

Payback period: No payback

Estimated lifetime of the initiative: 11-15 years

Comment
(Upstream)
Projects provide energy reductions through automation of processes.

Initiative category & Initiative type
Other, please specify: Project encompasses several projects across the ventures that focus on operational energy efficiency.

Estimated annual CO2e savings (metric tonnes CO2e): 3,900

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 9,600,000

Investment required (unit currency – as specified in C0.4): 1,700,000

Payback period: 4-10 years

Estimated lifetime of the initiative: 6-10 years

Comment
(Upstream)
Project encompasses several projects across the ventures that focus on operational energy efficiency.

**Initiative category & Initiative type**
Other, please specify: Project reduces emissions from processing systems, power generation and fired heaters due to decommissioning of equipment

**Estimated annual CO2e savings (metric tonnes CO2e):** 3,360

**Scope(s):** Scope 1

**Voluntary/Mandatory:** Voluntary

**Annual monetary savings (unit currency – as specified in C0.4):** 68,750

**Investment required (unit currency – as specified in C0.4):** 200,000

**Payback period:** 1-3 years

**Estimated lifetime of the initiative:** 16-20 years

**Comment**
(Upstream)
Project reduces emissions from processing systems, power generation and fired heaters due to decommissioning of equipment.

**Initiative category & Initiative type**
Energy efficiency in production processes
Other, please specify: Project improves energy efficiency across various deep-water assets

**Estimated annual CO2e savings (metric tonnes CO2e):** 1,850
Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 2,556,757

Investment required (unit currency – as specified in C0.4): 300,000

Payback period: <1 year

Estimated lifetime of the initiative: 16-20 years

Comment
(Upstream)
Project improves energy efficiency across various deep-water assets

Initiative category & Initiative type
Energy efficiency in production processes
Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e): 46,800

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 6,000,000

Investment required (unit currency – as specified in C0.4): 10,000,000

Payback period: 1-3 years

Estimated lifetime of the initiative: 16-20 years
Comment
(Downstream)
Internals of a steam turbine for a refrigeration compressor were redesigned, fabricated, and installed during a unit turnaround. This resulted in improved energy efficiency and increased process unit capacity.

Initiative category & Initiative type
Energy efficiency in production processes
Process optimization

Estimated annual CO2e savings (metric tonnes CO2e): 8,500

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 400,000

Investment required (unit currency – as specified in C0.4): 0

Payback period: No payback

Estimated lifetime of the initiative: 6-10 years

Comment
(Downstream)
Optimisation of circulation of lean amine, which resulted in reduced steam requirements for rich amine regeneration.

Initiative category & Initiative type
Energy efficiency in production processes
Waste heat recovery
Estimated annual CO2e savings (metric tonnes CO2e): 7,420

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 235,000

Investment required (unit currency – as specified in C0.4): 940,000

Payback period: 4-10 years

Estimated lifetime of the initiative: 16-20 years

Comment
(Downstream)
Replacement of an end-of-life heat exchanger with upgraded metallurgy and installation of a larger pump with double the flow. The tubes were upgraded to SS to improve fouling resistance.

Initiative category & Initiative type
Energy efficiency in production processes
Waste heat recovery

Estimated annual CO2e savings (metric tonnes CO2e): 6,720

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 1,700,000

Investment required (unit currency – as specified in C0.4): 4,000,000
Payback period: 1-3 years

Estimated lifetime of the initiative: 16-20 years

Comment
(Downstream)
Addition of four new welded plates and frame heat exchangers for improved heat recovery.

Initiative category & Initiative type
Energy efficiency in production processes
Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e): 5,100

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 245,000

Investment required (unit currency – as specified in C0.4): 4,800,000

Payback period: 16-20 years

Estimated lifetime of the initiative: 16-20 years

Comment
(Downstream)
A 1950's vintage steam turbine was replaced with a new, higher efficiency turbine during a unit turnaround. The current financial benefit is about half what was planned due to reduced revenue (lower fuel prices).
Initiative category & Initiative type
   Energy efficiency in production processes
   Waste heat recovery

Estimated annual CO2e savings (metric tonnes CO2e): 1,500

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary

Annual monetary savings (unit currency – as specified in C0.4): 84,000

Investment required (unit currency – as specified in C0.4): 74,000

Payback period: <1 year

Estimated lifetime of the initiative: 16-20 years

Comment
   (Downstream)
   The heat source for a reboiler was changed from 250 psig steam to 40 psig steam via piping modifications. This allowed low level heat recovery into boiler feed water.

Initiative category & Initiative type
   Energy efficiency in production processes
   Waste heat recovery

Estimated annual CO2e savings (metric tonnes CO2e): 1,330

Scope(s): Scope 1

Voluntary/Mandatory: Voluntary
**Annual monetary savings (unit currency – as specified in C0.4):** 265,000

**Investment required (unit currency – as specified in C0.4):** 550,000

**Payback period:** 1-3 years

**Estimated lifetime of the initiative:** 16-20 years

**Comment**

(Downstream)
Replaced two heat exchanger bundles with twisted tubes technology, which have 30% more surface area/tube. Material was upgrade from CS to 316 SS for fouling/corrosion resistance.

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

<table>
<thead>
<tr>
<th>Method</th>
<th>Comment</th>
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<tr>
<td>Internal price on carbon</td>
<td>(Annual Report 2019, p93) To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions. In 2018, to help us stay in step with society’s progress toward the goals of the Paris Agreement, we switched from using a flat project screening value (PSV) of $40/tonne of GHG emissions, to country-specific estimates of future carbon costs. By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020). These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. They are the first NDCs under the Paris Agreement and are scheduled to be revised every five years. Therefore, as countries update their NDCs, we expect to update our estimates too. Accordingly, we believe they are a more accurate reflection of society’s current implementation of the Paris Agreement. The UN 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 to meet the goals of the Paris Agreement. We further test the robustness of our high-emitting projects by using long-term carbon cost estimates that are consistent with limiting the average global temperature rise to well below 2°C. Projects under development that are expected to have a material GHG footprint must meet carbon performance standards or industry benchmarks to allow them to compete and prosper in a more GHG constrained future. These assessments can lead to projects being stopped, designs being changed, and potential GHG mitigation investments being identified, in preparation for when regulation would</td>
</tr>
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</table>
make these investments commercially compelling. Our approach continues to evolve with the shifting policy landscape and the differing pace of energy transitions in different regions.

| Internal incentives/recognition programs | (Annual Report 2019, p92) The Remuneration Committee (REMCO) is responsible for determining the Directors’ Remuneration Policy in alignment with our business strategy. In 2019, following recommendations by SESCo, REMCO continued to include GHG intensity metrics in annual bonus performance measures and targets. In December 2018, Shell announced plans to link executive remuneration to short-term targets to reduce the Net Carbon Footprint of the energy products we sell, including our customers’ emissions from their use of our energy products. In 2019, following discussions with major shareholders and based on recommendations from SESCo, REMCO decided to add an energy transition condition to the 2019 Long-Term Incentive Plan (LTIP) award. This condition included our first three-year target aligned with the trajectory of our long-term Net Carbon Footprint ambition. It also featured other measures linked to our strategic ambitions, including the growth of Shell’s power business, the commercialisation of advanced biofuel technology, and the development of sinks to capture and store carbon. See “Directors’ Remuneration Report” on pages 155-163 of our Annual Report 2019. The Shell employee scorecard structure for determining employees’ annual bonus in 2019 was consistent with the Executive Directors’ scorecard. The energy transition condition in the 2019 LTIP awards applies to around 150 Senior Executives as well as the Executive Directors. The energy transition condition was included again in the 2020 LTIP awards for Executive Directors and Senior Executives, and will be extended to approximately 16,500 employees across the Group who receive Performance Share Plan awards. For the 2020 award, the target range is a 3-4% reduction in NCF against the 2016 baseline NCF (79 grams of CO2 equivalent per megajoule). This target range is aligned with the trajectory of our NCF ambition as set out in November 2017. The targets for the other leading energy transition measures are commercially sensitive, and will be disclosed retrospectively. Annual updates on our progress in relation to measures will be provided. |

| Partnering with governments on technology development | (Sustainability Report 2019, p7) Our strategy is to strengthen our position as a leading energy company by providing oil, gas and low-carbon energy products and services as the world’s energy system transforms. Safety and social responsibility are fundamental to our business approach. Shell will only succeed by working collaboratively with customers, governments, business partners, investors and other stakeholders. Our strategy is founded on our outlook for the energy sector and the chance to grasp the opportunities arising from the substantial changes in the world around us. The rising standard of living of a growing global population is likely to continue to drive demand for energy for years to come. The world will need to find a way to meet this growing demand, while transitioning to a lower carbon energy system to counter climate change. While liquid and gaseous fuels, including biofuels and hydrogen, will continue to be an important part of the energy mix, over time electricity needs to play a bigger part in the world if it is to meet the goals of the Paris Agreement. Technological advances and the need to tackle climate change mean there is a transition under way to a lower-carbon, multi-source energy system with increasing customer choice. We recognise that the pace and the path forward are uncertain and so require agile... |
decision-making. For more details on our business strategy, see the Strategy and outlook section in our Annual Report.

(Sustainability Report 2019, p11) Support for international agreements: we welcome the UN Sustainable Development Goals which seek to tackle the world’s economic, social and environmental challenges by 2030. We aim to play our part in helping governments and society to achieve them.

(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:** Group of products

**Description of product/Group of products**
(Annual Report 2019, p95) Biofuels
In 2019, we used around 10.1 billion litres of biofuel in our gasoline and 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 throughout the production chain. Currently, most available biofuels are produced from cereals, vegetable oils and sugar cane. From cultivation to use, some biofuels can emit significantly less CO2 compared with conventional gasoline. But this depends on several factors, such as how the feedstock is cultivated and the way biofuels are produced. Other challenges include concerns over labour rights, the amount of water used in the production process, and the competing demands for land use between biofuels and food crops.

Raízen, our joint venture in Brazil (Shell interest 50%), produces ethanol from sugar cane, with an annual production capacity of more than 2.5 billion litres; exports sugar, with an annual production of about 3.8 million tonnes; and manages a retail network.

**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: Shell Net Carbon Footprint model (quantification and tracking of GHG emissions from entire life cycle of energy products including produced by Shell but also sold by Shell, including those sourced from 3rd parties, see link in comment box.)

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

Comment
Sustainability Report 2019, p51/52
Turning waste into fuel
Most biofuels are produced from agricultural crops, such as corn, sugar cane or vegetable oil. Our main focus for biofuels development and investment is in using waste, inedible crops or forestry products.
In 2019, we announced that we will support SkyNRG to develop Europe’s first dedicated sustainable aviation fuel production plant by bringing our technical and commercial expertise to the development of the plant. Once operational, the plant will produce 100,000 tonnes of fuel made from waste cooking oil and will run on sustainable hydrogen.
The combined benefits of the feedstocks, sustainable hydrogen and low-carbon energy used to power production are expected to make the life-cycle carbon emissions of the plant’s sustainable aviation fuel 85% lower than conventional jet fuels, as estimated by the Roundtable on Sustainable Biomaterials. Read more about the plant at www.shell.com/shell-aviation-supports-skynrg.

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-food plants.


Level of aggregation: Group of products
Description of product/Group of products
(Sustainability Report 2019, p50) Solar
We are expanding our solar power generation business by investing in the development and operation of long-term commercial and industrial solar projects, including at our own sites. At the end of 2019, our share of solar installed capacity was 414 MW and 442 MW in development. Read more about our operations and investments in solar power at www.shell.com/energy-and-innovation/new-energies/solar. In 2019, we acquired a 49% interest in Singapore-based Cleantech Solar, which owns and operates around 145 megawatts (MW) of installed capacity and has 178 MW of signed and in-development capacity for commercial and industrial customers in India and across South-East Asia. We also acquired an interest of 49% in ESCO Pacific, one of Australia’s most successful solar development and asset management firms. The company has delivered nearly 500 MW of solar projects and has 350 MW under long-term management. In 2018, we acquired a 43.83% interest in Silicon Ranch, a leading US developer, owner and operator of solar assets. In 2019, Silicon Ranch announced the launch of a programme that combines clean electricity generation with carbon sequestration and ecosystem restoration. To help consumers generate, store and redistribute low-carbon electricity, we also bought sonnen, a leader in intelligent energy storage.

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: Shell Net Carbon Footprint model (quantification and tracking of GHG emissions from entire life cycle of energy products including produced by Shell but also sold by Shell, including those sourced from 3rd parties, see link in comment box.)

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

Comment

Level of aggregation: Product

Description of product/Group of products
(Sustainability Report 2019, p48/49) Wind
We are expanding our operations in wind power to make more renewable power available to our customers. At the end of 2019, the Shell share of total installed capacity combined from onshore and offshore wind was 290 megawatts (MW) with 2,196 MW in development.
Visit www.shell.com/energy-and-innovation/new-energies/wind to find out more about our work in wind power.
We have interests in offshore wind projects with the potential to generate nearly 5 gigawatts of power once constructed (total installed capacity, with some projects still to receive a final investment decision).
Shell has four onshore wind projects in operation in the USA and one offshore project in operation in the Netherlands.
We also have interests in three wind projects under development – two in the USA, Atlantic Shores Offshore Wind joint venture (Shell interest 50%) and the Mayflower Wind Energy joint venture (Shell interest 50%); and one in the Netherlands, the Blauwwind Consortium (Shell interest 20%).
Construction of the Borssele III and IV offshore wind project by the Blauwwind Consortium began in 2019. The wind farm project is designed to have a total installed capacity of 731.5 MW, enough to power 825,000 Dutch homes. Shell has an agreement to buy and trade half the electricity produced from Borssele.
In 2019, the Mayflower Wind Energy joint venture was chosen by the state of Massachusetts to supply 804 MW of renewable energy to electricity customers.
In 2019, we acquired EOLFI, a French renewable energy developer specialising in floating wind power. Floating wind technology could open up more locations for offshore wind. They include areas further from shore and where greater water depths do not allow for traditional foundations.

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: Shell Net Carbon Footprint model (quantification and tracking of GHG emissions from entire life cycle of energy products including produced by Shell but also sold by Shell, including those sourced from 3rd parties, see link in comment box.)

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

Comment
We continue to invest in floating technology turbine technologies and take part in several joint industry initiatives to boost innovation in this area, as well as demonstration projects.

**Level of aggregation:** Group of products

**Description of product/Group of products**
Producing engine efficiency fuels, fuel saving lubricants, light saving asphalts

**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 2019, p53) Energy-efficient products
Shell V-Power petrol and diesel and Shell Helix engine oil increase engine efficiency by burning more cleanly and reducing friction and wear. These products lubricate and protect millions of vehicle engines worldwide every day.
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 car CO2 emissions by up to 4%.
For heavy-duty vehicles, Shell Rimula engine lubricants help heavy-duty diesel engines reduce friction to improve fuel economy and therefore reduce CO2 emissions.
Read more about our fuels and lubricants at www.shell.com/motorist
We are also developing new technologies that create more durable, sustainable and energy-efficient roads. Using our clear bitumen in a light-coloured asphalt, for example, can reduce the need for lighting in tunnels by up to 40% without affecting driver visibility,
Level of aggregation: Product

Description of product/Group of products
Carbon Capture and Storage: captured CO2 is offloaded to a CO2 transportation operation and securely stored at a permanent sequestration facility. The stored CO2 is verified through a robust monitoring and verification system.
Sustainability Report 2019, p45
CARBON CAPTURE AND STORAGE
We invest in projects to capture and store carbon dioxide (CO2) and we are exploring new ways of using CO2 once it has been captured. These are crucial steps to help us achieve our ambition to reduce the Net Carbon Footprint of the energy products we sell by around half by 2050, in step with society’s drive to reduce greenhouse gas emissions as it moves towards the goals of the Paris Agreement.
The majority of climate change scenarios produced by organisations such as IEA, IPCC and Shell require a large component of carbon capture and storage (CCS) in order to achieve the Paris goals. We recognise the scale of the challenge in developing CCS globally as quickly and as widely as needed.
Shell is participating in seven of the 51 large-scale CCS projects globally, listed by the Global CCS Institute.
Since 2015, we have operated 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 more than 4 million tonnes of CO2, ahead of schedule.

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
Other, please specify: Other, please specify: Shell Net Carbon Footprint model (quantification and tracking of GHG emissions from entire life cycle of energy products including produced by Shell but also sold by Shell, including those sourced from 3rd parties, see link in comment box.)

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

Comment

Level of aggregation: Product

Description of product/Group of products
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 and liquids exploration and extraction, and the operation of upstream and midstream infrastructure that delivers gas and liquids to market. It markets and trades natural gas, LNG, electricity and carbon emission rights, and markets and sells LNG as a fuel for heavy-duty vehicles and marine vessels.

Note: Our Integrated Gas organisation covers two strategic themes: Integrated Gas, which is a Leading Transition theme; and New Energies, which includes the Emerging Power theme.

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 natural gas and low-carbon sources such as wind and solar.

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: Shell Net Carbon Footprint model (Quantification and tracking of GHG emissions from entire life cycle of energy products including produced by Shell but also sold by Shell, including those sourced from 3rd parties, see link in comment box.)

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

11.97

Comment

Note: calculation basis for % revenue:

(Annual Report 2019, p18, Segmental Reporting)
Total revenue across all segments: $344,877 million.
Revenue from Integrated Gas, excluding inter-segment sales: $45,602 million.
= Revenue %, based on the above: about 11.97%.

(Annual Report 2019, p46)

Portfolio and business development
Key portfolio events in 2019 included:
■ In December 2018, we formed two joint ventures: with EDF Renewables to build wind farms off the New Jersey coast; and with EDP Renewables (EDPR) to build wind farms off Massachusetts, USA. Leases were granted by the authorities for JV with EDF in December 2018 and with EDPR in February 2019. In November, Massachusetts state authorities selected our JV with EDPR (Shell interest 50%) to develop and supply 804 MW of clean, renewable energy from offshore wind to the electricity customers in the state;
■ In February, we acquired sonnen, a provider of smart energy storage systems;
■ In November, we acquired ERM Power, one of Australia’s leading commercial and industrial electricity retailers.

Major milestones reached in 2019:
■ the first shipment of LNG sailed from our Prelude Floating Liquefied Natural Gas facility (Shell interest 67.5%);
■ the first of 10 Moveable Modular Liquefaction System (MMLS) Units started up at Elba Island in Savannah, Georgia, USA;
■ FID was taken for the Barracuda Project (Shell interest 100%), a subsea tie-back of two gas wells to an existing platform on the East Coast of Trinidad.

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

**Methane strategy**
(Sustainability Report 19, p44) Our target is to maintain methane emissions intensity below 0.2% by 2025. This covers all Upstream and Integrated Gas oil and gas assets for which Shell is the operator.
(AR 2019, p94) We are working to reduce methane emissions by reducing the overall level of flaring and venting. We continue to implement leak detection and repair programmes across our sites to identify high-emission equipment, such as high-bleed pneumatic devices, so they can be replaced or repaired. We work on confirming that we have identified all potential methane sources and that we have reported our emissions from these sources in line with regulations and industry standards.

**Methane emission performance**
(Annual Report 19, p94) Methane emissions include those from unintentional leaks, venting and incomplete combustion, e.g., in flares/turbines. In 2019, our overall methane intensity was 0.08% for facilities with marketed gas and 0.01% for facilities without marketed gas. Intensities at facility level ranged from below 0.01% to 1.3%.
In 2019, our total methane emissions were 91 thousand tonnes compared with 92 thousand tonnes in 2018, in part driven by divestments (e.g., in Iraq and Canada). Methane emissions were less than 5% of Shell’s GHG emissions on a CO2-equivalent basis. More than 60% of our reported methane emissions in 2019 came from flaring and venting in our upstream and midstream operations.

**Example programmes and activities**

In 2019, we conducted a full leak source inventory at four facilities to improve detection and, at the same time, the accuracy of our reporting. At the Pearl GTL (gas-to-liquids) plant in Qatar (Qatar Shell GTL Ltd, QSGTL) we scanned 33,000 components to ensure that any methane emissions were detected and repaired.

At the Shell-operated QGC site in Australia, we safely reduced the time spent maintaining the site’s 2,600 wells, resulting in less methane venting into the atmosphere during work. This improvement in procedures reduced methane emissions by around 4,000 tonnes in the six months from Jul-Dec 2019.

In 2019, Shell partnered up with GHGSat to obtain methane emissions data of certain agreed Shell facilities globally leading to a better understanding of our emissions from our side demonstrating the satellite technology and the reliability of the data recovered.

**Methane initiatives and collaborations**

We encourage industry-wide action on methane emissions reduction by participating in a number of voluntary initiatives, including:

- the Methane Guiding Principles coalition, which Shell founded in 2017. The Methane Guiding Principles are an international multi-stakeholder partnership between industry and non-industry organizations with a focus on priority areas for action across the natural gas supply chain, from production to the final consumer. The Principles commit Shell, amongst many things, to maintain plans to systematically monitor and reduce methane emissions from identified sources in our existing operated assets, and we will prioritise higher emitting operations. The partnership’s growing membership includes major international and national oil companies and associate signatories such as the Environmental Defense Fund, Rocky Mountain Institute and the World Bank;
- we continue to work with Oil and Gas Climate Initiative, which has set a methane intensity target for their members of 0.25% by 2025. This would reduce collective methane emissions by 350,000 tonnes annually compared with the 2017 baseline; and
- the Oil and Gas Methane Partnership, founded by the Climate and Clean Air Coalition, whose principles we are using to enhance our methane emissions reporting.

Shell participates in the Collaboratory to Advance Methane Science (CAMS), an industry-led collaborative research consortium working to advance methane science to better understand global methane emissions and the need for additional solutions. Shell has implemented three separate programmes into our operations. These programmes are designed to further reduce emissions of methane and volatile organic compounds.

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, USA 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. Since the Challenge was launched, more than 20 technologies in early stages of development have been screened and tested to reduce methane emissions.
In following our global operating principles to develop shale resources safely and responsibly, we have existing voluntary leak detection and repair programmes across all Shell shale gas sites.

(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.

Source inventory:
Before methane leaks can be stopped, the sources must first be identified. To do this, we use a broad range of methods and technologies. These include implementing leak detection and repair programmes and using the best available technologies – such as optical gas imaging cameras – to reduce methane emissions at our sites.

Our target is to maintain methane emissions intensity below 0.2% by 2025. This target covers all Upstream and Integrated Gas oil and gas assets for which Shell is the operator. In 2019, 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 2019 ranged from below 0.01% to 1.3%.

Practical examples:
In 2019, we conducted a full leak source inventory at certain facilities to improve detection and, at the same time, the accuracy of our reporting. At the Pearl GTL (gas-to-liquids) plant in Qatar (Qatar Shell GTL Ltd, QSGTL) we scanned 33,000 components to ensure that any methane emissions were detected and repaired.
At a Shell-operated QGC site in Australia, we safely reduced the time spent maintaining the site’s 2,600 wells, which resulted in less methane venting into the atmosphere during work. This improvement in procedures reduced methane emissions by around 4,000 tonnes in the six months from July to December 2019.

LDAR Recommended Practice:
We updated our recommended practice for LDAR in 2019 to support our assets in improving the identification, quantification and repair of methane emissions from leaks and abnormally operating equipment. It was redesigned to reflect evolving approaches, our methane commitments and to help LDAR practitioners within our assets find the tools and gain the knowledge they need to successfully reduce methane leaks with their methane improvement programmes in 2019, we have updated our guidelines for LDAR programmes.

The LDAR Recommended Practice is structured around eight key messages:
• 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: Conduct Emission detection for LDAR using surveys should be performed via Optical Gas Imaging (OGI) cameras or other equivalent proven detection technology (unless regulation such as EPA Method 21 applies). Monitor emerging technologies that may ultimately deliver more accurate results cost effectively.

• Component Inventory: Develop and field verify an inventory of all applicable components. Provide each component with a unique identifier and keep the inventory up to date in accordance with the Shell Management of Change process.

• Frequency, Survey and Repair: 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, conduct LDAR within 60 days of turnaround, commissioning/start-up, but preferable during start-up and turnaround. Set repair response based on risk prioritization, but with initial repair preferably immediate.

• 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. Measurement that provides equivalent or more accurate emissions reporting is encouraged, as feasible.

• Data Quality, Records & Audits: Incorporate quality assurance and quality control practices into the LDAR programme. Verify reported fugitive emissions as part of assurance process.

• Continuous Improvement: Establish and continuous improvement program with KPIs to track effectiveness. Pair LDAR programme with preventative / predictive maintenance and equipment selection programmes.

We use LDAR programmes across Shell, with varying levels of maturity and complexity. LDAR programme improvements continue to be featured in business and asset-specific greenhouse gas improvement programs to help achieve our methane, and broader greenhouse gas, aspirations and commitments.

(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.

(Sustainability Report 2019) We are working to reduce flaring, which wastes valuable resources and contributes to climate change. Flaring is used to safely dispose of hydrocarbons that could pose a hazard to workers, nearby residents and facility equipment during non-routine occurrences. These occurrences include start-ups, maintenance turnarounds and power failures where production system pressure must be safely relieved. Gas produced alongside oil, known as associated gas, may also be flared when there are insufficient or no facilities to gather the gas.

*Flaring performance*
Flaring of gas in our Upstream and Integrated Gas businesses contributed around 8% to our overall direct greenhouse gas emissions in 2019. Flaring increased to 5.9 million tonnes of carbon dioxide equivalent in 2019 from 5.2 million tonnes of carbon dioxide equivalent in 2018. The increase in 2019 reflects an unanticipated spike in flaring during the start-up of the Prelude floating liquefied natural gas facility in Australia. We subsequently improved controls, and monthly flaring rates at Prelude fell by more than 60% as the facility moved towards stable operations.

Flaring can be used to safely dispose of associated gas where there is no infrastructure to capture it. In 2019, around 25% of flaring took place at such facilities, a decrease from around 40% in 2018.

**External initiatives**

As a signatory to the World Bank’s Zero Routine Flaring by 2030 initiative, we continue to pursue our 2015 commitment to eliminate associated gas flaring at facilities.

**Programmes and activities**

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. In Australia, Shell affiliate QGC Pty Limited’s upstream coal-seam gas facilities also reduced flaring by 80% in 2019 compared with 2018. In the USA, flare reduction continued at our Permian unconventional oil facilities, while in Qatar our Pearl gas-to-liquids plant reduced its greenhouse gas emissions from flaring by more than 25% in 2019 compared with 2018.

Oman is one of the countries where Shell has been partnering and working closely with the government and other companies for decades. In 2019, Petroleum Development Oman (PDO; Shell interest 34%) adopted our energy efficiency surveillance tool at 11 production sites. The tool, which spots unusual energy usage so it can be corrected, has so far saved 46 megawatts and lowered CO2 emissions by 275,000 tonnes a year. It has also cut associated gas flaring at one site by 30,000 cubic metres a day, which adds up to annual savings of about $24 million. PDO plans to install the system at all 26 production sites by 2022.

In Nigeria, investments since 2010 by the Shell Petroleum Development Company of Nigeria Ltd Joint Venture (SPDC) aimed at capturing associated gas and commercialising it through domestic and export markets have decreased routine flaring by around 80% between 2010 and 2019. These investments include gas-gathering projects in Oloma, Adibawa and Otumara. Two key gas-gathering projects, Southern Swamp and Forcados Yokri, identified for work in 2019, have been delayed and are currently expected to be completed in 2020.

In 2019, SPDC made significant progress with new gas production from two large projects: Southern Swamp and Forcados Yokri. Gas from the Southern Swamp is intended for export as LNG, providing revenue to the government and opportunities for expansion. Gas from Forcados is expected to be sent to the domestic Nigerian market to provide clean reliable power for more than 100 industrial and commercial customers through Shell Nigeria Gas Ltd. Customers include a large float glass manufacturer, a pharmaceutical factory as well as large commercial market zones and local and international consumer goods companies.
SPDC has taken big strides in building what is expected to be the largest gas facility in the country at the Assa North-Ohaji South project. When completed, the processed gas is expected to further boost gas supplies to industrial and commercial customers in Nigeria and boost economic prosperity for the growing population. Flaring from SPDC increased slightly in 2019 due to the construction of these gas facilities. Once fully functioning, the facilities’ overall contribution will be significant in eliminating continuous associated gas operational flaring in Nigeria. In Nigeria, investments to capture associated gas are helping to reduce flaring.

C5. Emissions methodology

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

Scope 1

Base year start
January 1, 2018

Base year end
December 31, 2018

Base year emissions (metric tons CO2e)
71,000,000

Comment
For the reporting year 2019, our base year was 2018. Our base year 2018 direct GHG emissions did not change by more than 5%; therefore, the base year has not been recalculated in 2019.

Scope 2 (location-based)

Comment
We have not recalculated our base year using the location-based approach.

Scope 2 (market-based)

Base year start
Base year end
December 31, 2018

Base year emissions (metric tons CO2e)
10,000,000

Comment
For the 2019 reporting year, our base year was 2018. Our base year 2018 scope 2 GHG emissions changed by more than 5%; therefore, the base year has been recalculated in 2019.

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
- Australia - National Greenhouse and Energy Reporting Act
- ISO 14064-1
- US EPA Mandatory Greenhouse Gas Reporting Rule
- Other, please specify: Shell’s internal “Performance Monitoring and Reporting Specification”

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

70,000,000

**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.

**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): 10,000,000

Comment
We calculated our scope 2 emissions from imported electricity and steam/heat using both methods. 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 gross global Scope 3 emissions, disclosing and explaining any exclusions.

**Purchased goods and services**

**Evaluation status:** Relevant, calculated

**Metric tonnes CO2e:** 35,000,000

**Emissions calculation methodology**

In 2010, an analysis was undertaken to look at the contracting and procurement spent in various categories. For 2019, there was an increase in Scope 3 emissions from purchased goods and services due to the inclusion of supplier Scope 1, 2 and 3 emissions (“cradle to gate” standard). In 2018, only supplier Scope 1 and 2 emissions were included. For supplier Scope 3 emissions, we multiply supplier Scope 1 and 2 emissions, which are consistently reported, with a multiplier per sector as published in the CDP Supply Chain Report 2019 (p18). 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**

- Please explain
In addition to the change in methodology, there was an increase in emissions due to the increased spend on purchased goods and services in 2019. 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 the Other (Upstream) category.

**Capital goods**

**Evaluation status:** Relevant, calculated

**Metric tonnes CO2e:** 5,000,000

**Emissions calculation methodology**

For 2019, there was an increase in Scope 3 emissions from purchased goods and services due to the inclusion of supplier Scope 1, 2 and 3 emissions ("cradle to gate" standard). In 2018, only supplier Scope 1 and 2 emissions were included. For supplier Scope 3 emissions, we multiply supplier Scope 1 and 2 emissions, which are consistently reported, with a multiplier per sector as published in the CDP Supply Chain Report 2019 (p18). Some of the Scope 1 and 2 emissions data are provided by our suppliers and the remainder are calculated using factors from the 2009 API Compendium.

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

**Please explain**

In addition to the change in methodology, there was an increase in emissions due to the increased spend on capital goods in 2019.

**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
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

Please explain

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 (Annual Report 2019, p74), 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**

Please explain

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 2019. It also excludes waste disposal through deep well injection.

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

Business travel
Evaluation status: Not relevant, calculated

Metric tonnes CO2e
0

Emissions calculation methodology
For 2019, 230,000 metric tonnes CO2e from business travel were offset by the purchase of project-based carbon credits. The emissions calculations, prior to offset purchases, are based on the DEFRA guidelines provided under section “International to/from Non-UK without RF”. The total figure includes travel for all Global Travel Agency Program (GTAP) and some Local Travel Agency Program (LTAP) countries as reported in our corporate travel system. The calculation is done separately for each ticket class: Business, Economy, First Class and Premium Economy. Starting in 2019, emissions from business travel also included rental vehicles and hotel accommodation. Emissions from rental vehicles were provided by the rental car agency, based on kilometres driven, and emissions from hotel accommodation were calculated from hotel stays from the travel management company and emission factors from DEFRA.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
- Please explain
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. 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**

- Please explain

**Upstream leased assets**

**Evaluation status:** Not relevant, explanation provided

**Please explain**

In line with the International Finance Reporting Standard (IFRS) 16 Leases (adopted by Shell with effect from 1 January 2019), GHG emissions from relevant lease contracts have been included in our 2019 Scope 1 and 2 equity inventory.

**Downstream transportation and distribution**

**Evaluation status:** Relevant, calculated
**Metric tonnes CO2e**

23,000,000

**Emissions calculation methodology**

The activity data was taken from Shell’s Annual Report 2019. 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) 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**

Please explain

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

**Use of sold products**

**Evaluation status:** Relevant, calculated

**Metric tonnes CO2e**

576,000,000

**Emissions calculation methodology**

The activity data is taken from Shell’s Annual Report 2019 and includes natural gas available for sale (p67) and refinery outturn (p74). 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

Please explain

End of life treatment of sold products

Evaluation status: Relevant, calculated

Metric tonnes CO2e
23,000,000

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

Please explain
We do not track the destination of all products through the processing, conversion, distribution, use and disposal by customers. Primary product data is 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

Please explain
We have not identified any Downstream leased assets in 2019.

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 2019 includes non-operated locations. The average electricity data was 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
-

Please explain
-

Investments

Evaluation status: Not relevant, calculated

Metric tonnes CO2e
100,000

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 either reported to us by the facilities or estimated.

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

Please explain
The numbers reported are for our investments in major facilities only. Data from our own facilities indicate other investments will not be material. The Scope 1 and 2 data reported in other parts of this document relate to facilities we operate. Our equity emissions are published on www.shell.com/ghg and do not include emissions from investments.
There was a significant decrease in 2019 due to the divestment of a major cost dividend facility in 2018.

**Other (upstream)**

**Evaluation status:** Relevant, calculated

**Metric tonnes CO2e**

21,000,000

**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 Shell’s Annual Report 2019.

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

-  

**Please explain**

-  

**Other (downstream)**

**Evaluation status:** Not relevant, calculated

**Metric tonnes CO2e**

430,000

**Emissions calculation methodology**

Metered quantities of CO2 sold.

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

-  

Please explain
Amount of CO2 gas sold as product to a third party.

(C6.7) Are carbon dioxide emissions from biogenic 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
0.00034

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
116,000,000

Metric denominator
unit total revenue

Metric denominator: Unit total
344,877,000,000

Scope 2 figure used
Market-based

% change from previous year
23

Direction of change
Increased
**Reason for change**

GHG intensity increased in 2019 mainly due to lower revenue and higher emissions due to inclusion of GHG emissions from relevant lease contracts in our 2019 inventory in line with the International Finance Reporting Standard (IFRS) 16 Leases (adopted by Shell with effect from 1 January 2019).

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 above was determined using verified direct and energy indirect equity emissions. If operated GHG data were used, the result would be 0.00023 tonne/$ revenue and a 10% increase from 2018.

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 2018 to 2019. 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**

0.17

**% change from previous year**

6

**Direction of change**

Increased

**Reason for change**
The GHG intensity increased in 2019 compared to 2018 in part due to the start-up of the Prelude floating liquefied natural gas facility in Australia.

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
1.06

% change from previous year
1

Direction of change
Increased

Reason for change
Refining: GHG intensity changed by 1% compared to 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
1.04
% change from previous year
8

Direction of change
Increased

Reason for change
Chemicals: the GHG Intensity increased by 8%, mainly as a result of turnarounds at three of our sites.

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 2019, 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 1.3%. There are uncertainties associated with methane emissions quantification. To reduce these uncertainties, our Upstream and Integrated Gas businesses are rolling out methane improvement programmes to further enhance data quality and reporting, continue implementation of leak detection and repair programmes, and make use of methane abatement opportunities.
The estimated total methane emitted as a % 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).

<table>
<thead>
<tr>
<th>Greenhouse gas</th>
<th>Scope 1 emissions (metric tons of CO2e)</th>
<th>GWP Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2</td>
<td>67,000,000</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number is rounded to the nearest million tonnes CO2 equivalent.</td>
</tr>
<tr>
<td>CH4</td>
<td>2,300,000</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
<tr>
<td>N2O</td>
<td>270,000</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
<tr>
<td>HFCs</td>
<td>41,000</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
<tr>
<td>PFCs</td>
<td>0</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
<tr>
<td>SF6</td>
<td>200</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
<tr>
<td>NF3</td>
<td>0</td>
<td>IPCC Fourth Assessment Report (AR4 - 100 year) - The number has been rounded.</td>
</tr>
</tbody>
</table>

(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)
<table>
<thead>
<tr>
<th>Value chain</th>
<th>Upstream, Midstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Unable to disaggregate</td>
</tr>
</tbody>
</table>

**Gross Scope 1 CO2 emissions (metric tons CO2)**
20,900,000

**Gross Scope 1 methane emissions (metric tons CH4)**
8,000

**Total gross Scope 1 emissions (metric tons CO2e)**
21,100,000

**Comment**
The total gross Scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

<table>
<thead>
<tr>
<th>Emissions category</th>
<th>Flaring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value chain</td>
<td>Upstream, Midstream</td>
</tr>
<tr>
<td>Product</td>
<td>Unable to disaggregate</td>
</tr>
</tbody>
</table>

**Gross Scope 1 CO2 emissions (metric tons CO2)**
5,500,000

**Gross Scope 1 methane emissions (metric tons CH4)**
17,000

**Total gross Scope 1 emissions (metric tons CO2e)**
5,900,000

**Comment**
The 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)**
14,000

**Total gross Scope 1 emissions (metric tons CO2e)**
400,000

**Comment**
The 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)**
770,000

**Gross Scope 1 methane emissions (metric tons CH4)**
31,000

**Total gross Scope 1 emissions (metric tons CO2e)**
1,500,000

**Comment**
The 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**

The 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)**

31,800,000

**Gross Scope 1 methane emissions (metric tons CH4)**

5,000

**Total gross Scope 1 emissions (metric tons CO2e)**

31,900,000

**Comment**
The total gross Scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.

<table>
<thead>
<tr>
<th>Emissions category</th>
<th>Value chain</th>
<th>Product</th>
<th>Gross Scope 1 CO2 emissions (metric tons CO2)</th>
<th>Gross Scope 1 methane emissions (metric tons CH4)</th>
<th>Total gross Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flaring</td>
<td>Downstream</td>
<td>Unable to disaggregate</td>
<td>1,030,000</td>
<td>2,000</td>
<td>1,100,000</td>
</tr>
</tbody>
</table>

Comment
The total gross Scope 1 emissions field above only includes CO2 and CH4 emissions. Other GHG emissions are shown separately. The numbers have been rounded.
Product
Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)
10,000

Gross Scope 1 methane emissions (metric tons CH4)
4,000

Total gross Scope 1 emissions (metric tons CO2e)
100,000

Comment
The 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)
4,000

Gross Scope 1 methane emissions (metric tons CH4)
1,000

Total gross Scope 1 emissions (metric tons CO2e)
<table>
<thead>
<tr>
<th>Emissions category</th>
<th>Value chain</th>
<th>Product</th>
<th>Gross Scope 1 CO2 emissions (metric tons CO2)</th>
<th>Gross Scope 1 methane emissions (metric tons CH4)</th>
<th>Total gross Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process (feedstock) emissions</td>
<td>Downstream</td>
<td>Unable to disaggregate</td>
<td>6,930,000</td>
<td>400</td>
<td>6,900,000</td>
</tr>
</tbody>
</table>

**Comment**

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

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States of America - Emissions have been rounded.</td>
<td>19,400,000</td>
</tr>
<tr>
<td>Middle East - Emissions have been rounded.</td>
<td>8,500,000</td>
</tr>
<tr>
<td>Netherlands - Emissions have been rounded.</td>
<td>7,000,000</td>
</tr>
<tr>
<td>Canada - Emissions have been rounded.</td>
<td>5,800,000</td>
</tr>
<tr>
<td>Singapore - Emissions have been rounded.</td>
<td>6,100,000</td>
</tr>
<tr>
<td>Nigeria - Emissions have been rounded.</td>
<td>4,200,000</td>
</tr>
<tr>
<td>Germany - Emissions have been rounded.</td>
<td>3,200,000</td>
</tr>
<tr>
<td>Malaysia - Emissions have been rounded.</td>
<td>2,400,000</td>
</tr>
<tr>
<td>Australia - Emissions have been rounded.</td>
<td>6,500,000</td>
</tr>
<tr>
<td>United Kingdom of Great Britain and Northern Ireland - Emissions have been rounded.</td>
<td>2,200,000</td>
</tr>
<tr>
<td>Other, please specify: International Waters - Emissions have been rounded.</td>
<td>1,600,000</td>
</tr>
<tr>
<td>Other, please specify: Rest of World - Emissions have been rounded.</td>
<td>2,800,000</td>
</tr>
</tbody>
</table>

(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.

<table>
<thead>
<tr>
<th>Business division</th>
<th>Scope 1 emissions (metric ton CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>12,900,000</td>
</tr>
<tr>
<td>Integrated Gas</td>
<td>16,300,000</td>
</tr>
<tr>
<td>Downstream</td>
<td>40,300,000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Gross Scope 1 emissions, metric tons CO2e</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement production activities</td>
<td></td>
</tr>
<tr>
<td>Oil and gas production activities (upstream)</td>
<td>29,200,000   Includes Upstream and Integrated Gas.</td>
</tr>
<tr>
<td>Oil and gas production activities (midstream)</td>
<td></td>
</tr>
<tr>
<td>Oil and gas production activities (downstream)</td>
<td>40,300,000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Scope 2, location-based (metric tons CO2e)</th>
<th>Scope 2, market-based (metric tons CO2e)</th>
<th>Purchased and consumed electricity, heat, steam or cooling (MWh)</th>
<th>Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States of America</td>
<td>Emissions have been rounded.</td>
<td>3,400,000</td>
<td>3,300,000</td>
<td>15,500,000</td>
</tr>
<tr>
<td>Canada</td>
<td>Emissions have been rounded.</td>
<td>2,300,000</td>
<td>2,300,000</td>
<td>7,900,000</td>
</tr>
<tr>
<td>Australia</td>
<td>Emissions have been rounded.</td>
<td>2,600,000</td>
<td>1,600,000</td>
<td>6,100,000</td>
</tr>
</tbody>
</table>
### (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.

<table>
<thead>
<tr>
<th>Business division</th>
<th>Scope 2, location-based (metric tons CO2e)</th>
<th>Scope 2, market-based (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>1,100,000</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Integrated Gas</td>
<td>2,700,000</td>
<td>1,600,000</td>
</tr>
<tr>
<td>Downstream</td>
<td>7,400,000</td>
<td>7,300,000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Comment</th>
<th>Scope 2, location-based, metric tons CO2e</th>
<th>Scope 2, market-based (if applicable), metric tons CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas production activities (upstream)</td>
<td>3,800,000</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Includes Upstream and Integrated Gas businesses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil and gas production activities (midstream)</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Oil and gas production activities (downstream)</td>
<td>7,400,000</td>
<td>7,300,000</td>
</tr>
<tr>
<td>Includes Downstream business incl. Shipping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(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.

<table>
<thead>
<tr>
<th>Change in emissions (metric tons CO2e)</th>
<th>Direction of change</th>
<th>Emissions value (percentage)</th>
<th>Please explain calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in renewable energy consumption</td>
<td>1,000,000</td>
<td>Decreased 1.2</td>
<td>In 2019, our energy indirect GHG emissions reduced by around 1 million tonnes CO2e due to renewable energy, which translates to a reduction of 1.2% of our total Scope 1 and 2 GHG emissions for 2018 (82 million tonnes). We arrived at 1.2% through (1/82)*100.</td>
</tr>
<tr>
<td>Other emissions reduction activities</td>
<td>1,100,000</td>
<td>Decreased 1.3</td>
<td>In 2019, 1.1 million tonnes of GHG emissions were reduced by our emissions reduction projects, which translates to a reduction of 1.3% of our total Scope 1 and 2 GHG emissions for 2018 (82 million tonnes CO2e). We arrived at 1.3% through (1.1 / 82)*100. Note that this number does NOT include additional 1 million tonnes of CO2 captured and sequestered by the Quest CCS project in Canada in 2019.</td>
</tr>
<tr>
<td>Divestment</td>
<td>2,900,000</td>
<td>Decreased 3.5</td>
<td>In 2019, our emissions decreased by 2.9 million tonnes of GHG emissions due to divestments (e.g. in Argentina, Canada, Iraq, Malaysia, Norway and the UK), which translates to a decrease of 3.5% of our total Scope 1 and 2 GHG emissions for 2018 (82 million tonnes CO2e). We arrived at 3.6% through (2.9/82)*100.</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>0</td>
<td>No change 0</td>
<td>There were no acquisitions in 2019.</td>
</tr>
<tr>
<td>Mergers</td>
<td>0</td>
<td>No change 0</td>
<td>There were no mergers in 2019.</td>
</tr>
<tr>
<td>Change in output</td>
<td>2,500,000</td>
<td>Increased 3</td>
<td>In 2019, our emissions increased by 2.5 million tonnes of CO2 equivalents due to a change in output, which translates to an increase of 3.0% of our total Scope 1 and 2</td>
</tr>
<tr>
<td>Change in methodology</td>
<td>1,100,000</td>
<td>Increased</td>
<td>1.3</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>-----</td>
</tr>
<tr>
<td>Change in boundary</td>
<td>70,000</td>
<td>Increased</td>
<td>0.09</td>
</tr>
<tr>
<td>Change in physical operating conditions</td>
<td>8,000</td>
<td>Increased</td>
<td>0.01</td>
</tr>
<tr>
<td>Unidentified</td>
<td>0</td>
<td>No change</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>260,000</td>
<td>Decreased</td>
<td>0.3</td>
</tr>
</tbody>
</table>

(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%

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstocks)</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired heat</td>
<td>No</td>
</tr>
<tr>
<td>Consumption of purchased or acquired steam</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired cooling</td>
<td>No</td>
</tr>
<tr>
<td>Generation of electricity, heat, steam, or cooling</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Heating value</th>
<th>MWh from renewable sources</th>
<th>MWh from non-renewable sources</th>
<th>Total (renewable and non-renewable) MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstock)</td>
<td>LHV</td>
<td>235,000,000</td>
<td>235,000,000</td>
<td></td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td></td>
<td>1,540,000</td>
<td>25,000,000</td>
<td>27,000,000</td>
</tr>
<tr>
<td>Consumption of purchased or acquired steam</td>
<td></td>
<td>0</td>
<td>18,000,000</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Consumption of self-generated non-fuel renewable energy</td>
<td></td>
<td>40</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Total energy consumption</td>
<td></td>
<td>1,540,000</td>
<td>278,000,000</td>
<td>280,000,000</td>
</tr>
</tbody>
</table>
(C8.2b) Select the applications of your organization’s consumption of fuel.

| 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**
- 35,000,000 MWh

**MWh fuel consumed for self-generation of electricity**
- 35,000,000 MWh

**MWh fuel consumed for self-generation of heat**
- 0 MWh

**MWh fuel consumed for self-generation of steam**
- 0 MWh

**MWh fuel consumed for self-cogeneration or self-trigeneration**
- 0 MWh
**Emission factor**
0.059

**Unit**
metric tons CO2 per million Btu

**Emissions factor source**
2009 API Compendium, table 4-3
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.

**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**
194,000,000

**MWh fuel consumed for self-generation of electricity**
194,000,000

**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

**Emission factor**
0.0607

**Unit**
metric tons CO2 per million Btu

**Emissions factor source**
2009 API Compendium, table 4-3
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.

**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
7,000,000

MWh fuel consumed for self-generation of electricity
7,000,000

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

Emission factor
0.0781

Unit
metric tons CO2 per million Btu

Emissions factor source
2009 API Compendium, table 4-3
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.

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

Emission factor
0.0746

Unit
metric tons CO2 per million Btu

Emissions factor source
2009 API Compendium, table 4-3 for motor gasoline (petrol)
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.

**Comment**
The numbers have been rounded.

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

<table>
<thead>
<tr>
<th></th>
<th>Total Gross generation (MWh)</th>
<th>Generation that is consumed by the organization (MWh)</th>
<th>Gross generation from renewable sources (MWh)</th>
<th>Generation from renewable sources that is consumed by the organization (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td>430,000</td>
<td>40</td>
</tr>
<tr>
<td>Heat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Sourcing method**
Unbundled energy attribute certificates, Guarantees of Origin

**Low-carbon technology type**
Solar

**Country/region of consumption of low-carbon electricity, heat, steam or cooling**
Asia Pacific (or JAPA)

**MWh consumed accounted for at a zero-emission factor**
10,000

**Comment**
The numbers have been rounded.
Sourcing method
Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

Low-carbon technology type
Low-carbon energy mix

Country/region of consumption of low-carbon electricity, heat, steam or cooling
Europe

MWh consumed accounted for at a zero-emission factor
200,000

Comment
The numbers have been rounded.

Sourcing method
Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

Low-carbon technology type
Low-carbon energy mix

Country/region of consumption of low-carbon electricity, heat, steam or cooling
Asia Pacific (or JAPA)

MWh consumed accounted for at a zero-emission factor
1,330,000

Comment
The numbers have been rounded.
**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).

<table>
<thead>
<tr>
<th>In-year net production</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude oil and condensate, million barrels</td>
<td>665.53</td>
</tr>
<tr>
<td>Natural gas liquids, million barrels</td>
<td>665.53</td>
</tr>
<tr>
<td>Oil sands, million barrels (includes bitumen and synthetic crude)</td>
<td>19.07</td>
</tr>
<tr>
<td>Natural gas, billion cubic feet</td>
<td>3,787.58</td>
</tr>
</tbody>
</table>

Shell Annual Report and Accounts 2019, p66, 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 627,276 (Shell subsidiaries) + 38,259 (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.

(Sum total of 3,108,750 (Shell subsidiaries) + 678,834 (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.

See Shell Annual Report and Accounts 2019, p61-69 and 239-256 for full details. Key extracts:

PROVED RESERVES
Proved reserves estimates are calculated pursuant to the US Securities and Exchange Commission (“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. Subsidiaries’ proved reserves at December 31, 2019, were divided into 79% developed and 21% undeveloped on a barrel of oil equivalent basis. For the Shell share of joint ventures and associates, the proved reserves at December 31, 2019, were divided into 86% developed and 14% undeveloped on a barrel of oil equivalent basis. Proved reserves are recognised under various forms of contractual agreements. Shell’s proved reserves volumes at December 31, 2019, present in agreements such as production-sharing contracts (“PSC”), tax/variable royalty contracts or other forms of economic entitlement contracts, where the Shell share of reserves can vary with commodity prices, were 2,170 million barrels of crude oil and natural gas liquids, and 13,433 thousand million standard cubic feet (scf) of natural gas. Proved reserves cannot be measured exactly because estimation of reserves involves subjective judgement (see “Risk factors” on page 27 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 28 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 34 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 de-bookings and endorses the total
aggregated proved reserves. Final approval of all proved reserves bookings remains with Shell’s Executive Committee, and 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.

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

<table>
<thead>
<tr>
<th>Estimated total net proved + probable reserves (2P) (million BOE)</th>
<th>Estimated total net proved + probable + possible reserves (3P) (million BOE)</th>
<th>Estimated net total resource base (million BOE)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,096</td>
<td></td>
<td></td>
<td>Only proved reserves are reported. - See Shell Annual Report and Accounts 2019, pages 61-69 and 239-256 for full details.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Hydrocarbon Category</th>
<th>Net proved + probable reserves (2P) (%)</th>
<th>Net proved + probable + possible reserves (3P) (%)</th>
<th>Net total resource base (%)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude oil/ condensate/ natural gas liquids</td>
<td></td>
<td></td>
<td></td>
<td>Only proved reserves are reported. See Shell Annual Report and Accounts 2019 pages 61-69 and 239-256 for full details. Page 63 of the Shell Annual Report and Accounts 2019 provides a Summary of proved oil and gas reserves of Shell subsidiaries and Shell share of joint ventures and associates (at December 31, 2019).</td>
</tr>
<tr>
<td>Natural gas</td>
<td></td>
<td></td>
<td></td>
<td>Only proved reserves are reported. See Shell Annual Report and Accounts 2019 pages 61-69 and 239-256 for full details. Page 63 of the Shell Annual Report and Accounts 2019 provides a Summary</td>
</tr>
</tbody>
</table>
of proved oil and gas reserves of Shell subsidiaries and Shell share of joint ventures and associates (at December 31, 2019).

<table>
<thead>
<tr>
<th>Development type</th>
<th>In-year net production (%)</th>
<th>Net proved reserves (1P) (%)</th>
<th>Net proved + probable reserves (2P) (%)</th>
<th>Net proved + probable + possible reserves (3P) (%)</th>
<th>Net total resource base (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil sands (includes bitumen and synthetic crude)</td>
<td>Details not available.</td>
<td>Only proved reserves are reported. See Shell Annual Report and Accounts 2019 pages 61-69 and 239-256 for full details. Page 63 of the Shell Annual Report and Accounts 2019 provides a Summary of proved oil and gas reserves of Shell subsidiaries and Shell share of joint ventures and associates (at December 31, 2019).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Development type

In-year net production (%)

Net proved reserves (1P) (%)

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

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

Net total resource base (%)

Comment
Details not available.
See Shell Annual Report and Accounts 2019, pages 61-69 and 239-256 for reported data.
Page 63 of the Shell Annual Report and Accounts 2019 provides a summary of proved oil and gas reserves of Shell subsidiaries and Shell share of joint ventures and associates (at December 31, 2019).

(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)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>2,832</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Throughput (Million barrels)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>854.83</td>
<td>Refining processing intake (Shell Investor Handbook) - 2342 Kboe/d = 854.83 MMboe</td>
</tr>
<tr>
<td>Other feedstocks</td>
<td>81.03</td>
<td>Refining processing intake (Shell Investor Handbook) - 222 Kboe/d = 81.03 MMboe</td>
</tr>
<tr>
<td>Total</td>
<td>935.86</td>
<td>Refining processing intake (Shell Investor Handbook) - 2564 Kboe/d = 935.86 MMboe</td>
</tr>
</tbody>
</table>

(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.

<table>
<thead>
<tr>
<th>Product produced</th>
<th>Refinery net production (Million barrels) *not including products used/consumed on site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasolines</td>
<td>347.48</td>
</tr>
<tr>
<td>Kerosenes</td>
<td>152.21</td>
</tr>
<tr>
<td>Other, please specify: Gas/diesel oils</td>
<td>298.57</td>
</tr>
<tr>
<td>Fuel oils</td>
<td>81.4</td>
</tr>
<tr>
<td>Other, please specify: cannot be specified</td>
<td>102.93</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Product</th>
<th>Production, Thousand metric tons</th>
<th>Capacity, Thousand metric tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other, please specify: Not available. RDS does not disclose production, only sales volumes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(C-OG9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

<table>
<thead>
<tr>
<th>Investment in low-carbon R&amp;D</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>In 2019, we spent $962 million on research and development (R&amp;D), compared with $986 million in 2018. Our R&amp;D projects often involve collaborations with public or private entities, including universities, government laboratories, technology start-ups and incubators. This collaborative approach to innovation with partners inside and beyond the energy sector helps spark new ideas and accelerates their development and deployment. In 2019, we started work on over 200 R&amp;D projects with universities. Many of these projects focus on areas that are crucial for low-carbon energy systems, such as biomass, renewable power and electrochemical batteries. (Sustainability Report 2019, p54)</td>
</tr>
</tbody>
</table>

(C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

<table>
<thead>
<tr>
<th>Technology area</th>
<th>Stage of development in the reporting year</th>
<th>Average % of total R&amp;D investment over the last 3 years</th>
<th>R&amp;D investment figure in the reporting year (optional)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon capture and storage/utilisation</td>
<td>Pilot demonstration</td>
<td></td>
<td></td>
<td>In 2019, we successfully completed a one-year pilot project to separate carbon dioxide (CO2) from the exhaust gases of a biomass power plant in Vienna, Austria. The project captured 0.7 tonnes of CO2 per day. The technology meets high CO2 recovery and purity standards and has the potential to cut separation costs per tonne of CO2 by up to 25%, compared to leading alternatives. We are now working to develop the technology to commercial scale so we can capture around 200 times more CO2. We developed the technology and operated the project in collaboration with two Austrian universities, TU Wien and the University of Natural Resources and Life Sciences, and six other partners. The pilot project and preceding research resulted in eight PhDs and 15 published papers.</td>
</tr>
</tbody>
</table>
In 2019, we successfully produced chemicals using a liquid feedstock made from plastic waste. The technique, known as pyrolysis, turns hard-to-recycle plastic waste into chemicals that are used to make new plastics. These are the building blocks of everyday consumer goods like clothing, computers and mobile phones.

This innovation takes us one step closer to our ambition to use 1 million tonnes of plastic waste a year in our global chemical plants by 2025.

**Plastic waste as feedstock for chemical plants**

- **Full/commercial-scale demonstration**

- In 2019, we successfully produced chemicals using a liquid feedstock made from plastic waste. The technique, known as pyrolysis, turns hard-to-recycle plastic waste into chemicals that are used to make new plastics. These are the building blocks of everyday consumer goods like clothing, computers and mobile phones.


**Renewable energy: Wind Power**

- **Large scale commercial deployment**

- **WIND POWER**

  We are expanding our operations in wind power to make more renewable power available to our customers. At the end of 2019, the Shell share of total installed capacity combined from onshore and offshore wind was 290 megawatts (MW) with 2,196 MW in development.

  We have interests in offshore wind projects with the potential to generate nearly 5 gigawatts of power once constructed (total installed capacity, with some projects still to receive a final investment decision). Shell has four onshore wind projects in operation in the USA and one offshore project in operation in the Netherlands. We also have interests in three wind projects under development – two in the USA, Atlantic Shores Offshore Wind joint venture (Shell interest 50%) and the Mayflower Wind Energy joint venture (Shell interest 50%); and one in the Netherlands, the Blauwwind Consortium (Shell interest 20%).

  Construction of the Borssele III and IV offshore wind project by the Blauwwind Consortium began in 2019. The wind farm project is designed to have a total installed capacity of 731.5 MW, enough to power 825,000 Dutch homes. Shell
| Renewable energy: Solar Power | Large scale commercial deployment | SOLAR POWER
We are expanding our solar power generation business by investing in the development and operation of long-term commercial and industrial solar projects, including at our own sites. At the end of 2019, our share of solar installed capacity was 414 MW and 442 MW in development.

In 2019, we acquired a 49% interest in Singapore-based Cleantech Solar, which owns and operates around 145 megawatts (MW) of installed capacity and has 178 MW of signed and in-development capacity for commercial and industrial customers in India and across South-East Asia.

We also acquired an interest of 49% in ESCO Pacific, one of Australia’s most successful solar development and asset management firms. The company has delivered nearly 500 MW of solar projects and has 350 MW under long-term management. |

has an agreement to buy and trade half the electricity produced from Borssele.

In 2019, the Mayflower Wind Energy joint venture was chosen by the state of Massachusetts to supply 804 MW of renewable energy to electricity customers.

In 2019, we acquired EOLFI, a French renewable energy developer specialising in floating wind power. Floating wind technology could open up more locations for offshore wind. They include areas further from shore and where greater water depths do not allow for traditional foundations.

We continue to invest in floating technology turbine technologies and take part in several joint industry initiatives to boost innovation in this area, as well as demonstration projects.
Sustainability Report 2019, p48-49
In 2018, we acquired a 43.83% interest in Silicon Ranch, a leading US developer, owner and operator of solar assets. In 2019, Silicon Ranch announced the launch of a programme that combines clean electricity generation with carbon sequestration and ecosystem restoration. We are using more solar power at our own sites. This includes our offices, retail sites, distribution terminals, refineries and offshore installations.

In 2019, we opened one of the largest on-site solar parks in the Netherlands at our Moerdijk chemical plant and built rooftop solar installations at seven lubricant plants worldwide.

Sustainability Report 2019, p50

| Renewable energy: Biofuels | Large scale commercial deployment | BIOFUELS

We are one of the world’s largest biofuels producers through our Raízen joint venture (Shell interest 50%, not Shell-operated) in Brazil. In 2019, we blended more than 10 billion litres of biofuels into our petrol and diesel worldwide.

Our main focus for biofuels development and investment is in using waste, inedible crops or forestry products.

In 2019, we announced that we will support SkyNRG to develop Europe’s first dedicated sustainable aviation fuel production plant by bringing our technical and commercial expertise to the development of the plant. Once operational, the plant will produce 100,000 tonnes of fuel made from waste cooking oil and will run on sustainable hydrogen. The combined benefits of the feedstocks, sustainable hydrogen and low-carbon energy used to power production are expected to make the life-cycle carbon emissions of the plant’s sustainable aviation fuel 85% lower than conventional jet fuels, as estimated by the Roundtable on Sustainable Biomaterials.

Shell is also a founding member of the Clean Skies for Tomorrow Coalition,
which will work together to help make sustainable aviation fuel widely available. This means, for example, encouraging blending of biofuels derived from waste with conventional jet fuel, allowing for a gradual introduction of the fuel into supply chains without the need to adapt engines. The coalition aims to support the ambition to achieve net-zero emissions in the aviation industry by 2050.

We are also investing in renewable natural gas in the USA and in Europe for use in natural gas-fuelled vehicles. Renewable natural gas, also known as biomethane, is gas collected from landfill sites, food waste or manure and then processed until it is fully interchangeable with conventional natural gas. We plan to expand and upgrade the JC Biomethane plant in Junction City, Oregon, USA.

We continue to invest in new ways to produce advanced biofuels from sustainable raw materials, such as waste and cellulosic biomass from non-food plants. 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 5 tonnes a day of feedstock, such as agricultural waste, and aims to demonstrate the technology for possible scaling up.

Sustainability Report 2019, p51-52

| Hydrogen          | Small scale commercial deployment | HYDROGEN FOR MOBILITY  
|                  |                                 | We are taking early steps to grow a network of hydrogen stations in Europe and North America, where we are part of several initiatives to encourage the adoption of hydrogen in transport.

In Germany, through our participation in the H2 Mobility Germany joint venture, we are working with the government and partners to develop a national network of around 100 hydrogen refuelling stations. Currently, 82 stations are open, 40 at Shell retail sites.
In the USA, we are working with Toyota and the state of California to open nine hydrogen refuelling stations. We are also developing with our partners three new refuelling stations for heavy-duty hydrogen fuelcell trucks. One of these stations will use hydrogen made from renewable biogas. Sustainability Report 2019, p53

| Energy efficiency in transport | Large scale commercial deployment | Shell V-Power petrol and diesel, and Shell Helix engine oil increase engine efficiency by burning more cleanly and reducing friction and wear. These products lubricate and protect millions of vehicle engines worldwide every day. 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 car CO2 emissions by up to 4%.

For heavy-duty vehicles, Shell Rimula engine lubricants help heavy-duty diesel engines reduce friction to improve fuel economy and therefore reduce CO2 emissions.

We are also developing new technologies that create more durable, sustainable and energy-efficient roads. Using our clear bitumen in a light-coloured asphalt, for example, can reduce the need for lighting in tunnels by up to 40% without affecting driver visibility. Sustainability Report 2019, p53 |

| Other, please specify Lower-carbon electricity | Large scale commercial deployment | Lower-carbon energy

In 2019, we stepped up our activities in generating and trading lower-carbon electricity, as well as providing it directly to customers. These activities are part of our aim to make power a significant business for Shell – a business that, in
the future, could sit alongside oil, gas and chemicals. This means being involved at almost every stage of the power system: from generating electricity, to buying and selling it, to storing it, to supplying it directly to homes and businesses.

In 2019, we supplied more than 900,000 customers in the UK with 100% renewable electricity. Through our Shell Energy Retail business (rebranded from First Utility, which we acquired in 2018), we supply renewable electricity as well as natural gas and smart home technology. In 2019, we also acquired Hudson Energy Supply UK Limited, which provides natural gas and renewable electricity to businesses.

Our renewable electricity is certified by Renewable Energy Guarantees of Origin, which means that all the electricity customers buy is matched with the equivalent amount of units from 100% renewable sources. In Australia, we acquired ERM Power, one of the country’s largest energy retailers for businesses and industry. ERM will become the platform for our integrated power business in Australia.

Sustainability Report 2019, p48

<table>
<thead>
<tr>
<th>Other, please specify</th>
<th>Distributed and household energy</th>
<th>Large scale commercial deployment</th>
<th>Solar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other, please specify</td>
<td>Distributed and household energy</td>
<td>Large scale commercial deployment</td>
<td>Solar</td>
</tr>
</tbody>
</table>

Other, please specify

Distributed and household energy

Large scale commercial deployment

Solar

The power market is more than just delivering electricity to companies and homes. Consumers, big and small, are for example starting to generate their own power through solar panels or wind turbines, store it for use later and redistribute it where it is needed most.

We are delivering products and services that help meet this changing consumer demand. We bought sonnen, a German company that provides smart battery storage and innovative energy services, such as virtual power plants. Around 50,000 households and small businesses across Europe, North America and Australia use sonnen batteries.
Sonnen’s battery solutions are a safe way to ensure homes are powered with cleaner and more reliable electricity. Households with solar and sonnen equipment can store their surplus solar power during the day and use it at night or when there is a grid power outage. In Germany, if customers are short of electricity, they have the capacity to share surplus solar power of other sonnen users.

Sonnen also supplies battery storage systems for residential virtual power plants, for example, at the 600 solar-powered, all-electric apartments at the Soleil Lofts community in Utah, USA. The local electricity supplier controls the batteries and can use the community’s surplus solar energy to help manage supply and demand. This is the largest virtual power plant of its kind in the USA.

In 2019, we also acquired the UK power trading company, Limejump, which helps smaller renewable energy generators to get a better outcome by combining their individual assets into a larger virtual grid. This enables the renewable energy companies to sell clean power in real time to the national grid.

### Sustainability Report 2019, p50

<table>
<thead>
<tr>
<th>Other, please specify</th>
<th>Large scale commercial deployment</th>
<th>E-Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Mobility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Shell is exploring how best to meet the needs of electric vehicle drivers – at home, at work or on the road. We are expanding our charging network worldwide.

Shell-owned NewMotion is Europe’s largest electric charging company, with more than 60,000 private electric charging points in France, Germany, the Netherlands and the UK. It also provides around 250,000 users with access to more than 135,000 public charging points in 35 European countries.

In 2019, we expanded our e-mobility business in the USA by acquiring Greenlots, a California-based company that provides around 5,000 electric
vehicle charging points, charging network software and grid services across the country. Greenlots also has a growing business in 12 other countries, including Canada, Malaysia, Singapore and Thailand. We are growing our Shell Recharge fast-charging service, which is now available at more than 300 forecourts across Canada, China, Germany, the Netherlands, Singapore, the UK and the USA. In the UK, we offer Shell Recharge at sites using 100%-certified renewable electricity. As part of our agreement with charging network operator IONITY, a joint venture of carmakers, we are installing 350 high-powered chargers at 60 of our biggest highway stations across 10 European countries.

In 2019, we launched a new range of fluids designed specifically for battery electric vehicles. These fluids and greases improve the performance and efficiency of the vehicles. Sustainability Report 2019, p52-53

| Hydrogen: Hydrogen for industry | Small scale commercial deployment | Hydrogen
At our Rheinland refinery in Germany, we are working with our partners to build an electrolyser that produces hydrogen using renewable energy. The new hydrogen electrolysis plant, which features advanced polymer electrolyte membrane technology, is expected to be the largest of its kind in the world. The electrolyser is designed to have a capacity of 10 megawatts and produce 1,300 tonnes of hydrogen a year.
In the UK, we are partnering with ITM Power, a company specialising in electrolysers, to make hydrogen fuel available at six Shell retail sites. The hydrogen is produced on-site using electricity from renewable sources. Sustainability Report 2019, p53

| Other, please specify Nature-based solutions | Small scale commercial deployment | Nature-based solutions
Shell’s ambition is to invest around USD 200 million in 2020 and 2021 in forests, wetlands and other natural ecosystems around the world, to reduce emissions |
and capture more CO2 while benefitting biodiversity and local communities. Shell recognises that nature-based solutions are a tool that can only ever complement, and not replace, others we are deploying to help society move to a low-carbon future.

Investing in nature is one of our tools to help us achieve our ambition to reduce the Net Carbon Footprint of the energy products we sell by 65% by 2050, in step with society’s progress to align with the goals of the Paris Agreement.

In the Netherlands, we are working with the Dutch state forestry service to plant more than 5 million trees over the next 12 years. We will also reforest 300 hectares of degraded land in Spain as part of an agreement with Land Life Company. Between April 2019 and January 2020, we planted around 260,000 trees for the project.

In the UK, we are working with the government in Scotland to generate carbon credits by helping to plant or regenerate around 1 million trees over the next five years. In Queensland, Australia, we are restoring 800 hectares of endangered woodland.

In 2019, we started to offer customers nature-based carbon credits to offset the CO2 emissions generated by the extraction, refining, distribution and use of the Shell fuel they buy. We launched the programme at around 400 service stations in the Netherlands and about 1,000 service stations in the UK.

We also offer nature-based carbon credits to business customers operating heavy- and light-duty fleets in 10 countries across Europe and Asia.

We delivered the world’s first carbon-neutral liquefied natural gas cargoes to Tokyo Gas and GS Energy. We used nature-based carbon credits to compensate the CO2 emissions generated from exploration and production to use by the consumer. The cargoes provided enough carbon-neutral energy to power nearly 300,000 homes for a year.

We buy our carbon credits from a global portfolio of nature-based projects. These projects are certified to standards, such as the Verified Carbon Standard and the Climate, Community and Biodiversity Standard.
Other, please specify
All technology areas: covering work for low carbon as well as any other technology categories across all our businesses Upstream, Downstream, Integrated Gas/New Energies.

<table>
<thead>
<tr>
<th></th>
<th>81-100%</th>
<th>962,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Technology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$962 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). It includes elements of different stages of development in the reporting year. Our R&D projects often involve collaborations with public or private entities, including universities, government laboratories, technology start-ups and incubators. This collaborative approach to innovation with partners inside and beyond the energy sector helps spark new ideas and accelerates their development and deployment.

In 2019, we started work on over 220 R&D projects with universities. Many of these projects focus on areas that are crucial for low-carbon energy systems, such as biomass, renewable power and electrochemical batteries.

(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.

We do not report this data externally in our Annual Report or Form 20-F.

(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).

<table>
<thead>
<tr>
<th></th>
<th>CO2 transferred – reporting year (metric tons CO2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 transferred in</td>
<td>0</td>
</tr>
<tr>
<td>CO2 transferred out</td>
<td>430,000</td>
</tr>
</tbody>
</table>
(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.

<table>
<thead>
<tr>
<th>Injection and storage pathway</th>
<th>Injected CO2 (metric tons CO2)</th>
<th>Percentage of injected CO2 intended for long-term (&gt;100 year) storage</th>
<th>Year in which injection began</th>
<th>Cumulative CO2 injected and stored (metric tons CO2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 injected into a geological formation or saline formation for long-term storage</td>
<td>1,130,000</td>
<td>100</td>
<td>August 23, 2015</td>
<td>4,800,000</td>
</tr>
</tbody>
</table>

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

Sustainability Report 2019, p45:

We invest in projects to capture and store carbon dioxide (CO2) and we are exploring new ways of using CO2 once it has been captured. These are crucial steps to help us achieve our ambition to reduce the Net Carbon Footprint of the energy products we sell by around half by 2050, in step with society’s drive to reduce greenhouse gas emissions as it moves towards the goals of the Paris Agreement.

The majority of climate change scenarios produced by organisations such as IEA, IPCC and Shell require a large component of carbon capture and storage (CCS) in order to achieve the Paris goals. We recognise the scale of the challenge in developing CCS globally as quickly and as widely as needed. Shell is participating in seven of the 51 large-scale CCS projects globally, listed by the Global CCS Institute.

Since 2015, we have operated 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 more than 4 million tonnes of CO2, ahead of schedule. In addition to Quest, the Chevron-operated Gorgon LNG CCS facility in Australia (Shell interest 25%) started operations in August 2019. Gorgon is the largest CCS operation in the world and, when fully operational, is expected to capture up to 4 million tonnes of reservoir CO2 annually.

In Norway, Shell is a partner in the Northern Lights project to develop ways to transport and store CO2 for industry across Europe. The aim is to transport CO2 by ship to a central hub and then send it by pipeline to an offshore storage location. Shell’s Cansolv technology has been selected for the CO2 capture at an energy-from-waste plant as part of the project.

Shell continues to invest in developing CO2 capture technology. For example, in Austria, our ViennaGreenCO2 project has completed its first year. The technology separates CO2 from flue gases in a lower-cost way.

In 2019, the Oil and Gas Climate Initiative (OGCI) launched an initiative to unlock large-scale investment in carbon capture, utilisation and storage, a crucial tool to help society achieve net-zero emissions. The initiative aims to decarbonise industrial hubs around the world, starting in China, Norway, the
Netherlands, the UK and the USA. It focuses on areas that limit the commercialisation such as lack of investor confidence, financial backing and access to expertise and data resources.

Shell, with OGCI’s investment arm, Climate Investments, and others, is working to develop the UK’s first commercial clean gas power CCS project as part of Net Zero Teesside, an industry partnership aiming to decarbonise a cluster of carbon-intensive businesses by as early as 2030.

(CCS is considered in the calculations of our Net Carbon Footprint ambition, see Sustainability Report 2019, p40)

C10. Verification

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

<table>
<thead>
<tr>
<th>Scope</th>
<th>Verification/assurance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 2 (location-based or market-based)</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Third-party verification or assurance process in place</td>
</tr>
</tbody>
</table>

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

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


Page/ section reference
The attachment is a 2-page standalone assurance statement for GHG emissions by LRQA. The tonnes assured match CC6.1 and cover 100% of the inventory. The assertion confirms that the verification covers direct (Scope 1) emissions for 2019. 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 2 emissions and attach the relevant statements.

**Scope 2 approach**
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**

**Page/section reference**
The attachment is a 2-page standalone assurance statement for GHG emissions by LRQA. 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 2019. 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 2 approach
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

Page/section reference
The attachment is a 2-page standalone assurance statement for GHG emissions by LRQA. 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 2019. 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

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.
**Scope 3 category**  
Scope 3: Use of sold products

**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**  
2019 Shell-other-indirect-scope-3-emissions-assurance-statement.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.
Proportion of reported emissions includes 100% of the use of our refinery fuel and natural gas products.
Emissions from the use and disposal of chem. products, lubricants and other non-fuel products like bitumen are not included. Refinery type products produced by Chemical plants are also not included.

**Relevant standard**  
ISO14064-3

**Proportion of reported emissions verified (%)**  
100

(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?

<table>
<thead>
<tr>
<th>Disclosure module verification relates to</th>
<th>Data verified</th>
<th>Verification standard</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4. Targets and performance</td>
<td>Other, please specify Net Carbon Footprint verification - see verification standard</td>
<td>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 2019 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. We undertake external verification of our Net Carbon Footprint values to a level of limited assurance at the Shell Group level.</td>
<td>Limited assurance of Shell’s 2019 Net Carbon Footprint</td>
</tr>
<tr>
<td>C5. Emissions performance</td>
<td>Change in Scope 1 emissions against a base year (not target related)</td>
<td>ISO 14064-3</td>
<td>Our assurance statement also covers the base year.</td>
</tr>
<tr>
<td>C5. Emissions performance</td>
<td>Change in Scope 2 emissions against a base year (not target related)</td>
<td>ISO 14064-3</td>
<td>Our assurance statement also covers the base year.</td>
</tr>
<tr>
<td>C6. Emissions data</td>
<td>Change in Scope 3 emissions against a base year (not target related)</td>
<td>ISO 14064-3</td>
<td>Our Scope 3 assurance statement also covers the base year.</td>
</tr>
</tbody>
</table>

NOTE: Find our assurance statements on our webpage: www.shell.com/ghg - tab “ASSURANCE”
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 Carbon Competitive Incentive Regulation (CCIR) – ETS
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 schemes you are regulated by.

Alberta Carbon Competitive Incentive Regulation (CCIR) – ETS

| % of Scope 1 emissions covered by the ETS | 8 |
| % of Scope 2 emissions covered by the ETS | 0 |

Period start date
January 1, 2019

Period end date
December 31, 2019

Allowances allocated
5,871,126

Allowances purchased
129,864

Verified Scope 1 emissions in metric tons CO2e
5,861,880

Verified Scope 2 emissions in metric tons CO2e

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
18

% of Scope 2 emissions covered by the ETS

Period start date
January 1, 2019

Period end date
December 31, 2019

Allowances allocated
9,970,064

Allowances purchased
2,854,030

Verified Scope 1 emissions in metric tons CO2e
12,824,094

**Verified Scope 2 emissions in metric tons CO2e**

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 you are regulated by or anticipate being regulated by?**

*Long-term compliance and regulatory risk management strategy:*

**Legal and regulatory risks:**
- We have set ourselves internal global environmental standards which match and, in some cases, exceed local regulatory requirements. We also adhere to external standards and guidelines, such as those developed by the World Bank and International Finance Corporation, to inform our approach.
- We have several dedicated climate change and GHG-related forums at different levels of the organisation where these issues are addressed, monitored and reviewed. All Shell entities and operated ventures are responsible for implementing climate change policies and strategies. Our 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. We review our portfolio annually to identify emerging risks from changing GHG regulatory regimes and physical conditions.
- Shell subsidiaries provide compliance balancing services to all Shell companies who have obligations under the above emissions trading systems.
- We proactively support emissions trading as a mechanism to deliver a price on CO2 which allows installations to manage emission levels down in an economically efficient manner. For example, Shell is supporting the development of emissions trading schemes through active participation in the Regional Greenhouse Gas Initiative (RGGI).

**Internal project screening value (CDP guidance: “internal carbon price”):**

**Sensitivity to government-led CO2 prices:**
Some governments have introduced carbon pricing mechanisms, which we believe can be an effective measure to reduce GHG emissions across the economy at lowest overall cost to society. We expect more governments to follow. As part of the Paris agreement, many countries have submitted their Nationally Determined Contributions (NDCs).
Using these NDC’s, we have developed short, medium and long-term estimates of future carbon costs which are reviewed and updated on an annual basis. By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020).
The NDC’s under the Paris Agreement are scheduled to be revised every five years. Therefore, as countries update their NDCs, we expect to update our estimates too. Accordingly, we believe they are a more accurate reflection of society’s current implementation of the Paris Agreement. The UN 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 to meet the goals of the Paris Agreement.

Emission performance management:
(SR 2019, p43) We require projects and facilities that produce more than 50,000 tonnes of GHG emissions a year to have a GHG and energy management plan in place. These plans help drive our emissions performance through various actions. This includes using more energy-efficient equipment, installing power from renewable sources and considering carbon capture and storage in the design of our new and largest projects. 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. During development, projects are expected to evaluate relevant low-carbon technologies and options to remove GHG emissions.

Specific emission reduction initiatives implemented at Shell installations are provided within section 4.3b.

(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)**
1,936,186

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
1,936,186

**Credits cancelled**
No

**Purpose, e.g. compliance**
Compliance
The amount of credits shown above reflects base credits generated between Oct 1 to Dec 31, 2017 (6th reporting period), Jan 1, 2018 to Dec 31, 2018 (7th/8th reporting period) and Jan 1-Dec 31, 2019, plus additional credits serialized from the 3rd, 4th and 5th reporting periods (2016 and 2017 vintage credits).

**Credit origination or credit purchase**
Credit purchase

**Project type**
Forests

**Project identification**
Forest Management to Reduce Deforestation and Degradation in Shipibo Conibo and Cacataibo Indigenous Communities of Ucayali Region - Peru

**Verified to which standard**
VCS (Verified Carbon Standard)
Number of credits (metric tonnes CO2e)
134,081

Number of credits (metric tonnes CO2e): Risk adjusted volume
134,081

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

Credit origination or credit purchase
Credit purchase

Project type
Forests

Project identification
Cordillera Azul National Park REDD Project

Verified to which standard
VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)
867,108

Number of credits (metric tonnes CO2e): Risk adjusted volume
867,108
Credits cancelled
   No

Purpose, e.g. compliance
   Voluntary Offsetting
   These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

Credit origination or credit purchase
   Credit purchase

Project type
   Other, please specify: Peatland restoration and conservation

Project identification
   Katingan Peatland Restoration and Conservation Project

Verified to which standard
   VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)
   361,170

Number of credits (metric tonnes CO2e): Risk adjusted volume
   361,170

Credits cancelled
   No

Purpose, e.g. compliance
   Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

**Credit origination or credit purchase**
Credit purchase

**Project type**
Forests

**Project identification**
Reduction of deforestation and degradation in Tambopata National Reserve and Bahuaja-Sonene National Park within the area of Madre de Dios region – Peru

**Verified to which standard**
VCS (Verified Carbon Standard)

**Number of credits (metric tonnes CO2e)**
163,176

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
163,176

**Credits cancelled**
No

**Purpose, e.g. compliance**
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.
Credit origination or credit purchase
Credit purchase

Project type
Forests

Project identification
REDD+ Project for Caribbean Guatemala: The Conservation Coast

Verified to which standard
VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)
163,176

Number of credits (metric tonnes CO2e): Risk adjusted volume
163,176

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

Credit origination or credit purchase
Credit purchase

Project type
Forests
Project identification
GreenTrees ACRE (Advanced Carbon Restored Ecosystem)

Verified to which standard
ACR (American Carbon Registry)

Number of credits (metric tonnes CO2e)
105,323

Number of credits (metric tonnes CO2e): Risk adjusted volume
105,323

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

Credit origination or credit purchase
Credit purchase

Project type
Forests

Project identification
UK Woodland Carbon Code: Minsca, Long Wood, Lawel Hill, Overkirkhope, Reathwaite, Holm of Drumlanrig, Merkland, Auchenhessnane, Riverbank

Verified to which standard
Other, please specify: UK Woodland Carbon Code
Number of credits (metric tonnes CO2e)
838

Number of credits (metric tonnes CO2e): Risk adjusted volume
838

Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell’s GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell’s GHG emissions under NCF.

Credit origination or credit purchase
Credit purchase

Project type
Forests

Project identification
Saihanba Jixielin Carbon Sink Afforestation Project

 Verified to which standard
Other, please specify: Chinese Certified Emissions Reductions (CCER)

Number of credits (metric tonnes CO2e)
116,122

Number of credits (metric tonnes CO2e): Risk adjusted volume
116,122
Credits cancelled
No

Purpose, e.g. compliance
Voluntary Offsetting
These project-based carbon credits were retired for 2019 and reduced Shell's GHG emissions as reported for the Net Carbon Footprint (NCF), because these carbon credits directly offset Shell's GHG emissions under NCF.

Credit origination or credit purchase
Credit purchase

Project type
Coal mine/bed CH4

Project identification
The Bluesource GCS Bear Canyon project is a mine methane capture project, carried out under the California ARB compliance protocol. By flaring methane gas originating from this abandoned underground mine, significant GHG emissions will be prevented from entering the atmosphere. (ARB Project Id # CAMM5403-A).

Verified to which standard
ACR (American Carbon Registry)

Number of credits (metric tonnes CO2e)
59,904

Number of credits (metric tonnes CO2e): Risk adjusted volume
59,904

Credits cancelled
No

Purpose, e.g. compliance
Compliance

Credit origination or credit purchase
Credit purchase

Project type
Other, please specify: Ozone Depleting Substances

Project identification
A-Gas ODS Destruction Project 2019-1 was undertaken voluntarily by A-Gas in order to avoid future emissions of GHGs in the US. The project ODS was sourced from Arizona, Texas, and Ohio. The ODS was destroyed at the A-Gas facility in Bowling Green, Ohio. All applicable laws and regulations were followed throughout this project. (ARB Project Id # CAOD6318-A).

Verified to which standard
CAR (The Climate Action Reserve)

Number of credits (metric tonnes CO2e)
100,000

Number of credits (metric tonnes CO2e): Risk adjusted volume
100,000

Credits cancelled
No

Purpose, e.g. compliance
Compliance

Credit origination or credit purchase
Credit purchase
**Project type**
Forests

**Project identification**
Improved Forest Management project under ARB Compliance Offset Protocol - U.S. Forest Projects - in Southeast Alaska (ARB Project Id # CAFR5294-A).

**Verified to which standard**
ACR (American Carbon Registry)

**Number of credits (metric tonnes CO2e)**
10,585

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
10,585

**Credits cancelled**
No

**Purpose, e.g. compliance**
Compliance

**Credit origination or credit purchase**
Credit purchase

**Project type**
Forests

**Project identification**
Improved Forest Management project in Campbell & Claiborne Counties, States of Tennessee and Kentucky. (ARB Project Id # CAFR5315-A)

**Verified to which standard**
CAR (The Climate Action Reserve)

**Number of credits (metric tonnes CO2e)**
100,000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
100,000

**Credits cancelled**
No

**Purpose, e.g. compliance**
Compliance

**Credit origination or credit purchase**
Credit purchase

**Project type**
Forests

**Project identification**
Improved Forest Management project in Berkshire, Hampshire, Franklin, and Worcester Counties within the Commonwealth of Massachusetts. (ARB Project Id # CAFR5235-A)

**Verified to which standard**
ACR (American Carbon Registry)

**Number of credits (metric tonnes CO2e)**
60,000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**
60,000
Credits cancelled
No

Purpose, e.g. compliance
Compliance

(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 2019, p93)
To assess the resilience of new projects, we consider the potential costs associated with operational GHG emissions.
In 2018, to help us stay in step with society’s progress toward the goals of the Paris Agreement, we switched from using a flat project screening value (PSV) of $40/tonne of GHG emissions, to country-specific estimates of future carbon costs.
By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020).
(AR 2019, p93) Projects under development that are expected to have a significant GHG footprint must meet carbon performance standards or industry benchmarks to allow them to compete and prosper in a more GHG constrained future.

Actual price(s) used (Currency /metric ton)
100
Variance of price(s) used
(Annual Report 2019, p93)
By 2050, our carbon cost estimates for all countries increase to $100/tonne of GHG emissions (updated in 2020).
These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. They are the first NDCs under the Paris Agreement and are scheduled to be revised every five years. Therefore, as countries update their NDCs, we expect to update our estimates too.
Accordingly, we believe they are a more accurate reflection of society’s current implementation of the Paris Agreement.
The UN 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 to meet the goals of the Paris Agreement.
We further test the robustness of our high-emitting projects by using long-term carbon cost estimates that are 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 variated (Annual Report 2019, p93)

Impact & implication
(Sustainability Report 2019, p43) To assess the resilience of proposed projects, we consider factors such as potential costs associated with operational GHG emissions.
Example of impact:
The financial impact figure represents the estimated net present value of regulatory CO2 costs over the next decade for our Refining business assets in Europe. It is currently expected to be around $456 million. It has been determined by adjusting the anticipated gross CO2 costs over a decade with relaxation from expected free allowances. The uncertainty around this estimate is high. The actual costs could turn out to be higher or lower than this estimate due to the possibility of higher or lower CO2 prices being realized in future as compared to those considered in this estimation.

(Annual Report 2019, p93) Projects under development that are expected to have a material GHG footprint must meet carbon performance standards or industry benchmarks to allow them to compete and prosper in a more GHG constrained future.
These assessments 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 with the shifting policy landscape and the differing pace of energy transitions in different regions.
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
Included climate change in supplier selection / management mechanism

% of suppliers by number
1

% total procurement spend (direct and indirect)
15

% of supplier-related Scope 3 emissions as reported in C6.5
35

Rationale for the coverage of your engagement
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 set out in our Shell General Business Principles and Shell Supplier Principles.
For more info visit our webpage: https://reports.shell.com/sustainability-report/2019/contribution-to-society/working-together/supply-chain.html
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 visit our webpage: https://www.shell.com/business-customers/shell-for-suppliers/supplier-principles.html

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. 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.

In 2019, Shell spent $44.9 billion on goods and services from around 29,000 suppliers globally. Shell’s Contracting & Procurement team is responsible for nearly everything that Shell buys across the full scope of activities in Upstream, Downstream, and Projects & Technology. Our set of policies and assurance processes define how we aim to operate in socially and environmentally responsible ways. Same performance and compliance expectations apply to all suppliers by applying our Category Management and Contracting Process. In our model procurement contracts, contractors and suppliers agree to adhere to the Shell General Business Principles and the Shell Supplier Principles.

Impact of engagement, including measures of success

We continue to work with our contractors and suppliers to find ways for them to build lower-carbon solutions into our supply chains. At present, the Shell Supplier Principles, that are embedded in contracts, are the tool we use for all suppliers for qualification on emissions. While we did not yet implement a separate climate selection mechanism focussed on priority supplier categories, we use priority supplier categories that are implementing the management mechanism to reduce emissions. For instance, we are installing performance optimization software and battery storage systems on our contracted offshore supply vessels to reduce fuel consumption and lower greenhouse gas emissions. We work with suppliers that can build pipelines using non-metallic materials, where appropriate, instead of carbon steel. Non-metallic pipes usually have a smaller carbon footprint than carbon steel pipes. Also, transportation and installation can be more efficient as non-metallic pipes usually weigh around a quarter less than the equivalent size steel pipe. Shell Shipping uses a supplier that provides low-friction paint for ship hulls, which makes the ship sail more fuel efficient.

Performance of our suppliers is measured at individual levels within the asset that the contract supports. We do not aggregate data as requested by CDP on a global level on this topic because we do not find it meaningful, e.g., in context of differing local environments.

Find out more about our approach to sustainability on our webpage: https://www.shell.com/business-customers/shell-for-suppliers/about-shell-for-suppliers.html

Comment

Type of engagement
Details of engagement
Collect climate change and carbon information at least annually from suppliers

% of suppliers by number
1

% total procurement spend (direct and indirect)
20

% of supplier-related Scope 3 emissions as reported in C6.5
25

Rationale for the coverage of your engagement
Building strong relationships with our contractors and suppliers is essential to delivering new projects and running our operations. The rationale for this is that one of the levers of Shell’s net zero energy business ambition is partnering for decarbonisation of energy use. In this context, it means partnering with our suppliers. We work to establish relations with suppliers which allow us to share our respective expertise and build on innovative thinking. 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.

Impact of engagement, including measures of success
We use CDP data of companies to identify those companies in our supply chain that report CO2 emissions. We assume that companies that already report to CDP are likely to be the first ones to 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. The impacts are reported per supplier, establishing emission baselines, setting targets and sharing plans to achieve these. As an example of the impact of this engagement, suppliers are maintaining programmes that support joint sustainability objectives, including but not limited to a reduction in CO2 intensity.

Comment
These data are contributing to our estimation of the total CO2 emissions in our supply chains for purchased goods and services and investment in our equipment.
**Type of engagement**

Engagement & incentivization (changing supplier behaviour)

**Details of engagement**

Offer financial incentives for suppliers who reduce your operational emissions (Scopes 1 & 2)

% of suppliers by number

1

% total procurement spend (direct and indirect)

20

% of supplier-related Scope 3 emissions as reported in C6.5

25

**Rationale for the coverage of your engagement**

Building strong relationships with our contractors and suppliers is essential to delivering new projects and running our operations. We target high impact categories which are likely to affect our own Scope 1 and 2 emissions, such as equipment (rotating/electrical), pumps/valves, logistics, energy, rigs, wells. We work to establish relations with suppliers which allow us to share our respective expertise and build on innovative thinking.

Our Governance is through performance standards or industry benchmarks for Projects and Greenhouse Gas Energy Management Plans for assets and sites. To assess the resilience of proposed projects, we also consider potential costs associated with operational GHG emissions.


**Impact of engagement, including measures of success**

Suppliers’ contributions to reducing our operational emissions (Scope 1 and 2) include, for example: technologies upgrading the equipment; sustainable site design and construction; increasing the use of sustainable raw materials; reduction, reuse and recycling of packaging across our supply chains; increasing availability of renewable energy at our sites; and continuous focus on maintenance measures to enhance the reliability of equipment and reduce emissions through leaks.

Example: LNG Canada (Shell interest 40%) stated in March 2020 that GHG emissions from its Kitimat operation will be lower than any facility currently operating anywhere in the world today [March 2020]: 35 per cent lower than the world’s best performing facilities and 60 per cent lower than the global weighted average. The success of this engagement is measured through GHG intensity metrics.
For more info visit webpage: https://www.lngcanada.ca/news/living-up-to-climate-promises/
Performance of suppliers is measured at individual levels within the asset that the contract support. Data as requested by CDP, are not aggregated on this topic on a global level 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; and
- 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/business-customers/shell-for-suppliers/supplier-principles.html

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

Type of engagement
Collaboration & innovation

Details of engagement
Other, please specify: Offer customers to offset their emissions using carbon credits

% of customers by number
-

% of customer - related Scope 3 emissions as reported in C6.5
-

Please explain the rationale for selecting this group of customers and scope of engagement
Rationale, scope and collaboration:
Sustainability Report 2019, p79
We are increasing our investment in protecting or developing natural ecosystems, such as forests, grasslands and wetlands, to capture more carbon
from the atmosphere and help our customers offset their emissions using carbon credits. A joint study by several universities and non-governmental organisations, including The Nature Conservancy and Wetlands International, found that nature-based solutions could reduce carbon dioxide (CO2) emissions by more than 11 billion tonnes a year by 2030. This is equivalent to the combined annual CO2 emissions of the USA and the European Union. Shell recognises that nature-based solutions are a tool that can only ever complement, and not replace, others we are deploying to help society move to a low-carbon future. Nature-based solutions also help deliver many other benefits, including improvements in biodiversity, water quality, flood protection and livelihoods. Investing in nature is one of our tools to help us achieve our ambition to reduce the Net Carbon Footprint of the energy products we sell by around half by 2050, in step with society’s progress to align with the goals of the Paris Agreement.


In the Netherlands, we are working with the Dutch state forestry service to plant more than 5 million trees over the next 12 years. Shell has also signed an agreement with Land Life Company to create a 300-hectare reforestation project in Spain. Around 300,000 trees have been planted in the Castilla y Leon region.

In the UK, Shell has partnered with Forestry and Land Scotland, the Scottish government agency. Over the coming years, our support will help plant or regenerate around 1 million trees.

Impact of engagement, including measures of success

Sustainability Report 2019, p79

- by means of example -

Carbon-neutral driving and transport

In 2019, Shell started to offer customers nature-based carbon credits to offset the CO2 emissions generated by the extraction, refining, distribution and use of the Shell fuel they buy. We launched the programme at around 400 service stations in the Netherlands and about 1,000 service stations in the UK.

We also offer nature-based carbon credits to business customers operating heavy- and light-duty fleets in 10 countries across Europe and Asia. We delivered the world’s first carbon-neutral liquefied natural gas cargoes to Tokyo Gas and GS Energy. We used nature-based carbon credits to compensate the CO2 emissions generated from exploration and production to use by the consumer. The cargoes provided enough carbon-neutral energy to power nearly 300,000 homes for a year.

We buy our carbon credits from a global portfolio of nature-based projects. These projects are certified to standards, such as the Verified Carbon Standard and the Climate, Community and Biodiversity Standard.

We believe that nature-based solutions are a critical tool in support of society’s efforts to achieve the goals of the Paris Agreement. Accelerating the pace of deployment will require collaboration between governments, industry and investors, and wider society.
We undertake external verification of the integrity of the processes for the screening of third-party NBS projects that generate carbon credits for voluntary use. We also undertake external verification of the integrity of the processes for carbon credit procurement, reconciliation, retirement and Shell-branded certificate production, in support of Shell’s Net Carbon Footprint and Customer Value Propositions (CVP).
The assurance statements for these scopes can be found on our webpage (see link above).

**Type of engagement**
Education/information sharing

**Details of engagement**
Other, please specify: Increasing the role that natural gas plays in the energy mix is one way countries can take action as the world moves to a low-carbon future. (Sustainability Report 2019)

**% of customers by number**
-

**% of customer-related Scope 3 emissions as reported in C6.5**
30

**Please explain the rationale for selecting this group of customers and scope of engagement**
Scope 3, category “use of sold products”, sub-category “natural gas”.
(SR 2019) In 2019, gas accounted for around half of Shell’s total production. We are a leading producer, marketer and trader of liquefied natural gas (LNG) and gas-to-liquids products.

(AR 2019, p93) Shell’s ambition is to expand the role of natural gas as a cleaner-burning fuel. In 2019, we continued to take steps around the world to achieve this. According to the IEA, more than 40% of global CO2 emissions in 2015 came from electricity and heat generation. For many countries, using gas instead of coal in power generation can make a large contribution, at lower cost, to meeting GHG emission reduction objectives. We expect that, in combination with renewables and the use of CCS, natural gas will be essential in significantly lowering GHG emissions. Natural gas made up more
than half of Shell’s proved reserves at the end of 2019. As a leader in liquefied natural gas (LNG), and with our conventional gas assets and technologies for recovering gas from tight-rock formations, we can supply natural gas to replace coal for power generation. Natural gas can also act as a partner for intermittent renewable energy, such as solar and wind, to maintain a steady supply of electricity, because gas-fired plants can start and stop relatively quickly.

Impact of engagement, including measures of success

Global LNG imports grew by 40 million tonnes in 2019. Significant LNG supply growth came mainly from Australia, the USA and Russia. In 2019, inventory levels were higher in Asia following mild winter conditions. LNG imports were down in Japan and South Korea due to milder weather and higher nuclear utilisation than in 2018.

Products substituted by natural gas help reduce customer emissions:
(SR 2019) Shell is an LNG pioneer with more than 50 years of expertise. We are expanding the use of LNG as a transport fuel for trucks and ships with potential economic and environmental benefits compared to diesel and fuel oil. Other uses include in trains, the mining sector and industrial applications. We are also looking at ways to use LNG more in our own operations.

www.shell.com: Shell GTL Fuel is an alternative fuel for use in diesel engines, which can lower local emissions (e.g. particulate matter, NOx, hydrocarbons and carbon monoxide).
It can be used in existing heavy-duty diesel vehicles without modifications, allowing for easy switchover from diesel fuel with no infrastructure investment required. Shell GTL Fuel is already in daily use with commercial fleets in Germany and the Netherlands.

GTL Kerosene is a synthetic product made from natural gas rather than crude oil, which can be used in aviation and other applications. GTL Jet Fuel is a blend of GTL Kerosene and conventional crude oil-derived standard jet fuel. It is approved for most aviation use at concentrations up to 50% blended with conventional oil-based kerosene (standard Jet A1).
Compared with conventional oil-based kerosene, GTL Kerosene produces virtually zero sulphur dioxide emissions and lower particulate emissions. This means that once blended with conventional jet fuel to create GTL Jet Fuel, it can be attractive to airlines and airport authorities keen to improve local air quality at busy airports by reducing local emissions.
In addition Shell GTL Kerosene has excellent combustion properties with low emissions, making it suitable as lamp oil and fuel for use in greenhouses due to its high smoke point. It can also be used as a feedstock in manufacturing the raw ingredients for detergents, and it makes a good solvent for metal cleaning and dry cleaning.
(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Working together to lower emissions (SR 2019, p38)
We continue to work with others to find ways to lower emissions, both ours and society’s more generally.
We are a founding member of the Energy Transitions Commission, which brings together leaders representing a wide range of sectors and interests. The commission aims to accelerate change towards low-carbon energy systems that enable robust economic development and limit the rise in global average temperature this century to well below 2°C above preindustrial levels.
We work with the Oil and Gas Climate Initiative (OGCI), a voluntary CEO-led group that focuses on carbon capture, utilisation and storage (CCUS), methane detection and reduction, as well as energy efficiency. In 2019, the OGCI launched an initiative to unlock large-scale investment in CCUS, with an early aspiration to double the amount of carbon dioxide that is currently stored globally before 2030. The initiative aims to decarbonise industrial hubs around the world, starting in China, Norway, the Netherlands, the UK and the USA.
We are also members of the Hydrogen Council, a group comprising CEOs working to raise the profile of hydrogen’s role in the transition to a low-carbon energy system.
In 2019, we published our first Industry Associations Climate Review, which assesses our alignment with 19 selected, key industry associations on climate-related policy. Read more about our work with industry associations at www.shell.com/public-advocacy-and-political-activity.
We have announced support for various country climate initiatives, including the direct regulation of methane in the USA, net-zero emissions in the UK by 2050; and the climate accord in the Netherlands.
We also support the European Commission’s proposal for the EU to achieve net-zero emissions by 2050. Visit www.shell.com/public-advocacy-and-political-activity for more on advocacy.

Methane initiatives and collaborations (SR 2019, p44)
We encourage industry-wide action on methane emissions reduction by participating in a number of voluntary initiatives, including:
- the Methane Guiding Principles coalition, which we initiated in 2017. The partnership’s growing membership includes major international and national oil companies and associate signatories such as the International Energy Agency and the UN Environment Programme;
- the Oil and Gas Climate Initiative, which has set a methane intensity target for their members of 0.25% by 2025. This would reduce collective methane emissions by 350,000 tonnes annually compared with the 2017 baseline; and
- the Oil and Gas Methane Partnership, founded by the Climate and Clean Air Coalition, whose principles we are using to enhance our methane emissions reporting.
We have also long supported the direct regulation of methane when regulation is efficient, effective and encourages innovation. We need more robust measurement, transparency and management to successfully reduce methane emissions globally.
Capturing carbon (SR 2019, p54)
In 2019, we successfully completed a one-year pilot project to separate carbon dioxide (CO2) from the exhaust gases of a biomass power plant in Vienna, Austria. The project captured 0.7 tonnes of CO2 per day. The technology meets high CO2 recovery and purity standards and has the potential to cut separation costs per tonne of CO2 by up to 25%, compared to leading alternatives. We are now working to develop the technology to commercial scale so we can capture around 200 times more CO2. We developed the technology and operated the project in collaboration with two Austrian universities, TU Wien and the University of Natural Resources and Life Sciences, and six other partners. The pilot project and preceding research resulted in eight PhDs and 15 published papers. Read more about capturing CO2 in Carbon capture and storage.

Plastic waste as feedstock for chemical plants (SR 2019, p54)
In 2019, we successfully produced chemicals using a liquid feedstock made from plastic waste. The technique, known as pyrolysis, turns hard-to-recycle plastic waste into chemicals that are used to make new plastics. These are the building blocks of everyday consumer goods like clothing, computers and mobile phones. This innovation takes us one step closer to our ambition to use 1 million tonnes of plastic waste a year in our global chemical plants by 2025.

(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?

<table>
<thead>
<tr>
<th>Focus of legislation</th>
<th>Corporate position</th>
<th>Details of engagement</th>
<th>Proposed legislative solution</th>
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<tbody>
<tr>
<td>Cap and trade</td>
<td>Support</td>
<td>Actively engaged in the US House Energy &amp; Commerce Questionnaire (September 2019) on action to address carbon emissions in the USA. Shell is active in both compliance and voluntary markets globally through our four regional desks in London, San Diego, Singapore and Shanghai. We manage the global CO2</td>
<td>Introduction of a broad-based carbon pricing mechanism as a first-best regulatory approach for governments to deliver their emission reduction goals including the goal established under the Paris Agreement. With the following design considerations: - Avoidance of overlapping policies which could undermine the establishment of the carbon price signal needed to</td>
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compliance obligations for all 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. 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.

With a focus on supporting the development of emerging markets, Shell Energy (China) Limited was one of the first foreign companies to 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.

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.

Support investments in low-carbon technology R&D and conversion of energy systems;
- Consideration on how to reinvest revenues to increase broad political resilience (impacts on low-income households and displaced workers), to promote innovation, and to increase the availability of affordable low-carbon energy options for the public and businesses; and
- Protection of industry competitiveness and prevention of carbon emissions leakage that can undermine climate objectives.

<table>
<thead>
<tr>
<th>Other, please specify</th>
<th>Support</th>
<th>Global Carbon Market</th>
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<tbody>
<tr>
<td>Shell provided detailed input to IETA’s proposals for developing the rules and procedures for implementation of Article 6 of the Paris Agreement. We also set out Shell’s views on how Article 6 of the Paris Agreement could work and key considerations for it to be effective in support of advocacy for agreement at COP25. Shell shared our views with stakeholders at the United Nations Climate Change Conference COP25 in Madrid.</td>
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Other, please specify | Support | Linked carbon markets through development of internationally traded mitigation outcomes (ITMOs) and emissions mitigation mechanisms (EMM) (Paris Agreement; Article 6). |
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<tr>
<td>Through the Oil and Gas Climate Initiative (OGCI), launched the CCUS KickStarter to facilitate large-scale commercial investment in CCUS. This aims to enable multiple low-carbon</td>
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- Help develop the necessary market conditions for CCUS;
- Facilitate large-scale commercial investment in CCUS; and
| Carbon Capture, Utilisation & Storage | industrial hubs. These hubs will capture carbon dioxide from several industrial sources within one region and bring economies of scale by sharing transport and storage infrastructure. Our aim is to create the market conditions for CCUS to play a significant role in decarbonizing industry. A joint statement between governments of the Clean Energy Ministerial (CEM) CCUS Initiative countries and OGCI member companies intend to explore opportunities to support the commercial development of CCUS through the various stages of development. This will notably include sustained dialogue on policy and regulatory frameworks, aiming for commerciality of identified hubs and projects. This could also consider, as appropriate, mechanisms for risk management at each operational phase, knowledge sharing, storage appraisal activities, corporate and project finance and engagement with civil society. 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 countries’ Nationally Determined Contributions. | - Bring economies of scale by sharing transport and storage infrastructure. |
| Other, please specify | Support | Shell’s CEO publicly supported the European Commission’s proposal for the EU to achieve net zero emissions by 2050. Shell also publicly supported the Netherland’s Climate Accord and Shell supported calls by the UK Committee on Climate Change for the UK to achieve net-zero greenhouse gas emissions by 2050. Success in reaching net zero by 2050 would, of course, rest on progress made on several key enabling policies and the EU should rapidly move to make them happen. The advances the EU has made with the Emissions Trading System have been very encouraging. But the world needs greater international co-operation. And the progress made to establish a global emissions trading system, as described... |
by Article 6 of the Paris Agreement, has simply not been enough. We cannot overstate the need for urgency on this, and the world needs EU leadership to help find a way forward at the next COP. A properly functioning Article 6 mechanism can accelerate climate action in a way nothing else can.

Another key area where policy can make a difference is in encouraging the greater integration of renewable power and investment in lower-carbon gases, notably hydrogen. And policy will be needed to ensure both nature-based solutions and carbon capture and storage are able to scale up to the level required. To balance unavoidable emissions, while maintaining industrial competitiveness.

<table>
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<th>Regulation of methane emissions</th>
<th>Support</th>
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<tr>
<td>Shell publicly called on the Environmental Protection Agency (EPA) in the USA to continue the direct regulation of methane emissions. We responded to the OIL AND NATURAL GAS SECTOR: EMISSION STANDARDS FOR NEW, RECONSTRUCTED, AND MODIFIED SOURCES REVIEW; PROPOSED RULE (Sept 24, 2019). We publicly stated that reduction of methane emissions must be a core focus of the EU’s decarbonisation strategy.</td>
<td>USA’s EPA should not remove the transmission and storage segments from the current NSPS oil and natural gas source category. Nor should the Agency rescind any of the methane-specific requirements applicable under the “40 CFR Part 60, OOOOa”. Methane is a potent greenhouse gas (GHG) for which its direct regulation is appropriate and necessary in order to address the many challenges of global climate change while further supporting the benefits of the increased use of natural gas for reducing GHG emissions throughout the U.S. economy. Based on these considerations, Shell supports the direct regulation of methane as long as those regulatory control requirements are implemented in an efficient and effective manner that encourages innovation. We believe that such an approach is critically important for ensuring natural gas plays a vital role in transitioning to a...</td>
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Shell encourages the EU to consider ambitious policies and incentives to drastically reduce methane emissions to near-zero from all natural gas used in Europe, including from imported gas, from its point of production to its end use.

As new technologies will not be cost competitive immediately, time-limited incentives for all low carbon technologies will be needed to bridge the gap and ensure an effective transition. The Framework can contribute to reducing transport emissions by sending a strong signal to consumers to consume fuel more efficiently while at the same time providing the support needed to deploy technologies that can reduce emissions, such as advanced biofuels, refuelling infrastructure for electric and hydrogen vehicles, and Carbon Capture Use and Storage (CCUS) technologies. Shell recommends biofuels be excluded from the programme like the exclusion of biofuels from California’s Cap and Trade programme.

We also recommend that TCI support the use of renewable fuels within the aviation and heating oil sectors as an offset generating activity. This approach is like the treatment of these fuels within the federal Renewable Fuel Standard (“RFS”).

To ensure a level competitive playing field, all gasoline and diesel sold for consumption in the TCI jurisdictions must be subject to regulation.

Shell supports inclusion of flexibility and cost containment mechanisms. Compliance flexibility allows businesses to select strategies that best suit their unique needs and
evolving circumstances, while delivering real emission reductions more efficiently and at less cost than rigid measures. In addition to allowances, it is important for the programme to allow obligated entities to meet a portion of their obligation with offsets. Offsets serve as a cost mitigation measure when other low carbon technology options are unreasonably expensive or unavailable, thereby potentially easing the cost of the energy transition to businesses and consumers.

(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.

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/1554466210642/0a46ab13e36e99f8762ebb021bd72dececc2f47b2/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 COP25 and throughout 2019 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 2020 and 2021.

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.


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.
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.


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 US 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 US power sector. API opposed the Clean Power Plan, which the Obama Administration said would reduce CO2 emission from the stationary power sector 32% 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.


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.


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.
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.
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
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.


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.

A Shell representative 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.


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/1554466210642/0a46ab13e36e99f8762ebb021bd72decc2f47b2/final-industry-association-climate-
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 is a member of the executive committee.

(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.
(SR 2019)
Collaborations and stakeholder engagement
We collaborate with governments, non-governmental organisations, industry bodies, national oil and gas companies and many other businesses. These collaborations range from working together on a project to sponsoring a particular group. Collaborating and engagement with these groups helps us in many different ways. It is a proven way to learn new things, share best practice, achieve specific objectives, set future goals and build trust with the stakeholders who have an interest in Shell. Read more about how we work with others at www.shell.com/ sustainability/our-approach/working-in-partnership. In 2019, we made significant progress in our work with stakeholders in, among other areas, tax and transparency, corporate good practice and tackling plastic waste.

TCFD
We welcome and support efforts, such as those led by the Task Force on Climate-related Financial Disclosures (TCFD), to increase transparency and to promote investors’ understanding of companies’ strategies to respond to the risks and opportunities presented by climate change. We believe that companies should be clear about how they plan to be resilient in the energy transition. In 2017, we joined the Oil and Gas Preparer Forum, initiated by the TCFD and convened by the World Business Council for Sustainable Development. The forum’s objectives are to review the current state of climate-related financial disclosures, to identify examples of effective disclosure practices and make proposals on how disclosures may evolve over time.

WBCSD
We are a founding member of the World Business Council for Sustainable Development, a global organisation led by the chief executive officers of more than 200 leading businesses that work together to accelerate the transition to a sustainable world. In 2019, we chaired and played an active role in the WBCSD's Climate & Energy programme. We also worked on a guide to natural climate solutions for the private sector.

**World Resource Institute**  
We are working with the World Resources Institute (WRI), a global research organisation, to review and further develop our GHG aspirations. In 2019, we have also 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. Shell’s global climate-related policy positions (accessible at www.shell.com/advocacy) are global principles which guide the positions Shell takes on regional and country-specific policies.

For example, our global climate-related policy positions set out that we advocate the direct regulation of methane emissions as a risk to the climate system and support reductions in methane emissions throughout the natural gas supply chain. Guided by this position, in 2019 we took positions on sector-specific policies through our membership of the Methane Guiding Principles partnership, which developed a Methane Policy Framework that sets out the key elements that would form an effective policy framework focused on ensuring ambitious methane reduction outcomes are met. In March 2019, the President of Shell Oil Company called on the Environmental Protection Agency (EPA) in the USA to continue the direct regulation of methane emissions. In December 2019, Shell also encouraged the EU to consider ambitious policies and incentives to drastically reduce methane emissions to near-zero from all natural gas used in Europe.

Shell’s global climate-related policy positions are also the basis for reviewing our memberships of industry associations. The alignment of industry associations with these principles is assessed on a case-by-case basis, recognising that associations vary in terms of the profile of their members and the scope of their activities. Support for the goal of the Paris Agreement is the core principle underpinning Shell’s climate-related advocacy and assessment of our alignment with industry associations.

(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

2019 Shell Annual Report.pdf

Page/Section reference

Section "CLIMATE CHANGE AND ENERGY TRANSITION", pages 91-98, including references to other sections in the report, such as ANNUAL REPORT ON REMUNERATION

Content elements

Strategy
Risks & opportunities
Emissions figures
Emission targets

Comment

Publication: In voluntary sustainability report

Status

Complete

Attach the document

2019 Sustainability Report.pdf

Page/Section reference

Page 13: SDGs, Climate Action; page 14-16: goals, performance and plan; page 17: Sustainability governance; page 18: Executive remuneration; page 35/36: Environment, e.g. flaring; page 38-47: Climate change and energy transition, page 88/89: Performance data tables

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication: In voluntary communications

Status
Complete

Attach the document

2020 Industry Associations Climate Review Update.pdf

Page/Section reference
INDUSTRY ASSOCIATIONS CLIMATE REVIEW, whole document

Content elements
Governance
Strategy
Risks & opportunities

Comment
Publication: In voluntary communications

Status
   Complete

Attach the document
   -

Page/Section reference

Content elements
   Strategy
   Risks & opportunities
   Other, please specify
      Uncertainties around energy transitions and climate change, including country, region and sector perspectives. Our scenarios also help governments, academia and business in understanding possibilities and uncertainties ahead.

Comment
   -

C15. 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.

CAUTIONARY NOTE
The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this 2020 CDP Climate Change response, “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 2020 CDP Climate Change response 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.

This 2020 CDP Climate Change response contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of 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 2020 CDP Climate Change response, 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; (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this 2020 CDP Climate Change response 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, 2019 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward-looking statements contained in this 2020 CDP Climate Change response and should be considered by the reader. Each forward-looking statement speaks only as of the date of this 2020 CDP Climate Change response, August 25, 2020. 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 2020 CDP Climate Change response. We may have used certain terms, such as resources in this 2020 CDP Climate Change response, that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website www.sec.gov.

SKY SCENARIO DISCLAIMER
This 2020 CDP Climate Change response contains data and analysis from Shell’s 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. Additionally, it is important to note that as of August 25, 2020, Shell’s operating plans and budgets do not reflect Shell’s Net-Zero Emissions ambition. Shell’s aim is that, in the future, its operating plans and budgets will change to reflect this movement towards its new Net-Zero Emissions ambition. However, these plans and budgets need to be in step with the movement towards a Net-Zero Emissions economy within society and among Shell’s customers.

Also, in this 2020 CDP Climate Change response we may refer to Shell’s “Net Carbon Footprint”, which 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. 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.

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

<table>
<thead>
<tr>
<th>Job title</th>
<th>Corresponding job category</th>
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<tr>
<td>Chief Executive Officer (CEO)</td>
<td>Chief Executive Officer (CEO)</td>
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