



SUSTAINABILITY REPORT 2019
ROYAL DUTCH SHELL PLC

DELIVERING ENERGY RESPONSIBLY

CONTENTS

03 INTRODUCTION

- 04 Letter from the CEO
- 06 About this report
- 09 Our business strategy
- 11 Our approach to sustainability

19 RESPONSIBLE BUSINESS

- 20 Human rights
- 24 Safety
- 30 Environment

37 SUSTAINABLE ENERGY FUTURE

- 38 Climate change and energy transition
- 40 Net Carbon Footprint
- 43 Managing greenhouse gas emissions
- 47 Natural gas
- 48 Lower-carbon energy
- 54 Developing technology

Digital

The Sustainability Report is published in an online version at reports.shell.com. The online version includes additional information, such as an interactive GRI index to enhance usability for the reader. In the event of any discrepancy between the online and hardcopy versions, the information contained in the online report prevails. This hardcopy version is provided for the reader's convenience only.

Scenarios

This report 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 and investors should not rely on them when making an

Cover image: The Pecten is the key symbol of the Shell Brand. It is sometimes referred to as our icon, logo or emblem, and is one of the world's most recognised symbols. It is an asset with enormous value, and a key enabler of successful business through our customers, governments, business partners, contractors and staff. It has been at the core of our branding for over 100 years.

56 CONTRIBUTION TO SOCIETY

- 57 Working for Shell
- 60 Revenue transparency and tax
- 61 Social performance
- 65 Working together

71 SPECIAL REPORTS

- 72 Economic development in Nigeria
- 75 Spill prevention and response in Nigeria
- 77 Working for the future of Groningen
- 79 Nature-based solutions
- 81 Energy efficiency in our operations
- 83 Growing gas and power in Australia

85 OUR PERFORMANCE DATA

- 86 About our data
- 87 Safety data
- 88 Environmental data
- 90 Social data

investment decision with regard to Royal Dutch Shell plc securities.

It is important to note that Shell's existing portfolio has been decades in development. While we believe our portfolio is resilient under a wide range of outlooks, including the IEA's 450 Scenario (World Energy Outlook 2016), it includes assets across a spectrum of energy intensities, including some with above-average intensity. While we seek to enhance our operations' average energy intensity through both the development of new projects and divestments, we have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10-20 years. Although we have no immediate plans to move to a net-zero emissions portfolio, in November of 2017, we announced our ambition to reduce our Net Carbon Footprint in step with society's progress toward the Paris Agreement's goal of holding the rise in global average temperature to well below 2°C above pre-industrial levels. Accordingly, assuming society aligns itself with the Paris Agreement's goals, we aim to reduce our Net Carbon Footprint, which includes not only our direct and indirect carbon emissions, associated with producing the energy products which we sell, but also our customers' emissions from their use of the energy products that we sell, by around 20% in 2035 and by around 50% in 2050. The use of the term Shell's "Net Carbon Footprint" is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

Design: **Friend** www.friendstudio.com

Production: **nexxar** www.nexxar.com

Print: **Tuijtel** under ISO 14001





INTRODUCTION

Welcome to the Shell Sustainability Report, which covers our social, safety and environmental performance in 2019 and significant events for Shell during the year.

- 04** Letter from the CEO
- 06** About this report
- 09** Our business strategy
- 11** Our approach to sustainability



LETTER FROM THE CEO



BEN VAN BEURDEN
CEO

Early 2020 has been a time of extraordinary turbulence because of the spread of the COVID-19 pandemic. It has affected so many people around the world. Many have lost their lives.

At Shell, we are doing everything we can to help in the global response to the virus. We are focused on protecting our staff and customers and supporting communities where we operate. We are working to ensure that our operations are resilient so we can continue to provide energy, helping to power hospitals and supplying fuel for ships to get goods around the world. Our chemical plants are stepping up production of isopropyl alcohol, a key ingredient of hand-sanitising liquid.

How this will all unfold in the short term is still uncertain, of course, but as the world battles to overcome what it is struggling with today, Shell will seek to assist in whatever way we can.

At the same time, Shell remains keenly aware of the longer-term challenges facing our society.

In 2019, demands for urgent action on climate change grew ever louder. All of society, from consumers, to businesses, to governments, recognised the need to accelerate global efforts to reduce greenhouse gas emissions.

Shell shares this sense of urgency. We continue to take climate action on many fronts, including tackling our own emissions and helping customers reduce theirs by expanding the choice of lower-carbon products we offer. We are working hard to play our part in the global transition by providing more and cleaner energy.

But we – and society as a whole – need to do much more because change is not happening fast enough.

You can read about our progress on helping tackle climate change, and our efforts to meet society’s expectations in this area, in the 2019 Sustainability Report. Of course, we must also work to meet society’s expectations in many other areas.

Our approach to sustainability can help us to be ultimately trusted, valued and supported by society.

RESPONSIBLE BUSINESS

Sustainability at Shell comes down to three things.

The first is running responsible and profitable operations.

We have made progress on improving the safety of our operations since the early 2000s. This is largely due to more effective standards and requirements, such as the Life-Saving Rules. It is also the result of a stronger safety culture, guided by our Goal Zero ambition to achieve no harm and no leaks. But sadly we have not been able to eliminate all fatal incidents involving Shell employees and contractors.

Tragically, seven people died while working for Shell in 2019. This is unacceptable. We must strive to do more and continuously improve our efforts to keep people safe.

We are building on our current approach to safety with a more consistent focus on the way people, culture, equipment, work systems and processes all interact. Many of our fatalities over the last five years were due to the complex interaction between these elements. We need to better understand the gap between how we expect work will be done safely and how the work is actually carried out.

We must continue to work to prevent incidents by maintaining protective barriers to improve safety and by providing training. But we also acknowledge that people can make mistakes and processes can fail.

This means, for example, we can train our people to be even better at dealing with the unexpected and on our response in the moment to avoid the risk of a serious injury. We want to get to a place where even if there is an incident, everyone emerges unhurt.

We must also operate responsibly to safeguard the environment. This includes efforts to manage our water use, to respect ecosystems and to reduce waste related to our operations. For example, in 2019, we became a founding member of the Alliance to End Plastic Waste, a group of major chemical and consumer goods companies. We also aim to use 1 million tonnes of plastic waste as a raw material in our chemical plants by 2025. And, in Nigeria, we continue to tackle environmental challenges related to oil spills in places with oil theft or



sabotage of pipelines, as well as illegal oil refining. We also have programmes in place to reduce the number of operational spills over the long term. In 2019, we continued to carry out vital work to clean up Bodo, an area badly affected by oil spills.

Being responsible is also about behaving ethically. Our employees must show absolute integrity every day. They must meet the ethical standards that Shell, and society, expects. Our standards are set out in Shell’s business principles and code of conduct. We are very clear that it is not sufficient for Shell’s actions and behaviour merely to be legally sound. We must take a broad view that also considers the wider implications of our commercial choices and our stakeholders’ view of them. We spent a lot of time in 2019 reinforcing the standard of behaviour we expect. For example, all senior executives completed a mandatory ethical leadership programme. I strongly believe all leaders must set the tone from the top.

SUSTAINABLE ENERGY FUTURE

The second area we focus on is to help shape a more sustainable energy future.

That is why we are taking action to provide lower-carbon products to help customers reduce their emissions. These are products that people rely on to live their lives, in their homes and businesses, and for transport.

We continue to work towards delivering on our Net Carbon Footprint ambition to cut the intensity of the greenhouse gas emissions of the energy products we sell by about 50% by 2050, and 20% by 2035 compared to our 2016 levels, in step with society as it moves towards meeting the goals of the Paris Agreement. In 2019, we set shorter-term targets for 2021 of 2-3% lower than our 2016 baseline Net Carbon Footprint. In early 2020, we set a Net Carbon Footprint target for 2022 of 3-4% lower than our 2016 baseline. We will continue to evolve our approach over time.

We are taking action to achieve this ambition. In 2019, we continued to offer lower-emission energy products, including natural gas, biofuels, hydrogen and renewable power. We increased our investment in natural ecosystems that produce carbon credits to help drivers in two key markets, the Netherlands and the UK, to offset their carbon emissions. And we increased our use of detection and repair programmes at our gas production sites to reduce leaks of methane, a potent greenhouse gas.

Of course, the task of tackling climate change is bigger than any single company. Everyone on the planet, from consumers, to businesses, to governments, must play their part in reducing greenhouse gas emissions. Everyone must work together. One form of collaboration is for businesses like Shell, which supply energy, to work alongside businesses that use energy, to decarbonise their sector. The shipping industry is one sector where such an approach could have a huge impact. For example, the Getting to Zero Coalition brings together more than 90 companies to find a way to put a commercially viable net-zero emissions ship to sea by 2030.

CONTRIBUTION TO SOCIETY

The third area of sustainability for us – and it is a critical one – is to make a positive contribution to society.

Meeting society’s expectations involves playing a positive role in communities where we operate and in wider society. We do this by creating jobs, developing talent and using local suppliers. We also invest in education programmes to equip young aspiring engineers and scientists with the tools and skills needed to become future innovators.

In 2019, we made further progress in providing energy to people who would otherwise go without basics such as electric lighting. We made several investments to help provide reliable electricity across Africa, Asia and beyond. This supports the effort to help to achieve universal access to clean, affordable energy, one of the many UN sustainable development goals to which we contribute.

Contributing to society also means gaining and maintaining people’s trust. We do this by being as open as we can about what we do and why we do it. For example, we are being increasingly transparent about the industry groups we are part of. In 2019, we published the Industry Associations Climate Review, which assessed for the first time Shell’s alignment with 19 industry associations on climate-related policy. We also published our first Tax Contribution Report in 2019, which presents Shell’s approach to tax and explains how our business activities are taxed globally.

This Sustainability Report details our activities during 2019. The report builds on our actions on sustainability and transparency. We are a founding member of the UN Global Compact and we also continue to support its corporate governance principles on human rights, environmental protection, anti-corruption and better labour practices.

Once again, I would like to thank the members of the independent Report Review Panel, who help us provide more balanced, relevant and responsive reporting.

This report shows much progress. But Shell must further step up efforts on all fronts, from climate change to ethical leadership to greater transparency. We must continue to make a real contribution to people’s lives. We can only do this by keeping our approach to sustainability at the heart of the way we do business.



Ben van Beurden
Chief Executive Officer



ABOUT THIS REPORT

TOPIC OVERVIEW

The 2019 Sustainability Report, published on April 7, 2020, is our 23rd such report. It focuses on the key sustainability challenges and opportunities we face and the many ways in which we are responding. It details our social, safety and environmental performance in 2019.

Topic selection

The topic selection process identifies the sustainability subjects that were most relevant to Shell and our stakeholders or were prominent globally in 2019.

Each year, we use a structured process to select the report's content. We engage with various groups and individuals to understand specific concerns about our business and its impact worldwide, particularly relating to the environment and society. We consider the views of others such as non-governmental organisations, customers, the media, academics, investors and employees. We gather opinions and advice in various ways, including formal and informal meetings, workshops and surveys.

This report lists the topics that were a priority for Shell in 2019. Topics that consistently ranked of higher importance were energy transition and climate change, business ethics, transparency and corporate governance.

The main steps involved in selecting topics were:

- identify and understand topics that are important to our stakeholders and our strategy;
- collate the topics identified as of high importance;
- identify the topics that will be covered on www.shell.com;
- consider input from our Report Review Panel to ensure that coverage is balanced, relevant and complete; and
- inform Shell's Executive Committee of the topics, for its endorsement.

External voices

Several individuals have shared views on Shell's activities in sections called "External voices". These quotes are intended to give independent perspectives on our activities. They come from a range of organisations in areas such as civil society, academia, contracting and supply, community leadership, as well as customers and people living or working near our facilities. They also reflect some of the different regions where we operate and some of our businesses and projects. The views expressed are those of the individual and do not represent views by Shell. Contributors are not remunerated.

Reporting guidelines

We report in line with guidelines developed by IPIECA, the global oil and gas industry association for advancing environmental and social performance. This report has also been prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core option (see [GRI index](#) for full details).

We used the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) to guide and inform our reporting in our Sustainability Report and Annual Report, which were complemented by our Sky scenario and the Shell Energy Transition Report.

More detailed information about how we report is available at www.shell.com



REPORT REVIEW PANEL

We use an external review panel to strengthen our sustainability reporting. The panel helps evaluate and improve the quality and credibility of our Sustainability Report.

The 2019 Report Review Panel was comprised of five sustainability and corporate reporting experts:

- Faris Natour, Germany/USA. Founding Director, Human Rights and Business Initiative, University of California, Berkeley (Chair of the Report Review Panel)
Andrew Logan, USA. Senior Director, Oil and Gas, Ceres
Changhua Wu, China. Chief Executive Officer, Beijing Future Innovation Center

- Mandy Kirby, UK. Chief Strategist and Co-founder, City Hive
Hilary Parsons, UK. Formerly Head of Creating Shared Value Engagement, Nestlé

You can read more about the panel members at www.shell.com/sustainability-report-review-panel.

The panel provided input into our topic selection process. They reviewed the report, discussed Shell's reporting and spoke to relevant Shell employees to prepare their statement. The panel's mandate focused on the quality of Shell's reporting, including credibility, completeness and responsiveness.

Panel members are offered an honorarium for their input.

2018 RECOMMENDATIONS AND OUR RESPONSES

2018 RECOMMENDATIONS

HOW SHELL RESPONDED IN 2019

UN sustainable development goals (SDGs): Integrate the SDGs more in Shell's reporting. Use the goals more to clearly frame Shell's strategic priorities and to connect the related steps being taken to meet its objectives.

All the SDGs are relevant to Shell. We can make the greatest contribution to three (see UN sustainable development goals).

A new interactive table of contents has been added to the report's homepage to direct readers to information related to the SDGs (see www.shell.com/sustainabilityreport).

We have also launched a new SDG page on www.shell.com/sdgs that contains more on our actions to support the goals.

Balance: Provide more balanced internal and external voices in the report.

We continue to include views on our activities, from inside and outside Shell. Several individuals have shared their perspectives from a range of organisations, different regions where we operate and some of our businesses and projects. We seek to further improve the balance in future reports by encouraging individuals to provide constructive feedback.

Water: Provide additional targets and other measures Shell uses to minimise water risks for its operations at the project level.

Water is managed at a local level and targets are not shared in the report. Case studies have been provided to give some insight into how water is managed at this local level. A new chart has been added to the report to show the source of fresh water that is withdrawn (see Water use).

Plastics: Include more discussion of Shell's role in addressing the global challenge of ocean plastics.

The report features a number of new initiatives to address plastic waste, run by Shell and in collaboration with the Alliance to End Plastic Waste (see Plastics).

Approach to sustainability reporting: Focus on integrating Shell's strategic priorities under a clearly articulated sustainability strategy. This would also enable Shell to produce a more succinct report with the opportunity for more in-depth discussion and precise reporting on progress on strategic priorities.

The 2019 report organises content under three themes: Responsible business, Sustainable energy future and Contribution to society. The commentary and case studies have been carefully appraised to correlate more closely with the results of the topic selection process and to reflect our key business decisions. There remains an opportunity to narrow the breadth of topics included in the report.



**2019 recommendations letter
Report Review Panel statement**

The Report Review Panel issues the following independent statement on Shell's 2019 Sustainability Report.

"We have had the opportunity to review two drafts of the 2019 Sustainability Report and provide feedback to Shell through conference calls and in writing. Shell has responded to our questions and suggestions. In line with the scope of our review, our feedback focuses on the quality of Shell's sustainability reporting rather than its sustainability performance.

Following our review of the 2018 Sustainability Report, the Report Review Panel recommended that Shell evolve its approach to its sustainability reporting with a clear focus on strategic priorities. We are pleased to see that Shell has developed a report that is more concise, clearly structured and puts greater emphasis on sustainability priorities under its three pillars of responsible business, sustainable energy future, and contribution to society. Throughout the report, it is evident that Shell has sought to address much of our feedback. We commend Shell on its continued commitment to transparency and on reporting its most material sustainability impacts.

Building on the work already undertaken, we see potential for Shell to more clearly articulate how its sustainability priorities intersect with its core business strategy to drive decisions, such as resource allocation and prioritisation. While we value the high level of detail in the report, Shell could more effectively convey the big picture of its place in society – including both risks and opportunities. Forming a clear sustainability strategy would strengthen Shell's potential to engage

readers who are not sustainability experts but are concerned about material issues such as climate change and ecological integrity. Similarly, Shell has an opportunity to demonstrate leadership by addressing growing concerns about the role that companies should play in society and to present a point of view on how business can help address society's most pressing challenges.

For next year's report, we see potential for innovation in measuring sustainability performance. We would also like to see Shell continue to provide more context and explanation for the metrics it already reports against so that readers are better able to assess changes in performance and progress towards long-term goals. We are pleased to see an emphasis in the report on safety and the steps Shell is taking to evolve its safety culture. This presents the possibility to develop new ways to measure and convey the impact of this change on Shell's safety culture. We also welcome Shell's disclosure on its sustainability-related partnerships. We would like to see more information on how and when Shell pursues such partnerships and how their impact is measured.

Finally, we welcome Shell's continued commitment to include more internal and external voices in the report. We see an opportunity to further improve the balance of the report by including more diverse and critical points of view from independent voices and by articulating in more depth the potential challenges facing key business areas.

We would like to thank Shell for the opportunity to share our feedback here and throughout the drafting process and we look forward to reading Shell's next sustainability report."



OUR BUSINESS STRATEGY

Shell's purpose is to power progress together by providing more and cleaner energy solutions.

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.

STRATEGIC AMBITIONS

We have the following strategic ambitions to guide us in pursuing our purpose:

- to thrive in the energy transition by responding to society's desire for more and cleaner, convenient and competitive energy;
- to provide a world-class investment case. This involves growing free cash flow and increasing returns, all built upon a strong financial framework and resilient portfolio; and
- to sustain a strong societal licence to operate and make a positive contribution to society through our activities.

OUR BUSINESS STRATEGY

OIL



2%

approximately of the world's oil provided by Shell

CUSTOMERS



30 million

customers served at our retail sites on average every day

CAPITAL INVESTED



\$28.8 billion

in 2019

NATURAL GAS



3%

approximately of the world's natural gas provided by Shell

PRODUCTION



3.7 million

barrels of crude oil equivalent a day in 2019

RESEARCH AND DEVELOPMENT



\$962 million

invested in research and development in 2019



Shell business activities

Exploration

- 1. Exploring for oil and gas onshore and offshore

Development and extraction

- 2. Developing onshore and offshore fields
- 3. Producing conventional, deep-water and shale oil and gas
- 4. Capturing carbon dioxide and storing it safely underground
- 5. Extracting bitumen

Manufacturing and energy production

- 6. Upgrading bitumen
- 7. Refining oil into fuels and lubricants
- 8. Producing gas-to-liquids (GTL) products
- 9. Producing petrochemicals
- 10. Producing biofuels
- 11. Generating renewable power
- 12. Producing liquefied natural gas (LNG)

Transport and trading

- 13. Shipping gas to where it is needed
- 14. Shipping oil to where it is needed
- 15. Trading oil and gas
- 16. Supply and distribution of LNG for transport applications
- 17. Regasifying LNG
- 18. Trading power

Sales and marketing

- 19. Supplying domestic electricity
- 20. Supplying products to businesses, including gas for cooking, heating and electrical power
- 21. Progressing electric vehicle and hydrogen refuelling infrastructure
- 22. Providing mobility solutions for customers, including fuels and lubricants
- 23. Supplying aviation fuel

Technical and business services

- 24. Researching and developing new technology solutions
- 25. Managing the delivery of major projects
- 26. Providing technical and supporting services



OUR APPROACH TO SUSTAINABILITY

SUSTAINABILITY AT SHELL

Sustainability at Shell means providing more and cleaner energy solutions in a responsible manner – in a way that balances short- and long-term interests, and that integrates economic, environmental and social considerations into decision-making.

Sustainability is integrated across our business on three levels.

Running a safe, efficient, responsible and profitable business

This is the foundation of our approach. We strive to produce and deliver energy responsibly – with respect for people, their safety and their environment. At the simplest level, this means doing no harm. We apply global standards to manage safety, the environment and how we engage with communities and we work to continuously improve our performance.

Helping to shape a more sustainable energy future

We provide products that people need and want to improve their lives – in their homes and businesses, and for transport. We aim to be responsible stewards for these products. We intend to adapt, innovate and play our part in the global shift to provide more and cleaner energy. This means transforming our product mix over time. We are taking action to provide lower-carbon products to help customers reduce their emissions. We aim to reduce the Net Carbon Footprint of the energy products we sell by around 50% by 2050, and 20% by 2035 compared to our 2016 levels, in step with society’s progress to align with the goals of the Paris Agreement.

Making a positive contribution to society

We aim to play a positive role in communities where we operate and in wider society. We contribute to the development of local economies by creating jobs, boosting skills, sourcing from local suppliers, as well as paying taxes and royalties. We support community projects that are based on the needs of local people. Our ambition is to provide a reliable electricity supply to 100 million people, primarily in Africa and Asia, by 2030.

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 (see [Sustainable development goals](#)).

We aim to respect human rights as set out in the UN’s Universal Declaration of Human Rights and the International Labour Organization’s core conventions. We are a founding member of the UN Global Compact and also support a number of external voluntary codes that promote responsible business practices. Read more about these codes at www.shell.com/sustainability/transparency/external-voluntary-codes.

We fully support the Paris Agreement’s goal to keep the rise in global average temperature this century to well below two degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

Find out more about our approach to sustainability at www.shell.com/sustainability/our-approach/sustainability-at-shell.

EMBEDDING SUSTAINABILITY INTO PROJECTS

Safety, the environment and communities are vital considerations when we plan, design and operate our projects and facilities.

We conduct impact assessments for every major project and consider the economic, social, environmental and health opportunities and risks.



The rising standards of living of a growing global population are likely to continue to drive energy demand.



1. Introduction

2. Responsible business

3. Sustainable energy future

4. Contribution to society

5. Special reports

6. Our performance data

Managing these as well as political, commercial and technical risks is essential to delivering a successful project.

We engage with communities and other stakeholders to discuss projects. Their input helps us to design better projects, comply with relevant social and environmental regulations, and align with international standards. This includes standards from the World Bank and the International Finance Corporation.

We train our project teams to embed sustainability into projects and aim to balance short- and long-term business interests. Specialists support our project teams in areas such as biodiversity, waste, air, energy and water management, and human rights, including indigenous peoples' rights, cultural heritage and resettlement.

The mandatory requirements in our Health, Safety, Security, Environment and Social Performance Control Framework help to ensure our projects and facilities are managed safely, responsibly and in a consistent way.

We use our framework for greenhouse gas (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. To assess the resilience of proposed projects, we also consider potential costs associated with operational GHG emissions (see [Greenhouse gas emissions](#)).

We track and report our Net Carbon Footprint and work on reducing the environmental impact of our operations. Our Net Carbon Footprint is a carbon intensity measure that takes into account the estimated full life-cycle greenhouse gas emissions, including customers' emissions, of these products.



We view our contribution to universal access to energy as fundamental to our core purpose: to provide more and cleaner energy.

We work continuously to improve the energy efficiency of our assets. This work includes monitoring our electricity use, making our equipment more efficient through regular and smart scheduling of maintenance, and increasingly by seeking opportunities to use renewable energy sources. We have also started to collaborate with communities on district heating and using co-generation power plants at our projects.

We aim to work with contractors and suppliers that are economically, environmentally and socially responsible. The Shell Supplier Principles outline what we expect from suppliers. We aim to contribute to the development of local economies in the regions where we operate by creating jobs, boosting skills and sourcing from local suppliers.

We work to play a positive role where we operate. Our General Business Principles and Code of Conduct describe how we live up to our core values of honesty, integrity and respect for people.

A guide to sustainability across the life of a project

	Identify and assess	Select	Define	Execute	Operate	Decommission and restore
Identify people who may be interested in or affected by the project	✓	✓	✓	✓	✓	✓
Engage with stakeholders (e.g. communities, host governments and NGOs) and feed responses into our risk analyses and decision-making process	✓	✓	✓	✓	✓	✓
Conduct baseline studies of the local environment (e.g. water, biodiversity and social livelihoods) and consider how the project may affect it	✓	✓				
Based on assessment of potential impacts and stakeholder engagement, identify mitigation and enhancement measures		✓	✓	✓		
Implement a mitigation plan for project development, construction, operation, decommissioning and restoration				✓	✓	✓



UN SUSTAINABLE DEVELOPMENT GOALS

The UN's 17 sustainable development goals (SDGs) seek to address the world's biggest challenges, including ending poverty, improving health and education, making cities sustainable and tackling climate change.

Governments are responsible for prioritising and implementing approaches that meet the SDGs but achieving these tasks will require unprecedented collaboration and collective action with business and civil society.

All the goals are relevant to Shell and we have an important role to play in supporting these ambitions. We can make the greatest contribution to three goals: Ensure access to affordable, reliable, sustainable and modern energy (Goal 7), Decent work and economic growth (Goal 8) and Climate action (Goal 13). For information on Shell's actions that support other goals, please visit www.shell.com/sdgs.

solar home systems. We continue working to achieve our ambition to provide a reliable electricity supply to 100 million people, primarily in Africa and Asia, by 2030.

For more information on our approach, see [Access to energy](#).



Goal 8: Decent work and economic growth

Employment is a critical route out of poverty and helps people towards prosperity.

We provide jobs and follow applicable labour, health and safety standards. We work with governments and others to offer training to build local skills and expertise. We encourage local businesses to be part of our supply chain and seek to ensure our suppliers meet Shell standards.

We also support entrepreneurs and help young people start their own businesses through social investment programmes such as Shell LiveWIRE.

We contribute to economic growth by paying taxes and royalties to local governments. In December 2019, we published a new report detailing the corporate income tax that Shell companies paid in countries and locations around the world in 2018.

For more information on our approach, see [Contribution to society](#).



Goal 13: Climate action

The world needs to take action to tackle climate change. The Paris Agreement set a goal of holding the rise in global average temperature this century to well below two degrees Celsius above pre-industrial levels.

Everyone in society has a role to play to achieve the Paris goals, and Shell intends to play its part. We continue to work towards delivering on our Net Carbon Footprint ambition to cut the intensity of the greenhouse gas emissions of the energy products we sell by around 50% by 2050, and 20% by 2035 compared with our 2016 levels, in step with society.

We only control the emissions from our own activities, but by changing the mix of energy products we supply, we also aim to help customers to lower their emissions. For example, by continuing to increase the lower-emission energy products we offer, including natural gas, biofuels, hydrogen and renewable power. We also aim to invest more in natural ecosystems to help drivers and businesses offset their carbon emissions.

For more information on our approach, see [Climate change and energy transition](#).



Goal 7: Ensure access to affordable, reliable, sustainable and modern energy

Globally, around 850 million people live without access to electricity, according to the International Energy Agency's World Energy Outlook 2019, and hundreds of millions more are estimated to have an unreliable supply. Access to reliable and safe energy is critical to enabling economic and social development.

Our contribution to Goal 7 includes investments in companies that offer innovative energy access solutions, such as solar mini-grids and



PERFORMANCE HIGHLIGHTS

This table represents a selection of global metrics that we track within Shell. These metrics have been selected because they reflect the direct impact of Shell companies' operations on people and the environment. We used them to set our goals and measure progress in 2019 and to define priorities for 2020.

We review our metrics regularly to ensure we capture the information needed to improve our performance. For example, we introduced Goal Zero for personal safety at Shell in 2007. Since then, we have broadened the goal to aim for no harm to people and the environment. More information on our performance, definitions of the indicators and the referenced goals is provided in the environmental, social and safety data sections.

GOALS, PERFORMANCE AND PLANS



GOAL 2019

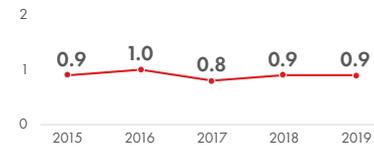
TRCF ≤ 0.7

Achieve total recordable case frequency (TRCF) – the number of injuries per million working hours – of 0.7 or below for employees and contractors.

Goal Zero has been our ambition for personal safety since 2007.

PROGRESS IN 2019

Total recordable case frequency (TRCF)



The TRCF was 0.9 in 2019; the same as in 2018 (see Safety performance).

PRIORITIES IN 2020

- Start to deploy a new approach to safety with a more consistent focus on the way people, culture, equipment, work systems and processes interact.
- In road safety, continue to focus on effective implementation of proven practices across all lines of business, with an emphasis on improving the management of fuel transport in high-risk countries. Work with road transport contractors to increase the use of advanced technology to support safe driving.
- Support the development and implementation of common industry safety standards.
- Improve our capabilities to learn from audit findings and investigations into incidents with the potential to cause harm.



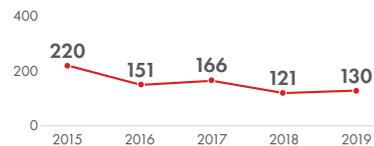
Leaks ≤ 115

Reduce the number of operational leaks to 115 or below (classified as "operational Tier 1 and 2 process safety events").

Since 2011, we have extended our ambition of Goal Zero to process safety.

From 2017, we combined operational Tier 1 and 2 safety events when setting the target. Previously, we only used Tier 1 events.

Number of operational Tier 1 and 2 process safety events



The number of Tier 1 and 2 operational process safety events increased from 121 in 2018 to 130 in 2019 (see Safety performance).

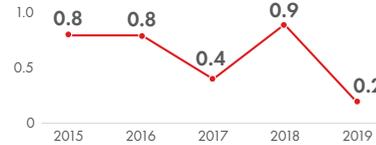
- Continue to focus on asset integrity and quality of operational execution by, among other things, shifting attention to leading indicators to understand and measure success, embedding our Process Safety Fundamentals, and rolling out a group-wide asset management system.
- Continue to improve learning from process safety events with high potential impacts.



ENVIRONMENT

Goal Zero extends to the environment with our goal of no operational spills.

Volume of operational spills in '000 tonnes



The number of operational spills fell from 93 in 2018 to 70 in 2019. The volume of operational spills of oil and oil products in 2019 was 0.2 thousand tonnes, a decrease from 0.9 thousand tonnes in 2018 (see Environmental performance).

- Continue to learn from incidents with spills to improve the reliability of our facilities and further reduce the number and volume of operational spills.
- Continue to work with the oil and gas industry to further develop effective oil spill response capacities.



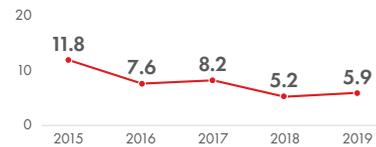
GHG AND ENERGY

Reduce flaring in our Upstream business.

Our policy is to reduce flaring and venting to as low a level as is reasonably practical.

We are a signatory of the World Bank's Zero Routine Flaring by 2030 initiative.

Upstream flaring: million tonnes CO2 equivalent [A]



[A] Includes Upstream and Integrated Gas.

Our upstream flaring increased to 5.9 million tonnes of CO2 equivalent in 2019 from 5.2 million tonnes in 2018 (see Flaring).

- Continue to link staff bonuses to the management of greenhouse gas emissions.
- Further embed the guiding principles for reducing methane emissions in the gas industry, which Shell and seven other energy companies signed in November 2017.
- Continue to focus on maintenance measures to enhance the reliability of our equipment and reduce emissions through leaks.

Upstream and Integrated Gas GHG intensity ≤ 0.168

For our Upstream and Integrated Gas facilities, achieve a GHG intensity of 0.168 tonnes or below of CO2 equivalent per tonne of hydrocarbon production available for sale.

Upstream and Integrated Gas: tonnes CO2e per tonne of hydrocarbon production available for sale



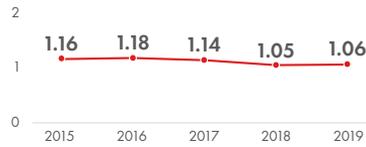
Our Upstream and Integrated Gas GHG intensity was 0.168 tonnes CO2 equivalent per tonne of hydrocarbon production available for sale in 2019 compared with 0.158 in 2018.



Refinery GHG intensity ≤ 1.06

For our refineries, reduce GHG intensity to 1.06 tonnes or below of CO₂ equivalent per Solomon's Utilised Equivalent Distillation Capacity (UEDC)

Refineries: tonnes CO₂e per Solomon's UEDC



Refinery GHG intensity in 2019 was 1.06 tonnes CO₂e per UEDC compared with 1.05 in 2018.

Chemicals GHG intensity ≤ 1.00

For our chemical plants, reduce GHG intensity to 1.00 tonnes or below of CO₂ equivalent per tonne of high-value petrochemicals produced.

Chemicals: tonnes CO₂e per tonne of petrochemicals produced



Chemical GHG intensity was 1.04 tonnes CO₂ equivalent per tonne of high-value petrochemicals produced in 2019 compared with 0.96 in 2018.

SOCIAL PERFORMANCE

Effective community feedback.

- Enhance our online community feedback tool aiming to assess feedback effectively and respond quickly to concerns, based on the improvement areas identified in 2018.
- Identify further improvement opportunities for our community feedback mechanism (CFM) based on a self-check exercise.

- Our online community feedback tool was developed after completing pilot tests at several sites. The new tool provides fast and mobile access for employees engaging with communities to help resolve issues quickly.
- Based on an annual social performance assessment, we identified 31 sites in need of further assessment of the effectiveness of CFMs. For these assessments, we used a checklist informed by the UN Guiding Principles for Business and Human Rights. Twenty-three sites implemented CFMs well, with clear procedures, dedicated employee focal points and leadership oversight, and with feedback that was well understood and addressed. For the other eight sites, we developed improvement plans primarily to ensure more effective standardisation for community feedback across sites.
- Introduce the new online community feedback tool to reduce the workload for Shell employees and improve tracking and reporting of feedback.
- Implement improvement plans at priority CFM sites to enable a proactive approach.



SUSTAINABILITY GOVERNANCE

We have clear and effective governance structures in place throughout Shell, along with performance standards and other controls. These include the Shell General Business Principles, Code of Conduct and Health, Safety, Security, Environment and Social Performance (HSSE & SP) Control Framework. These influence the decisions we make and the actions we take at every level of 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.

Safety, Environment and Sustainability Committee

The Safety, Environment and Sustainability Committee (SESCo), formerly the Corporate and Social Responsibility Committee, is one of four standing committees of the Board of Royal Dutch Shell plc. During 2019, the committee reviewed its purpose and updated its terms of reference to ensure it focuses on areas of most strategic importance to Shell.

The overall role of SESCO is to review the practices and performance of Shell, primarily with respect to safety, environment including climate change, and broader sustainability.

Visit www.shell.com/sustainability/our-approach/governance and see our [Annual Report](#) for more on SESCO's responsibilities.

SESCo meets regularly to review and discuss a wide range of prioritised topics. These include 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 Shell's Net Carbon Footprint targets and ambition, and climate change and energy transition.

The committee also endorses Shell's annual HSSE & SP assurance plan and reviews the execution of the plan and audit outcomes.

SESCo assesses Shell's overall sustainability performance and provides input into Shell's annual reporting and disclosures on sustainability. 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.

SESCo reviews and considers external stakeholder perspectives in relation to Shell's business, as well as 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 2019, the committee held five meetings in person and three meetings by conference call. 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. SESCO also reviewed Shell companies' operations and the challenges faced in Nigeria.

SESCo conducted one major site visit in 2019 to Singapore. Over three days, the committee met with Shell employees, contractors, government officials, local community leaders and representatives from local non-governmental organisations to gain a deeper understanding of Shell's business in Singapore. The committee visited



Members of the committee discuss safety and assurance with Shell senior managers during a meeting in The Hague.

refinery operations at Pulau Bukom and chemicals operations at Jurong Island, including the accommodation used by contractors, and reviewed Shell's developing New Energies businesses in the country.

In 2019, the members of the committee were:

- Sir Nigel Sheinwald – Member since July 2012 and Chair since May 2018;
- Catherine Hughes – Member since November 2017;
- Linda Stuntz – Member since May 2018; and
- Neil Carson – Member since June 2019.

Committee voice



Sir Nigel Sheinwald
SESCo Chair

"In 2019, we reviewed the purpose of the committee and transitioned from the Corporate and Social Responsibility Committee to become the Safety, Environment and Sustainability Committee (SESCo). We believe this sharpened focus will allow SESCO to play a more influential role in overseeing the practices and performance of Shell with respect to safety, environment including climate change, and broader sustainability issues.

"In line with the strategic importance of SESCO's agenda, the Chair of the Board and the CEO regularly attend SESCO meetings for discussions on specific topics. The committee appreciated the assistance throughout the year from Executive Committee member Harry Brekelmans, who continues to be a strong champion for sustainability within Shell."

Sir Nigel Sheinwald
SESCo Chair



EXECUTIVE REMUNERATION

Annual bonus

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, based on recommendations from the Safety, Environment and Sustainability Committee (previously called the Corporate and Social Responsibility Committee), with outcomes reported retrospectively in the Annual Report. The same annual bonus scorecard used for the Executive Directors applies to the majority of Shell’s employees around the world.

Read more about the 2019 directors’ remuneration 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 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 [Net Carbon Footprint](#)).

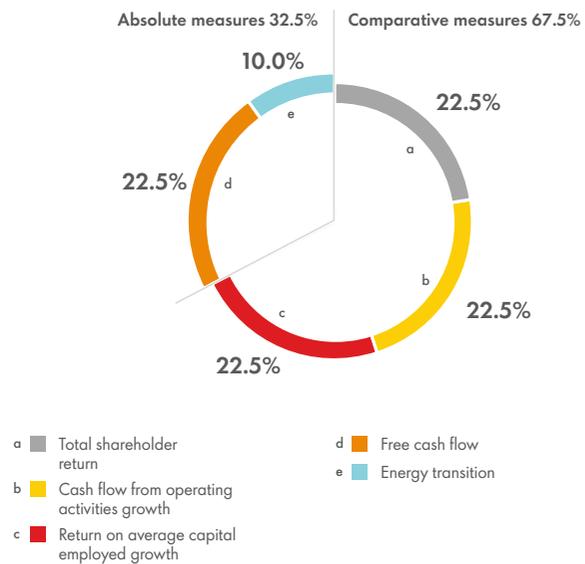
We announced plans in 2018 to link executive remuneration to short-term targets to reduce the Net Carbon Footprint of the energy products we sell, including our customers’ emissions from their use of our energy products. We accelerated our plans by including an energy transition condition in the performance 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 (see [Business strategy](#)). 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.

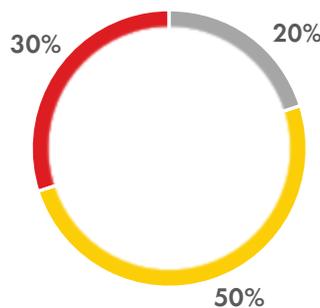
Long-term incentive plan

%



Scorecard structure

Operational excellence	
2019	
Production	12.5%
LNG liquefaction volumes	12.5%
Refinery and chemical plant availability	12.5%
Project delivery	12.5%



Sustainable development		
2019		
Safety	Personal safety	5%
	Process safety	5%
Environment	Upstream/Integrated Gas GHG intensity	4%
	Refining GHG intensity	4%
	Chemicals GHG intensity	2%

■ Sustainable development ■ Operational excellence ■ Cash flow from operating activities



RESPONSIBLE BUSINESS

We work to reduce our environmental impact and manage our operations safely and responsibly. Safety and respect for people – our employees, contractors and neighbours – are fundamental to how we do business.

20 Human rights

24 Safety

30 Environment



HUMAN RIGHTS

RESPECTING HUMAN RIGHTS

We focus on four areas where human rights are critical to how we work and where we see the highest risk for potential impact on human rights: communities, security, labour rights and supply chains.

Our approach applies to all our employees and contractors. It is informed by the UN Universal Declaration of Human Rights, the core conventions of the International Labour Organization and the UN Guiding Principles on Business and Human Rights. Human rights due diligence is embedded into our existing processes and frameworks, such as the Health, Safety, Security, Environment and Social Performance Control Framework.

Visit www.shell.com/sustainability/transparency/human-rights for more on our policy and procedures towards human rights.

Approach to human rights



Labour rights

We respect our employees' and contractors' rights by working in line with the International Labour Organization's core conventions and the UN Global Compact. Labour rights include freedom of association, the right to collective bargaining, non-discrimination and equal opportunity, conditions of work, adequate remuneration and freedom from forced labour and child labour.

Communities

We manage the impact we may have on people living near our operations in line with the International Finance Corporation's Performance Standards and the UN Guiding Principles on Business and Human Rights. Our Health, Safety, Security, Environment and Social Performance Control Framework expects us to first avoid or, where this is not possible, minimise our impacts on people through project design. We work with local communities to jointly identify solutions and opportunities.

Security

Shell aims to keep staff and facilities safe while respecting the human rights and security of local communities. We carefully assess the security threats and risks to our operations. We work with governments and partners to safeguard assets and provide a secure working environment for employees and contractors. Shell only uses armed security in countries where the threats are most severe or if it is a requirement under local laws. Since their development in 2000, companies in Shell have actively implemented the Voluntary Principles on Security and Human Rights that guide companies in assessing human rights risks when working with public and private security organisations.

Supply chains

The Shell Supplier Principles outline what we expect from contractors and suppliers in areas such as human rights. This includes ensuring no use of forced, prison or compulsory labour; no payment of recruitment fees by workers; regulations on freedom of association and collective bargaining; a safe, secure and healthy workplace; and the provision of wages and benefits that meet or exceed the national legal standards. We will develop and strengthen relationships with contractors and suppliers that are committed to the principles found on Shell.com or to similar standards through their own activities and the management of their own suppliers and subcontractors. Contractors and suppliers should provide workers with a dedicated whistleblowing mechanism where grievances related to the above topics can be logged confidentially.

**Reviewing our progress**

In 2019, we continued to take steps to seek to improve our approach to human rights. This included carrying out an internal assurance review of the processes and systems in our four focus areas. We also assessed our performance in human rights, and employee and contractor welfare in nine countries. We have made good progress overall, particularly in senior management oversight and reporting. However, the review identified improvement opportunities in the areas of community feedback mechanisms, labour rights assessment, training and worker welfare.

In 2019, we focused on:

- assessing our community feedback mechanism against the access to remedy criteria of the UN Guiding Principles on Business and Human Rights, and implementing improvements (see [Social performance data](#));
- strengthening our supply chain labour rights assessment through an initiative with BP, Equinor and Total that aims to create an industry standard approach to make it easier and more efficient for suppliers to demonstrate how they respect human rights (see [Supply chain](#));
- updating our human rights training, for employees and contractors, which we expect to roll out in 2020, improving relevant sections of the Shell website; and
- working with our supply chain contractors to ensure our worker welfare principles are adopted at major construction and production sites (see [Supply chain](#)).

**MANAGING OUR IMPACT ON PEOPLE
Indigenous peoples**

Our activities can affect indigenous peoples who hold specific rights for the protection of their cultures, traditional ways of life and special connections to land and water. We seek the support and agreement of indigenous peoples potentially affected by our projects. We do this through dialogue and impact management processes.

Shell has also developed a public position statement on Free Prior and Informed Consent (FPIC), a principle recognised in the UN Declaration on the Rights of Indigenous Peoples. We work to ensure we meet the requirements of FPIC for governments and companies to obtain the support of indigenous peoples before starting a project that may affect their rights. For example, the LNG Canada joint venture (Shell interest 40%) was planned and designed by working closely with the Haisla Nation and six other indigenous communities.

In addition to securing support for projects, we look for opportunities to minimise the impact on our indigenous neighbours and their land rights. In 2019, Shell Canada returned around 0.2 square kilometres of land to the Aamjiwnaang First Nation. The land is next to Shell's Sarnia manufacturing facility and was acquired by Shell Canada in the 1960s. This is the first time Shell Canada has returned land to its ancestral owners and is the result of several years of engagement. The indigenous community plans to build around 60 homes on the land.

We also help to create employment for indigenous peoples through our local content and skills development programmes. For example, Shell Australia has been working with the Wirrpanda Foundation on a multi-year programme for unemployed Aboriginal job seekers to improve their physical fitness and self-confidence and provide training and networking opportunities. The programme has so far helped 130 people secure jobs. Around 80% of the programme's graduates retained jobs for more than one year.



In Canada, we worked with Aamjiwnaang First Nation members to transfer land near the Shell Sarnia Manufacturing Centre back to the community.

Cultural heritage

Preserving cultural heritage is an important part of our efforts to manage our social impact.

Cultural heritage refers to places of archaeological, historical, cultural, artistic and religious significance. It also includes unique environmental features, cultural knowledge and traditional lifestyles that should be preserved.

Before starting projects, we develop "chance find procedures" to deal with previously unknown heritage resources that may be discovered during construction. We aim to ensure these procedures adhere to industry standards and have mandated them in Shell's Health, Safety, Security, Environment and Social Performance Control Framework.

We also provide training for inspectors to make them fully aware of cultural resources and give them the authority to halt work if necessary.

In 2019, Shell Pipeline Company LP started construction of the Falcon Pipeline that will connect three major ethane source points in Pennsylvania and Ohio, USA. When planning the pipeline, we engaged with around 1,200 landowners and surveyed about 320 square kilometres to identify sites of archaeological importance. We took steps to avoid these sites, such as adjusting the pipeline's path and using horizontal drilling. This enabled us to protect, among other areas, a prehistoric Native American site and a residential and farming complex containing historic artefacts.

In Albania, we commissioned an archaeological field survey ahead of onshore exploration. This revealed several sites of historical significance, such as cemeteries, mosques and churches, dating back to the Greek, Roman, Byzantine and Ottoman empires. As a result, we identified new target areas for a seismic survey to avoid damaging these historic areas.

Modern slavery

Shell is opposed to all forms of modern slavery. Such exploitation is against our commitment to respect human rights as set out in the UN Universal Declaration of Human Rights and the International Labour Organization's core conventions.

We continually work to safeguard human rights in all aspects of doing business and have embedded human rights in our General Business Principles, Code of Conduct and Shell Supplier Principles.



Material for the Falcon ethane pipeline system arrived from Japan on the Clipper Kamoshio vessel into the Port of Philadelphia, USA.

We also expect our contractors and suppliers to respect human rights as set out in the UN Universal Declaration of Human Rights and the International Labour Organization’s core conventions. In our model procurement contracts, contractors and suppliers agree to adhere to our general business principles and supplier principles. Suppliers are required to comply with all applicable laws and regulations of the country or countries in which they do business and agree to provide and maintain safe and healthy working conditions for all supplier personnel.

Parts of our supply chain may pose higher labour rights risk due to the location and type of goods and services procured. We carry out risk assessments combining both these areas. For location, we use external indices from risk consultancy Verisk Maplecroft to check potential modern slavery risks. For types of goods and services, we have identified sectors where there may be higher risks of unethical labour practices for migrant workers, such as in construction or maintenance services.

Read more about our approach in our statement under the [UK Modern Slavery Act](#).

Involuntary resettlement

We sometimes require temporary or permanent access to areas of land or sea where people are living or working. Where resettlement is unavoidable, we work with local communities to help them resettle and maintain, or improve, their standard of living in accordance with international standards for resettlement (IFC Performance Standard 5). If necessary, we help support them as they establish alternative livelihoods.

For example, Karachaganak Petroleum Operating B.V. (KPO) (Shell interest 29.25%) completed the physical resettlement of 464 families in north-west Kazakhstan in 2018. In 2019, KPO focused on restoring their livelihoods, including working to upgrade houses, provide fertile soil for growing vegetables and build playgrounds.

The North Mindanao Import Facility, Shell’s largest terminal in the southern Philippines, resettled 83 informal settlers due to noise from the facility’s fire-water reservoir and the expansion of the port authority’s berthing area. The facility worked with local government and non-government organisations to provide housing and compensation. Work to restore peoples’ livelihoods was ongoing in 2019; and an independent review found that resettled families were adjusting well. Read more about this work at www.shell.com/sustainability/communities/working-with-communities/laying-the-foundations-for-new-lives.



In the Philippines, Community Coordinator Mark Brazil, met with informal settlers living near an import terminal to discuss their concerns following a formal public consultation led by the local government, the Philippine Ports Authority and Shell. Meetings like this help to avoid rumours and potential grievances escalating.

Internal voice



Mark Brazil
Community coordinator

Mark Brazil has worked as a community coordinator for the North Mindanao Import Facility since construction of the project started in 2016.

“The biggest challenge that I personally faced was making sure to do things right. Delivering a resettlement programme, with the help of an experienced resettlement advisory team, involves the real lives of people being directly or indirectly impacted by a project. A company with strong adherence to social responsibility will ensure that impacted households should be given due attention to address their concerns. This will result in better well-being.

“Shell took on this task by cooperating with partners, such as the Philippine Port Authority, which owns the property, and complying with both local and international regulations and standards.

“We adopted a collaborative approach involving stakeholders, such as the government agencies, non-governmental organisations and the village leaders. We established an efficient communication strategy to coordinate all the different activities. We engaged in public consultation, open dialogue and negotiations until we reached agreement on the new site and the resettlement plan.

“Establishing livelihoods for people remains a challenge due to the distance from their former source of livelihood. We continue to work with the resettled families and Pilipinas Shell Foundation to identify income-generating activities at their new site.

“We have already carried out consultations and training needs assessments. We are also working with a local technical school to help people learn new skills so that they can learn how to generate an alternative income for their households.”



Security

We continually seek to improve how we manage security risks to help protect our employees, contractors, fence-line communities and the environment.

We work to maintain the safety, security and human rights of our employees, contract staff and local communities. The Voluntary Principles on Security and Human Rights (VPSHR) are implemented across Shell where there are identified threats of infraction.

We include VPSHR clauses in our private security contract template and raise the principles in engagements with public security forces. We carry out annual risk assessments and develop plans to manage the identified risks.

Visit www.shell.com/sustainability/transparency/human-rights for more on our approach to human rights and security. Read more about our implementation of the VPSHR at www.shell.com/vpsshr.

Tackling the cyber threat

Digitalisation and information technology systems play an increasingly important role in our operations. As a result, cyber security is central to managing the risk of data or information loss that could impact our people, environment and processes.

We continuously monitor external developments and share information on threats and security incidents. Our people are subject to mandatory courses and regular awareness campaigns to help protect us from cyber threats.

We periodically test and adapt cyber security response processes and seek to enhance our security monitoring capability.

Read more about our approach to cyber security in our [Annual Report](#).

Internal voice



Michael Bell
Security manager for Basrah Gas Company, Iraq

Shell provides coaching and mentoring for staff at the Basrah Gas Company joint venture (BGC, Shell interest 44%). Security staff were trained on the VPSHR as part of a broader skills training programme.

“My security team has worked for many years to maintain a secure environment for people connected to BGC. This involved security and human rights training, including for the Iraqi Oil Police Force, who are armed police that protect Iraq’s hydrocarbon infrastructure.

“Training Iraqi BGC guards and the Oil Police Force on the VPSHR posed a real challenge, mainly given Iraq’s ongoing struggle to balance security needs and human rights. Part of our approach was to modify training to reflect cultural norms, for example, using passages from the Koran.

“BGC guard training covered everything from simply wearing correct protective gear to operating access control systems for people entering facilities, to medical and firefighting training.

“BGC also conducted VPSHR briefings for the Oil Police Force and invested in security infrastructure, including patrol vehicles. This has improved safety and security for BGC employees and facilities and strengthened ties with the Oil Police Force. It also enables BGC to monitor alignment with the VPSHR.

“As a result of this, we saw the Oil Police Force de-escalate a potentially deadly dispute recently between farmers who had exchanged small arms fire near the BGC living quarters. The Oil Police Force calmly disarmed and escorted the farmers to a police station. This is testament to their training in crowd management and non-lethal response.”



SAFETY

MANAGING SAFETY

Keeping employees and contractors safe is our top priority. We aim to do no harm to people and to have no leaks across our operations. We refer to this as our Goal Zero ambition.

We expect everyone working for Shell to intervene and stop work that may appear unsafe.

We investigate incidents and aim to learn from them, sharing findings to improve safety performance across our industry.

All Shell employees and contractors must meet our safety standards and requirements, including complying with our 12 mandatory Life-Saving Rules. Since their launch in 2009, the rules have helped us make significant progress in preventing serious incidents, including many potential fatalities.

But seven people died while working for Shell in 2019, which is an increase on previous years. We were deeply saddened by the loss of these employees and contractors and are determined to learn from what happened.

Listed below are the fatal incidents that occurred in 2019.

In Nigeria, two contractors died when an oil and gas maintenance vessel they were travelling on capsized in bad weather.

A Shell employee died after falling from height into water while a vessel was being moored at Shell's Mormon Island facility in the USA.

A Shell employee based at Convent Refinery in the USA was fatally injured in a collision on the road when driving from the airport after his return from a business conference.

A Shell employee and a contractor died during a routine and mandatory test of the lifeboat launch and retrieval capabilities at the Auger tension-leg platform in the US Gulf of Mexico when the lifeboat disconnected from the lifting apparatus at height.

A roll-over incident occurred in Pakistan involving a road tanker which led to one contractor being fatally injured.

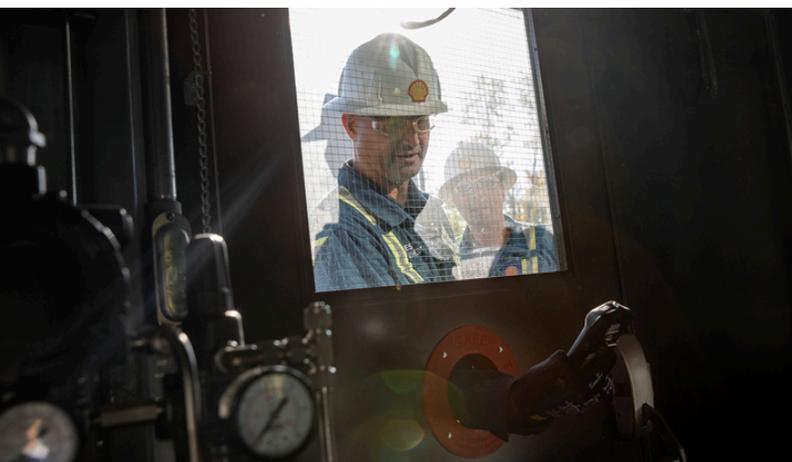
Our safety approach

In 2019, the Royal Dutch Shell plc Board and Executive Committee spent considerable time reflecting on the concerning safety performance, measured by the number of fatalities, and what needs to change at Shell to prevent fatalities and all other serious incidents. This included carrying out a full review of Shell's safety approach, which covered the effectiveness of current preventative tools, such as the Life-Saving Rules and Goal Zero ambition.

Since the early 2000s, we have made progress in improving the safety of our operations. This is largely due to a stronger safety culture guided by our Goal Zero ambition – to achieve no harm and no leaks – and requirements such as the Life-Saving Rules. Of all the fatalities in recent years, the vast majority have no link to a breach of the Life-Saving Rules.

But we have not been able to eliminate all fatal incidents involving Shell employees and contractors.

We are now building on our current approach to safety with a more consistent focus on the way people, culture, equipment, work systems and processes all interact. Many of our fatalities in recent years were down to the complex interaction between these elements.



In line with one of the Life-Saving Rules, a Shell Canada wells team investigates for dangerous gases to ensure they can safely enter a confined space.



We aim to understand better the gap between how we anticipate work will be safely carried out and what happens in reality. We continue to work to prevent incidents through maintaining safety barriers and training, but acknowledge that people can make mistakes and processes can fail. We will also focus more on how people can “fail safely”, and on our response in the moment to avoid the risk of a serious injury. This approach is a philosophical change, which we will start to deploy from 2020 onwards for all employees and contractors.

Investigating and learning from incidents

Shell requires incidents to be investigated to understand underlying causes, including the technical, behavioural and organisational reasons. We share learnings and take steps to mitigate future incidents at the site, at the country level and in the wider business. We aim to use findings to improve our standard ways of working in similar activities.

For example, after a complete investigation of a fatality in Appalachia in 2018, we developed learning toolkits for employees and contractors. We held formal conversations about the incident in all main lines of business and produced a video that received more than 10,000 views. These steps helped people consider lessons that could be applied in their workplace.

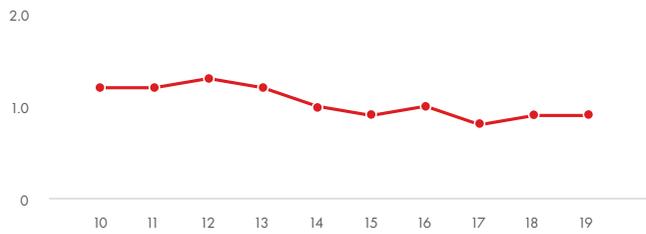
We are also exploring ways to use data analytics to improve decision-making and deliver more targeted learning to employees in frontline operations.

Personal safety performance

In 2019, following steady improvements in our safety performance over the last decade, the number of injuries per million working hours – the total recordable case frequency (TRCF) – was 0.9, the same as in 2018.

Total recordable case frequency (TRCF)

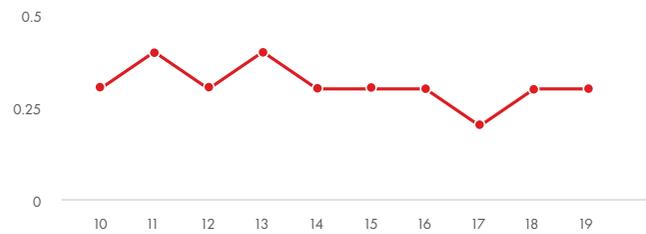
Injuries per million working hours



The level of injuries that led to time off work in 2019 also remained flat compared with 2018 at 0.3.

Lost time injury frequency (LTIF)

Injuries per million working hours

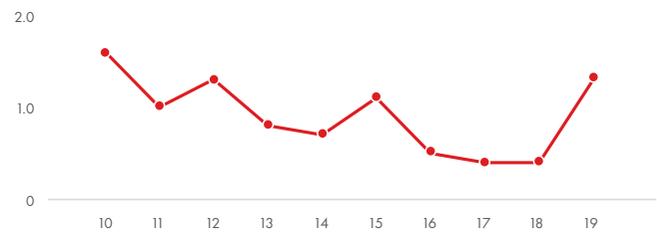


Tragically, seven people lost their lives while working for Shell in 2019. Our fatal accident rate – the number of fatalities per 100 million working hours – increased to 1.3 in 2019 compared with 0.4 in 2018.

For details of Shell’s 2019 safety performance and remuneration outcomes, see the **Directors’ Remuneration Report** in our Annual Report.

Fatal accident rate (FAR)

Fatalities per 100 million working hours



PROCESS SAFETY

Process safety management is about keeping our hazardous substances in pipes, tanks and vessels so they do not cause harm to people or the environment.

It starts with designing and building projects and is implemented throughout the life cycle of the facilities to ensure they are operated safely, well maintained and regularly inspected.

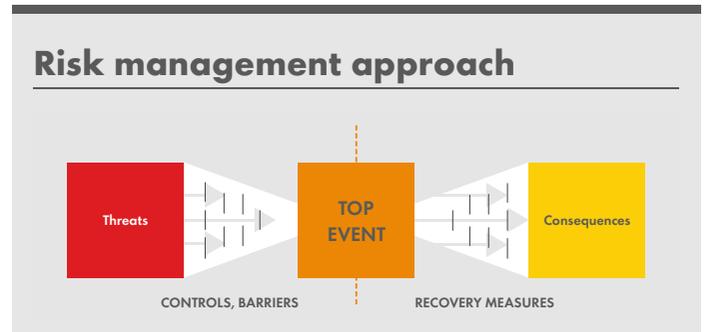
Visit www.shell.com/process-safety for more on our approach to process safety.

Improving risk management

Our global standards and operating procedures define the controls and physical barriers we believe are necessary to prevent incidents.

We regularly inspect, test and maintain these barriers to ensure they meet our standards. In the event of a loss of containment such as a spill or a leak, we deploy independent recovery measures to prevent the release from becoming catastrophic.

We refer to this system of barriers and recovery measures as a bow-tie model, which visually represents a system where process safety hazards are managed through prevention and response barriers.



In 2019, leaders throughout Shell continued to work with their teams to develop a better shared understanding of process safety challenges and behaviours, and to jointly design improvements. We have also been shifting our focus to leading indicators of process safety to understand and measure success, rather than focusing just on lagging indicators, such as the absence of safety incidents.



Process safety fundamentals

Since 2016, we have strengthened barriers that involve critical safety tasks carried out by frontline staff by embedding a set of 10 process safety fundamentals across Shell. They provide clear guidelines for good operating practice to prevent unplanned releases of hazardous materials. We encourage employees and contractors to use them in daily conversations to identify safety dilemmas, so they can be resolved.

Safer wells

An example of a safety initiative with a strong process safety element is the Assist and Assure programme, which aims to ensure that leading safety indicators are front of mind for our global wells team. The programme encourages employees and contractors to take steps such as scheduling more in-depth discussions before, during and after tasks and regularly conducting assurance to identify and close safety gaps.

The Shell-operated QGC project in Australia, which produces natural gas for domestic and international markets, improved its safety performance, recording a 40% decrease in total recordable case frequency since the programme was introduced in 2018. QGC focused on safe drilling, well completion and intervention activities.

The lessons of the Assist and Assure programme are being shared across different businesses in Shell.

Process safety performance

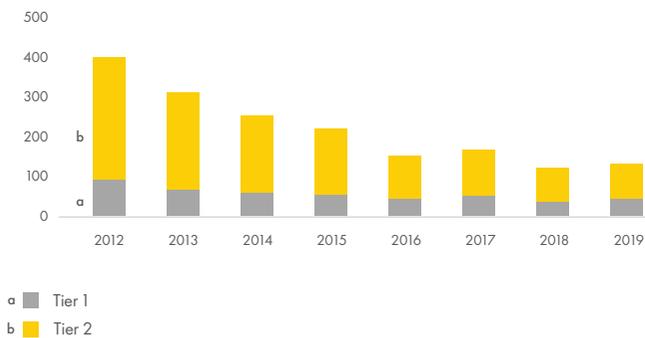
In line with industry standards, we measure and report process safety incidents according to significance, with Tier 1 as the most significant.

The number of Tier 1 and 2 operational process safety events increased from 121 in 2018 to 130 in 2019, of which 41 were Tier 1 and 89 were Tier 2. For comparison, there were 35 Tier 1 and 86 Tier 2 operational process safety events in 2018.

In 2019, the most significant incident related to process safety was an explosion and subsequent fire at the Shell Scotford Complex in Canada. The incident was caused by a sudden rise in temperature within a heater as we were preparing to shut down a section of the facility. New heater protection controls were installed to help prevent this type of incident occurring again. There were no injuries or health implications related to the incident.

Tier 1+2 operational process safety events

excluding sabotage



Process safety events related to sabotage and theft in Nigeria are recorded separately. There were nine Tier 1 events in 2019, the same as in 2018.

Visit www.shell.com/safety for more on Shell and safety.



Executives from Shell and our partners meet with a frontline operational team in Scotland, UK, as part of Shell's contractor safety leadership programme.

RAISING SAFETY STANDARDS Across the industry

We share our safety experience and standards with other operators, contractors and professional organisations, including the International Association of Oil & Gas Producers (IOGP), the Energy Institute and IPIECA, the global oil and gas industry association for advancing environmental and social performance.

In 2019, we contributed to the IOGP's guide to fatigue and driver fatigue awareness campaign, which IPIECA also supports. We shared materials developed by our health specialists so they can be used by others in the industry.

We worked with the Energy Institute, IOGP and several contractors to launch learning materials, which encourage reflection on how contractors and clients can jointly manage safety risks.

With our contractors

We employ a large number of contractors and we work with them to ensure they understand our safety requirements. Together, we build skills and expertise to improve safety performance.

For example, we worked with several South Korean and Malaysian shipyards and contractors between 2017 and 2019 to develop common safety practices. At one site in Malaysia, all contracting companies agreed to adopt the common health, safety and environmental management system of the yard, which helped to deliver a more consistent approach and a stronger safety performance.

Since 2014, Shell executives have collaborated in pairs with executives of major contractor companies - as part of Shell's contractor safety leadership programme - to identify strategies and practical steps to improve safety culture and achieve our Goal Zero ambition of no harm and no leaks. They also worked to drive standardisation together. The programme has a joint safety vision, which they call a declared future, and includes 19 companies.

Together with these contractors, we have signed up to a set of worker welfare principles developed by Building Responsibly, a group of leading engineering and construction companies (see [Supply chain](#)).

PREPARING FOR EMERGENCIES

We seek to ensure we have the necessary resources to deal with spills, leaks, fires and explosions, both offshore and onshore. We regularly test our response procedures and capability so we can respond rapidly to an incident.



Visit www.shell.com/sustainability/safety/process-safety for more on our emergency response.

In 2019, we trained around 950 employees and contractors on five large-scale oil spill exercises – one in Australia, one in Denmark and three in the USA. All the exercises involved our emergency response contractors, joint-venture partners and local authorities to test our organisational capability to manage a worst-case spill incident.

For example, at the Prelude floating liquefied natural gas facility in Australia (Shell interest 67.5%), a three-day exercise simulated a loss of well control that resulted in an uncontrolled flow of gas and condensate (a light oil by-product of gas production). The simulation tested procedures to contain the release, such as deploying floating barriers and applying dispersant to the oil.

Spills

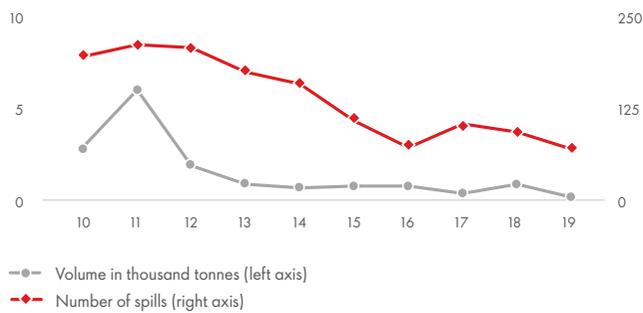
Shell has requirements and procedures in place to prevent operational spills. We have routine programmes to maintain facilities and pipelines, and improve their reliability, to reduce spills.

However, spills still occur for reasons such as operational failure, accidents or unusual corrosion. We investigate and learn from all spills to improve our performance and aim to clean up the areas around operations that are affected by spills, irrespective of the cause.

Spills performance

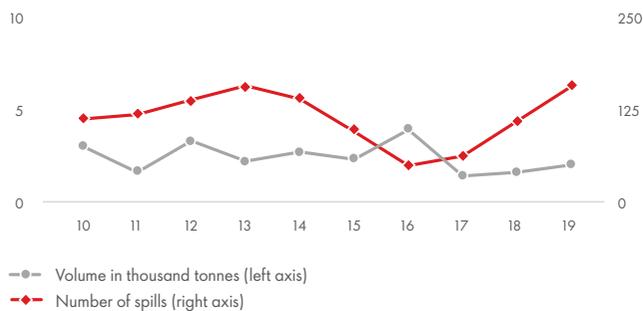
The volume of operational spills of oil and oil products in 2019 was 0.2 thousand tonnes, a significant decrease from 0.9 thousand tonnes in 2018. The number of operational spills of more than 100 kilograms decreased to 70 in 2019 from 93 in 2018. We have programmes in place to reduce the number of operational spills over the long term.

Spills – operational [A]



[A] Over 100 kilograms.

Spills – sabotage [A]



[A] Sabotage- and theft-related spills of more than 100 kilograms. All sabotage- and theft-related spills occurred in Nigeria, except in 2016 (0.001 thousand tonnes) and 2015 (0.005 thousand tonnes).

The number of spills caused by sabotage and theft rose to 156 in 2019 from 109 in 2018. The volume of these spills increased to 2.0 thousand tonnes in 2019 from 1.6 thousand tonnes in 2018. Sabotage and oil theft remained a significant cause of spills in the Niger Delta, Nigeria.

TRANSPORT SAFETY

Moving large numbers of people, products and equipment by road, rail, sea and air poses safety risks. We develop best-practice standards within Shell to reduce transport safety risks, and work with others such as specialist contractors, industry bodies, non-governmental organisations and governments.

Visit www.shell.com/sustainability/safety/transport-safety for more on our approach to transport safety.

In our maritime business, for example, we are working with our contractors to improve the quality and consistency of their safety management. This includes developing more effective tools to learn from incidents and improve behaviours. In 2019, Shell and contractors visited more than 4,000 ships to engage mariners on safety and make the programme more effective.

We charter planes to transport passengers, observe pipelines and carry out geophysical surveys. These planes flew around 13,000 hours in 2019 for Shell.

We used helicopters for about 46,000 flying hours in 2019 to carry people to and from facilities, onshore and offshore.

In 2019, we worked with offshore helicopter safety association HeliOffshore and the International Association of Oil & Gas Producers (IOGP) in a number of areas to drive safer ways of working with aircraft. For example, we developed a common set of industry specifications for offshore helicopter flights that includes benefits such as warning systems with earlier hazard alerts.

Road transport remains a challenging and complex area for industry worldwide. To improve performance, we focus on safe practices and behaviours and calling for safe vehicle design.

Road traffic accidents claim around 1.35 million lives every year, according to the World Health Organization. In 2019, Shell employees and contractors drove a combined distance of around 575 million kilometres on business in around 60 countries. There were two road transport-related fatalities under the operational control of a Shell company in 2019.

We run road safety programmes, such as our mandatory defensive driving course that teaches safe techniques and behaviour.

In 2019, around 13,200 Shell employees and contractors completed some form of in-vehicle training. Everyone who drives on public roads on Shell business also needs to take an annual online defensive driving training course.

We also continued to share our safety experience and standards with other operators, contractors and professional organisations. For example, as a member of the IOGP, we advocated for its policy that all members only buy new light vehicles that conform to the highest globally accepted safety rating, known as the New Car Assessment Programme (NCAP 5 star). Shell adopted this policy on January 1, 2019, and is applying it to all our owned, contracted and leased light vehicles worldwide.



Transporting fuel

In 2019, we continued to implement learnings from a tragic roll-over incident that occurred in Pakistan in 2017, involving a road tanker hired by a company that was providing road transport services to Shell Pakistan Limited. More than 200 people died after the spilled fuel ignited as they were collecting it from the incident site.

The Royal Dutch Shell plc Board and Executive Committee have launched several improvement programmes to be adopted throughout Shell. This includes a road transport risk management initiative focused on high-risk countries.

Shell Pakistan Limited continues to work with regulators, emergency services and the wider oil and gas industry in Pakistan with a view to improving safety standards. Shell Pakistan Limited is also working with the road transport industry, including hauliers and retailers, and local authorities specifically to address driver well-being, fatigue and care.

In July 2019, there was another tragic roll-over incident in Pakistan involving a contractor road tanker, which led to one contractor (the co-driver of the truck) being fatally injured. The investigation report noted there were improvements in response procedures compared to the 2017 incident. This included emergency teams arriving on site more quickly, blocking off the site to avoid people collecting spilled fuel and a full recovery of the truck's remaining cargo.

Eye care for truckers

India has one of the worst traffic accidents records in the world, with someone dying on the road every four minutes, according to government figures. About a quarter of these accidents involve heavy commercial vehicles, such as trucks and buses.

We take the health and safety of our employees very seriously, so all our drivers get their eyes checked regularly. However, we know this is not necessarily the case for other drivers.

Shell India and social partner VisionSpring are working together on a road safety initiative in India. The #DriveSafeIndia Eye Camps campaign provides free eye tests and free prescription spectacles to truck drivers.

Internal voice



Nigel Hobson
VP Trading and Supply Operations

"Shell contractors, distributors and other partners travel around 1.2 billion kilometres a year to deliver fuel to our customers. We have around 3,000 trucks on the road at any one time. This is a significant safety challenge, especially for fuel transport in high-risk countries.

"We focus on several elements to reduce risk as much as possible. First, we carefully consider fuel transport risks in our business growth plans. We contract with professional transport companies that meet our health and safety standards and requirements, and that focus on employing competent drivers.

"We run road safety programmes for our employees and contractors to build skills and to promote the right behaviours. This includes running fatigue awareness programmes.

"We work with our road transport contractors to increasingly use advances in technology to support drivers to work more safely. For example, we are expanding the use of in-vehicle monitoring devices with cameras to help provide more targeted coaching to drivers.

"While we work to minimise the likelihood of incidents, sadly some do occur. We work with local authorities, specialist contractors and other partners to improve emergency response. We also share our safety standards and experience with the fuel transport industry and government authorities to help improve road safety infrastructure and increase industry capability in emergencies."



Eye-testing centres have been set up at truck stops, ports and other transport hubs where truck drivers congregate.

As part of the eye care campaign in India, we found more than two-thirds of truck drivers had never had their eyes tested, with a quarter unable to see sufficiently beyond 20 metres.

In 2019, more than 120,000 commercial drivers had their eyes tested and 84,000 received free prescription spectacles, mostly on the spot. The programme aims to reach 365,000 drivers by the end of 2020.

Read more about this programme at www.shell.com/inside-energy/a-clear-vision-for-india-truck-drivers.

External voice



Ella R. Gudwin
CEO VisionSpring

“Sometimes solutions to complicated problems like road safety are sitting, quite literally, right in front of our eyes. Vision screening and eyeglasses are a simple, scalable intervention with immediate benefit. With Shell, we are ensuring that drivers and allied transportation workers can see clearly so that everyone on the road is safer.

“We have found that 68% of drivers attending the #DriveSafeIndia vision camps have never had their eyes tested before and 69% of drivers who need glasses are acquiring their very first pair through the programme. With glasses, they can sustain their livelihoods, get home safely to their families and reduce the risk of traffic accidents – one of India’s leading causes of death and injury.

“Our work together in India is just the beginning of what’s possible. We are looking forward to others joining in this high-impact initiative.”

PRODUCT STEWARDSHIP

We work to ensure our products – such as fuels, lubricants and chemicals – are safe throughout their life cycle. Our goal is to protect employees, customers, communities and the environment from potential risks posed by these products and to comply with relevant laws such as chemicals management laws.

Good product stewardship means we assess and manage the products’ potential health, safety and environmental risks. We work with customers and suppliers, monitor changes in the science behind our products and support research to reduce risks. We communicate the potential hazards associated with our products and publish safe handling information on labels and safety data sheets.

Visit www.shell.com/product-stewardship for more on our approach to product stewardship.

In 2019, we published and distributed more than 346,000 safety data sheets to customers in around 120 countries. We also follow formal internal risk assessment processes to identify and manage risks. In 2019, we carried out more than 600 formal risk assessments for products and additives.

We are also preparing for regulations and requirements that aim to create a more circular economy, such as those arising from changes to waste framework directives. A circular economy is based on the idea that things are designed to last longer and to be reused, repurposed or recycled. In 2019, we worked to define and establish internal health, safety and environmental standards for recycling used oil back into useful motor oils for the market. Our product stewardship team has also helped us use **recycled plastics** as chemicals feedstock for the first time by assessing risks and assuring regulatory compliance of this circular feedstock.



We have technology centres in our three major innovation hubs – in India, the Netherlands and the USA – with scientists and engineers conducting vital research into our products.



ENVIRONMENT

OUR APPROACH

We are determined to operate responsibly to protect the environment. This means carefully considering the potential impact of our activities and how local communities and the local environment can be affected before, during and at the end of our operations.

We aim to make a positive contribution to local environments where we operate and continually work to improve our performance.

We set ourselves stringent environmental standards, which meet regulatory requirements and often exceed them. We use external standards and guidelines, such as those developed by the World Bank and the International Finance Corporation, to inform our approach.

Visit www.shell.com/sustainability/environment/our-approach-sustainability for more on our approach to the environment.

We follow global environmental standards for managing our emissions, minimising our use of fresh water and conserving biodiversity. Within our operations, we focus on reducing energy use, flaring less gas and preventing spills and leaks of hazardous materials. Where necessary, we also clean up and remediate areas impacted by spills that come from our facilities.

We carry out detailed environmental, social and health impact assessments when planning major projects, such as exploration and drilling activities, offshore platform installation or decommissioning.

BIODIVERSITY AND SENSITIVE AREAS

We seek to understand, avoid and respond to any potential impacts our activities may have on biodiversity and ecosystem services.

We use a tool called the mitigation hierarchy in our projects and operations to aim to minimise our impact on the environment as much as possible. When looking at biodiversity, for example, this means that we first aim to avoid impacts on biodiversity and ecosystem services. Where avoidance is not possible, we aim to minimise our impact. Where our operations have affected biodiversity and the communities that rely on biodiversity for their livelihoods, we seek to help restore impacted habitats.

We also look for opportunities where we operate to make a positive contribution to conservation, also called net-positive impact. In 2003, we made the commitment that we will not explore for or develop oil and gas resources in natural World Heritage Sites. Find out more about our commitments at: www.shell.com/environmentally-sensitive-areas.

Visit www.shell.com/sustainability/environment/biodiversity for more on our approach to biodiversity.

Biodiversity management

At the Shell Moerdijk chemical complex in the Netherlands, our biodiversity action plan has helped maintain a variety of flora and fauna. It has also raised awareness about biodiversity among technical staff. For example, in 2019, planned maintenance work was adjusted after operators found a protected bird species nesting in equipment.

In 2019, we completed the installation of a solar park at Moerdijk. We worked with scientists from Dutch biodiversity centre Naturalis to study flora and fauna at the site. The research found a variety of species, including 34 bee species of which four are threatened in the Netherlands. The study provided insights into the optimum design for solar parks in relation to biodiversity.



Biodiversity research at the Shell Moerdijk chemical complex in the Netherlands may help to inform the design of solar parks more widely.



External voice



Professor Dr. Koos Biesmeijer
Scientific Director at Naturalis Biodiversity Center, head of the Pollinator Ecology research group, and professor of Natural Capital at Leiden University

“The transition to sustainable energy will have an impact on the world’s land use. While solar panels on roofs and other hard surfaces are preferred, many solar parks will appear in our landscapes.

“At Naturalis, we provide the knowledge to design and manage solar parks for biodiversity. With good design and careful management, solar parks can harbour many plant and animal species that are in need of more suitable habitats.

“At Shell’s Moerdijk solar park, we found many more species of pollinators than can be found on neighbouring agricultural land, including several threatened and rare species. This was a first, promising step.”

In Australia, the Shell-operated QGC natural gas producer in Central Queensland manages the 10,000-hectare Valkyrie property, a large area of open woodland, to offset our carbon emissions and impact on biodiversity (see [Growing gas and power in Australia](#)).

We also aim to increase biodiversity through reforestation projects as part of our nature-based solutions business (see [Nature-based solutions](#)).

We continue to support research programmes to protect life below water. For example, we are a member of the International Association of Oil & Gas Producers Joint Industry Programme on Sound and Marine Life, an initiative to improve understanding of the effect that sound generated by energy exploration and production has on marine life.

WATER USE

We design and operate our facilities to help reduce fresh-water use and tailor our use of fresh water to local conditions. We carefully manage our water use and discharges at these facilities.

Our impact assessments help us to understand better the water risks for our projects and broader impact on the surrounding watershed.

We evaluate the long-term sustainability of water resources to select the options that avoid or minimise disruption to the environment and other users. We use a combination of tools to help us do this, including the World Resources Institute’s Aqueduct Water Risk Atlas.

Visit www.shell.com/reusing-and-recycling-water to read more about our approach to water use.

In 2019, the Pernis refinery in the Netherlands concluded a review of how we manage rainwater, cooling and process water at the site. The results highlighted a range of water management improvements, such as making maintenance work more efficient by identifying the most

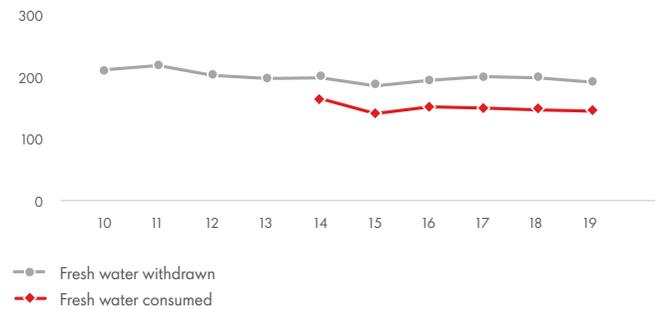
water-critical equipment, as well as adding water quality to the Pernis leadership team’s permanent agenda.



In Alberta, Canada, we carried out water sampling near our shales facilities.

Fresh-water use performance

Fresh water withdrawn and consumed [A]
million cubic metres

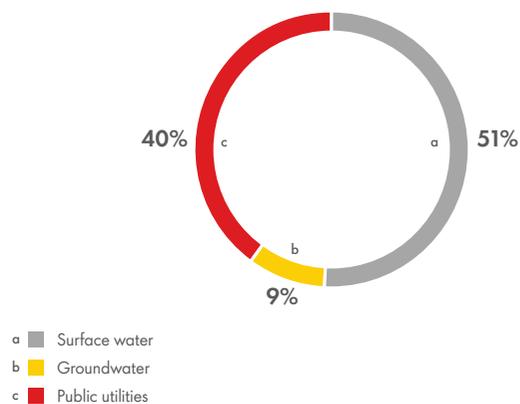


[A] Fresh water figures do not include once-through cooling water.

In 2019, our intake of fresh water was 192 million cubic metres, compared with 199 million in 2018. Around 90% of our fresh water intake was used for refining oil products and chemicals, with the balance mainly being consumed in oil and gas production.

Fresh water withdrawn by source

%

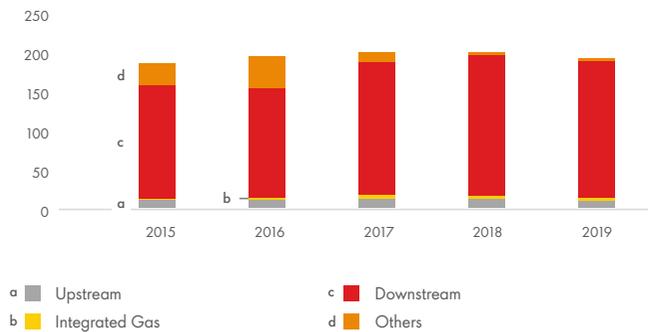


About 40% of fresh water intake was from public utilities such as municipal water supplies.



Fresh water withdrawn by business

million cubic metres



The volume of fresh water withdrawn by our Downstream business decreased slightly in 2019. Oil sands data are included in Others in the graph.

Waste water and produced water

We develop technologies to treat, reuse and recycle water from our operations. Where appropriate, we look for ways to treat water from our operations using natural solutions, such as constructed wetlands.

At the Petroleum Development Oman (PDO, Shell interest 34%) joint venture in Oman, the Nimr Reed Wetlands project uses a natural approach to clean the water extracted alongside oil production. PDO expanded the wetland facility in 2019, increasing the maximum capacity of water flow to 175,000 cubic metres a day from 95,000 cubic metres a day.

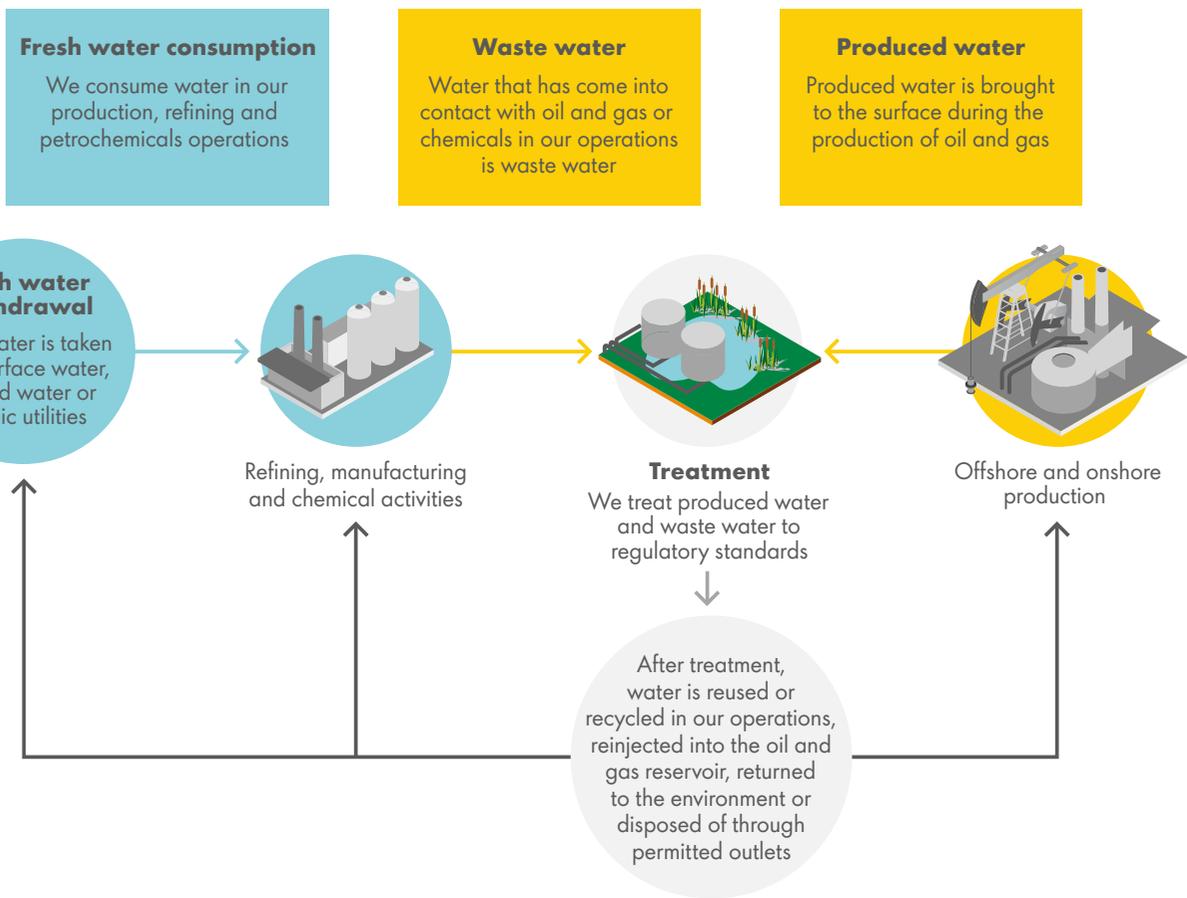
We track low-level concentrations of oil, grease and other hydrocarbons within water returned to the environment from the day-to-day running of our facilities (collectively referred to as “discharges to surface water”). We work to minimise these discharges in line with regulatory requirements and our own standards.

In 2019, the combined total of hydrocarbons discharged to surface water from our facilities was 1.3 thousand tonnes, down from 1.4 thousand tonnes in 2018. This was mainly due to a decrease in the amount of oil discharged to water at the Pulau Bukom site in Singapore.

Soil and groundwater

We assess and carefully manage the risks of potential soil and groundwater contamination. We conduct scientific research on potential risks of contamination from petroleum activities and share our findings with government agencies, researchers and other stakeholders to support the development of environmental guidelines.

Water use





The Brent Bravo platform topside was removed by the Pioneering Spirit, a ship stretching the length of six jumbo jets.

We helped establish the collaborative soil and groundwater network in Africa called NICOLA (Network on Industrially Contaminated Land in Africa). The network comprises energy companies, mining firms, regulators and academia that share, among other things, the latest scientific research and technology for managing contaminated land more effectively. In 2019, Shell was recognised by the South African Department of Environment, Forestry and Fisheries for its leadership in developing best practice in South Africa, and its contribution to NICOLA.

Working with others

We support open innovation and work with others to improve water management, including IPIECA, the global oil and gas industry association for advancing environmental and social performance. In 2019, we worked with IPIECA to improve water horizon scanning.

DECOMMISSIONING AND RESTORATION

Decommissioning is part of the normal life cycle of every oil and gas structure when a facility reaches the end of its life.

Safe and responsible decommissioning is a priority for Shell. This includes restoring the surroundings of offshore platforms and facilities in line with relevant legislation, while taking our own environmental standards into account.

A growing number of oil and gas platforms and facilities are coming to the end of their expected life, having extracted economically recoverable reserves offshore. As a result, we have decommissioning activities under way in Brunei, India, Malaysia, the Netherlands, the UK and the USA. We expect decommissioning to increase over the next few decades.

Our largest decommissioning project to date is the **Brent oil and gas field**, which lies in the North Sea between the UK and Norway. Preparation for decommissioning the four **Brent platforms – Alpha, Bravo, Charlie and Delta** – started more than a decade ago. In June 2019, the Brent Bravo topside – the part that is visible above the sea – was successfully removed in a single lift and sent for dismantling. It is expected that more than 97% will be recycled. The recommendation in the Brent field decommissioning programme is for the concrete legs (called gravity base structures), which are part of Bravo, Charlie and Delta, to be left in place.

Find out more about Brent Bravo’s decommissioning at www.shell.co.uk/top-5-questions-about-brent.

Watch the film at <https://youtu.be/D5xXmEHPf8>.

Shell’s Curlew floating production, storage and offloading vessel was approved for decommissioning in March 2019. The vessel was towed to Dundee, UK, in June 2019.

In October 2019, the decommissioning of the Goldeneye field was approved and planning is under way for the removal of the topside and jacket. The pipeline for Goldeneye has been preserved to be used potentially to transport carbon dioxide as part of a carbon capture and storage project.

WASTE

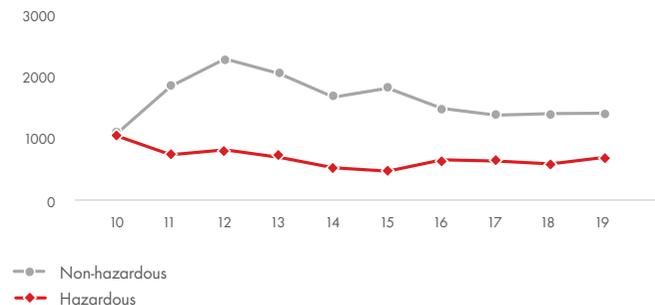
We aim to reduce the amount of waste we generate. In our operations and supply chains, we are also starting to explore a circular economy approach, which is based on the concept that things are designed to last longer and to be reused, repurposed or recycled.

Waste performance

In 2019, we disposed of 2,113 thousand tonnes of hazardous and non-hazardous waste, which is broadly comparable with 2018.

In 2019, we sent more than 400 thousand tonnes off-site for recycling or reuse. Three of our downstream refineries sent more than 80% of their waste generated during the year for recycling or reuse in 2019.

Waste disposal
thousand tonnes



Visit www.shell.com/managing-waste for more on our approach to waste.

We also assessed new waste management software that could help our efforts to reduce the amount of waste we generate. We worked with our supplier to configure the system specifically for Shell. We have started to implement the system in our Australian business and plan to roll it out to major facilities across our businesses over the next few years.

Our facilities in Australia have been implementing a number of waste improvement projects aimed at reducing waste to landfill and providing benefits to local communities. For example, the contractor that collects and recycles waste oil from our facilities in rural Queensland now also collects waste oil from farms during these trips, allowing this oil to be recycled as well.

We have also been working to improve the sustainability performance of our buildings by reducing consumption and waste. For example, Shell Business Operations centres in Kuala Lumpur, Malaysia, are aiming for zero food waste to landfill in 2020 and have implemented several waste projects. In 2019, they reduced total food waste at their offices by 70%.



We are a founding member of the global Alliance to End Plastic Waste and Shell employees are also taking steps to address plastic waste. For example, Shell companies in Nigeria, which use around 9 million single-use plastic bottles in their operations each year, pledged to reduce plastic by 50% in 2020 and 90% by 2021 (see [Plastics](#)).

Shell is looking at options to reduce the amount of material used in packaging by selling products, such as lubricants, in larger packs. We use recycled material in packaging where technically possible.

PLASTICS

We produce chemicals that are the raw materials for plastics and plan to produce more as global demand increases. Plastics provide important benefits, helping to improve living standards, hygiene and nutrition around the world.

We are finding new ways to reduce the unnecessary use of plastics and recycle plastic waste into innovative products.

Circular economy for plastics

In 2019, for example, we announced our ambition to use 1 million tonnes of plastic waste as feedstock at our chemical plants by 2025. This is an important step towards building a circular economy by using plastic waste to produce chemicals, which can be used to make plastics again.

The first of our plants to do this in 2019 was Norco in Louisiana, USA. Our intention is to scale up the technology and deploy it at our chemical plants in North America, Europe and Asia, gradually achieving world-scale production by 2025.

Read more about using plastic waste to produce chemicals at www.shell.com/shell-uses-plastic-waste-to-produce-chemicals.

Watch the film at <https://youtu.be/iTGghtDUIG0>.

Ending plastic waste

We are a founding member of the Alliance to End Plastic Waste, which intends to invest about \$1.5 billion over the next five years to help end plastic pollution in the environment. The alliance represents a major effort to minimise and manage plastic waste and to develop solutions for used plastics by helping to create a circular economy. To read about our project to prevent plastic waste from entering the river Ganges in India, see [Collaborations](#). You can also visit the Alliance website at endplasticwaste.org.

Reducing, reusing and recycling

We also seek to reduce, reuse and recycle packaging across our supply chains and are exploring different and more sustainable packaging solutions.

For example, Shell companies that manufacture lubricants were the first to create a modern, reusable container for motor engine oil offered on the Loop shopping platform, which allows customers to buy everyday products in reusable containers that do not result in waste. The container is designed to be reused at least 100 times before it is recycled into new lubricant bottles at the end of its life.

In our retail operations, we are working to eliminate unnecessary single-use plastic in our shops and encourage customers and employees to change from disposables to reusables.

In the Philippines, we are working with Green Antz to transform used lubricant bottles and other plastic waste into eco-bricks, which are used to build Shell retail sites and, as a next step, affordable houses and schools.



In 2019, our Norco chemical plant in the USA started using a new type of feedstock, a liquid made from plastic waste.

PRODUCING SHALE OIL AND GAS RESPONSIBLY

Shales – also known as tight gas and oil – will continue to play an important role in meeting global energy demand. We focus on producing shale resources responsibly by following our [onshore operating principles](#), which cover safety, air quality, water protection and usage, land use and engagement with local communities.

Visit www.shell.com/energy-and-innovation/natural-gas/tight-and-shale-gas for more on our approach to shales.

We use advances in technology to help make our shales operations safer and more efficient, while reducing greenhouse gas emissions.

In 2019, SWEPI LP, a subsidiary of Shell Oil Company, completed the construction of a newly designed shales facility called iShale in the Permian Basin in West Texas, USA. The facility is smaller and costs less to build than traditional shale projects. This is mainly due to a production system that more closely combines equipment for drilling wells with equipment for processing oil and gas.

The facility is also designed to emit 60% less greenhouse gas emissions compared with other shale projects. This is because it can operate without gas storage tanks, which require flaring to dispose of hydrocarbons safely. Other environmental improvements include using solar panels and wind turbines to power operations, and infrared cameras to detect small leaks of methane, a potent greenhouse gas.

We aim to take learnings from the design for possible use at our other shale facilities.



Shell's new shales facility has been designed to operate without the need for flaring to dispose of hydrocarbons safely.

Internal voice



Jennifer Morgan
Senior technical safety engineer who worked on the design of the new iShale facility

"One of the first things you notice at the site is our communications tower, which enables us to use more advanced camera surveillance. The cameras mean we can carry out remote monitoring in real time, so we can better manage our sites while reducing the number of miles our inspection teams have to drive."

Improving road safety

The expansion of the shale industry in the USA has put significant pressure on road networks. In the Permian Basin, the vast distances between sites and small rural roads make driving our number one risk.

As a founding member of the Permian Road Safety Coalition, SWEPI LP continues to work to help find ways to improve road safety and reduce the number of traffic-related injuries. We share technology and expertise, such as the use of in-vehicle systems to monitor and coach drivers on better behaviour, and educate the public on safe driving.

We are also helping first responders by providing them with tools and resources to more effectively deal with incidents.

In 2019, we continued to take action to reduce the distances driven by our employees, including opening accommodation at our sites to reduce commute times. So far, this has resulted in a reduction of around 23% of the distances being driven each day. We have deployed additional safety measures, such as anti-crash systems in vehicles that can bring a vehicle to a standstill in the event of an accident.

We also collaborate with other energy companies to invest in ways to support the demand for roads, health care, education and affordable housing rising from shale activity.

Read more about our ongoing road safety work at shell.com/permian-basin-road-safety. You can also read about how we work with communities and about our social investment programmes at our shale operations.

FLARING

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.

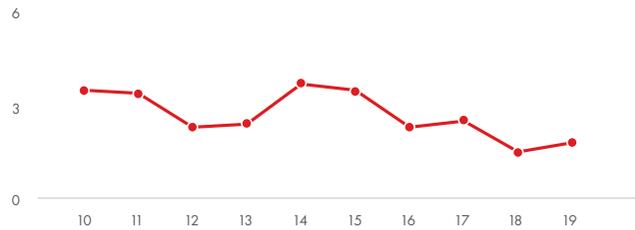
As a signatory to the World Bank's Zero Routine Flaring by 2030 initiative, we continue to pursue our 2015 commitment to eliminate associated gas flaring at facilities.

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.

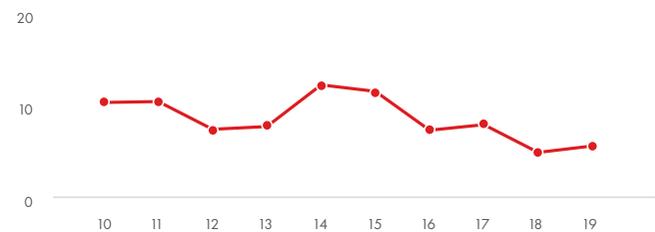
Flaring – upstream

million tonnes hydrocarbons flared



Flaring – upstream

million tonnes CO₂ equivalent



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.

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.



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.

In Nigeria, investments since 2010 by the Shell Petroleum Development Company of Nigeria Ltd Joint Venture 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 Nigeria, investments to capture associated gas are helping to reduce flaring.

AIR QUALITY

By 2050, two out of three people could be living in cities, and the number of cars could double from 1 billion today. The wider use of electric, hydrogen or natural gas-powered vehicles – and more efficient combustion engines – can make a major contribution to air quality. This is in addition to switching from coal to natural gas-fired power generation.

We continue to invest in cleaner ways to power homes and vehicles to improve air quality and make urbanisation more sustainable.

Visit www.shell.com/future-transport to find out more about future transport options.

Managing emissions from our operations

We take steps to reduce airborne pollutants in our oil and gas production and processing, for example, lowering emissions of nitrogen oxides, sulphur oxides and volatile organic compounds.

Sulphur oxide, nitrogen oxide and volatile organic compound emissions performance

Our sulphur oxide emissions in 2019 decreased to 65 thousand tonnes compared with 74 thousand tonnes in 2018, primarily due to divestments in Argentina, Canada and Iraq.

Our nitrogen oxide emissions decreased from 111 thousand tonnes in 2018 to 108 thousand tonnes in 2019, primarily as a result of divestments.

Our emissions of volatile organic compounds (VOCs) decreased to 55 thousand tonnes in 2018 from 59 thousand tonnes in 2018, mainly due to divestments.

Read about Shell's [Greenhouse gas emissions](#).

Cleaner-burning fuels

Shell GTL (gas-to-liquids) fuel is a cleaner-burning alternative to diesel which can be used in existing diesel engines without the need for modifications.

Kroonborg, a maintenance support vessel owned by services company Wagenborg Offshore, is the world's first offshore vessel to run on GTL.

We also produce cleaner-burning LNG for use as maritime and land transport fuel. LNG as a marine fuel, for example, can reduce sulphur emissions, particulates and nitrogen oxide compared to heavy fuel oil or marine diesel. In 2019, Shell Gas & Power Developments B.V. announced a partnership with Qatar Petroleum to expand LNG marine fuel availability around the world and opened our second LNG retail station for trucks in [Germany](#).

In 2019, we launched **Alexia 40**, a lubricant to help the performance of ships' engines as they move to lower-sulphur fuels that comply with the new International Maritime Organisation regulations.

Also in 2019, we launched a **bitumen product** that reduces emissions of specific gases that impact local air quality when asphalt is produced or a road surface is laid. The new formulation, developed at our technology centre in Bangalore, India, acts directly with chemical compounds which are the source of gases such as sulphur dioxide and nitrogen oxide, particulates and odour-releasing molecules.

Working with others

As a member of IPIECA, we support the UN-sponsored Partnership for Clean Fuels and Vehicles, a leading global public-private initiative.

Shell continues to look for ways to help improve local air quality. These include investments in hydrogen fuel technology and electric vehicle recharging stations.



Ground support vehicles at Amsterdam Schiphol Airport in the Netherlands run on Shell gas-to-liquids fuel as part of an agreement with airline KLM.



SUSTAINABLE ENERGY FUTURE

Society faces a dual challenge: how to make a transition to a low-carbon energy future, while also extending the economic and social benefits of energy to everyone on the planet.

- 38** Climate change and energy transition
- 40** Net Carbon Footprint
- 43** Managing greenhouse gas emissions
- 47** Natural gas
- 48** Lower-carbon energy
- 54** Developing technology



CLIMATE CHANGE AND ENERGY TRANSITION

We fully support the Paris Agreement’s goal to keep the rise in global average temperature this century to well below two degrees Celsius (2 °C) above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 °C.

We are taking action to tackle our own emissions and to help customers to reduce theirs. As the energy system evolves, so will our business to provide the mix of products that our customers need.

We believe more renewable energy such as solar and wind is critical for a cleaner energy future, and that how people live, work and play is increasingly going to need to be powered by low-carbon electricity. But we expect that consumers will continue to use oil and gas for some time to come and not all economic activities can be easily, swiftly or cost-effectively electrified. We see continuing, changing roles for oil and gas alongside renewable energy, hydrogen and new technologies.

We are growing our New Energies business with investments in low-carbon technologies, including biofuels, electric vehicle charging and wind power. We are also developing complementary approaches like carbon capture and storage and nature-based solutions to manage the difficult-to-avoid emissions that will remain in the system for years to come due to continued consumer use of oil and gas.

Addressing a challenge as big as climate change requires a collaborative, society-wide approach. 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.

WORKING TOGETHER TO LOWER EMISSIONS

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 pre-industrial 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



Today, change is being driven by a growing global population, a rising urban population and increasing prosperity.



External voice



Jim Skea
Professor of Sustainable Energy, Centre for Environmental Policy, Imperial College London

“Shell has long provided leadership in preparing global energy scenarios.

“Our team at Imperial College London has been trying to understand the differences – and similarities – between the Intergovernmental Panel on Climate Change’s scenarios underpinning the Paris Agreement and those produced by the International Energy Agency, Shell and other energy companies.

“This helps us understand how the gap between long-term climate ambitions and shorter-term energy trends can be bridged. Shell has helped us in this task, first through the Sky scenario, which aims to be compatible with the Paris goal, and second by publishing detailed assumptions and model outputs.

“This unequalled degree of transparency really helps us hone in on what matters, and can underpin the dialogue across sectors that is urgently needed. Our team was very pleased by Shell’s willingness to interpret and explain their scenario work.”

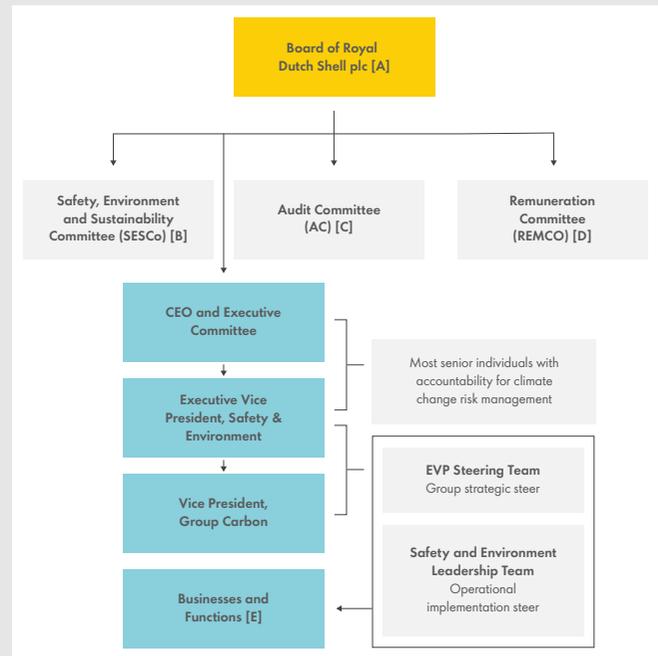
Netherlands. We also support the European Commission’s proposal for the EU to achieve net-zero emissions by 2050. Visit www.shell.com/public-advocacy-and-political-activity for more on advocacy.

DECARBONISING ENERGY USE BY SECTOR

We also helped to develop a range of sector-specific programmes under the Mission Possible Platform, a collaborative initiative by the World Economic Forum in partnership with the Energy Transitions Commission. The platform focuses on developing partnerships for enabling the heavy industry and heavy-duty transport sectors to achieve net-zero carbon emissions.

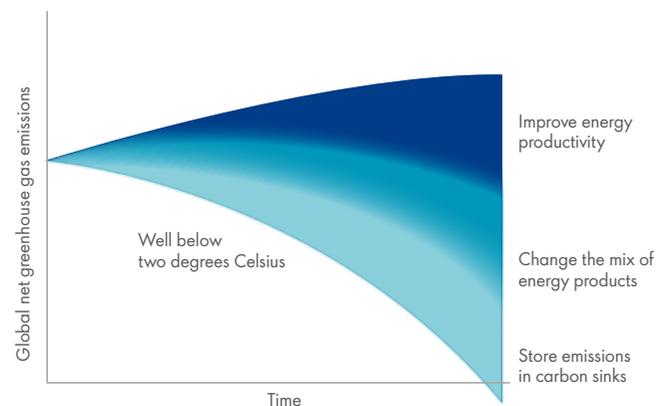
For example, we joined the Global Maritime Forum’s Getting to Zero shipping coalition announced at the UN Climate Summit in New York in 2019. The coalition brings together more than 90 companies from a range of backgrounds, including maritime, energy and finance, to engineer clean fuels and vessels while pushing to ensure these are supported by adequate infrastructure, such as ports. The coalition aims to find a way to put a commercially viable net-zero emissions ship to sea by 2030.

Climate change management organogram



[A] Oversight of climate change risk management.
 [B] Non-executive Directors appointed by the Board to review and advise on sustainability policies and practices including climate change.
 [C] Non-executive Directors appointed by the Board to oversee the effectiveness of the system of risk management and internal control.
 [D] Non-executive Directors appointed by the Board to set the remuneration policy in alignment with strategy.
 [E] Responsible for implementing Shell’s GHG strategy. They are represented in the Safety and Environment Leadership Team.

Three ways to reduce global net greenhouse gas emissions





NET CARBON FOOTPRINT

We want to play our part and contribute to the global effort to tackle climate change and meet the goal of the Paris Agreement.

In 2017, Shell announced a long-term ambition to reduce the Net Carbon Footprint of the energy products we sell. This is a carbon intensity measure that takes into account their full life-cycle greenhouse gas (GHG) emissions, including customers' emissions when they use these products.

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

While we seek to enhance our operations' average energy intensity through both the development of new projects and divestments, we have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10-20 years.

Visit www.shell.com/what-is-shells-net-carbon-footprint-ambition for more on our Net Carbon Footprint ambition.

We are building on our long-term ambition with a commitment to set specific Net Carbon Footprint targets for shorter periods. Shell will set the target each year, for the following three- or five-year period. Starting in 2019, we linked these targets and other measures to our executive remuneration policy.

In 2019, we set a target to reduce our Net Carbon Footprint by 2-3% compared to 2016, by 2021. In early 2020, we decided to set a Net Carbon Footprint target for 2022 of 3-4% lower than our 2016 Net Carbon Footprint of 79 grams of CO₂ equivalent per megajoule.

The calculation of the Net Carbon Footprint includes:

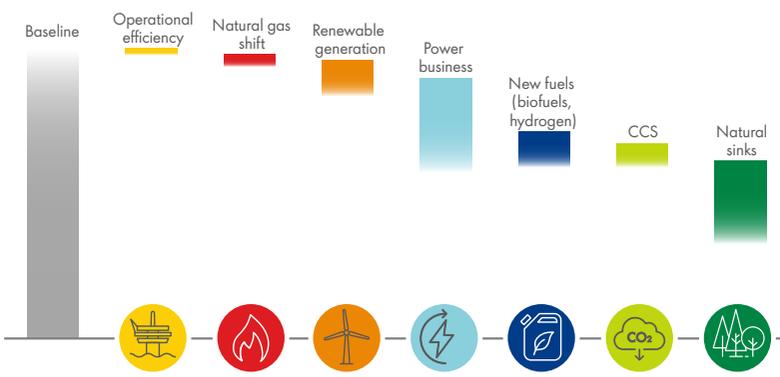
- emissions directly from Shell operations associated with the production and processing of energy products;
- emissions generated by third parties who supply energy to us;
- our customers' emissions from their use of our energy products; and
- carbon offsets such as reforestation as well as carbon capture 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. The calculation also includes biofuels, as well as emissions that we offset by using CCS or natural carbon sinks, such as forests and wetlands. Chemicals and lubricants products, which are not used to produce energy, are excluded from the scope of this ambition.

ACHIEVING OUR AMBITION

To meet the decarbonisation goals of the Paris Agreement, society needs an increasing supply of energy products that produce lower or zero GHG emissions over their full life cycle, and needs to use those products more efficiently and to store emissions that cannot be avoided in sinks. Within this framework, our strategy is to keep increasing the share of such low-carbon energy products in our portfolio, while also developing carbon sinks.

Lowering our Net Carbon Footprint





External voice



Helen Mountford
Vice President for Climate and Economics,
World Resources Institute

“The science and economics are clear: bold climate action is critical for strong and resilient economies, for healthy communities and for the natural systems on which we rely.

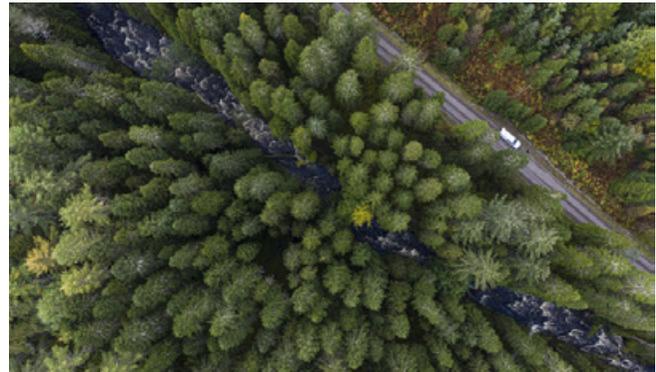
“The transition to net-zero emissions in the energy sector will be critical. Leading energy companies can play an important role in hastening the development and rapid deployment of clean energy solutions, and in engaging policymakers on the policies that can accelerate this transition across sectors.

“To lead, companies cannot wait. They must act now to shift investment away from fossil fuels. Shell’s actions, such as linking executive remuneration to climate targets, public positions on climate policy and its Net Carbon Footprint ambition are important steps.

“However, Shell must go further to align its investments and targets with the global goal of keeping warming below 1.5 degrees Celsius, and to fully leverage its robust influence and suite of resources to help drive the energy transition at a pace commensurate with the urgency of climate science.”

By broadening our focus to the full life-cycle emissions from the energy products that we sell to our customers, instead of solely on our operational emissions, we believe we will be better aligned with societal need and growing customer demand for more energy with lower life-cycle GHG emissions. Our strategy is to reduce our Net Carbon Footprint, mainly by increasing the proportion of lower-carbon products such as natural gas, biofuels, electricity and hydrogen in the mix of products we sell to our customers.

We are also investing in ways to mitigate emissions through capturing and storing CO₂ safely underground, or by planting and protecting natural ecosystems.



In the UK, we have a partnership with Forestry and Land Scotland, the Scottish government agency, to preserve and extend native woodland in Glengarry forest.

Net Carbon Footprint performance

Shell’s Net Carbon Footprint values between 2016 and 2019 inclusive are shown in the table 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.

	2019	2018	2017	2016
Net Carbon Footprint (gCO ₂ e/MJ)	78	79	79	79

The reduction in our Net Carbon Footprint was due to an increase in sales of electricity in markets with declining grid intensity and growth in customer demand for carbon-neutral product offerings.

Lloyd’s Register Quality Assurance Ltd has provided limited assurance for our Net Carbon Footprint assertion for each year from 2016 to 2019. Limited assurance means nothing has come to the auditor’s attention that would indicate that the Net Carbon Footprint data and information as presented in the Net Carbon Footprint Assertions were not materially correct.

While the Net Carbon Footprint 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 Net Carbon Footprint calculation can be derived from the final Net Carbon Footprint value for any year. Similarly, a fossil equivalent estimate of the total amount of energy sold included in the calculation can also be determined. These estimated values for the years 2016 to 2019 are presented in the table below.

	2019	2018	2017	2016
Estimated total energy (MJ) delivered by Shell [A]	2.105E+13	2.200E+13	2.144E+13	2.093E+13
Estimated greenhouse gas emissions covered by the Net Carbon Footprint calculation (million tonnes CO ₂ e) [B]	1,646	1,731	1,688	1,645

[A] Total volume of energy products sold by Shell, aggregated on an energy basis, with electricity represented as fossil equivalents. This value is derived from energy product sales figures disclosed by Shell in the Annual Report, Form 20-F and the Sustainability Report.

[B] Total CO₂e emissions estimated using Shell’s Net Carbon Footprint value and the estimate of total delivered energy. Note that this estimated value is calculated from the portfolio average intensity value, which is determined in Shell’s Net Carbon Footprint calculation. It is only intended to give an indication of the scope of the emissions included within Shell’s Net Carbon Footprint; it does not represent an inventory of emissions.

For more information, see www.shell.com/net-carbon-footprint-additional-information.



Data sources

The Net Carbon Footprint calculation uses production and product sales data taken from the Annual Report and Form 20-F. Any other product sales data used for the calculation but not disclosed in the Annual Report or Form 20-F is disclosed in the Sustainability Report, this includes the gas and power data given below.

Sales of gas and power produced by third parties

Gas and power produced or generated by third parties but sold by Shell are included in the Net Carbon Footprint calculation. The figures in the table below show the global volumes of third-party gas and power sold by Shell between 2016 and 2019.

	2019[A]	2018	2017	2016
Gas (tBtu)	2,720	3,246	3,276	3,298
Power (TWh)	207	179	165	169

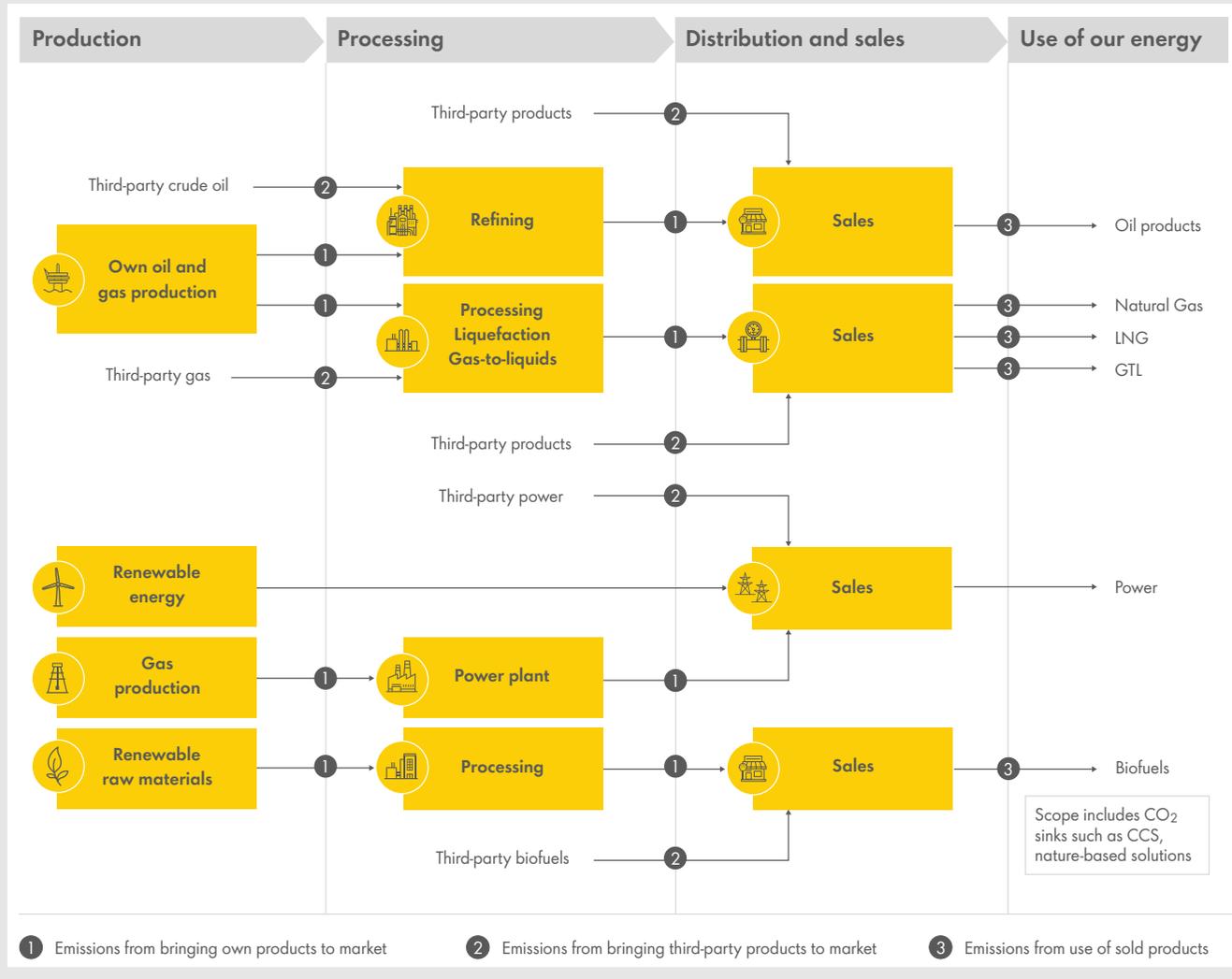
In certain cases, prior to 2019, it was not possible to disaggregate sales of Shell and third-party gas volumes. To avoid double counting these sales volumes were not included in the above figures.

[A] From 2019, gas and power sales volumes are reported based on a revised methodology. Sales volumes reported exclude those related to pure trading activities.

Watch the film at <https://youtu.be/ArHy4vK4g0I>

Scope of our Net Carbon Footprint

Emissions from energy products included within the Net Carbon Footprint framework.





MANAGING GREENHOUSE GAS EMISSIONS

GREENHOUSE GAS EMISSIONS

We are taking action to manage the emissions from our own operations and the emissions from the energy we use in our operations.

Improving the energy efficiency of our facilities is one of the ways to help us achieve our Net Carbon Footprint ambition to cut the intensity of the greenhouse gas (GHG) emissions of the energy products we sell by around half by 2050, in step with society's progress to align with the goal of the Paris Agreement.

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

During development, projects are expected to evaluate relevant low-carbon technologies and options to remove GHG emissions. To assess the resilience of proposed projects, we consider factors such as potential costs associated with operational GHG emissions.

We use estimates of future carbon costs that are specific to each country. This is an important part of our efforts to stay in step with society's progress toward the goals of the Paris Agreement. These estimates were developed using the current Nationally Determined Contributions (NDCs) submitted by countries as part of the Paris Agreement. By 2050, our estimates for all countries increase to \$85 a tonne of GHG emissions.

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 have also developed and implemented a comprehensive CO₂ and energy management information system that supports our facilities, for example, by analysing real-time data to highlight maintenance gaps and monitor performance.

Greenhouse gas emissions performance

Our direct GHG emissions decreased from 71 million tonnes of CO₂ equivalent in 2018 to 70 million tonnes of CO₂ equivalent in 2019. The main reasons for the decrease were divestments (for example, in Argentina, Canada, Iraq, Malaysia, Norway and the UK). These decreases were partly offset by the start-up of the Prelude floating liquefied natural gas facility in Australia.

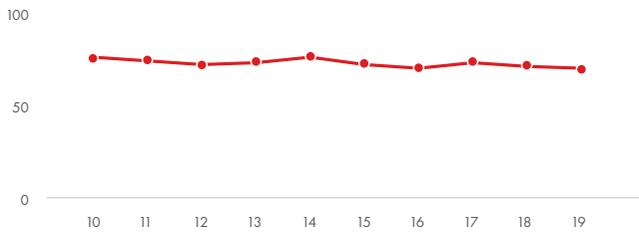


A Shell employee inspects equipment for potential methane leaks at a facility in Pennsylvania, USA.



Direct greenhouse gas emissions

million tonnes CO₂ equivalent



Direct and indirect GHG emissions from energy use changes in 2019 [A]

million tonnes CO₂ equivalent



[A] Direct and indirect GHG emissions from imported energy from 2018 to 2019
 [B] Total greenhouse gas emissions are rounded to the nearest million
 [C] Does not include around 1 million tonnes of CO₂ captured and sequestered by our Quest CCS project in Canada in 2019

METHANE EMISSIONS

Methane is a potent greenhouse gas. When it is released into the atmosphere, it has a much higher immediate global warming impact than carbon dioxide.

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%.

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 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

External voice



Mark Radka
Chief, Energy and Climate Branch, UN Environment Programme

"Cost-effective technologies and management practices can dramatically reduce methane emissions from oil and gas operations, so it's encouraging to see Shell, along with other companies in the Methane Guiding Principles, making strong commitments to reduce emissions, take action and report on their results."

procedures reduced methane emissions by around 4,000 tonnes in the six months from July to December 2019.

In 2019, our operated gas portfolio, including liquefied natural gas and GTL, contributed slightly more than 50% to our overall methane emissions. We are currently working with our partners to understand the methane emissions from non-operated ventures.

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 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.

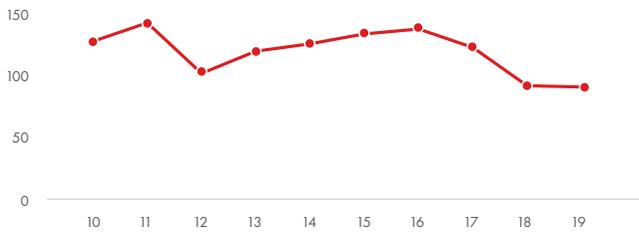
Methane emissions performance

In 2019, our total methane emissions were 91 thousand tonnes compared with 92 thousand tonnes in 2018, in part driven by divestments (for example, in Iraq and Canada). Methane emissions were less than 5% of Shell's greenhouse gas 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.



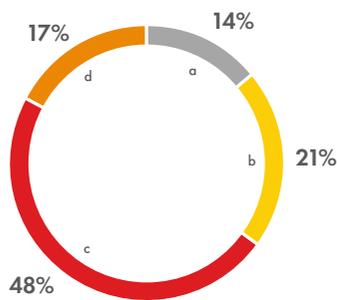
Methane (CH₄) emissions

thousand tonnes



Methane emissions by source

%



- a Combustion
- b Flaring
- c Process and venting
- d Fugitive

We report our methane emissions in accordance with applicable regulations and industry standards. We also engage in industry-wide work on developing more accurate reporting methods, such as through IPIECA, the global oil and gas industry association for advancing environmental and social performance.

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.

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 (see [Developing technology](#)).

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.



The Shell Scotford Complex in Canada consists of a bitumen upgrader, oil refinery, chemicals plant and a CCS facility.

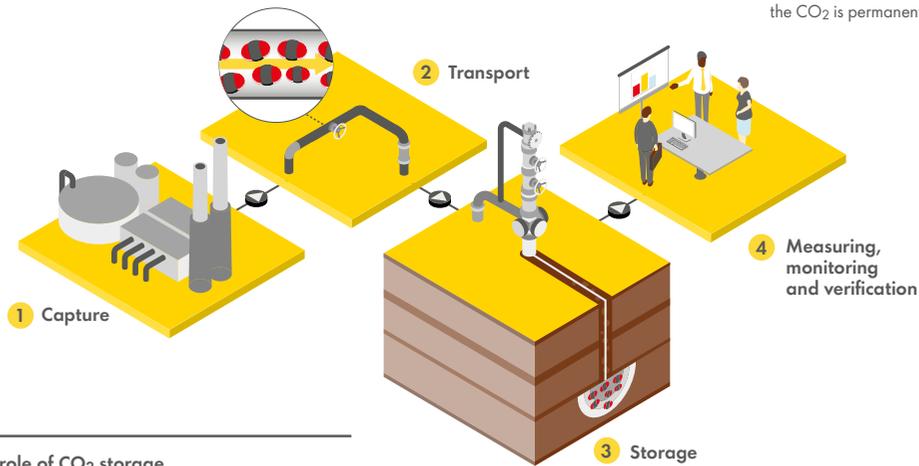
Society will struggle to achieve its climate goals without CCS. The technology is proven, but more projects need to be built. Accelerating the pace of CCS deployment requires collaboration between governments, industry and investors, among others, to help unlock financing capacity, accelerate technology development and encourage public support.



How carbon capture and storage works

See what is involved in the process of capturing and storing carbon dioxide deep underground

- 1 Capture**
CO₂ capture separates CO₂ from gas before it is emitted using a chemical solvent. The captured CO₂ is separated from the solvent and compressed into a liquid form for transport.
- 2 Transport**
CO₂ is generally pumped through a pipeline, taking the CO₂ from the industrial site where it has been produced to its storage site, which may be onshore or offshore.
- 3 Storage**
CO₂ is injected deep underground into the microscopic spaces in porous rocks. A layer of impermeable rock, called a cap rock, lies directly above the porous rocks ensuring that the CO₂ remains there permanently.
- 4 Measuring, monitoring and verification**
Monitoring of storage sites takes place within the storage reservoir, as well as at the injection well, where sensors can detect small changes in pressure or CO₂ levels. In addition, a number of monitoring technologies can be incorporated within the geosphere, biosphere and atmosphere surrounding the storage site to make sure the CO₂ is permanently stored.



The role of CO₂ storage

In the IEA's Clean Technology Scenario, carbon capture, utilisation and storage technologies contribute 13% of the cumulative emissions reductions needed to 2060.

Source: International Energy Agency's The Role of CO₂ Storage 2019



NATURAL GAS

Natural gas helps provide more and cleaner energy around the world. It is expected to meet around 40% of additional energy demand up to 2040.

Gas will help us achieve our ambition, in step with society's progress towards meeting the Paris Agreement goal, to cut the carbon intensity of the energy products we sell by around half by 2050, and by around 20% by 2035 as an interim step. We call this our Net Carbon Footprint ambition. It is consistent with the Paris Agreement.

Visit www.shell.com/energy-and-innovation/natural-gas and www.shell.com/providing-more-and-cleaner-energy for more on how natural gas contributes to a lower-carbon world.

Gas is the cleanest-burning hydrocarbon and produces a fraction of the air pollution that coal does when burned to generate electricity. Increasing the role that gas plays in the energy mix is one way countries can take action as the world moves to a low-carbon future.

Natural gas is an abundant, secure and readily available source of energy, one of the few that can be used across power generation, industry, the built environment and transport.

Gas has significant advantages when used to generate power alongside renewables, being able to quickly compensate for dips in supply from solar or wind generation, and rapidly respond to surges in demand. Although natural gas emits much less CO₂ than coal when burnt for electricity, this environmental benefit is reduced if high levels of methane are emitted. Shell is working to reduce methane emissions through various initiatives (see [Methane emissions](#)).

NATURAL GAS

NATURAL GAS



We provide around 3% of the world's natural gas

LNG SHIPPING



We manage one of the world's largest fleets of LNG carriers



In Gibraltar, we opened an LNG regasification terminal to supply the territory's new gas-fired power station.

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.

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.



LOWER-CARBON ENERGY

CLEANER POWER

Lower-carbon electricity

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.

Electricity from renewable sources, such as wind and solar, can be combined with the electricity produced from **natural gas**. Together, they can provide cleaner sources of power.

Read more about our lower-carbon electricity business and solutions at www.shell.com/energy-and-innovation/electricity.

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.

We also made acquisitions and investments in solar, wind, battery storage for solar-powered homes and renewable energy trading, as well as charging networks for electric vehicles (see **Wind, Solar, Distributed and household energy** and **e-Mobility** respectively).

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.

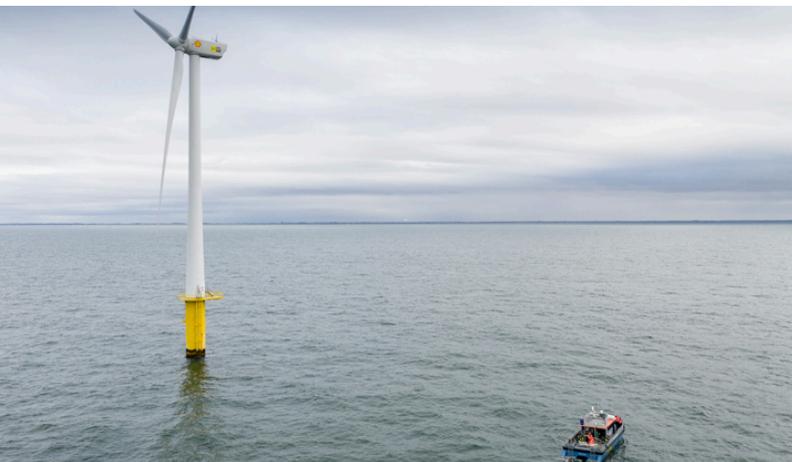
Visit www.shell.com/energy-and-innovation/new-energies/wind to find out more about our work in wind power.

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%).

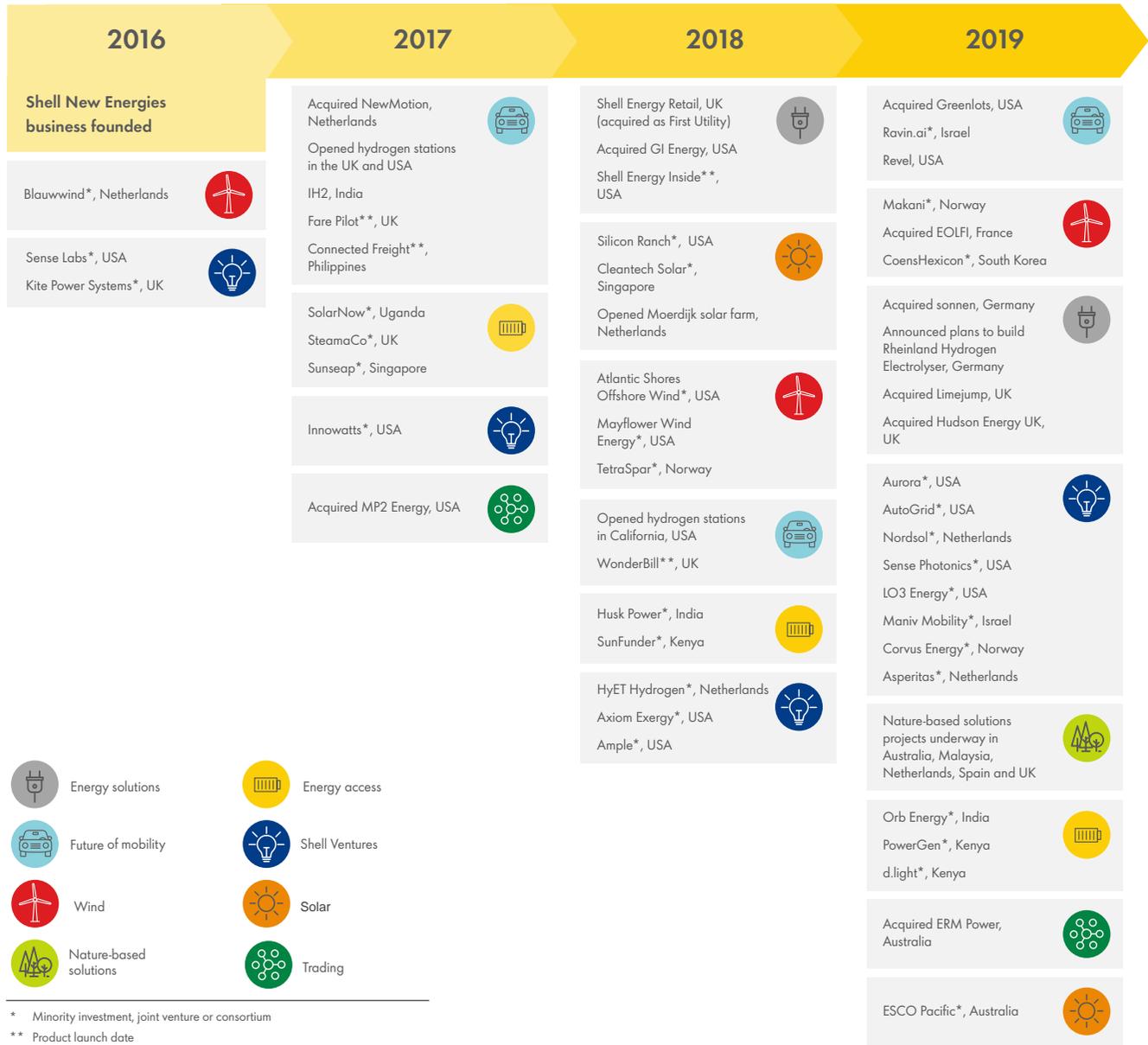
Construction of the Borssele III and IV offshore wind project by the Blauwwind Consortium began in 2019. The wind farm project is designed to have a total installed capacity of 731.5 MW, enough to



We now have interests in wind farms globally with the potential to generate more than 2 gigawatts of power.



New Energies – a selection of investments, acquisitions and ventures



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.

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.



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. Read more about sonnen in [Distributed and household energy](#).

Solar at our sites

We are using more solar power at our own sites. This includes our offices, retail sites, distribution terminals, refineries and offshore installations (see [Energy efficiency in our operations](#)).

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.



Cleantech Solar focuses its solar photovoltaic projects on commercial and industrial customers.

Distributed and household energy

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.

Visit www.shell.com/energy-and-innovation/electricity for more on our renewable energy solutions for homes and businesses.

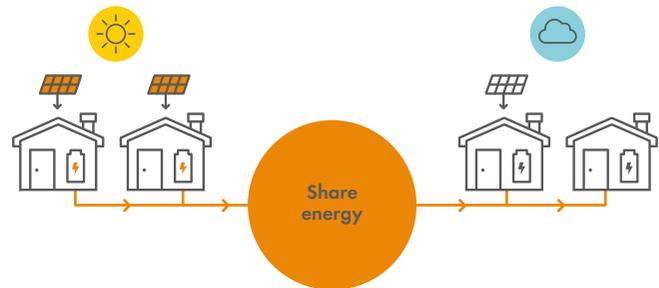
We are delivering products and services that help meet this changing consumer demand. We bought sonnen, a German company that provides smart battery storage and innovative energy services, such as virtual power plants. Around 50,000 households and small businesses across Europe, North America and Australia 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.

How sonnenCommunity works



Access to energy

Goal 7 of the UN sustainable development goals recognises the vital importance of “access to affordable, reliable, sustainable and modern energy for all” in eradicating poverty and protecting the planet. We are working to support this goal by providing more and cleaner energy.

Globally, around 860 million people lack access to electricity, according to the International Energy Agency, and hundreds of millions more are estimated to have an unreliable supply.

We want to help people gain access to the benefits of electricity and, in line with society’s expectations, from cleaner sources.

Read how we are helping people across the world gain access to a reliable supply of cleaner electricity at www.shell.com/energy-access.

Our ambition is to provide a reliable electricity supply to 100 million people, primarily in Africa and Asia, by 2030.



Investing in energy access

We are investing in companies that deliver innovative off-grid, or distributed, energy access solutions with the potential to be developed on a larger scale. These include solar mini-grids and solar home systems that can deliver the reliable, affordable electricity customers need.

In 2019, Shell New Energies acquired a minority interest in Orb Energy, which provides solar energy solutions in India and Africa, mainly serving small- and medium-sized enterprises such as factories, schools and hospitals. We announced our intention to make a minority investment in PowerGen, a company that develops, builds and operates mini-grids in Africa, as well as in d.light, which provides reliable and affordable solar lighting and power systems for households and small businesses in 70 countries.

Read more about the rest of our energy access investments at www.shell.com/energy-access.

Social programmes

Alongside, but separate from, our commercial investments, we also support social programmes that benefit communities where we work. Through these voluntary initiatives, we work with partner organisations to provide the means for individuals and communities to access reliable electricity to improve lives and generate greater economic opportunity.

We invest in a range of programmes in selected communities located near our operations to provide access to energy to local people and strengthen local economies.

Read more about our access to energy social programmes at www.shell.com/sustainability/communities/access-to-energy and how we tackle energy poverty with our energy access business at <https://www.shell.com/energy-access>.

In 2019, Shell Pakistan Limited worked with the National Rural Support Programme on an initiative to help people in Basti Bullah Baloch, a small village in eastern Pakistan, use energy and resources more productively and sustainably.

Farmers in the village grow cotton, wheat and sugar cane. Irrigation is essential to help crops grow.

The initiative helped replace diesel well pumps with a new solar-powered tube well, which more than doubled the water output and significantly reduced the time needed to irrigate fields. This saved villagers \$22 an acre in fuel for each irrigation cycle. A new solar-powered flour mill was also installed, meaning people no longer needed to travel around 8 kilometres to grind their wheat into flour.

Many families were also able to switch to using cleaner stoves to cook meals. Previously, they relied on solid fuels for cooking, which filled their homes with harmful fumes and smoke. The cleaner stoves were developed by a winner of Shell LiveWIRE, our flagship youth entrepreneurship programme.

Further training and a community-owned fund will help the village sustain these improvements successfully over the long term.



In 2019, Shell invested in solar debt financing firm Sunfunder that supports the growth of commercial businesses to improve energy access in East Africa, West Africa and other developing regions.



We are working in India with Husk Power Systems, a mini-grid company, using a hybrid solar photovoltaic and biomass gasification system with battery storage to provide reliable and affordable electricity 24 hours a day to customers on a pay-as-you-go basis.

FUELLING MOBILITY Biofuels

Biofuels are a renewable energy source, made from organic matter or waste, which can significantly reduce carbon dioxide (CO₂) emissions from transport.

Biofuels are blended with other fuels such as petrol and diesel. They can help decarbonise the aviation, marine and heavy-duty road transport sectors.

We are one of the world's largest biofuels producers through our Raizen joint venture (Shell interest 50%, not Shell-operated) in Brazil.

Visit www.shell.com/biofuels for more on our approach to biofuels.

In 2019, we blended more than 10 billion litres of biofuels into our petrol and diesel worldwide.

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-skyng.

Together with World Energy, we have agreements with Air France and Lufthansa to fuel their flights from San Francisco International Airport. The type of sustainable aviation fuel we supply can reduce CO₂ emissions by up to 85% compared with conventional jet fuel.

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.



In 2019, Shell companies signed agreements with airlines including Lufthansa to supply sustainable aviation fuel.

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. In the USA, we plan to expand and upgrade the JC Biomethane plant in Junction City, Oregon.

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.

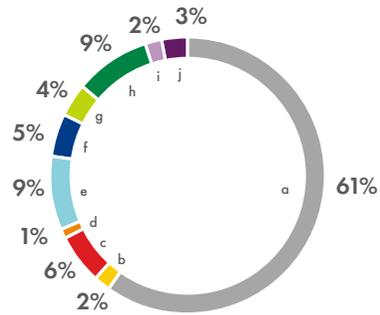
We have a demonstration plant at the Shell Technology Centre Bangalore, India, which features an advanced biofuel process called IH², a technology that can turn waste into transport fuel. The plant can process around 5 tonnes a day of feedstock, such as agricultural waste, and aims to demonstrate the technology for possible scaling up and commercialisation.

Sustainable production

Shell aims to have 100% of the sugar-cane ethanol and South American soy biodiesel used in Shell-blended or traded biofuels certified as sustainable by 2020. In 2019, 80% was certified as sustainable.

All the palm oil that we blend is certified by the Roundtable for Sustainable Palm Oil (RSPO) or International Sustainability and Carbon Certification for feedstocks or covered by offsets from the RSPO certificate trading system. We continue to participate in the RSPO and support its latest set of standards for sustainable palm oil production adopted in 2018.

Global bio-component purchase [A][B]
by feedstock



- a Corn
- b Molasses
- c Oilseed rape
- d Wheat
- e Palm
- f Soy
- g Sugar cane
- h Waste
- i Blended feedstock
- j Other

[A] Does not include purchases by Raizen.
[B] Percentages do not add up to 100% due to rounding.

e-Mobility

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.

Visit www.shell.com/electric-vehicle-charging for more on e-mobility.

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.

Fast-charging with renewable electricity

Electric vehicle drivers need to top up their batteries much faster during a journey than when they are at home or work. 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.



Greenlots uses a software platform that enables electric vehicle charging infrastructure to be deployed at scale.

e-fluids for e-vehicles

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.

Hydrogen

Hydrogen is a versatile energy carrier that can play a significant role in the transition to a low-carbon world.

It has great potential to help meet growing demand for cleaner transport. When driven, hydrogen vehicles do not emit carbon dioxide, only water vapour. If the hydrogen is produced using renewable energy, the fuel is virtually emission-free.

Shell is helping to build the infrastructure that will be needed if hydrogen is to fulfil its potential.

Learn more about how we are developing and using hydrogen to reduce greenhouse gas emissions at www.shell.com/hydrogen

Expanding our refuelling network

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 fuel-cell trucks. One of these stations will use hydrogen made from renewable biogas.

In the UK, we are partnering with ITM Power, a company specialising in electrolyzers, to make hydrogen fuel available at six Shell retail sites. The hydrogen is produced on-site using electricity from renewable sources.

World's largest electrolyser

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.



Our concept for the next generation of retail stations sees conventional fuels being sold alongside hydrogen.

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.



DEVELOPING TECHNOLOGY

In 2019, we spent \$962 million on research and development (R&D), compared with \$986 million in 2018.

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 223 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.

Read more about innovation and collaboration at Shell at www.shell.com/innovation-through-research-and-development.

CAPTURING CARBON

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.

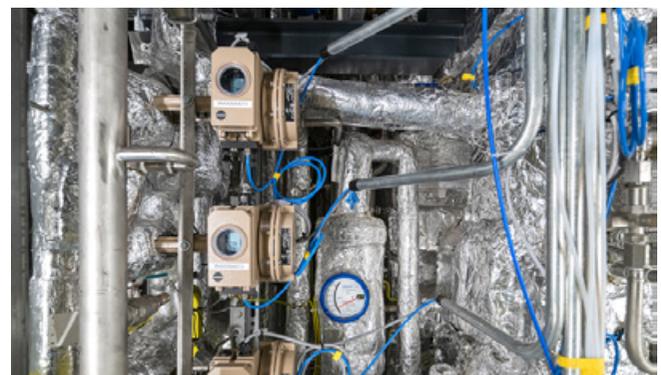
The technology meets high CO₂ recovery and purity standards and has the potential to cut separation costs per tonne of CO₂ by up to 25%, compared to leading alternatives. We are now working to develop the technology to commercial scale so we can capture around 200 times more CO₂.

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

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.



The technology we developed with universities and others helped capture 0.7 tonnes of CO₂ per day at the Austrian pilot project.

We have completed a project that demonstrates a new carbon capture process at a biomass power plant in Austria.



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 (see [Plastics](#)).

MEASURING CARBON UPTAKE IN NATURE

Measuring the level of CO₂ that is absorbed by nature, such as forests, grasslands and wetlands, is an important technique for assessing the health of ecosystems and the impacts of climate change.

For Shell, it is an essential tool that measures the carbon uptake of our nature-based solutions (see [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.

The system is small and compact and a fraction of the cost of other systems on the market, while producing accurate data that can be accessed remotely. This will allow scientists to deploy more carbon flux measuring systems and gather more data on ecosystem health and

climate change. For Shell it provides cost-effective and accurate measurement of carbon uptake in our nature-based solutions.



We work with scientists and universities around the world on research and development projects that focus on, among other things, low-carbon energy systems.



CONTRIBUTION TO SOCIETY

Our contribution to society comes in many forms. It includes providing energy products that millions of people rely on. We also contribute by paying taxes that support public services, creating jobs and supporting communities through our social investment programmes.

- 57** Working for Shell
- 60** Revenue transparency and tax
- 61** Social performance
- 65** Working together



WORKING FOR SHELL

OUR PEOPLE

Our people are essential to the successful delivery of the Shell strategy and to sustaining business performance over the long term. We accelerate development of our people, grow and strengthen our leadership capabilities and enhance employee performance through strong engagement.

Visit www.shell.com/about-us/our-values for more on our people.

Employee engagement

The Shell People Survey is one of the principal tools used to measure employee engagement, motivation, affiliation and commitment to Shell. It provides insights into employees' views and has had a consistently high response rate.

In 2019, the response rate was 85.5%, which was an increase of 3.5 percentage points compared with 2018. The average employee engagement score was 78 points out of 100, an increase of one point compared with 2018, and which places us among the leading results across a range of industries.

Workforce diversity

Our diversity and inclusion approach focuses on hiring, developing and retaining the best people.

Embedding the principles of diversity and inclusion in the way we do business gives us a better understanding of the needs of our people, partners, suppliers and customers. We believe a diverse workforce, and an inclusive and caring environment that respects and nurtures

OUR PEOPLE IN 2019 [A]

EMPLOYEES



83,000

and 4,000 in certain New Energies and Downstream companies, at December 31, 2019

REGION



>70

countries in which we operate

TRAINING



373,000

formal training days for employees and joint-venture partners

EMPLOYEES



31%

female

DIRECTORS



42%

women on the Board of Directors

SENIOR LEADERS



26%

women in senior leadership positions

EXPERIENCED HIRES



2,800

of which 32% were women

OPERATIONS CENTRE HIRES



3,600

recruited for Shell Business Operations centres, 51% female

GRADUATE HIRES



500

48% female

[A] All these numbers exclude the 4,000 employees in certain New Energies and Downstream companies, except the total employees number.



Strong employee engagement is especially important in maintaining strong business delivery in times of change.

diverse people, is a way to improve our safety and business performance.

We continue our relentless focus on attracting, developing and promoting more women, and we are supporting initiatives that encourage girls to study science, technology, engineering and mathematics (STEM). We also do this by creating a culture of respect and inclusion.

Shell Chief Executive Officer Ben van Beurden is a member of the Catalyst CEO Champions for Change, a group of more than 50 CEOs who have pledged to support women’s advancement at all levels of leadership. A Shell global Gender Gap campaign on closing the gender gap in STEM roles also features Ben van Beurden.

In 2019, Shell joined the disability campaign **The Valuable 500**, which seeks to eliminate the exclusion of disabled people worldwide. Our workplace accessibility service currently serves 83 locations globally. The service is designed to ensure that all employees have access to reasonable physical workplace or other adjustments so that they can work effectively and productively.

We also run an initiative called **I’m Not OK** to promote open and honest conversations about mental health. In 2019, we focused on stigma by launching an online portal for employees worldwide to

share their stories about the support that helped them most when they struggled. They addressed the issue of stigma by demonstrating that mental ill health can happen to anyone irrespective of job, nationality, age, gender or culture.

At Shell, we support and enable remarkable people from every background, and strive to be a leader in lesbian, gay, bisexual and transgender (LGBT) inclusion in the workplace. We have pledged our support to the UN LGBTI Standards of Conduct for Business. We benchmark ourselves externally with consistent top-tier results and in 2019 earned a 100% score in the Human Rights Campaign Foundation’s Corporate Equality Index, a recognition Shell has earned annually since 2016.

LIVING BY OUR PRINCIPLES

Our core values of honesty, integrity and respect for people underpin our work with employees, contractors, suppliers, non-governmental organisations and others.

The Shell General Business Principles describe our core values, our responsibilities and the principles and behaviours by which we do business.

Visit www.shell.com/about-us/our-values for more on our values.

Data privacy

In 2019, we continued working to ensure everyone at Shell complies with our global framework for data privacy compliance. We focused on our incident handling process to ensure that we can meet the 72-hour reporting requirement under the EU General Data Protection Regulation.

Our Ethics and Compliance Office updated and improved our data privacy training and simplified our approach to personal data risk assessments. We introduced a virtual assistant that responds to general ethics and compliance questions, including guiding employees to appropriate requirements for storing and deleting information.

As part of our renewed incident handling process we have put in place systems and controls to identify and address any data protection incidents which arise, including notifying appropriate regulators and

LIVING BY OUR PRINCIPLES

SHELL GLOBAL HELPLINE



1,686

Reports to the helpline

TAKING ACTION



248

Employees or contractor staff subject to disciplinary action

CODE OF CONDUCT



263

Confirmed breaches of the Code of Conduct

TAKING ACTION



93

People dismissed



people that are impacted, where required. We regularly review our incident handling process to ensure we further improve our approach.

Ethical leadership

In 2019, we built on our ethical leadership expectations programme, which was introduced in 2018 for all senior executives across Shell. The programme was designed to reinforce and explore the level of commitment to ethics and compliance in senior leaders. It supports the move in Shell to approach ethics as a topic of personal ownership rather than a matter of technical compliance. We launched an online toolkit to provide material and support for more than 1,000 leaders to set out ethical leadership expectations in team sessions. These sessions are designed to reinforce what Shell requires of leaders, focusing on values, behaviours, business pressures and leadership, with an emphasis on ensuring people feel comfortable speaking up.

Speaking up

Shell employees, contractors and any third party can report any potential breaches of the Code of Conduct confidentially and anonymously through several channels, including a global helpline, which is operated by an independent provider.

Shell has specialists who investigate concerns or allegations about a breach of our Code of Conduct. If a violation is confirmed, the relevant Shell company will take appropriate action up to and including a contract termination or dismissal. We maintain a stringent no retaliation policy to protect any person making an allegation in good faith.



Our people are essential to the successful delivery of the Shell strategy and to sustaining business performance over the long term.

Internal investigations confirmed 263 substantiated breaches of the Code of Conduct in 2019 compared with 370 in 2018. As a result, we dismissed or terminated the contracts of a total of 93 employees and contract staff, compared with 92 in 2018. Most Code of Conduct violations related to harassment, conflicts of interest and protection of assets.

Anti-bribery and corruption

There is no place for bribery or corruption at Shell. Shell has clear rules on anti-bribery and corruption that are included in our Code of Conduct and ethics and compliance manual. Both are available publicly online. Contractors and consultants are also required to act consistently with our Code of Conduct when acting on our behalf.

Read more about our values at www.shell.com/values and our requirements for our businesses and functions to comply with at www.shell.com/shell-ethics-and-compliance-manual.

Various national and international laws prohibit business involvement with certain individuals, entities and organisations. Our anti-bribery and corruption, anti-money laundering and trade compliance programmes set out the requirements for screening business partners to comply with those laws and to ensure we understand who we do business with. Using a risk-based approach, we screen potential business partners before and during the contractual relationship. In 2019, we carried out 8,363 enhanced pre-screenings for higher-risk contracts. Additionally, around 3.5 million counterparties are screened on a continuous basis against a range of trade compliance, anti-bribery and corruption and anti-money laundering watch lists.

The court case regarding our investment in Nigerian oil block OPL 245 and the 2011 settlement of litigation pertaining to that block is currently ongoing in Milan, Italy. We are under investigation for the same matter in other jurisdictions (see [Note 25 to the Consolidated Financial Statements](#) in our Annual Report).



REVENUE TRANSPARENCY AND TAX

The payment of taxes is a central link between governments, communities and businesses. Being transparent is about showing how developing energy resources responsibly provides governments with an opportunity to generate revenues, support economic growth and enhance social development.

We recognise our responsibilities towards investors, governments, suppliers, employees and the communities we are part of. Revenue transparency and the taxes we collect and pay are among the ways we embrace this responsibility.

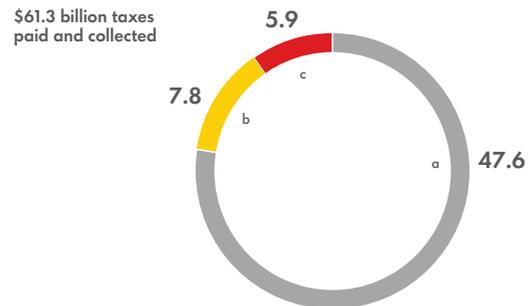
In 2019, Shell published its first Tax Contribution Report. The report presents Shell's approach to tax and explains how our business is taxed. We also share our views on special topics such as tax incentives and low-tax jurisdictions. For the first time, we also voluntarily disclosed the corporate income tax paid to individual countries and locations for 2018.

Read more about tax and transparency in the Tax Contribution Report at www.shell.com/taxcontributionreport.

This report builds on the information we disclose in our Annual Report and Form 20-F, Sustainability Report, **Payments to Governments Report** and through the Extractive Industries Transparency Initiative. We aim to publish our Tax Contribution Report annually.

In 2019, Shell paid more than \$61.3 billion to governments. We paid \$7.8 billion in income taxes and \$5.9 billion in government royalties, and collected \$47.6 billion in excise duties, sales taxes and similar levies on our fuel and other products on behalf of governments.

Overview of tax and other payments to governments in \$ billion



- a ■ Customs, excise duties, sales taxes and similar levies collected
- b ■ Corporate income taxes paid
- c ■ Government royalties paid



Shell has a tax presence in 99 countries and locations.



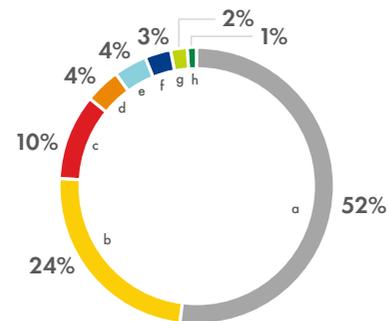
SOCIAL PERFORMANCE

ENGAGING COMMUNITIES

Engaging with communities is an important part of our approach to managing human rights and providing access to remedy.

Community engagement helps us design better projects, comply with social and environmental regulations and align with international standards, including those from the World Bank and the International Finance Corporation.

Complaints reported globally in 2019 [A] by category



- a Social [B]
- b Environment
- c Safety
- d Security
- e Business integrity, contractual and commercial
- f Unrelated to Shell
- g Other
- h Health

[A] Chart excludes clusters of complaints regarding earthquakes in the Netherlands, which are managed outside of Shell.
 [B] Social category includes labour and local content.

The community feedback mechanisms implemented in our major operations and projects allow us to receive, track and respond to questions and complaints from community members. Our network of around 100 community liaison officers acts as a bridge between the local community and the business.

In Berat, southern Albania, our activities increased traffic, resulting in dust pollution and health concerns for the local community. Shell set up a community centre with a community liaison officer, who brought the concerns to the attention of leaders in Shell's upstream organisation in Albania.

The team implemented three initiatives: traffic-calming measures, dust suppression using environmentally friendly chemicals and additional watering to minimise the impact of dust on local communities. After the community centre was set up, the time it took to resolve complaints decreased from 33 to eight days.

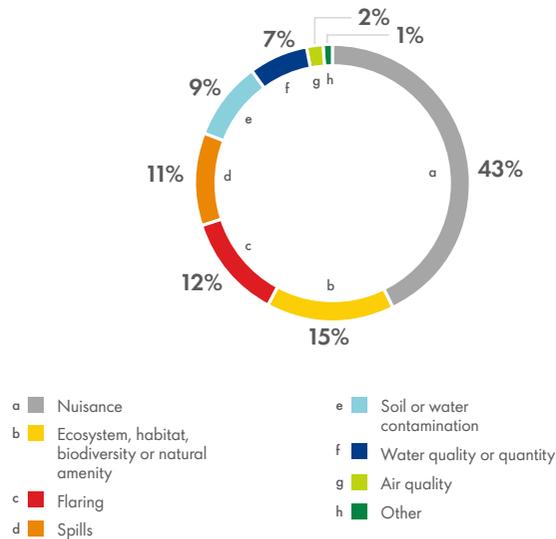
In 2018, Karachaganak Petroleum Operating B.V. (KPO) (Shell interest 29.25%) completed the physical resettlement of 464 families in north-west Kazakhstan. Community liaison officers continue to use the community feedback mechanism to address issues related to the new housing. In 2019, KPO received 189 complaints and suggestions from the residents, including requests for additional soil for their back gardens so that they could grow vegetables. KPO coordinated the home repairs and supplied 375 trucks of soil.



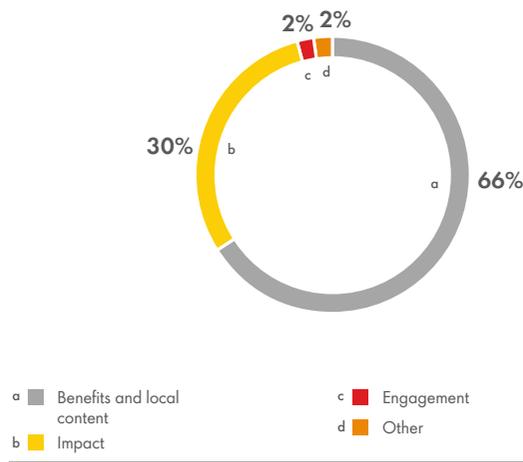
Work continued in 2019 to restore the livelihoods of residents from the villages of Berezovka and Bestau in Kazakhstan after an expansion of the safety perimeter around the Karachaganak field required them to be resettled.



Environmental complaints received in 2019 by category



Social complaints received in 2019 by category



In 2019, Shell developed a tool to check if our community feedback mechanisms were fully effective according to the UN Guiding Principles. The tool was used to assess where additional support was needed and laid out plans for improvements in 2020.

LOCAL CONTENT AND SKILLS DEVELOPMENT

Local content is a term we use to describe the ways we contribute to the development of the countries where we operate, beyond paying taxes and royalties to governments. This mainly involves creating jobs, training people, supporting local businesses and buying goods and services from local suppliers.

In 2019, we spent \$44.9 billion on goods and services, of which around 65% was in Australia, Canada, the Netherlands, the UK and the USA. In 2019, we estimate around \$5.7 billion was spent in countries that, according to the UN Development Programme Human Development Index 2017, have a gross domestic product of less than \$15,000 a year per person. In these countries, Shell companies spent around 87%, or around \$4.9 billion, with local companies.

In some countries we support efforts to help more local nationals into the workforce.

For example, Shell Oman has helped the Petroleum Development Oman joint venture (PDO, Shell interest 34%) create around 17,000 jobs for local nationals since 2011 as part of a partnership to develop the country's energy industry.

In 2019, Shell Oman worked with PDO and other major operators to open up new opportunities for Omanis. This included using smarter scheduling of maintenance activities for facilities in a local area so nationals could access multiple sites more easily from their homes.

Our enterprise development and skills programmes create opportunities, while adding value to our supply chain. We also sponsor training programmes for people who are not part of Shell's supply chain. For example, in the Philippines, we support the **Bridging Employment through Skills Training** programme, which provides vocational training to out-of-school youths and unemployed adults.

Enterprise development

Shell's LiveWIRE programme helps local entrepreneurs turn their ideas into reality. The programme marked its 37th anniversary in 2019 and operates in 18 countries. In 2019, we launched programmes in Canada and the Philippines. Around the world, Shell LiveWIRE trained 3,079 people and supported 1,269 businesses, while 1,392 jobs were created.

In 2019, 44 Shell LiveWIRE-supported businesses entered our supply chain. One of these was **WormingUp**, an enterprise which helps to reduce and more efficiently recycle waste in Shell retail stations. Shell LiveWIRE also supports **She'Kab**, a ride-sharing service in Pakistan that uses a digital platform and an app to connect women with security-checked drivers.

HySiLabs, a Shell France-supported company, recently signed up to the Shell GameChanger programme, which works with start-ups and businesses on unproven early-stage ideas with the potential to impact the future of energy.

Shell has also launched the Shell Startup Engine in partnership with StartupBootCamp. The programme offers entrepreneurial support, including coaching and mentoring and access to industry experts.



In the Philippines, the Shell LiveWIRE programme aims to help coconut farmers find an additional source of income from the by-products of their harvest.



SOCIAL INVESTMENT

We invest in community projects so that local people can benefit from social and economic development. This investment is sometimes voluntary and sometimes required by governments, or part of a contractual agreement.

The intent of our social investment programmes is to benefit society and the environment where we operate, and also to create a more positive local business environment for Shell.

As well as responding to local social investment priorities, we have three global social investment themes:

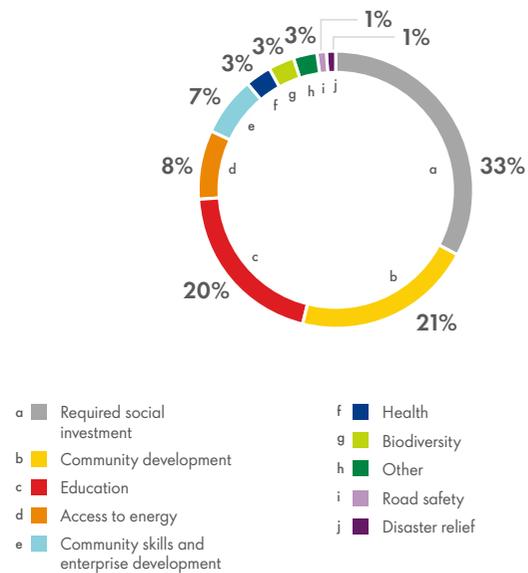
- access to energy;
- science, technology, engineering and mathematics education (STEM); and
- community skills and enterprise development.

Social investment programme focus areas are determined by local community needs and priorities.

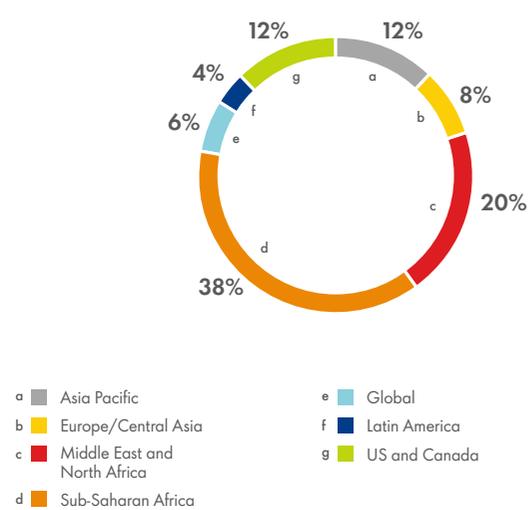
In 2019, we spent almost \$173 million on social investment, of which 33% was required by government regulations or contractual agreements. We spent \$116 million on voluntary social investment, of which around \$60 million was in line with our global themes. The remaining \$56 million was spent on local programmes for community development, disaster relief, road safety, health and biodiversity.

Around \$84 million of our total social investment spend in 2019 was in countries that are part of the UN Development Programme’s Human Development Index 2018. These countries have a gross domestic product of less than \$15,000 a year per person.

Social investment proportion of spend



Social investment by region



SOCIAL INVESTMENT IN 2019

TOTAL SPENT GLOBALLY



\$173 million

TOTAL SPENT IN LOWER-INCOME COUNTRIES



\$84 million



STEM EDUCATION

Our industry needs talented people with knowledge and skills in science, technology, engineering and mathematics (STEM).

We actively support STEM with a range of programmes in more than 20 countries. NXplorers, our flagship STEM programme, aims to equip young people with the problem-solving skills needed to become future innovators and leaders. The programme provides twelve practical tools that help them explore issues that matter to them, create preferred future scenarios and bring about positive change.

In 2019, we continued to expand NXplorers and it has now been launched in 17 countries.

We launched the programme in Russia with three workshops, including one attended by 40 young people from 15 countries in St Petersburg. The workshops explored ways to address some of the world's biggest challenges, such as energy access and climate change.

In India, NXplorers has so far reached more than 19,000 students at 240 schools. Students have developed 268 projects that address challenges related to food, water and energy.

In Malaysia, NXplorers delivered training to more than 600 students from 15 schools. Shell Malaysia also collaborated with the government to expand its main road safety programme to 26 universities.

We also expanded NXplorers in Australia in 2019 to reach more than 200 students across five schools in Perth and two in Broome. Students worked on several projects focused on the feasibility of using renewable energy in schools and the community.

Read more about NXplorers at NXplorers.com and Shell's approach to education at www.shell.com/education.



NXplorers is an educational programme that introduces young people to the complex and creative thinking needed to bring about positive change.

SHELL FOUNDATION

Shell Foundation is an independent charity that applies business thinking to the global development challenges of access to energy and transport services.

The charity provides business support, grants and market connections to help social entrepreneurs prove new business models in low-income communities. The charity selects partners who could benefit 10 million people within 10 years, achieve financial independence and spur international replication.

Visit www.shellfoundation.org/impact for more on Shell Foundation.

Since 2000, Shell Foundation has deployed \$344 million of grant funding in Africa, Asia and Latin America. Its current portfolio consists of 71 early-stage businesses and new market builders.

In 2019, the charity's activities included the co-creation of a new business that aims to integrate energy solutions to deliver universal access in rural African markets. **Konexa's** services include improving existing grid reliability, providing additional generation capacity and delivering affordable off-grid technologies such as solar home systems and mini-grids.

The charity also entered a new £30 million, five-year strategic partnership with the UK government in 2019. The CASEE (Catalysing Agriculture by Scaling Energy Ecosystems) partnership plans to deliver access to energy for **smallholder farmers** in sub-Saharan Africa and South Asia, and builds on the existing strategic partnerships focused on household and small business energy needs.



Shell Foundation partner SunCulture provides low-cost solar irrigation solutions to farmers in Kenya.



WORKING TOGETHER

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.

Tax transparency

In December 2019, we published our first Tax Contribution Report, setting out our approach to tax and the corporate income tax that Shell companies paid in countries and locations around the world in 2018. The report is part of our commitment to the B Team Responsible Tax Principles, developed with a group of leading companies, along with the involvement of civil society, investors and representatives from international institutions.

While preparing the Tax Contribution Report, we engaged with several non-governmental organisations and individuals with a strong interest and expertise in tax transparency. We sought their views on best practice and their expectations of an organisation like Shell. This provided useful input for our reporting procedures (see [Revenue transparency and tax](#)).

Ending plastic waste

We are a founding member of the Alliance to End Plastic Waste, a not-for-profit organisation that aims to invest \$1.5 billion over five years to help end plastic waste in the environment. The alliance comprises more than 40 global companies, including chemical and plastics manufacturers, consumer goods and waste management companies, and the World Business Council for Sustainable Development.

In 2019, the alliance started several projects, including one in India to stop plastic waste entering the Ganges, one of the world's most polluted rivers. The project turns worthless waste into a saleable product by encouraging local people to collect discarded plastic, which is then converted into liquid fuel. We are supporting the project with expertise, such as hazard identification, fuel product analysis and qualification, and design of the converter facility (see [Plastics](#)).

Corporate good practice

In Brazil, we have worked closely with the Ethos Institute, the national organisation for corporate social responsibility, for more than 20 years. Shell Brasil Petróleo Ltda. was one of 14 companies in the country to sign the Guide to Good Practices in Corporate Integrity for the Oil and Gas Sector. We are a member of the Brazilian Petroleum, Gas and Biofuels Institute, which is producing a set of videos to illustrate the guide, covering topics such as human rights.

We are a founding member of the World Business Council for Sustainable Development (WBCSD), 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,



The Alliance to End Plastic Waste supports Renew Oceans, a localised investment and engagement project. The first Renew Oceans project focuses on India's Ganges River into which more than half a million tonnes of plastic waste is reported to be dumped annually.



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.

Collaborations overview

The table shows some of the organisations that we collaborate with globally on topics such as environmental sustainability and technology. Shell also works with many community-based organisations.

	Environmental sustainability	Human rights and social responsibility	Safety and technical standards	Technology and innovation	Transparency and governance
Alliance to End Plastic Waste	✓				
Clean Skies for Tomorrow Coalition	✓			✓	✓
Hydrogen Council	✓		✓	✓	✓
Mercy Corps		✓			
GIZ		✓			
E4D / SOGA		✓			
Roundtable for Sustainable Palm Oil (RSPO)	✓	✓			
Roundtable for Responsible Soy (RTRS)	✓	✓			
Roundtable for Sustainable Biomaterials (RSB)	✓			✓	
International Sustainability and Carbon Certification (ISCC)	✓				
IPIECA (global oil and gas industry association for environmental and social issues)	✓	✓	✓		✓
Bonsucro	✓	✓			
Earthwatch	✓				
Energy Institute (EI)			✓	✓	
Energy Transitions Commission (ETC)	✓			✓	
Extractive Industries Transparency Initiative (EITI)					✓
Clean Cooking Alliance		✓			
Building Responsibly		✓	✓		
Global Road Safety Partnership (GRSP)			✓		
International Association of Oil and Gas Producers (IOGP)	✓	✓	✓	✓	✓
International Union for Conservation of Nature (IUCN)	✓				
The Nature Conservancy (TNC)	✓			✓	
World Business Council for Sustainable Development (WBCSD)	✓	✓	✓		✓
Oil and Gas Climate Initiative (OGCI)	✓			✓	✓
UN Global Compact					✓
Business for Social Responsibility		✓			
B Team Responsible Tax Principles					✓
Voluntary Principles Initiative		✓			
Transparency International UK Business Integrity Forum					✓
Methane Guiding Principles Coalition	✓		✓	✓	✓



SOCIAL PARTNERS

Our partners help us to understand external perspectives on a variety of community or human rights topics and address specific priorities, such as boosting local employment and improving access to energy.

We work with local and global non-governmental and humanitarian organisations, including BSR (Business for Social Responsibility) and the Clean Cooking Alliance. These groups help us address the needs of the communities where we operate. In 2019, we also joined the Smart Communities Coalition, which seeks to improve the delivery of essential services to refugees and host communities.

Better access to jobs and training

In Tanzania and Kenya, we supported the Employment and Skills for Eastern Africa (or E4D/SOGA) programme in partnership with the German, British and Norwegian governments, the European Union and several companies. E4D/SOGA aims to improve access to jobs and economic opportunities for local people in natural resource-based industries and related sectors.

In 2019, 7,290 people received training and 3,867 people (a third of whom were women and the majority young people) secured employment across eastern Africa.

Since the programme started in 2015, more than 55,000 people have received training and around 15,600 people have secured employment. More than 18,700 people have increased their income, by an average of 235%, and about 31,130 local enterprises have increased revenues and competitiveness.

ENVIRONMENTAL PARTNERS

We work with partners to reduce our environmental impact, improve areas around our operations and ensure local communities benefit from our presence.

Together, we share our scientific and conservation knowledge with industry and environmental groups and engage on sustainability challenges.

The International Union for Conservation of Nature (IUCN) has been our global partner focusing on biodiversity policy and projects for

more than 20 years. In 2019, together we started working with European utility companies EDF and EDP on ways to mitigate the impact of solar and wind power projects on biodiversity.

IUCN has also set up independent scientific panels to help us mitigate environmental impacts. In 2019, the Western Gray Whale Advisory Panel received a new three-year mandate to advise Sakhalin Energy (Shell interest 27.5% minus one share) in Russia on assessing and managing its impact on western gray whales.

IUCN and Shell Petroleum Development Company of Nigeria Limited (SPDC) have continued to collaborate with others in Nigeria to monitor the biodiversity recovery in areas where SPDC's new remediation standard is being applied (see [Spill prevention and response in Nigeria](#)).

We also collaborate on local projects. In 2019, Shell Oil Company partnered with the Coastal Conservation Association to help protect the shoreline of Louisiana, USA. To do this, we are using artificial floating islands made from recycled plastic water bottles. The islands, which host around 2,500 square feet of native grasses, attract marine life and act as a barrier against strong waves.

Shell Development Oman continued to work with Wetlands International to support bird migration counts of the Wetlands Reserve in Al Wusta Governorate, which includes the Barr Al Hikman peninsula. In 2019, the autumn migration survey results showed that more than 200,000 birds of around 60 different species made the intertidal wetland on the coast of Oman their home for resting and feeding during their annual migration.

Employee engagement

We partner with Earthwatch to give Shell employees a chance to hone their sustainability leadership skills and make a direct contribution to scientific research and global conservation efforts. In 2019, 96 employees from 27 countries took part in Earthwatch science and learning expeditions.



Shell employees collect samples as part of an Earthwatch expedition helping scientists at the Schoodic Institute, Maine, USA, understand the impacts of climate change on the local environment.

Through the Earth Skills Network, employees share business skills with staff in IUCN or UNESCO-protected areas. In 2019, six employees supported 18 staff from these organisations in protected areas, including Nigeria's Gashaka-Gumti National Park.

External voice



Sonja Palm
Program Director, Employment for Development (E4D/SOGA), GIZ

"The collaboration with Shell has enabled us to understand industry needs better and to customise our skills programmes to what industry needs.

"By joining forces, we can have a stronger impact on supporting local jobs and broader economic changes in eastern Africa. GIZ, as a development agency, and international companies such as Shell each bring different expertise and perspectives into a partnership through which we learn from each other and thrive to deliver better outcomes."



20+ YEARS OF COLLABORATION WITH IUCN AND EARTHWATCH

International Union for Conservation of Nature (IUCN)



50+

joint projects



4

conservation commitments since 2003 [A]



16

years of the Western Gray Whale Advisory Panel



78

Niger Delta Panel recommendations implemented [B]

Earthwatch Europe

Earthwatch expeditions



1,183

Shell participants, 56 research projects



57,000

hours of data collection

Earth Skills Network



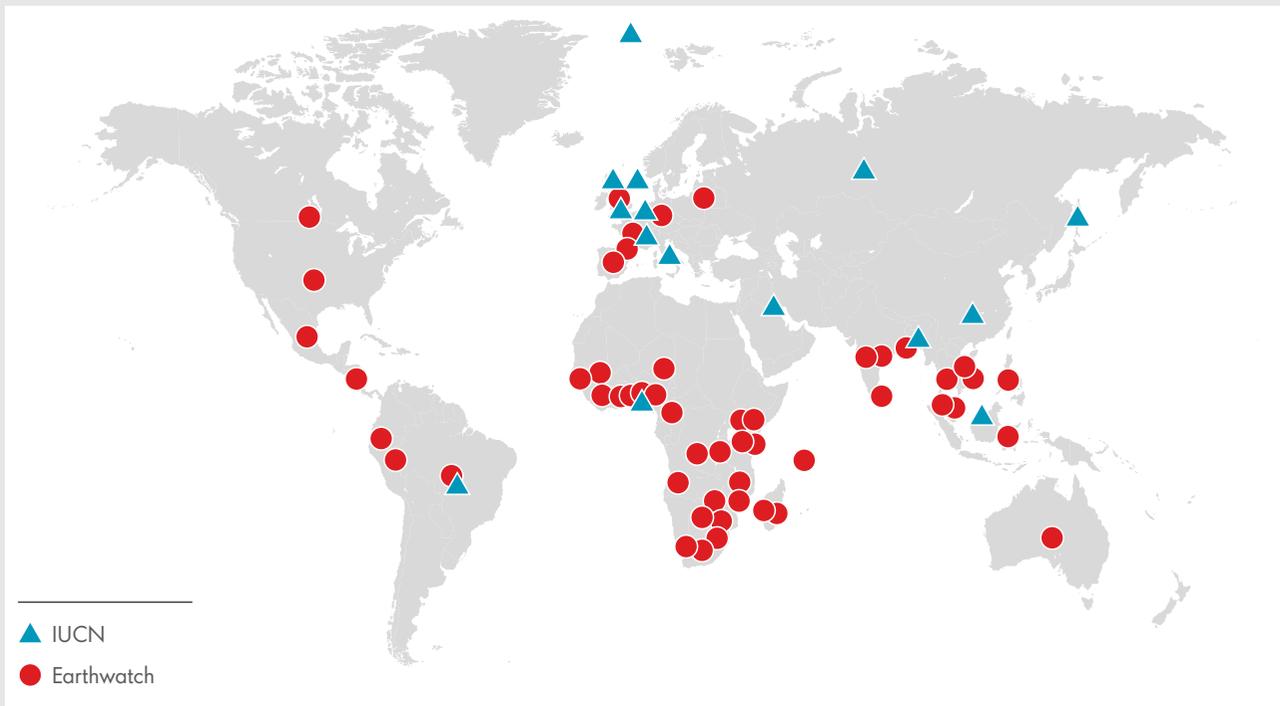
184

protected area staff supported



63

protected areas, including World Heritage Sites



[A] Shell will not explore for, or develop, oil and gas resources in natural World Heritage Sites; we will further improve the way we operate in International Union for Conservation of Nature (IUCN) Category IV protected areas and areas of high biodiversity value; we will publicly report on our activities in IUCN Categories I-IV; and we will work with IUCN and others to help safeguard protected areas.
[B] 78 out of 83 IUCN Niger Delta Panel recommendations have been agreed and implemented.



SUPPLY CHAIN

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. These principles cover requirements such as business integrity, health and safety, and human rights. Working with suppliers and contractors in this way is crucial to being a responsible member of society.

Read more about how we work with contractors and suppliers at www.shell.com/business-customers/shell-for-suppliers.

In 2019, Shell spent \$44.9 billion on goods and services from around 29,000 suppliers globally.

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

Human rights

We are collaborating with BP, Equinor and Total to create a standard approach to human rights supplier assessments for the energy industry. The aim is to make it easier and more efficient for suppliers to show how they respect human rights and care for their people. In 2019, each organisation began using a common framework developed for all risk-based labour rights assessments of suppliers. We continue to invite companies in the energy industry to join the initiative.

The initiative supports the objectives of UN sustainable development Goal 8 to “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”. We also continue to support the UN Global Compact and its corporate governance principles on human rights.

Read more on our approach to human rights at www.shell.com/sustainability/transparency/human-rights.

Worker welfare

In 2019, we carried out an internal assurance review to assess the design and operational robustness of our control processes to ensure

we fulfil our commitment to respect human rights (see [Respecting human rights](#)).

We have detailed guidance for our project management teams that sets minimum global standards for worker welfare and respect for people. We continuously aim to deliver a standard of accommodation and facilities that improves the quality of life and well-being of people working on our projects. This includes accommodation and facilities that enhance their well-being and promote safe and productive work.

We conducted a review of our approach to worker welfare in 2019, including how suppliers and contractors working at our sites care for their people. The outcome of this review has resulted in the development of a new chapter on worker welfare for our management system, which we call our Health, Safety, Security, Environment and Social Performance Control Framework.

It will require an assessment of worker welfare risk and, where necessary, the creation of a worker welfare plan for the site, and require that contractors and suppliers also make a worker welfare plan for their staff. We expect the content of worker welfare plans to cover the areas addressed by the Building Responsibly Worker Welfare Principles.

Lower-carbon supply chain

We continuously work with our contractors and suppliers to find ways for them to build lower-carbon solutions into our supply chains. For instance, we are installing performance optimisation software and battery storage systems on our contracted offshore supply vessels to reduce fuel consumption and lower greenhouse gas emissions.



In Louisiana, USA, we have been playing an important part in the state's coastal economy for more than a century.

NON-OPERATED VENTURES

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

More than half of Shell’s joint ventures are not operated by Shell. We do not have direct control over how these ventures embed sustainability in their operations but seek instead to offer our support and exert a positive influence on their operations.

For example, our representatives and Shell-appointed board members in a joint venture require our partners to adopt the Shell commitment and policy on health, safety, security, environment and social performance (HSSE & SP), or one materially equivalent to our own. They are also expected to put in place standards to adequately address HSSE & SP risks.

SUPPLY CHAIN IN 2019

SUPPLIERS



29,000

GOODS AND SERVICES



\$44.9 billion



When these joint ventures implement our HSSE & SP Control Framework – designed to help ensure our projects and assets are safe – or a similar approach, Shell teams carry out independent audits or participate in the joint venture’s own auditing programmes where possible. We also offer to review the effectiveness of the framework’s implementation, with the review overseen by the joint venture’s board of directors.

We periodically evaluate the health, safety, environmental and community risks of our joint ventures. If a joint venture is falling below expectations, plans will be put in place, in agreement with the other partners, to improve performance.

Reducing energy and CO₂ emissions

Oman is one of the countries where Shell has been partnering and working closely with the government and other companies for decades.

For example, we are helping Petroleum Development Oman (PDO; Shell interest 34%) save energy and reduce carbon dioxide (CO₂) emissions. In 2019, PDO 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.

Read more at [Methane emissions and Energy efficiency in our operations](#).

DIVESTING RESPONSIBLY

We continue working to reshape our global portfolio to drive growth and resilience, and carry out due diligence on potential buyers when divesting parts of our business.

In 2018, we successfully completed our three-year \$30 billion divestment programme and our efforts to refresh and upgrade our assets will continue.

In 2019, we completed divestments of around \$5 billion. See the [Shell Annual Report 2019](#) for details.

We have a well-established, systematic and assured method of assessing risk in divestments. This includes using in-house and external experts, where appropriate, to conduct checks and examine key attributes of potential buyers.

These attributes include their financial strength; operating culture; health, safety, security and environment (HSSE) policies; and approach to ethics and compliance. We also consider risk and people management processes and standards; community liaison practices; and social investment programmes.

Applicable attributes are assessed against Shell’s policies, as well as the likely requirements of relevant laws and regulations.

Divestments are often subject to the approval of regulatory authorities, which includes potential buyers’ HSSE capacity and capability.



SPECIAL REPORTS

Take a detailed look at how we put sustainability at the heart of our biggest business decisions and in key locations during 2019.

- 72** Economic development in Nigeria
- 75** Spill prevention and response in Nigeria
- 77** Working for the future of Groningen
- 79** Nature-based solutions
- 81** Energy efficiency in our operations
- 83** Growing gas and power in Australia



SPECIAL REPORT

ECONOMIC DEVELOPMENT IN NIGERIA

Shell has interests in several companies in Nigeria that help power economic growth and improve the quality of life for Nigerians. Safety and security remain top priorities and we continue to work closely with communities, civil society, contractors and joint-venture partners, and federal and state government agencies to create a safe operating environment.

Shell Companies in Nigeria also contribute social investment in communities and support the development of Nigerians and indigenous companies.

Visit www.shell.com.ng/nigeria-briefing-notes for more on Shell in Nigeria.

POWERING NIGERIA'S ECONOMY

In 2019, the Shell Petroleum Development Company of Nigeria Ltd (SPDC), the operator of the SPDC Joint Venture (SPDC interest 30%), focused on restoring and repairing wells and pipelines in the Niger Delta to restart oil and gas production. Some wells that were closed for about 20 years are producing again. The Trans Ramos pipeline is also supplying oil and gas for export after being shut due to leaks in 2018. The result is an increase in production of nearly 10% on 2018.

SPDC also continued to make progress on developing several large gas projects that are key to eliminating continuous flaring from its operations. Since 2002, flaring has been reduced by 90%. Gas that was once flared is now captured and processed for domestic and international gas markets. Gas is sent for the export market as liquefied natural gas (LNG) or channelled into the domestic Nigerian gas market. Here, it displaces diesel generators to provide cleaner, reliable and affordable power for industrial and commercial customers.

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 operational flaring in Nigeria.



EXPANDING IN DEEP-WATER OIL AND GAS

Unlocking the oil and gas resources in the deep waters of the Gulf of Guinea can help meet growing energy demand in Nigeria and international markets. Shell works with local Nigerian companies and develops the skills and experience of Nigerian employees.

The Shell Nigeria Exploration and Production Company (SNEPCo), operator of the Bonga field, produces 12.5% of Nigeria's oil production. This generates significant and stable revenue for the government through taxes, royalties and levies. In 2019, SNEPCo continued to use its knowledge, experience and proven deep-water technologies to unlock new resources safely and efficiently. For example, the company used a specialised twin-deck drillship over the Bonga field to reduce the cost and time to complete a well-drilling operation. This involved a technique known as single trip completion, which combined fine instruments and careful planning. It was developed with Schlumberger and used for the first time anywhere in the world in Nigeria.



The Tunu gas-gathering project is part of the Southern Swamp Associated Gas Solutions initiative and is designed to manage natural gas produced along with oil.



External voice



Yolo Bakumor Smith
CEO, De-Rabacon Plastics

De-Rabacon Plastics is a Nigeria-based plastic recycling and waste management solution company that recycles end-consumer plastics into viable commercial products such as pavement blocks, buckets, cans and carpets. The company won the maiden Shell Top Ten Innovators Award's Outstanding Achievement Award in 2018.

"There is often a paper-thin line between success and failure in business, especially for a start-up. The training, support systems and valuable networks I have gained over the last 5 years, courtesy of Shell LiveWIRE, have gone a long way to ensure that my business start-up, De-Rabacon Plastics, is thriving.

"Shell's approach on supporting local enterprises to grow and excel is enabling us to scale up our business and focus on designing eco-friendly, energy-efficient and affordable products. Today my organisation employs 16 people and has recycled over 800,000 tonnes of plastic waste. We plan to achieve two million tonnes by the end of 2020."

In 2019, SNEPCo continued to take steps to add production in deep water. The company invited contractors to bid to develop the Bonga South West Aparo field. The project's first phase will include developing around 20 deep-water wells and subsea infrastructure, and building a floating production, storage and offloading vessel.

CONTRIBUTION TO SOCIETY

Shell Companies in Nigeria continue to support the development of local communities and companies as part of their contribution to the economy. These companies also work with others such as the government to run social investment programmes. In 2019, Shell-operated ventures contributed \$40 million in social investment projects, mainly in enterprise support, education, health care and road safety.

In 2019, Shell companies awarded contracts worth more than \$1.1 billion to Nigerian firms and helped to develop infrastructure.

SPDC worked with around 286 Nigerian companies and about 3,000 Nigerians to deliver the Southern Swamp Associated Gas Solution project. The contracted companies provided services including building processing facilities, laying pipelines and providing commercial offshore divers.



SNEPCo's social performance programme involved building and equipping a chemistry laboratory at the Eruku Integrated Ultra-Modern Science Laboratory in Kwara State, Nigeria.

IMPROVING HEALTH CARE

We run various health care projects in Nigeria, often in partnership with local authorities or development bodies. We aim to improve access for local people to health care and treatments for diseases such as cancer. We also have health facilities for employees, contractors and, where possible, local people.

Access to health care is provided through a community health insurance scheme, which was set up in 2010 by SPDC, Rivers State government and local communities. Since 2010, more than 67,000 people have enrolled.

The scheme provides access to the Obio Cottage Hospital in Port Harcourt, which remains one of the most visited health facilities in the Niger Delta. SPDC set up the hospital in 2010. It specialises in maternity health care and in 2019 was the birthplace of about 300 babies each month. The hospital includes a vaccination clinic, screening to prevent the passing of HIV from mother to child and an operating theatre.

In 2019, SNEPCo collaborated with the Nigeria Federal Ministry of Health to improve cancer care. They invested around \$1.5 million to upgrade the National Hospital Abuja. The funds went towards the procurement and installation of a world-class radiotherapy machine within the facility and medical staff training.

TACKLING PLASTIC WASTE

In 2019, Shell Companies in Nigeria announced plans to reduce single-use plastic at facilities by at least 50% by 2020. They began by introducing alternatives such as water refill stations and reusable water bottles. Some sites made significant progress, including the Gbaran-Ubie facility that reduced single-use plastic by 90% in 2019, a drop from around 10,000 1.5 litre bottles a month to 1,000.



A Shell employee at the Gbaran central processing facility refills his water bottle as part of efforts to tackle plastic waste.

OPERATING SAFELY

The safety of employees and contractors in Nigeria remains our top priority. Shell companies aim to achieve no harm to people and no leaks across operations. We refer to this as our Goal Zero ambition.

In 2019, we focused on three safety areas: improving how managers stop unsafe work in their teams, preventing objects being dropped from height – a common hazard in the industry – and marine safety.

Sadly, in 2019, two contractors working for the Shell Petroleum Development Company of Nigeria Ltd died when a vessel they were

travelling on capsized in bad weather. An investigation into the incident is ongoing.

In 2019, there were 16 cases of personal injuries that required medical treatment or time off work at Shell Companies in Nigeria.

Shell Companies in Nigeria continue to contribute to the safety of communities around facilities by responding to third-party fires and emergencies. In 2019, Shell companies responded to 44 of these incidents, including an overturned fuel tanker and a search and rescue operation on a collapsed hotel building under construction, both in Port Harcourt.



Firefighters from Shell Nigeria Emergency Services take part in emergency training in Port Harcourt.



SPECIAL REPORT

SPILL PREVENTION AND RESPONSE IN NIGERIA

Shell Companies in Nigeria continue their relentless focus on working to reduce the environmental impact of their oil and gas operations in the Niger Delta.

The Shell Petroleum Development Company of Nigeria Ltd (SPDC), the operator of the SPDC Joint Venture (SPDC interest 30%), is run according to the same technical standards as other Shell companies globally. SPDC is working to eliminate spills from operational activities, remediate past spills and prevent spills caused by crude oil theft, sabotage of pipelines or illegal oil refining. These illegal activities accounted for 95% of SPDC JV spill incidents in 2019.

To reduce the number of operational spills, SPDC is focused on implementing its ongoing work programme to appraise, maintain and replace key sections of pipelines and flow lines. In 2019, SPDC completed 30 kilometres of new flow lines, bringing the total to around 1,330 kilometres over the last eight years.

These efforts have significantly reduced operational spills to seven incidents and around 0.03 thousand tonnes of crude oil in 2019, compared with 15 incidents and 0.4 thousand tonnes in 2018. This represents a year-on-year reduction of more than 90% by volume.

However, the challenge of preventing spills relating to sabotage and theft by third parties remains.

In 2019, there were 156 [A] sabotage- and theft-related spills of more than 100 kilograms, up from 109 in 2018. This is due to factors such as increased availability of our production facilities after a major export line repair in 2017; crude theft activities in an election year; and the higher price of crude oil and refined products, which is seen as an opportunity for more illegal refining. Spilled volumes relating to sabotage and theft increased to around 2.0 thousand tonnes of crude oil.

We continued to implement operational improvements to shorten our response time, and improve relations with communities. There were also ongoing commitments from government agencies to tackle spills.

SPDC's average [B] time to complete clean-up of free and/or residual spilled oil has decreased from 13 days in 2016 to seven days in 2019. For example, closer engagement with communities has helped SPDC to access spill locations more quickly, meaning, on average, joint investigations now commence within three days in 2019 compared with six days in 2016.

SPDC is working to minimise the impact of third-party incidents and spills. It works with government agencies, non-governmental



organisations and communities to proactively prevent and minimise spills from illegal activity.

This work includes using simplified pipeline visuals and maps, which help to better target our response to third-party interference in our operations. Since 2017, SPDC has removed more than 523 illegal theft points. Illegal theft points are identified by daily overflights and on-the-ground inspections.

The company has also implemented anti-theft protection mechanisms, such as anti-tamper locks and steel cages for wellheads. By the end of 2019, 301 cages had been installed and around 80 more are planned for 2020 that will all come with CCTV technology. In 2019, three breaches of the cages were recorded out of 300 attempts. The volume of wellhead-related crude oil losses decreased significantly, from 30,000 barrels a day in 2016 to 1,000 barrels a day in 2019.

Regardless of the cause, SPDC cleans up and remediates areas impacted by spills that come from its facilities. In the case of operational spills, SPDC also pays compensation to communities impacted by the spill. Once the clean-up and remediation are completed, the work is inspected, and, if satisfactory, approved and certified by Nigerian government regulators.

As well as responding to recent spill incidents, SPDC continues to identify and remediate legacy spill locations. In 2019, 130 sites were remediated and 123 certified by Nigerian government regulators, compared with 116 certified and 45 remediated in 2018.

More details on spill prevention and response in Nigeria can be found at shell.com.ng/environment and www.shell.com.ng/security-theft-and-sabotage.

[A] In addition, there were four separate sites where crude oil was released from a tanker truck onto SPDC's pipeline right of way. The source of the crude is not known and could not be linked directly to any unique or identifiable SPDC assets or spill points.

[B] Averages exclude sites where significant delays were encountered outside of our operational control due to security, community disturbance or flood conditions.



COLLABORATING WITH THE IUCN

SPDC has worked with the International Union for Conservation of Nature (IUCN) since 2012 to enhance remediation techniques and protect biodiversity at sites affected by oil spills in SPDC's areas of operation in the Niger Delta. This work includes using bioremediation, a process that uses micro-organisms to naturally break down, and ultimately remove, oil contamination.

The Niger Delta Panel, an independent scientific advisor, has also provided input on oil spill response and remediation of soil and groundwater contamination. Based on this, SPDC strengthened its approach in this area.

In 2019, SPDC and IUCN joined forces on the Niger Delta Biodiversity Technical Advisory Group, which also includes representatives from the Nigerian Conservation Foundation and Wetlands International. The groups will continue to work together to monitor biodiversity recovery of remediated sites. Four sites have been assessed and selected as pilot sites for monitoring. These sites represent three ecosystems in the Niger Delta: land, seasonal swamp and swamp.

SPDC also works with a range of stakeholders in the Niger Delta to build greater trust in spill response and clean-up processes. Local communities take part in the remediation work for operational spills. In certain instances, some non-governmental organisations have also participated in joint investigation visits along with government regulators, SPDC and members of impacted communities to establish the cause and volume of oil spilled.

SPDC has also implemented several initiatives and partnerships to raise awareness of the negative impact of crude oil theft and illegal oil refining. Examples include community-based pipeline surveillance and the promotion of alternative livelihoods through Shell's flagship youth entrepreneurship programme, Shell LiveWIRE.

CLEAN-UP IN BODO

In 2015, SPDC – on behalf of the SPDC JV – and the Bodo community signed a memorandum of understanding granting SPDC access to begin the clean-up of areas affected by two operational spills in 2008. As part of this initiative, two contractors were selected to conduct the clean-up, overseen by an independent project director.

After two years of significant engagement with the Bodo community and others, managed by the Bodo Mediation Initiative, the first phase of clean-up activities started in September 2017. The clean-up consists of three phases: 1) removal of free-phase surface oil, 2) remediation of soil and 3) planting of mangroves and monitoring. The first phase was completed in August 2018.

The contract procurement process for phase two was completed in 2019, with remediation contractors and consultants selected. Local communities were then contacted. Around 800 community workers have been medically checked, assessed for their swimming ability, to ensure they can safely respond to potential incidents in rivers and creeks, and trained to International Maritime Organisation oil spill response levels one and two. Field remediation activities started in November 2019.

Phase two (remediation of soil) is expected to take around 18 months. However, it will only be successful if the repeated re-contamination of cleaned-up sites from illegal third-party activity stops.

CLEAN-UP EFFORTS IN OGO NILAND

SPDC is working with the relevant stakeholders to implement the 2011 UN Environmental Programme (UNEP) Report on Ogoniland. Over the last eight years, SPDC has taken action on all, and completed most, of the UNEP recommendations addressed specifically to it as operator of the joint venture.

The UNEP report recommended the creation of an Ogoni Trust Fund with \$1 billion capital, to be co-funded by the Nigerian government, the SPDC JV and other operators in the area. The SPDC JV remains fully committed to contributing \$900 million of the \$1 billion over five years as its share of the fund and made \$10 million available in 2017 to help set up the Hydrocarbon Pollution and Remediation Project (HYPREP), an agency established by the federal government to lead the clean-up effort. In 2018, the SPDC JV deposited a further \$170 million into the escrow account to fund HYPREP's activities, to complete its first-year contribution of \$180 million. In 2019, the SPDC JV released a further \$180 million contribution to fund HYPREP.

For more information on the activities of HYPREP go to hyprep.gov.ng.



SPECIAL REPORT

WORKING FOR THE FUTURE OF GRONINGEN

The NAM joint venture with ExxonMobil (Shell interest 50%) in partnership with the Dutch government operates the Groningen gas field in the Netherlands. NAM continues to help people living in Groningen who regrettably have been affected by earthquakes linked to gas production.

In 2019, the Dutch government decided to reduce NAM's production from the Groningen field to zero by 2022, eight years earlier than previously stated. NAM is working with the government on plans to close down production as quickly and safely as possible while considering the energy security of the Netherlands. NAM is safely decommissioning its facilities and consulting with local municipalities to plan for the future of these production sites.

HELPING LOCAL COMMUNITIES

NAM continues to address the impact of earthquakes on people in Groningen, including supporting a programme to strengthen houses and public buildings, when asked to do so by the responsible authorities. The programme is delivered by the local and federal government collaboration called the National Coordinator for Groningen.

NAM has supported several socio-economic initiatives for the Groningen region. For example, helping develop a social economic board that creates new business opportunities and jobs. NAM also runs the Livability and Sustainability programme to upgrade several community centres with more efficient power, such as solar panels and LED lighting.



Safe and responsible decommissioning of surface infrastructure at gas production facilities is a priority for NAM.



External voice



Christiaan Wiepkema
Member of the community association for Steendam village, Groningen

Christiaan Wiepkema is a member of the community association for Steendam village in Groningen that has set up an energy co-operative. This co-operative is in discussions to convert NAM gas facilities in Siddeburen to renewable energy.

"Self-reliance and creativity come naturally to us in Steendam. When we needed fast internet, and the authorities couldn't help, a group of us dug trenches, laid cables and installed a superfast network. Now we have formed an energy co-operative with around 200 people.

"We've had NAM's gas production nearby for years, and of course seen the impact of earthquakes, but we got thinking about life after this. A co-operative gives us freedom and ensures different opinions are heard on important decisions. We are building a solar farm and a wind park to obtain green electricity for our entire village. We are also looking to replace the gas that powers our village with renewable energy.

"We want to use hydrogen to store and transport this renewable energy, but installing a hydrogen network is complicated and not feasible for a small village. So, we are talking to Economic Board Groningen and NAM about using the nearby gas facilities at Siddeburen. It seems like a waste to leave all that infrastructure unused in the ground."



HANDLING DAMAGE CLAIMS

NAM is settling outstanding damage claims for affected residents, although it is not involved in the administration of these claims. All claims are now handled by independent public organisations set up under a new policy announced by the Dutch government in 2018.

NAM was, and will remain, responsible for all earthquake-related costs. Shell has provided a guarantee that it will fund its share of these costs.

PLANNING FOR THE FUTURE

In 2019, NAM began decommissioning the surface infrastructure at its gas production facilities in Groningen. Safe and responsible decommissioning is a priority for NAM. This includes restoring the sites and surroundings in line with the requirements of landowners and relevant legislation, while taking NAM's own environmental standards into account.

NAM began the first phase of the permanent closure of the Groningen field by decommissioning the surface facilities in Ten Post, a small village in north-east Groningen, and one of 20 production sites to be decommissioned. Production at Ten Post stopped in February 2018 and plugging of the gas wells was completed in March 2019. By 2022, NAM plans for all wells in Ten Post to be abandoned.

NAM is proactively discussing plans with neighbours of the production location, the local municipality and the Economic Board Groningen to reuse locations like Ten Post for renewable energy facilities.

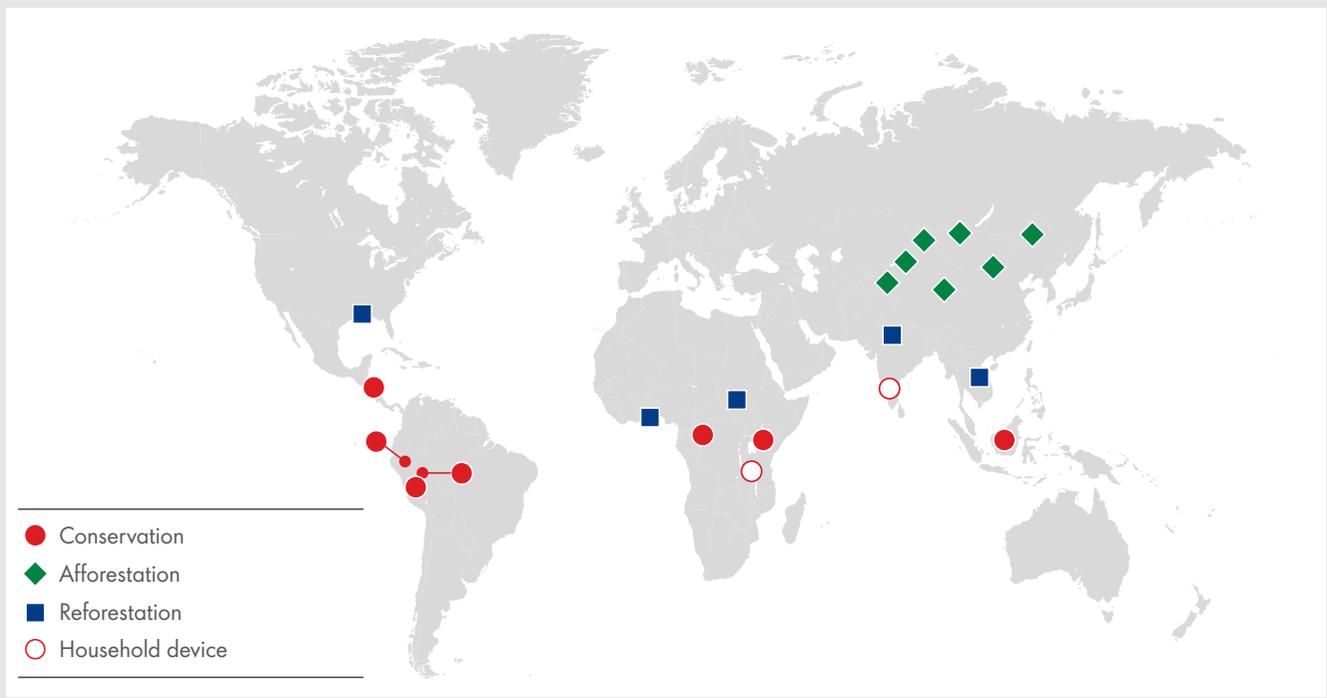


In 2019, NAM began decommissioning the surface gas facilities in Ten Post, one of 20 production sites to be decommissioned.



SPECIAL REPORT

NATURE-BASED SOLUTIONS



This map shows some of the projects in Shell's voluntary carbon credit portfolio in October 2019.

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.



Our reforestation project in Spain is part of a growing international effort to prevent the destruction of forests, increase reforestation and restore degraded land.

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.

CARBON-NEUTRAL DRIVING AND TRANSPORT

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.

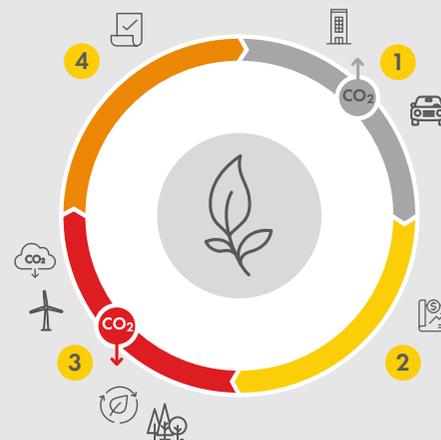
We also offer nature-based carbon credits to business customers operating heavy- and light-duty fleets in 10 countries across Europe and Asia.

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.

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.

How carbon offsets work



- 1** When CO₂ emissions cannot be avoided...
- 2** ...an investment can be made in a project elsewhere.
- 3** This project captures/ reduces CO₂ emissions that otherwise would not be captured...
- 4** ...and issues carbon credits that can be retired to demonstrate that an amount of carbon emissions have been offset.

Read about carbon flux measurement in [Developing technology](#).



We are working with Land Life Company to plant trees on abandoned land surrounding grazing pastures.



SPECIAL REPORT

ENERGY EFFICIENCY IN OUR OPERATIONS



Improving the energy efficiency of Shell-operated facilities is one of the ways we manage our greenhouse gas emissions. We also increasingly work to avoid waste by ensuring what we use is designed to last longer and to be reused, repurposed or recycled.

BOOSTING REFINERY AND CHEMICAL PLANT EFFICIENCY

We are investing in co-generation plants that provide our refineries and chemical plants with on-site power in the form of both electricity and recycled heat. We are also helping communities near us to reduce emissions by passing on waste heat so residents rely less on the power grid.

In Rotterdam, the Netherlands, waste heat from our Pernis refinery helps warm about 16,000 homes, helping to avoid around 35,000 tonnes of carbon dioxide (CO₂) emissions a year. In the USA, we are building a 250 megawatt (MW) co-generation power plant at our Pennsylvania chemicals facility that will also supply electricity to local homes.

We have reduced fuel consumption by about 40% and air emissions by around 20-25% at our Appomattox platform in the US Gulf of Mexico by using a combined-cycle power plant. This operates far more efficiently by extracting energy that would otherwise be wasted as exhaust heat from a regular power plant.



Installing a more efficient power plant at the Appomattox deep-water oil and gas project in the USA has helped cut fuel consumption by around 40% and air emissions by about 20-25%.



In Germany, our Rhineland refinery is building a modernised power plant that is expected to improve energy efficiency and lead to a reduction of 100,000 tonnes of CO₂ emissions a year. We are also building a hydrogen electrolysis unit at the Rhineland site to generate hydrogen from electricity rather than natural gas, which will help to further reduce CO₂ emissions.

REDUCING ELECTRICITY CONSUMPTION

At our lubricant plants, we are using technology to help track and reduce electricity consumption. For example, in 2019, we began using a monitoring system at our Nangang, Zhapu and Zhuhai blending plants in China. This is a web-based tool that identifies waste and opportunities to improve energy efficiency in real time.

We piloted the tool at our Tianjin lubricant plant in China in 2018 and the result was an 8.5% reduction in electricity consumption compared to 2017. We are planning to introduce the tool more widely.

SOLAR ENERGY AT SITES

We are increasing solar power at our own offices, retail sites, distribution terminals, refineries and offshore platforms.

In 2019, we installed solar panels at seven lubricant plants in China, India, Italy, Singapore and Switzerland. Combined, the panels are expected to generate more than 7,500 MW an hour of electricity a year and can avoid around 4,500 tonnes of CO₂-equivalent emissions a year, which is equivalent to taking about 2,600 cars off the road.



Our lubricant oil blending plant in Taloja, India, is now one of seven of our lubricants facilities around the world that benefit from solar power.

The solar energy generated will be used to help power operations, lower operating costs and reduce our reliance on the power grid.

ENERGY INTENSITY PERFORMANCE

The main metric we use to measure our performance is energy intensity: the amount of energy consumed for every unit of output.

The refining energy intensity index in 2019 was 94.4 compared with 94.3 in 2018.

In 2019, we moved from Chemical Energy Index to chemicals steam cracker energy intensity (measured in gigajoules per tonne of high value chemical production (GJ/tonne HVC)) as a primary measure of energy intensity for our steam cracker units. Chemical steam cracker energy intensity in 2019 was 19.7 GJ/tonne HVC, up from 18.3 GJ/tonne HVC in 2018, mainly as a result of turnarounds at three of our sites.

Energy intensity – chemical plants

Chemicals energy index [A]



[A] Methodology was updated in 2015. Data for previous years are not directly comparable.

Energy intensity – refining

Refinery energy index [A]



[A] Indexed to 2002; based on Solomon EITM methodology.

In 2019, the overall energy intensity for the production of oil and gas in our Upstream and Integrated Gas businesses (excluding liquefied natural gas (LNG) and gas-to-liquids (GTL)) increased slightly compared with 2018.

We expect it will be difficult to maintain the energy intensity levels of recent years, as existing fields age and new production comes from more energy-intensive sources. This may increase our upstream energy intensity over time.

Energy intensity – upstream

(Excluding oil sands, GTL and LNG) gigajoules/tonne production [A]



[A] Methodology was updated in 2012. Data for previous years are not directly comparable.



SPECIAL REPORT

GROWING GAS AND POWER IN AUSTRALIA

Shell is one of the largest foreign investors in Australia, with a presence that stretches back more than a century in exploration, petrochemicals and natural gas.

Today, we continue to produce gas and hone our liquefied natural gas (LNG) expertise through deploying technologies in onshore and offshore activities.

We work with partners to responsibly deliver energy by keeping safety, communities and the environment at the heart of our projects.

Visit www.shell.com.au to read more on Shell in Australia.

CLEANER ENERGY FUTURE

We are working to play our part in the transition to a low-carbon future and Australia is central to this effort. One way to do this is to start to decarbonise the electricity sector through investments in renewable sources, such as solar or wind generation.

We are building our first industrial-scale solar project in Australia in Queensland, which is designed to generate around 120 megawatts of solar electricity from about 400,000 photovoltaic panels.

Through our acquisition of sonnen, a leader in smart home and business solar energy storage systems, we are selling batteries in Australia that ensure customers with solar panels have a constant supply of clean electricity. Customers can store their surplus solar power during the day and use it at night.

Shell Australia has also taken a 49% equity stake in ESCO Pacific, one of Australia's most successful developers of utility-scale solar farms.

DELIVERING NATURAL GAS RESPONSIBLY

Gas is the cleanest-burning hydrocarbon and is an abundant, secure and readily available source of energy.

Recognition of the role of LNG continues to grow as the world tackles poor air quality and climate change. Global demand for LNG has tripled since 2000. There are now 42 countries that import LNG, up from 10 at the start of 2000. Shell supplies 76 customers in 27 of these countries.

We are working in Australia to unlock its rich onshore and offshore gas resources to help meet this energy demand. For example, the Shell-operated QGC project in Queensland, Eastern Australia, produces natural gas from the Surat Basin and supplies domestic and international markets. In 2019, QGC shipped its 500th cargo of LNG from its plant on Curtis Island.

We are working hard to deliver energy in Australia safely and responsibly. For example, we ran a safety programme at QGC focused on our wells business that improved its safety performance, recording a 40% decrease in total recordable case frequency since the programme was introduced in 2018 (see [Process safety](#)). We also



QGC produces natural gas and supplies it to domestic and international markets.

ensure we have the necessary resources to deal with spills, leaks, fires and explosions, both offshore and onshore.

We are also expanding the role of natural gas as it has significant advantages when used to produce electricity alongside renewable sources of energy. Gas-powered turbines, which ramp up and ramp down quickly, can compensate for dips in solar or wind supply as well as rapidly respond to surges in demand.

In 2019, Shell Energy Australia acquired ERM Power, a leading commercial and industrial electricity retailer in the country with two gas-fired generation plants.

CARBON CAPTURE AND STORAGE

Australia is central to our investments in carbon capture and storage projects.

We are a partner in the Chevron-operated Gorgon LNG CCS project in Australia (Shell interest 25%), which started up in August 2019 and is the world's largest CCS project. At full capacity, Gorgon is expected to capture up to 4 million tonnes of CO₂ each year. It is expected that 100 million tonnes of CO₂ will be captured and stored over the life of



the project. During the pre-start-up and commissioning checks of the injection project, some issues were identified that needed to be resolved before injection started.

BIODIVERSITY AND NATURAL SOLUTIONS

We carefully consider and aim to respond to any potential impacts our Australian activities may have on biodiversity and ecosystems.

For example, QGC continues to manage the 10,000-hectare Valkyrie property, a large area of open woodland, as part of its strategy to offset its carbon emissions and impact on biodiversity. This includes using nature-based solutions that protect or redevelop ecosystems and help us offer our customers the opportunity to offset their emissions using carbon credits.



The Shell-operated QGC natural gas project in Central Queensland manages the 10,000-hectare Valkyrie property, a large area of open woodland, as a carbon and biodiversity offset.

Valkyrie is home to Freyja, Shell Australia’s first nature-based solutions project. Freyja is an 800-hectare endangered native forest regeneration project that was registered under the Carbon Credits (Carbon Farming Initiative) Act 2011 in 2019. Over the next 25 years, Freyja is expected to sequester 90,000 tonnes of CO₂ equivalent and generate Australian Carbon Credit Units.

Valkyrie is also home to several at-risk species, including the Greater Glider marsupial. In 2019, we developed effective biodiversity strategies to help protect the glider and other species. We also developed a significant biodiversity management plan.



In 2019, we engaged with local residents near our QGC natural gas facility in Central Queensland, Australia.

BOOSTING ECONOMIC DEVELOPMENT

Our contribution to Australian society comes in many forms. It includes employing more than 2,000 people directly and supporting 21,800 jobs. Many of these people live, work and raise their families close to our operations.

We are also helping to create employment opportunities for indigenous peoples through our local content and skills development programmes. For example, Shell Australia partners with the Wirrpanda Foundation in Western Australia to help improve the physical fitness and self-confidence of unemployed Aboriginal job seekers. The programme has so far helped 130 people secure jobs.

We have partnered with Queensland Museum to connect teachers with science specialists from the museum to build their understanding of science, technology, engineering and mathematics subjects.

We also aim to support local businesses inside and outside the energy industry.

For example, our Emerging Exporters programme helps **agribusinesses** in Queensland find new domestic and international customers. It connects them with leading food experts in the region, who provide mentoring and coaching through workshops and tailored trade missions.

The programme helped family-owned cattle farm **Four Daughters Premium Black Angus** export its beef from Meandarra in rural Queensland to China.



OUR PERFORMANCE DATA

Each year, we measure our global performance and report on the safety of our operations, our impact on the environment and our contribution to communities.

- 86** About our data
- 87** Safety data
- 88** Environmental data
- 90** Social data



ABOUT OUR DATA

We began reporting voluntarily on our environmental, safety and social performance with the first Shell Report in 1997. We support transparency and share information and data in this report and on www.shell.com.

There are inherent limitations to the accuracy of environmental and social data. We recognise that our data will be affected by these limitations, so we continue to improve data integrity by strengthening our internal controls.

We provide all non-financial data in this report on a 100% basis for companies and joint ventures where we are the operator. Environmental data pertain to direct Shell operations unless otherwise stated. We report in this way, in line with industry practice, because these are the data we can directly manage and affect through operational improvements. We refer to the number of people employed or contracted on a full-time equivalent basis.

Operations acquired or divested during 2019 are included only for the period in which we operated these assets. Other data are collected from external sources, employee surveys and other internal sources as indicated. Data marked in the social data table come from an internal survey completed by the senior Shell representative in each country. The accuracy of environmental and social data may be lower than that of data obtained through our financial systems.

We only include data in this report for 2019 that were confirmed by the end of March 2020. If incidents are reclassified or confirmed, or if significant data changes occur after preparation of this report, they will be updated in the following year's publication.

ASSURANCE

We have clear standards and reporting requirements for our health, safety, security, environment and social performance (HSSE & SP) data.

Shell facilities are required to adopt these standards, which define management roles and responsibilities, the scope of data at facilities and how data are calculated and collected. These standards are part of our HSSE & SP Control Framework.

To ensure we provide accurate information, our assurance process of HSSE & SP data is also a key element of the HSSE & SP Control Framework. The process flows from the facility all the way up to group level. Some examples of the assurance mechanisms in this process are:

- self-assessments at the facility level;
- internal audits at all levels of Shell;
- quarterly reviews and assessments of the data at all levels;
- an annual series of meetings between leaders at group level and senior business managers to discuss outcomes and reporting parameters; and
- formal sign-off by Shell's senior country leaders.

The Report Review Panel of independent experts helps make sure our reporting is balanced, relevant and responsive to stakeholders' interests.

Lloyd's Register Quality Assurance Ltd has provided limited assurance of our direct and indirect greenhouse gas emissions data for 2019. Limited assurance means nothing has come to the auditor's attention that would indicate that the greenhouse gas data and information as presented in the Greenhouse Gas Assertion were not materially correct. The assurance statements are available at www.shell.com.

Conversions into US and Canadian dollars are based on the average exchange rates for 2019.



SAFETY DATA

Safety performance data [A]

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Fatalities										
Total number	7	2	2	3	7	5	5	8	6	12
Employees	3	0	0	0	1	3	0	3	1	0
Contractors	4	2	2	3	6	2	5	5	5	12
Fatal accident rate (FAR)	1.3	0.4	0.4	0.5	1.1	0.7	0.8	1.3	1.0	1.6
Fatalities per 100 million working hours (employees and contractors)										
Injuries and process safety incidents										
Total recordable case frequency (TRCF)	0.9	0.9	0.8	1.0	0.9	1.0	1.2	1.3	1.2	1.2
Injuries per million working hours (employees and contractors)										
Lost time injury frequency (LTIF)	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.3
Lost time injuries per million working hours (employees and contractors)										
Operational process safety events										
Tier 1 [B]	41	35	49	41	51	57	65	91	n/c	n/c
Tier 2 [B]	89	86	117	110	169	194	246	308	n/c	n/c
Illnesses										
Total recordable occupational illness frequency (TROIF)	0.5	0.4	0.3	0.4	0.6	1.0	0.8	0.5	0.7	0.8
Illnesses per million working hours (employees only)										
i Security										
Using armed security (% of countries)	20	21	14	17	19	24	19	17	14	9
Using armed company security (% of countries)	1	3	1	1	1	1	3	0	1	1
Using armed contractor security (% of countries)	11	10	3	7	8	10	8	10	9	6

[A] In line with industry standards, we distinguish three contract modes. Mode 1: contractor/supplier performs work under Shell's HSSE Management System (HSSE MS); Mode 2: contractor/supplier performs work under its own HSSE MS, which is materially equivalent to Shell's HSSE MS; Mode 3: contractor/supplier performs work under its own HSSE MS. Also in line with industry standards, we report on safety performance only for contract modes 1 and 2.

[B] Process safety events classified according to guidance from the IOGP and API. In 2019, there were nine Tier 1 sabotage-related events.

i Data obtained from an internal survey completed by the senior Shell representative in each country.

n/c = not calculated



ENVIRONMENTAL DATA

Environmental performance data

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Greenhouse gas (GHG) emissions										
Total GHG emissions										
Net Carbon Footprint (gCO ₂ e/MJ)	78	79	79	79						
Direct GHG emissions (Scope 1) (million tonnes CO ₂ equivalent) [A]	70	71	73	70	72	76	73	72	74	76
Carbon dioxide (CO ₂) (million tonnes)	67	68	70	67	68	73	71	69	71	72
Methane (CH ₄) (thousand tonnes) [P]	91	92	123	138	132	134	120	102	143	128
Nitrous oxide (N ₂ O) (thousand tonnes)	1	1	1	1	1	1	1	1	1	2
Hydrofluorocarbons (HFCs) (tonnes) [P]	29	31	22	21	20	16	18	23	22	23
Energy indirect GHG emissions (Scope 2) (million tonnes CO ₂ equivalent) [B]	10	11	12	11	9	10	10	9	10	9
GHG emissions associated with exported energy (subset of direct GHGs)	3	3	3	3	2	3				
Use of our refinery and natural gas products (Scope 3 Category 11) (million tonnes CO ₂ equivalent) [Q]	576	599	579	600	560	600	600	580	570	670
GHG emissions breakdown by business (Scope 1 and 2)										
Scope 1 – Upstream (million tonnes CO ₂ equivalent)	12.9	14.8	19.6	18.7						
Scope 1 – Integrated Gas (million tonnes CO ₂ equivalent)	16.3	13.0	12.0	13.7						
Scope 1 – Downstream (million tonnes CO ₂ equivalent)	40.3	42.2	41.1	37.6						
Scope 2 – Upstream [B] (million tonnes CO ₂ equivalent)	1.1	1.4	1.4	1.4						
Scope 2 – Integrated Gas [B] (million tonnes CO ₂ equivalent)	1.6	2.4	2.4	2.0						
Scope 2 – Downstream [B] (million tonnes CO ₂ equivalent)	7.3	6.8	7.5	7.3						
GHG intensity by Business										
Upstream and Integrated Gas GHG intensity	0.168	0.158	0.166	0.166						
Refinery GHG intensity	1.06	1.05	1.14	1.18						
Chemical GHG intensity	1.04	0.96	0.95	0.99						
Flaring										
Flaring (upstream) (million tonnes CO ₂ equivalent) [C] [P]	5.9	5.2	8.2	7.6	11.8	12.5	8.0	7.7	10.7	10.6
Flaring (upstream) (million tonnes hydrocarbon flared) [C] [P]	1.8	1.5	2.5	2.3	3.5	3.7	2.4	2.3	3.4	3.5
Nigeria [D] [P]	0.7	0.6	0.8	0.5	0.9	1.2	1.2	1.5	2.0	2.4
Rest of the world [E]	1.2	1.0	1.7	1.8	2.6	2.5	1.1	0.8	1.4	1.0
Energy intensity										
Upstream excl. oil sands, LNG and GTL (gigajoules per tonne production) [C] [F]	1.07	1.06	1.05	1.02	0.83	0.87	0.89	0.83	0.75	0.74
Refineries: Refinery Energy Index [G]	94.4	94.3	94.8	95.4	95.4	94.9	95.6	98.4	100.8	101.8
Chemical plants: Chemicals Energy Intensity	19.7	18.3	17.6	18.9	19.6					
Acid gases and VOCs										
Sulphur oxides (SO _x) (thousand tonnes SO ₂) [P]	65	74	81	83	88	97	99	113	136	139
Nitrogen oxides (NO _x) (thousand tonnes NO ₂)	108	111	107	113	104	146	144	147	146	159
Volatile organic compounds (VOCs) (thousand tonnes) [P]	55	59	95	153	131	151	89	89	129	147



	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Ozone-depleting emissions										
CFCs/halons/trichloroethane (tonnes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hydrochlorofluorocarbons (HCFCs) (tonnes)	8	9	7	8	8	6	8	8	12	21
Spills and discharges [H] [I] [P]										
Sabotage spills – volume (thousand tonnes) [J]	2.0	1.6	1.4	3.9	2.3	2.7	2.2	3.3	1.6	3.0
Sabotage spills – number [J]	156	109	62	49	95	139	157	138	118	112
Operational spills – volume (thousand tonnes)	0.2	0.9	0.4	0.8	0.8	0.7	0.9	1.9	6.0	2.9
Nigeria [K]	0.03	0.4	0.1	0.3	0.2	0.3	0.4	0.2	5.3	0.7
Rest of the world	0.2	0.5	0.3	0.5	0.7	0.4	0.5	1.8	0.7	2.2
Operational spills – number	70	93	104	72	108	158	174	207	211	195
Nigeria [L]	7	15	10	8	16	40	31	37	64	32
Rest of the world	63	78	94	64	92	118	143	170	147	163
Hurricane spills – volume (thousand tonnes) [M]	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil in effluents to surface environment (thousand tonnes)	1.3	1.4	1.2	1.0	1.0	0.9	1.1	1.0	1.3	1.6
Water [N]										
Fresh water withdrawn (million cubic metres) [P]	192	199	201	195	186	199	198	203	219	212
Fresh water consumed (million cubic metres)	145	147	150	152	141	165				
Waste disposal										
Hazardous (thousand tonnes) [P]	698	592	638	658	474	529	698	820	740	1,048
Non-hazardous (thousand tonnes) [P]	1,414	1,407	1,382	1,491	1,820	1,674	2,056	2,295	1,850	1,079
Total waste (thousand tonnes) [O] [P]	2,113	1,999	2,020	2,148	2,294	2,203	2,755	3,115	2,590	2,127

[A] Greenhouse gas emissions (GHG) comprise carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. The data are calculated using locally regulated methods where they exist. Where there is no locally regulated method, the data are calculated using the 2009 API Compendium, which is the recognised industry standard under the GHG Protocol Corporate Accounting and Reporting Standard. There are inherent limitations to the accuracy of such data. Oil and gas industry guidelines (IPIECA/API/IOGP) indicate that several sources of uncertainty can contribute to the overall uncertainty of a corporate emissions inventory. We have estimated the overall uncertainty of our direct GHG emissions to be around 2%. 2015-2019 emissions are calculated using Global Warming Potential factors from the IPCC's Fourth Assessment Report. Data for prior years were calculated using Global Warming Potential factors from the IPCC's Second Assessment Report.

[B] These emissions were calculated using the market-based method in line with the GHG Protocol Corporate Accounting and Reporting Standard.

[C] The term upstream in this context includes assets and activities from our Upstream and Integrated Gas businesses.

[D] Nigeria includes SPDC onshore operations (0.6 million tonnes flared in 2019) and SNEPCo offshore operations (0.02 million tonnes flared in 2019).

[E] Flaring from Prelude in Australia and from Malaysia amounted to 0.7 and 0.1 million tonnes of hydrocarbons respectively in 2019.

[F] Methodology was updated in 2012. Data for prior years are not directly comparable.

[G] Data are indexed to 2002, based on Solomon Associates Energy Intensity Index methodology.

[H] All spill volumes and numbers are for spills of more than 100 kilograms.

[I] As of the end of March 2020, there was one spill under investigation in Nigeria that may result in adjustments.

[J] All sabotage- and theft-related spills have occurred in Nigeria except in 2016 (0.001 thousand tonnes) and 2015 (0.005 thousand tonnes). We have updated the number of sabotage spills for 2018 and 2019 as published in our 2019 Annual Report following a review of the data.

[K] Nigeria includes SPDC onshore operations and SNEPCo offshore operations. A single spill at the Bonga field offshore Nigeria amounted to 4.8 thousand tonnes in 2011.

[L] Nigeria includes SPDC onshore operations (seven operational spills in 2019) and SNEPCo offshore operations (zero operational spills in 2019).

[M] 2017 data reflect four spills caused by Hurricane Harvey in the USA.

[N] Freshwater figures do not include once-through cooling water.

[O] In 2019, we sent waste off-site for recycling or reuse, or sold over 400 thousand tonnes of material that would otherwise have been disposed of as waste.

[P] We have updated some of our historical figures following a review of the data.

[Q] 2019 numbers reflect emissions in CO₂ equivalents. Prior years' data only reflected CO₂ emissions.



SOCIAL DATA

Social performance data

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Gender diversity [A]										
In supervisory/professional positions (% women)	30.8	29.9	29.1	28.0	28.0	29.0	28.8	28.1	27.3	26.3
In management positions (% women)	24.5	23.7	22.3	21.0	20.0	21.0	18.8	18.2	17.6	17.0
In senior leadership positions (% women)	26.4	24.0	22.2	20.0	19.0	18.2	17.2	16.2	16.6	15.3
[i] Staff forums and grievance procedures										
% countries with staff access to staff forum, grievance procedure or other support system	100	100	100	100	100	100	100	100	99	100
[i] Child labour (% countries with procedures in place)										
Own operations	100	100	100	100	100	100	100	100	100	99
Contractors and suppliers	100	100	100	100	100	100	100	100	97	96
[i] Forced labour (% countries with procedures in place)										
Own operations	100	100	100	100	100	100	100	100	100	99
Contractors and suppliers	100	100	100	100	100	100	100	100	97	95
Integrity										
Code of Conduct violations [B]	263	370	261	341	217	267	181	209	226	205
[\$] Contracting and procurement										
Estimated expenditure on goods and services in lower-income countries (\$ billion) [C] [D]	5.7	4.1	4.9	4.4	6	14	12	14	12	13
Social investment [E]										
[\$] Estimated voluntary social investment (equity share) (\$ million)	116	113	111	103	122	160	159	149	125	121
[\$] Estimated social investment spend (equity share) in lower-income countries (\$ million) [F]	84	102	107	96	43	73	74	67	45	61

[A] Diversity data obtained from our human resources system.

[B] Code of Conduct violations represent the number of reported incidents in the Shell Global Helpline (excluding queries or customer service queries), that have been investigated and closed during the relevant period and where the allegation was found to be (at least partially) true.

[C] Estimated expenditure in countries where gross domestic product amounts to less than \$15,000 per year per person (source: UNDP Human Development Index 2017).

[D] From 2013 onwards, this figure only includes the amount spent on goods and services by Shell Group companies.

[E] Social investment spending varies from year to year depending on business climate, locations and types of activities under way. This is voluntary social investment and does not include social investments made through contractual agreements with host governments, voluntary work by Shell employees or donations of equipment.

[F] Estimated voluntary social investment spending in countries where gross domestic product amounts to less than \$15,000 a year per person (source: UNDP Human Development Index 2018).

[\$] Social investment and contracting and procurement data collected via our financial system since 2007.

[i] Data obtained from an internal survey completed by the senior Shell representative in each country.

n/c = not calculated

DEFINITIONS AND CAUTIONARY NOTE

Divestments is a measure used to monitor the progress of our divestment programme. This measure comprises proceeds from sale of property, plant and equipment and businesses, joint ventures and associates, and other Integrated Gas, Upstream and Downstream investments in equity securities, adjusted onto an accruals basis and for any share consideration received or contingent consideration initially recognised upon the related divestment, as well as proceeds from sale of interests in entities while retaining control (for example, proceeds from sale of interests in Shell Midstream Partners, L.P.).

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this report “Shell”, “Shell Group” and “Royal Dutch Shell” are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words “we”, “us” and “our” are also used to refer to Royal Dutch Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities. “Subsidiaries”, “Shell subsidiaries” and “Shell companies” as used in this report refer to entities over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as “joint ventures” and “joint operations”, respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as “associates”. The term “Shell interest” is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

Also, in this report 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. But, to support society in achieving the Paris Agreement goals, we aim to help such suppliers and consumers to likewise lower their emissions. The use of the term Shell’s “Net Carbon Footprint” is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

This report contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management’s current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management’s expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as “aim”, “ambition”, “anticipate”, “believe”, “could”, “estimate”, “expect”, “goals”, “intend”, “may”, “objectives”, “outlook”, “plan”, “probably”, “project”, “risks”, “schedule”, “seek”, “should”, “target”, “will” and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this report, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell’s products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in 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 report and should be considered by the reader. Each forward-looking statement speaks only as of the date of this report, April 7, 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 report.

We may have used certain terms, such as resources, in this report that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. U.S. 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.

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- Comprehensive financial information on our activities throughout 2019
- Detailed operational information including maps
- Report on our progress in contributing to sustainable development