



North Sea Region

2020 Annual Environmental Statement



2020

Introduction

This is the annual environmental statement for the bp entities which operated in the United Kingdom Continental Shelf (UKCS) in 2020. The statement covers offshore installations operated by bp entities and also installations owned and operated by third parties in the course of providing services to bp entities, it does not include information on our operated by others (OBO) portfolio. ^{1,2}

Environmental impacts

One of our three HSSE goals is to cause **no damage to the environment**. The others are **no accidents** and **no harm to people**. While environmental challenges and opportunities differ depending upon the lifecycle stage of each operating installation, this goal remains the same.

The North Sea oil and gas sector is subject to strict environmental regulation, with which bp strives to comply. We work closely with regulators to keep under review what we do, how we do it, and how we can do it better. Our Operating Management System is designed to drive continuous improvement in our operations including regulatory compliance and environmental performance. Our system meets the requirements of the latest version of the international standard for environmental management ISO14001:2015.

Our HSSE goal: no damage to the environment

In the North Sea we aim to achieve our goal of no damage to the environment by:

- systematically identifying environmental impacts and seeking to avoid or minimise these;
- improving environmental performance, including reducing our carbon emissions;
- putting plans in place to reduce environmental risks associated with our projects and operations;
- working to understand developments in future environmental legislation and working to uphold our continued compliance.

¹ To fulfil the requirements of OSPAR Recommendation 2003/5, all operators of offshore installations on the United Kingdom Continental Shelf (UKCS) are required to produce an annual environmental statement which is made available to the public and the Department for Business, Energy & Industrial Strategy (BEIS), previously the Department of Energy and Climate Change (DECC).

² DECC Guidance and Reporting Requirements: Environmental Management System Requirements in relation to OSPAR Recommendation 2003/5 to Promote the Use and Implementation of Environmental Management Systems by the Offshore Industry.

bp in Scotland

bp has been operating in the North Sea for more than 50 years, providing a reliable source of energy to consumers around the world.

bp's ambition is to become a net zero company by 2050 or sooner and to help the world get to net zero. We're working hard to make our North Sea business the safest in the region and even more efficient and sustainable, deploying some of the latest technologies to reduce emissions offshore.

It's a challenge our people thrive on, knowing that the energy generated here in the north-east of Scotland is helping to keep our company on a strong footing to help fund increased investment in low carbon activities.

We are working to achieve zero routine flaring from our global operations by 2030 and eliminate routine flaring across our North Sea operations by 2027.

Last year, we introduced flare gas recovery technology on our Glen Lyon and Clair Ridge installations, resulting in zero routine flaring on those assets and contributing to a near-45% reduction in flaring across our North Sea operations in 2020 compared to 2019.

Similar technology is planned for our Clair Phase One and ETAP assets. Beyond this we are exploring options to power our North Sea installations using clean energy from shore.

Since 2015, we have implemented sustainable emissions reductions of more than 400,000 tonnes of CO2 equivalent across our North Sea operations. In 2021 alone, we are on track to deliver a further 68,000 tonnes of CO2 equivalent reductions.

We have also been working with fellow North Sea operators and industry bodies to look at the role technology can play in driving down emissions.

Through a successful partnership with the OGTC in 2020, we deployed a drone equipped with methane sensors to our west of Shetland installations to detect and quantify methane emissions, and support the development of focused plans to reduce them.

bp's new strategy, announced in August 2020, will see us pivot from an international oil company to an integrated energy company, increasingly investing in low carbon solutions.

The good news is we're not starting from scratch. Our existing low carbon businesses provide us with a solid foundation, including in Scotland.

Whether it's exploring offshore wind opportunities or powering more than 1,000 homes with clean electricity from Lightsource bp's solar development in Angus, we are delivering right here in Scotland to help meet the world's growing demand for low carbon energy.

That extends to helping our communities through innovative partnerships with Aberdeen City Council and Future Woodlands Scotland. With the former we aim to help the Council achieve the goals of its Net Zero Vision to reduce carbon emissions and become a climate positive city. With the latter, bp has enabled the creation of a £2million fund to help create and restore native woodlands across the country.

Our partnerships and low carbon businesses - both those operating now and proposed for the future - will see us build on and transform our long-standing position in Scotland's energy industry.



Our **North Sea portfolio**

bp North Sea portfolio

Our mission is to become the safest, most sustainable and most efficient producer in the North Sea.

We believe we have the portfolio to achieve that while also helping to keep our company on a strong footing to find unprecedented investment in low carbon energy and make net zero a reality.

Schiehallion Area

The Schiehallion Area incorporates the Schiehallion, Loyal and Alligin fields located around 175 kilometres west of the Shetland Islands. Schiehallion and Loyal are developed through the Glen Lyon floating production, storage and offloading (FPSO) vessel. Alligin was sanctioned in 2018 and was developed as a two-well subsea tieback to the Glen Lyon, achieving first oil in late 2019.

Production from the Schiehallion Area was shut-in between 2013 and 2017 to allow for the Quad 204 project – a multi-billion-pound investment by bp and partners to completely redevelop the hub and maximise production from the fields. Quad 204 saw the removal of the old FPSO, construction and installation of the Glen Lyon FPSO and renewal of much of the subsea infrastructure network.

Through the Quad 204 project, bp and partners expect to unlock a further estimated 450 million barrels of resources, extending the life of the fields out to 2035 and beyond.





Clair Phase One

With an estimated seven to eight billion barrels of oil in place, the Clair field is the largest oilfield on the UK Continental Shelf. The field, located 75 kilometres west of the Shetland Islands, was discovered in 1977, but challenging reservoir characteristics and the technological limits of the time meant it was the mid-1990s before the field saw extensive drilling and 2001 before bp and partners approved a development plan.

Production from the Clair field began in 2005 through the Clair Phase One platform which was the first fixed platform west of Shetland.



Clair Ridge

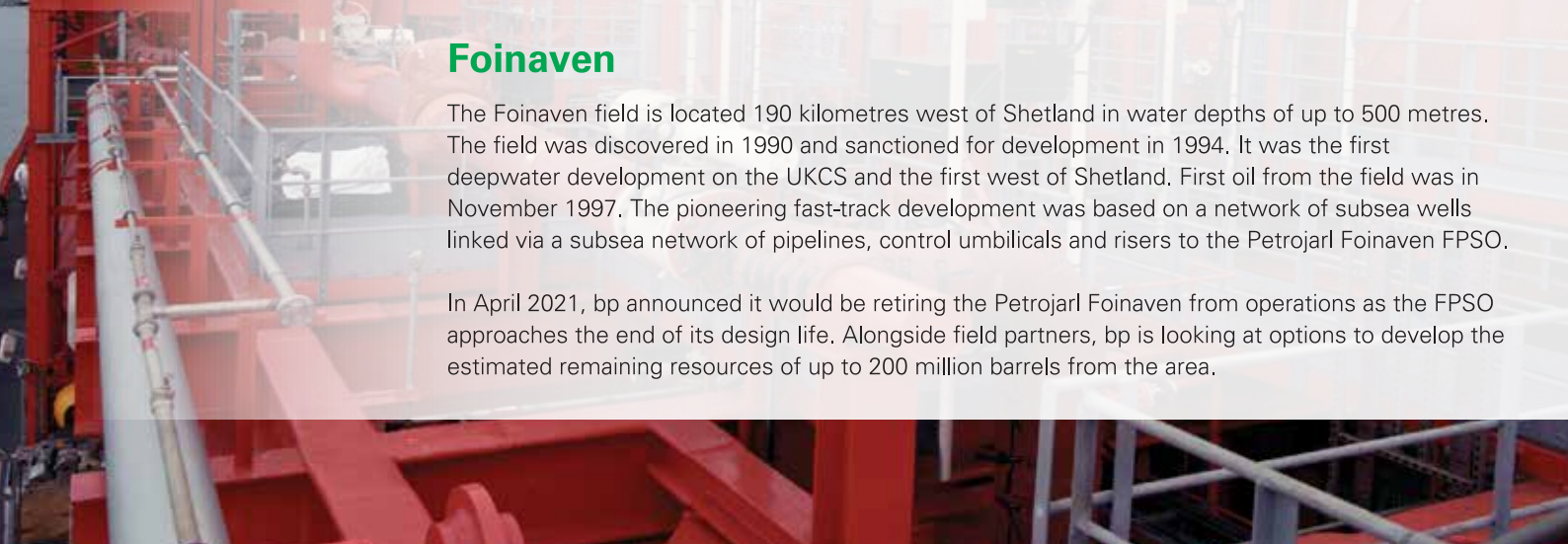
The physical size of the Clair field dictates development via a phased approach. Clair Ridge is the second phase of development. The bridge-linked platforms, which delivered first oil in November 2018, are designed to recover an estimated 640 million barrels of oil and ramp up to 120,000 barrels of oil per day at peak production. The new facilities, which are designed for 40 years of production, required capital investment in excess of £4.5 billion. bp and partners are now considering options to unlock future potential from the massive Clair field.



Foinaven

The Foinaven field is located 190 kilometres west of Shetland in water depths of up to 500 metres. The field was discovered in 1990 and sanctioned for development in 1994. It was the first deepwater development on the UKCS and the first west of Shetland. First oil from the field was in November 1997. The pioneering fast-track development was based on a network of subsea wells linked via a subsea network of pipelines, control umbilicals and risers to the Petrojarl Foinaven FPSO.

In April 2021, bp announced it would be retiring the Petrojarl Foinaven from operations as the FPSO approaches the end of its design life. Alongside field partners, bp is looking at options to develop the estimated remaining resources of up to 200 million barrels from the area.



Eastern Trough Area Project (ETAP)

ETAP ranks as one of the largest and most commercially complex North Sea oil and gas developments of the past 20 years; multiple fields with varying ownership sharing a central processing facility (CPF). bp operates all of the ETAP fields; Machar, Madoes, Mirren, Mungo, Monan and Marnock. The non-operated Seagull field (bp ownership share 50%) will be tied back to the ETAP CPF. We are exploring options to develop another new field, Murlach, through the ETAP hub. ETAP came on stream in July 1998 with an estimated production life of 20 years. However, a multi-million-pound investment programme in 2015 secured its future well into the 2030s.

In the two decades of operations, more than 550 million barrels of oil equivalent (gross) have been produced from the bp-operated ETAP fields.



Andrew Area

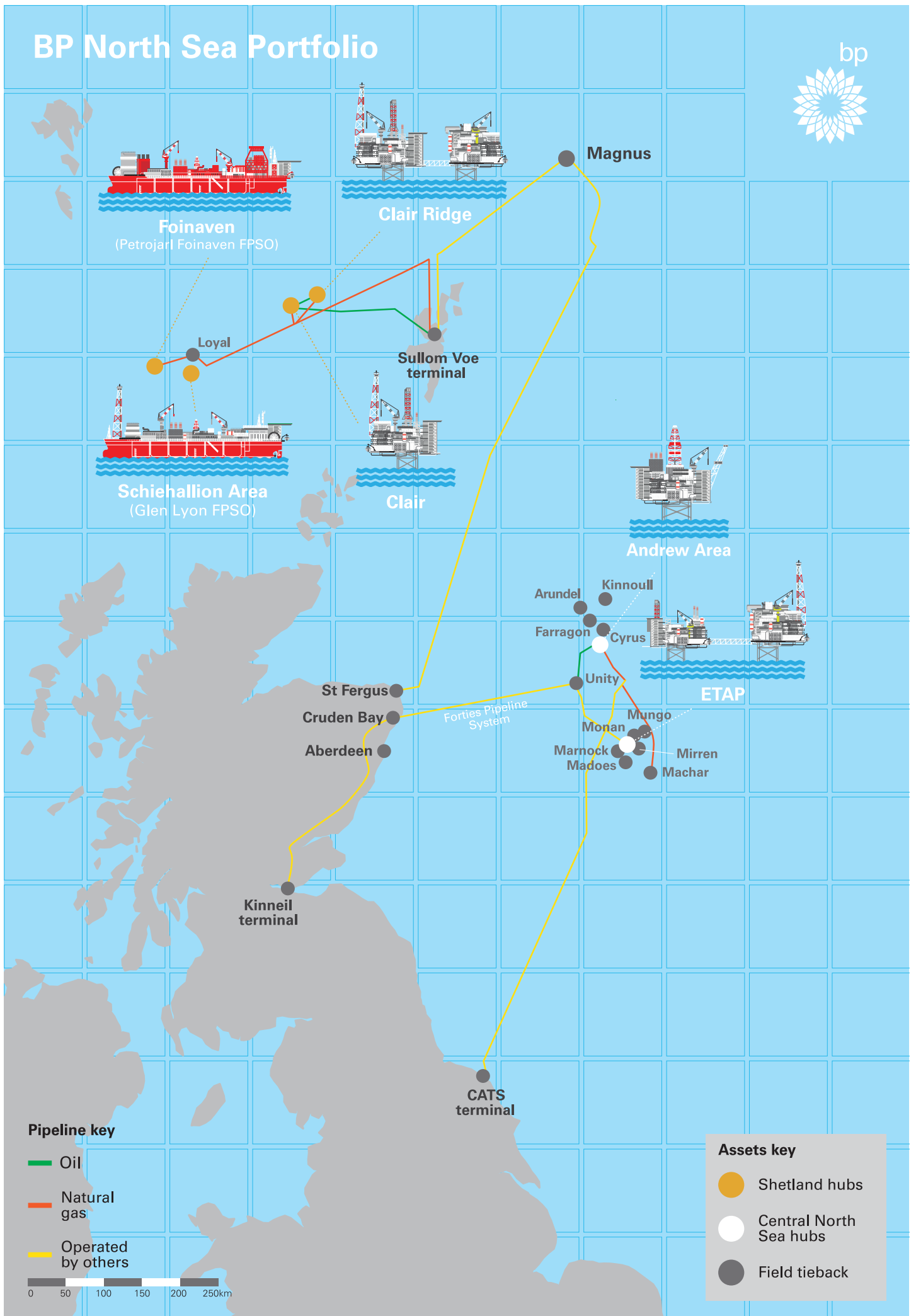
The Andrew area includes the Andrew, Arundel, Cyrus, Farragon and Kinnoull fields which all produce through the Andrew platform. The field started production in 1994.

Andrew, Cyrus and Farragon were shut in in mid-2011 to allow for the Andrew Area Development (AAD), a major brownfield project enabling the Kinnoull field, located 28 kilometres to the north, to be developed through the existing facilities.

The ADD also included extensive new subsea infrastructure, a new 750-tonne process module and structural strengthening of the platform. In 2017, the Arundel field came on stream - only 18 months after project sanction.



BP North Sea Portfolio



Pipeline key

- Oil
- Natural gas
- Operated by others



Assets key

- Shetland hubs
- Central North Sea hubs
- Field tieback

1. Releases to the Environment

bp seeks to avoid unpermitted releases to the environment. However, during the course of conducting operations, hydrocarbons and chemicals can be accidentally released. We monitor the number and volume of such releases closely and investigate the causes, with the intention to avoid similar events in the future. In 2020, we reported a 13% reduction in unpermitted releases from offshore installations to the regulator with 54 releases in 2020 compared to 62 in 2019. This reduction is shown in Figure 1 below.

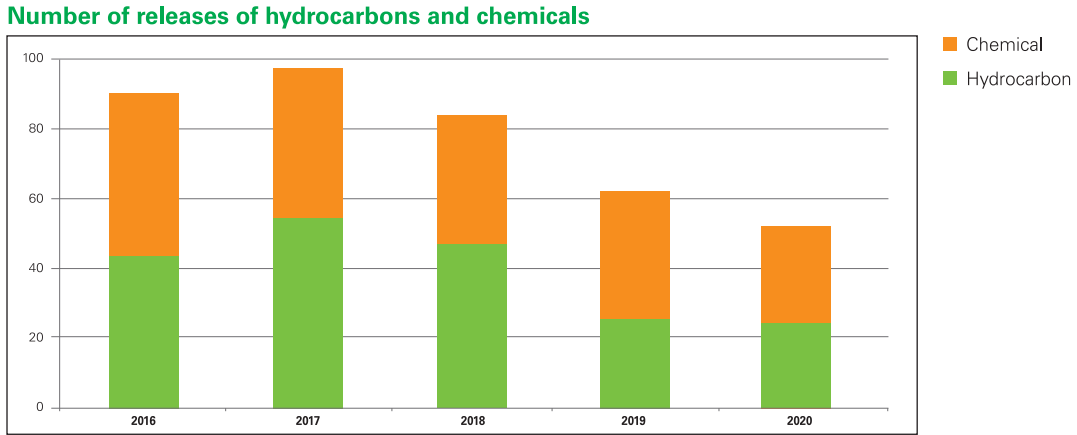


Figure 1: Total number of releases of hydrocarbons and chemicals between 2016 and 2020

There were 30 chemical releases in 2020, five fewer than the previous year. The number of hydrocarbon releases also decreased from 27 in 2019 to 24 in 2020. The 24 hydrocarbon releases were attributed to either the release of crude oil, or from utility systems installed to support the production of oil and gas and consisted of hydraulic oil, diesel and oil-based lubricants. In total, 0.24 tonnes of oil and oil-based products were released to the environment in 2020.

As Figure 2 shows, there was a clear decrease in releases from activities, from 62 in 2019 to 54 in 2020. There was a significant decrease from 18 hydrocarbon and chemical releases from mobile drilling operations reported in 2019, to five for 2020.

Total number of hydrocarbon and chemical releases reported to the regulator

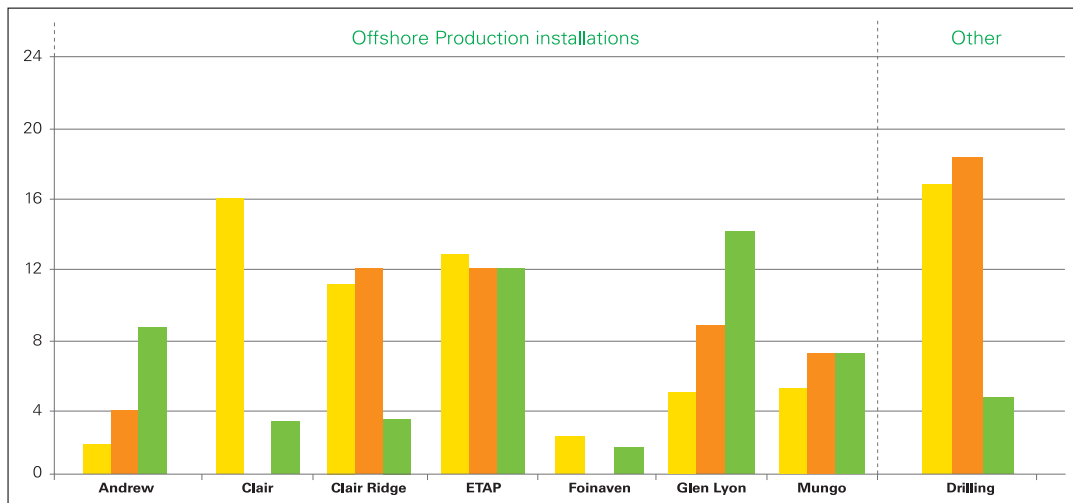


Figure 2: Number of hydrocarbon and chemical releases reported to the regulator between 2018 and 2020 for bp-operated installations and third party mobile drilling rig activities in the course of providing services to bp entities

NOTE Releases shown for Foinaven relate to subsea system only. Topsides releases are reported separately for the Petrojarl Foinaven floating, production, storage, offload (FPSO) vessel by the duty holder Alterra Infrastructure.

NOTE The vast majority of emissions and releases reported in this statement under the category "drilling" relate to operations undertaken by third parties such as drilling contractors from installations owned and operated by those third parties in the course of providing services to bp entities.

1. Releases to the Environment (cont'd)

In 2020, the total quantity of hydrocarbons and chemicals unrecovered from our offshore operations in the UKCS declined by approximately 88% to less than 3.4 tonnes (Figure 3). This decrease was primarily driven by a significant drop in chemical releases from approximately 28 to 3 tonnes.

Quantity of hydrocarbons and chemicals unrecovered (tonnes)

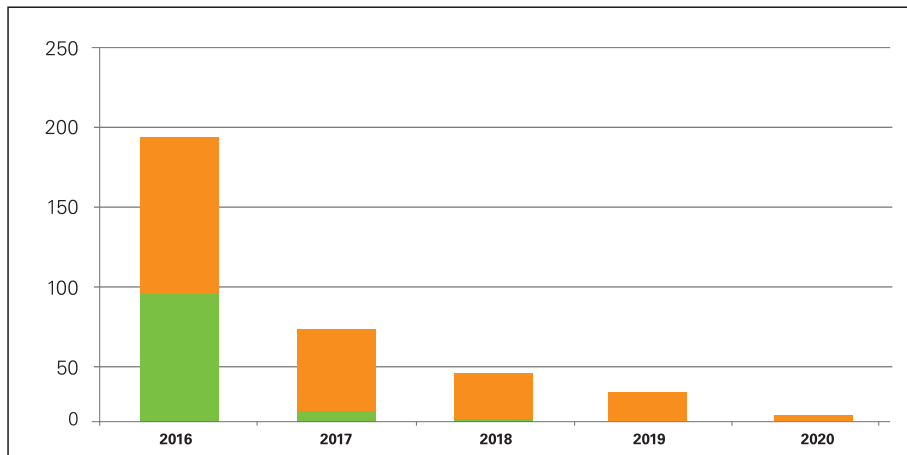


Figure 3: Total quantity (tonnes) of unrecovered hydrocarbon and chemical releases between 2016 and 2020. ■ Chemical ■ Hydrocarbon

Total hydrocarbon and chemical unrecovered spills declined across all bp operated installations and third party mobile drilling rig activities with the exception of ETAP which had an increase to approximately 0.8 tonnes.

Total hydrocarbon and chemical unrecovered releases (tonnes)

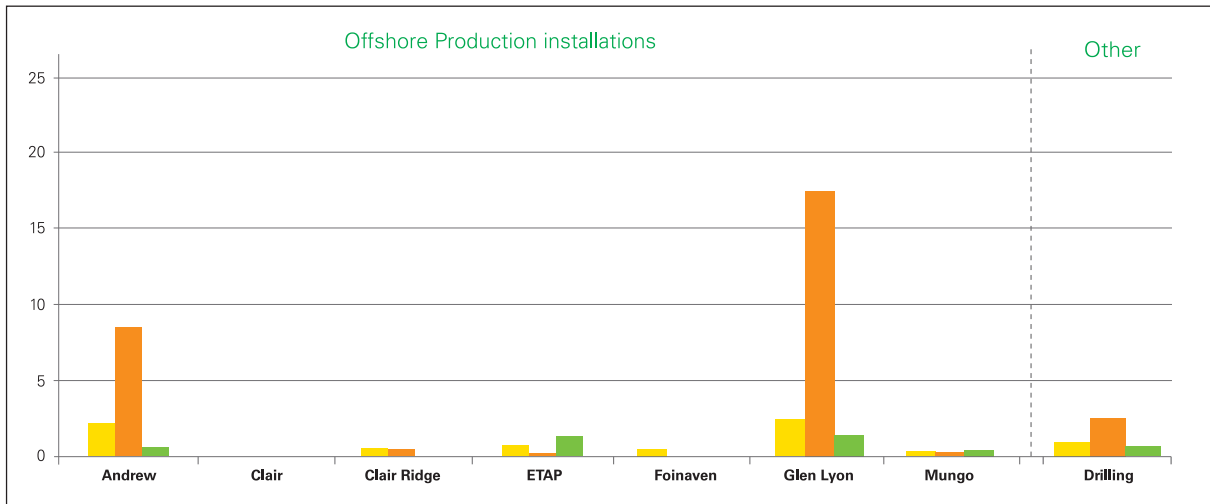


Figure 4: Quantity (tonnes) of hydrocarbon and chemical releases reported to the regulator between 2018 and 2020 for bp-operated installations and third party mobile drilling rig activities. ■ 2018 ■ 2019 ■ 2020

2. Atmospheric emissions

Atmospheric emissions occur in our operations, mainly through combustion of fuel gas to generate power and through flaring. We track and report our greenhouse gas (GHG) emissions and non-GHG emissions. We work to manage our emissions to air principally by focusing on plant reliability, energy efficiency and the introduction of technology, such as flare gas recovery systems.

We report GHG emissions on a carbon dioxide (CO₂) equivalent basis, including CO₂ and methane. bp continues to deliver what it refers to as Sustainable Emissions Reductions (SERs). In order to qualify as an SER, an intervention must have taken place to permanently reduce GHG emissions. The SER is quantified by comparing current emissions with those that would have happened in the absence of the intervention. In 2020 we delivered approximately 41,000 tonnes CO₂ equivalent of SERs through interventions such as reducing spinning reserve, commissioning a flare gas recovery system, and prioritising start-up of a vapour recovery unit. In 2020, total greenhouse gas emissions reduced by approximately 10%, as shown in Figure 5, this includes SERs.

Total greenhouse gas emissions (millions of tonnes of CO₂ equivalent)

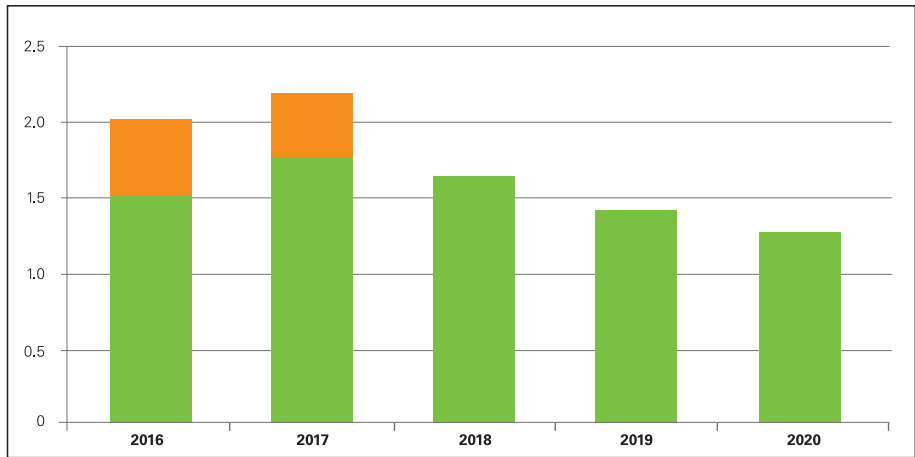


Figure 5: Total greenhouse gas (GHG) emissions (millions of tonnes of CO₂ equivalent) between 2016 and 2020

Greenhouse gas emissions by asset (tonnes of CO₂ equivalent)

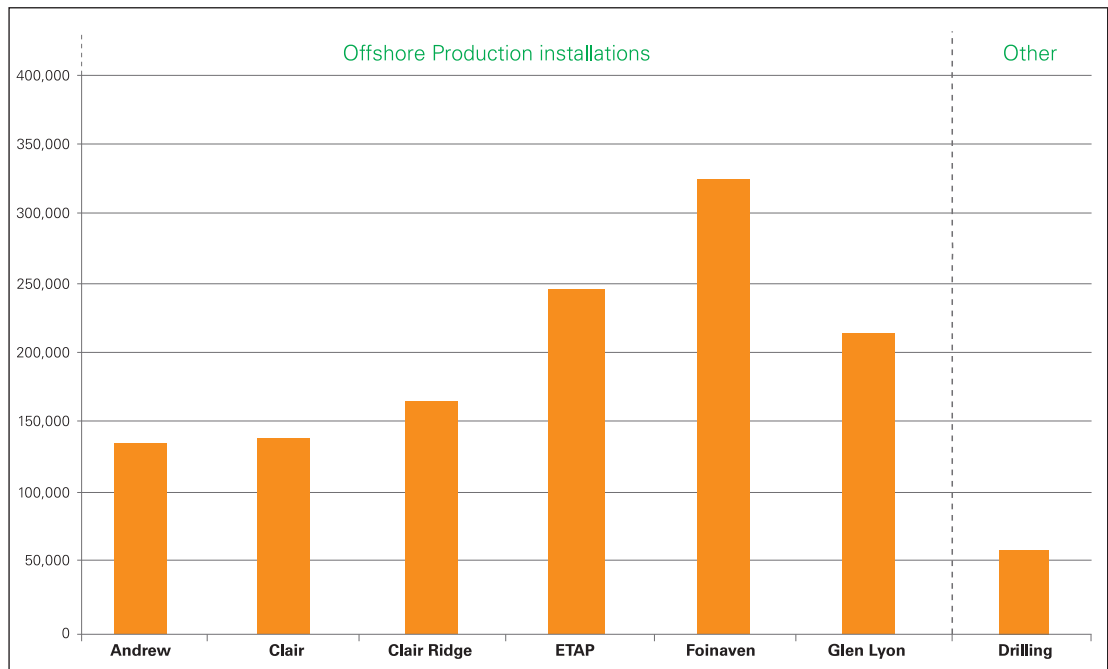


Figure 6: GHG emissions for bp-operated installations and third party drilling activities during 2020.

NOTE Greenhouse gas emissions and gas flared at Foinaven FPSO are included. Non-greenhouse gas emissions are reported separately for the Petrojarl Foinaven FPSO vessel by the duty holder Alterra Infrastructure.

2. Atmospheric emissions (cont'd)

Figure 7 below shows the ongoing improvement in offshore GHG intensity across bp’s North Sea portfolio compared with previous years. This was as a result of improved plant reliability, resizing of pumps, changes to compressor seals and reduced flaring through flare gas and vapour recovery projects outlined above.

Greenhouse gas emissions (tonnes of CO₂ equivalent per 1,000boe)

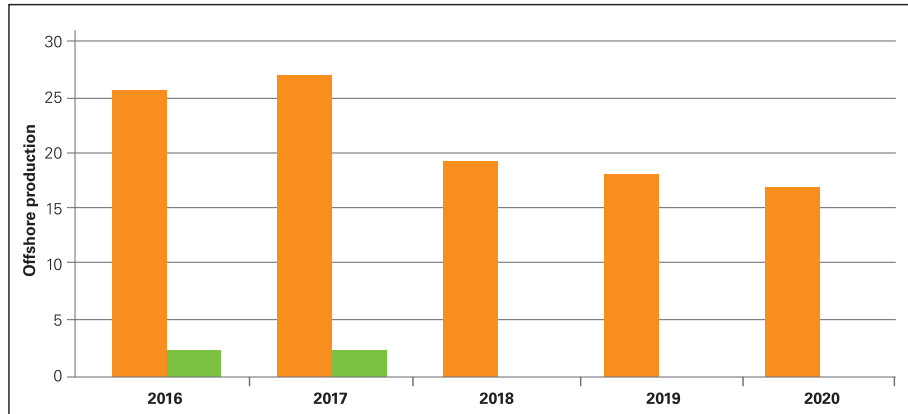


Figure 7: GHG intensity (tonnes of CO₂ equivalent per 1,000 boe) for bp-operated installations and onshore terminals between 2016 and 2020.

Flaring of gas on offshore installations is often essential for safety reasons. We seek to minimise flaring from our operations to reduce emissions, maximise resource recovery and ensure compliance with consented flaring limits. In 2020, approximately 64,000 tonnes of gas was flared (see Figure 8 below), a 47% decrease on the previous year as a result of improved compression train reliability at Glen Lyon and the flare gas and vapour recovery projects outlined above. In addition, bp North Sea has adopted proactive asset management of flaring which has already reduced GHG emissions from flaring by over 10,000 tonnes a year. We created a dynamic monitoring system to allow operators to monitor close to real time changes in flaring performance. Optimisation opportunities are then identified which leads to improved flaring performance and a reduction in emissions.

Total production gas flared (tonnes)

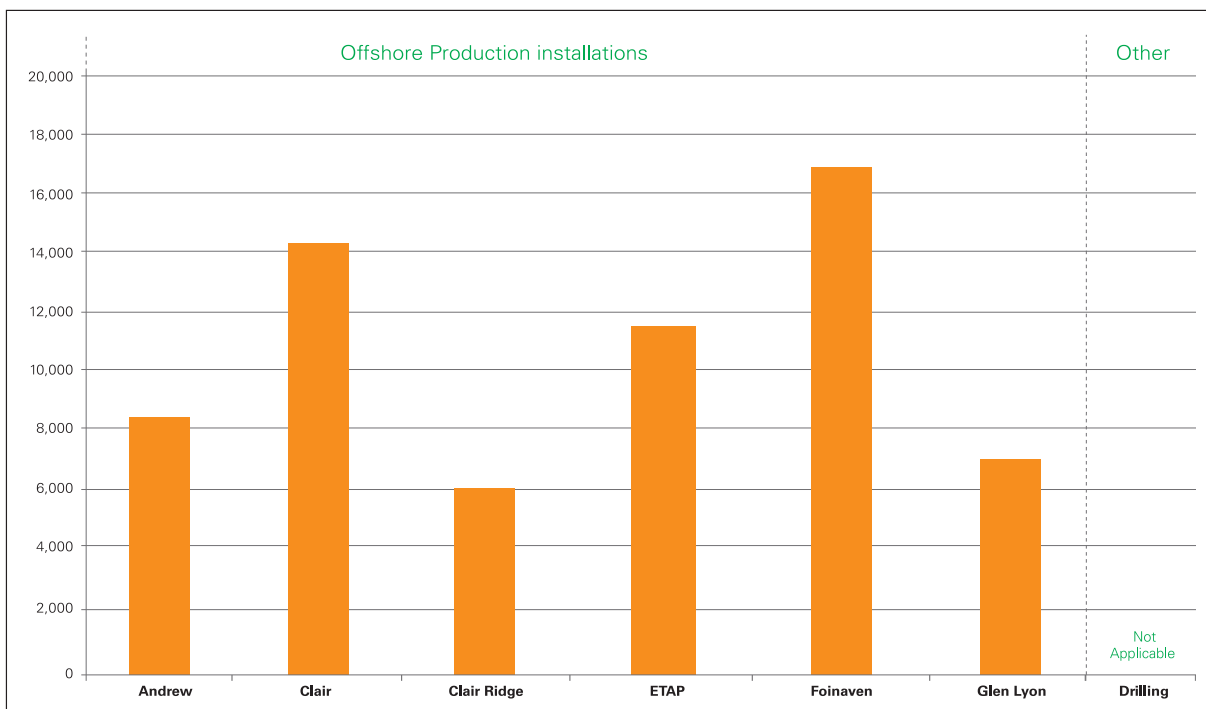


Figure 8: Total production gas flared (tonnes) for bp-operated installations during 2020.

2. Atmospheric emissions (cont'd)

The non-GHG emissions we track include Nitrogen Oxides, Sulphur Oxides, Carbon Monoxide and Volatile Organic Compounds. The emissions of these substances are shown in Figure 9 below.

Total non-greenhouse gas emissions (tonnes)

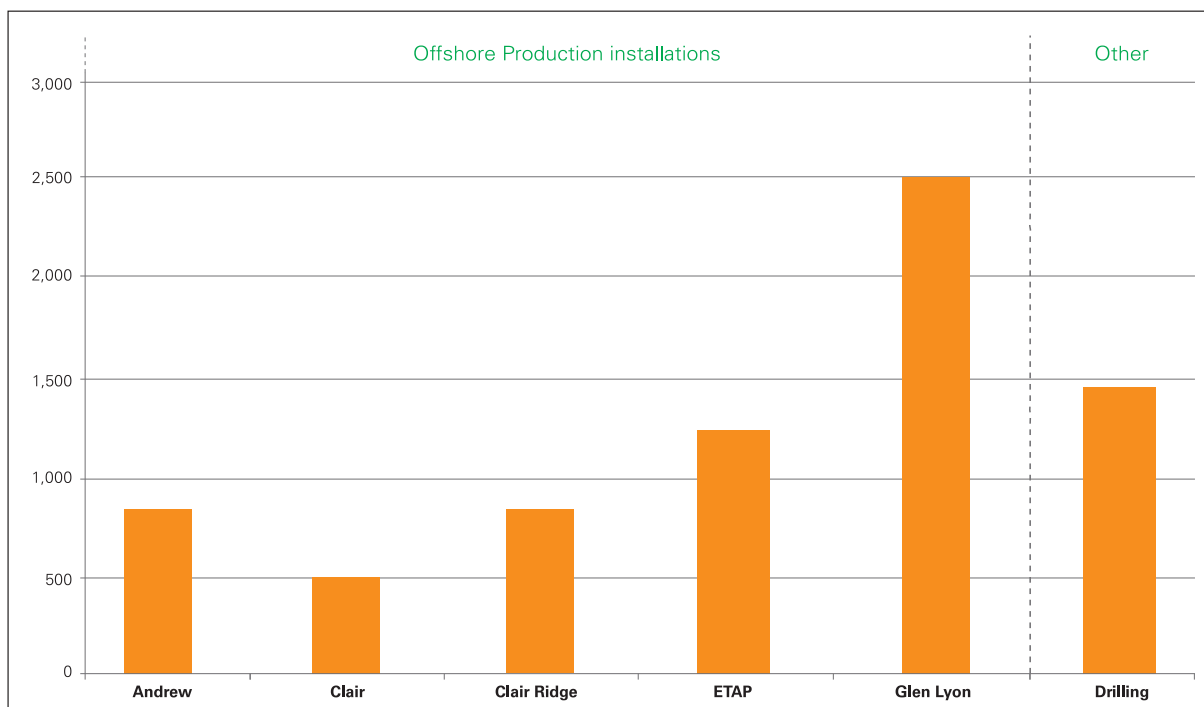


Figure 9: Total non-GHG emissions (tonnes) for bp-operated installations and third party drilling activities during 2020.

3. Permitted discharges

We use chemicals offshore to improve the flow of fluids; to facilitate the separation of materials; to prevent the degradation and fouling of process equipment and in control systems. The composition of these chemicals is diverse, and their usage and discharge are permitted by the regulator. Our production chemical usage decreased approximately 8% in 2020, while discharges decreased by around 45% in 2020, as shown in Figure 10 below.

Total production chemicals used and discharged by offshore facilities (tonnes)

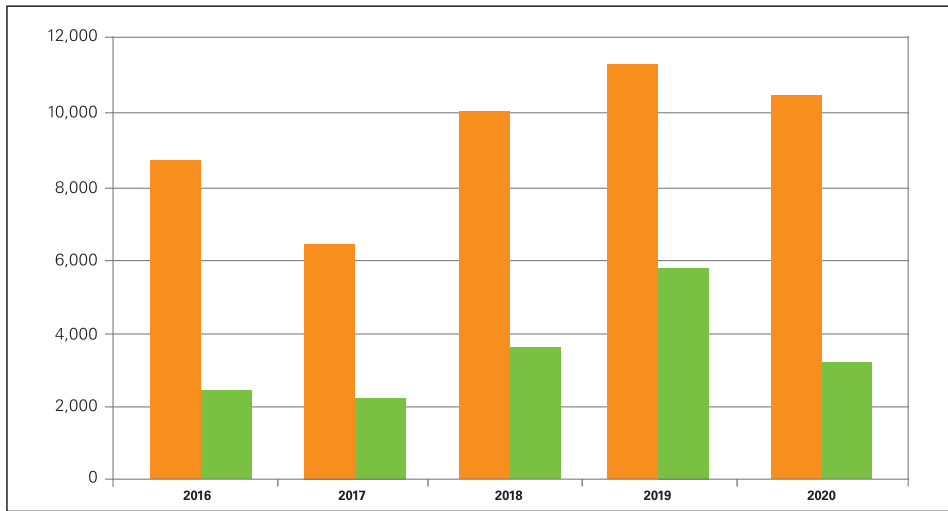


Figure 10: Total permitted production chemical use and discharge (tonnes) between 2016 and 2020. ■ Total Used ■ Total Discharged

Figure 11 below shows the total use and discharge of production chemicals by bp-operated installations in 2020. Chemical use on Clair is primarily related to the management of hydrogen sulphide. A significant proportion of chemical use on Glen Lyon relates to using calcium nitrate for reservoir souring. Subsea chemical use and discharge relates to flushing of pipelines to remove hydrocarbons before maintenance and inspection activities are undertaken and for use in hydraulic control systems.

Total permitted production chemicals used and discharged by offshore facilities (tonnes)

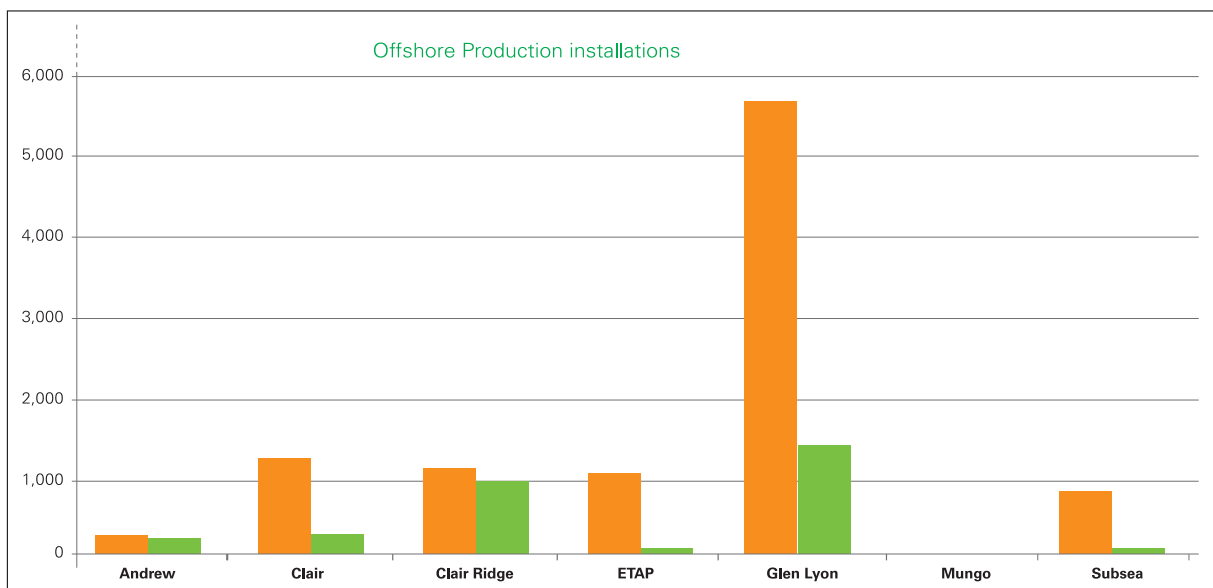


Figure 11: Total permitted production chemical use and discharge (tonnes) for bp-operated installations during 2020. Excludes third party drilling chemicals (shown in separate graph) ■ Total Used ■ Total Discharged

NOTE Permitted production chemical use and discharge are reported separately for the Petrojarl Foinaven FPSO vessel by the duty holder Altera Infrastructure.

3. Permitted discharges (cont'd)

Fluids produced from oil producing wells often contain large quantities of water as well as hydrocarbons. The water and hydrocarbon are separated during processing. Hydrocarbons are exported and the remaining produced water, which contains trace amounts of oil, is either reinjected into the wells or discharged to sea in accordance with environmental permits. In order to seek to minimise oil discharges, all but one of our offshore installations have been designed to reinject some or all produced water.

Figures 12 and 13 summarise the produced water discharges. Total produced water discharged by bp-operated installations increased by 40% in 2020. Andrew increased the mass of produced water being discharged by over 62% in 2020, this was primarily due to the water cut in the subsea fields increasing rapidly. Potential improvements are being worked to reduce produced water discharge at Andrew.

Total produced water discharged (millions of tonnes)

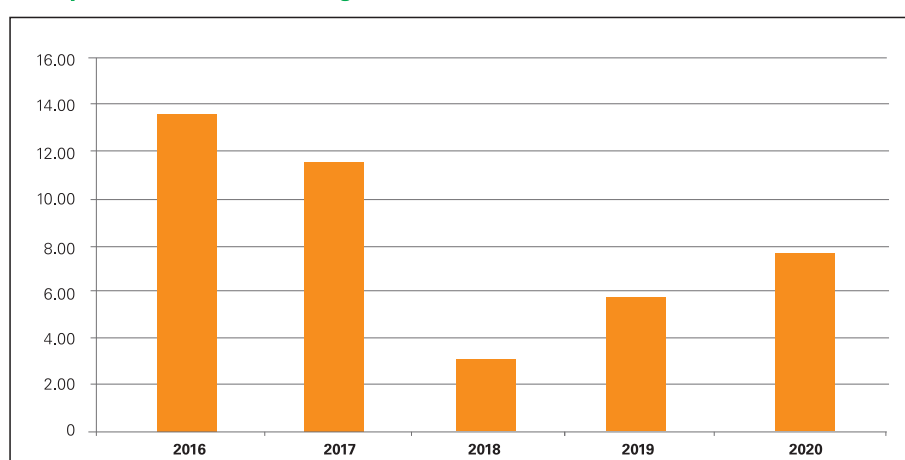


Figure 12: Total produced water discharged (millions of tonnes) between 2016 and 2020.

Total produced water discharged (millions of tonnes)

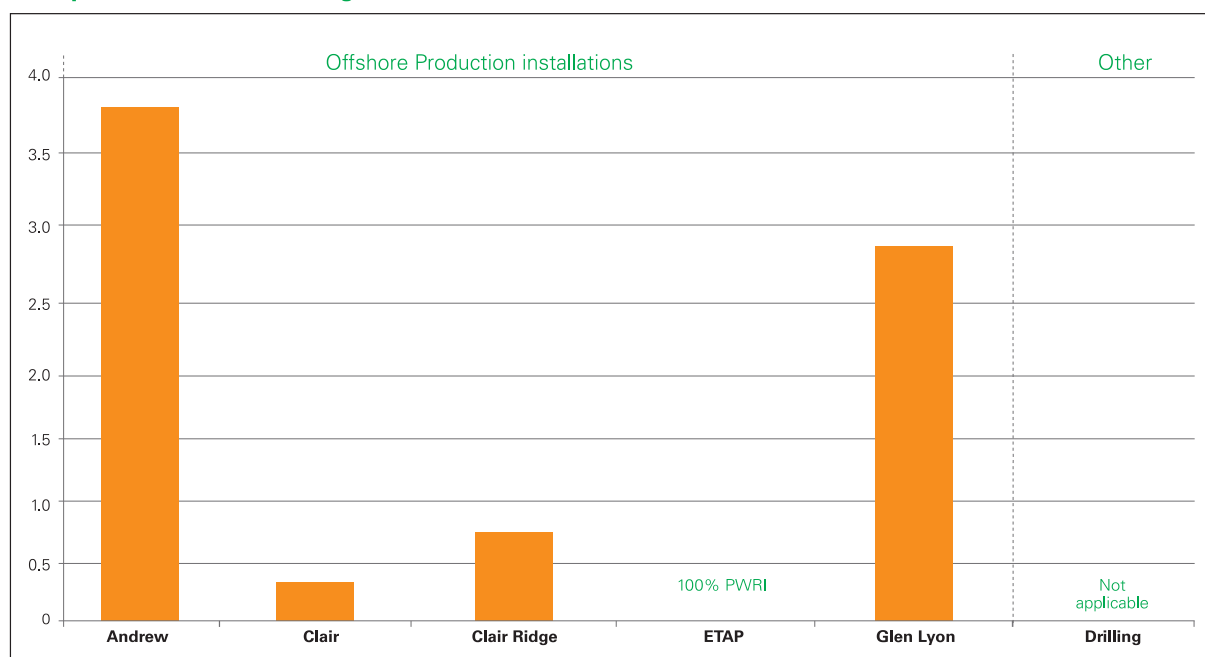


Figure 13: Total produced water discharged (millions of tonnes) for bp-operated installations during 2020.

NOTE Produced water discharged is reported separately for the Petrojarl Foinaven FPSO vessel by the duty holder Altera Infrastructure.

3. Permitted discharges (cont'd)

The total amount of oil in produced water that can be discharged and concentrations of oil in produced water are governed by the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 as amended and specified in the permits for each operating installation. Where such installations discharge produced water, the permits require the monthly average concentrations of oil to be below 30 milligrams (mg) of oil per litre.

Figure 14 below shows the annual average oil in produced water concentrations for each operating installation in 2020. All installations achieved the 30 mg/l threshold for discharges to sea (see Figure 15). The ETAP installation reinjects 100% of its recovered produced water and therefore has no associated discharge.

Annual average oil concentration in produced water discharged (mg/l)

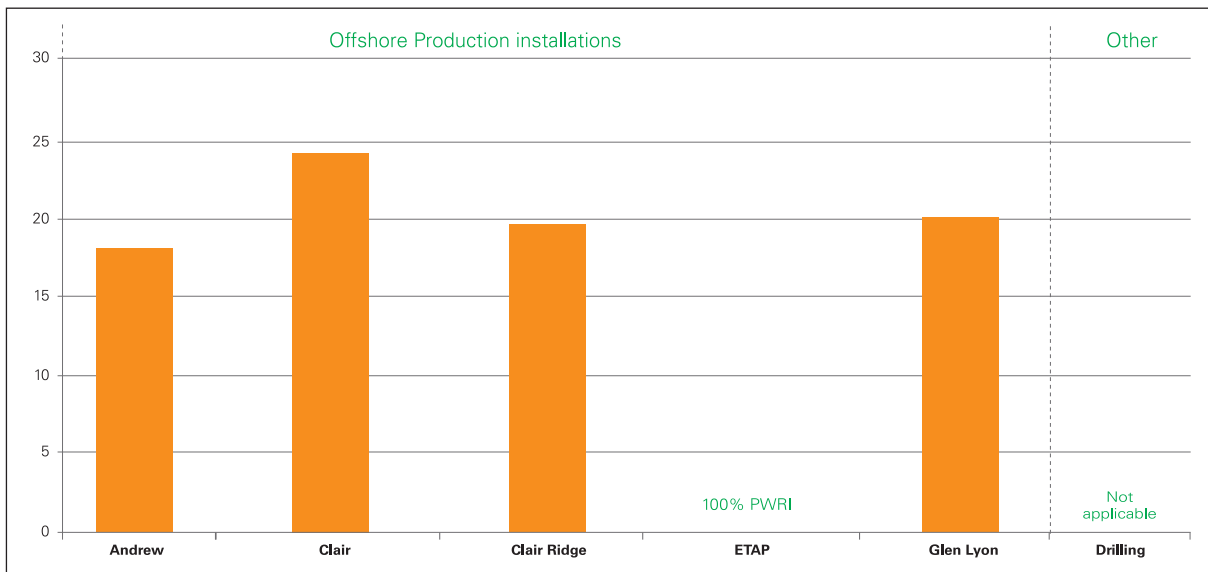


Figure 14: Annual average oil in produced water discharge (mg/l) for bp-operated installations during 2020.

Figure 15 shows the total oil in produced water discharged for our operated installations during 2020. Of all the produced water discharged by our operated installations, oil makes up less than 0.002% of the total mass. Andrew does not have reinjection facilities and therefore 100% of produced water at an annual average of 18.24 mg/l was discharged to sea (Figures 14 and 15). Due to a high number of well start-ups, Glen Lyon discharged approximately 55 tonnes of oil in produced water in 2020. During well start-up, reinjection facilities are offline and produced water must be discharged.

Total oil in produced water discharged (tonnes)

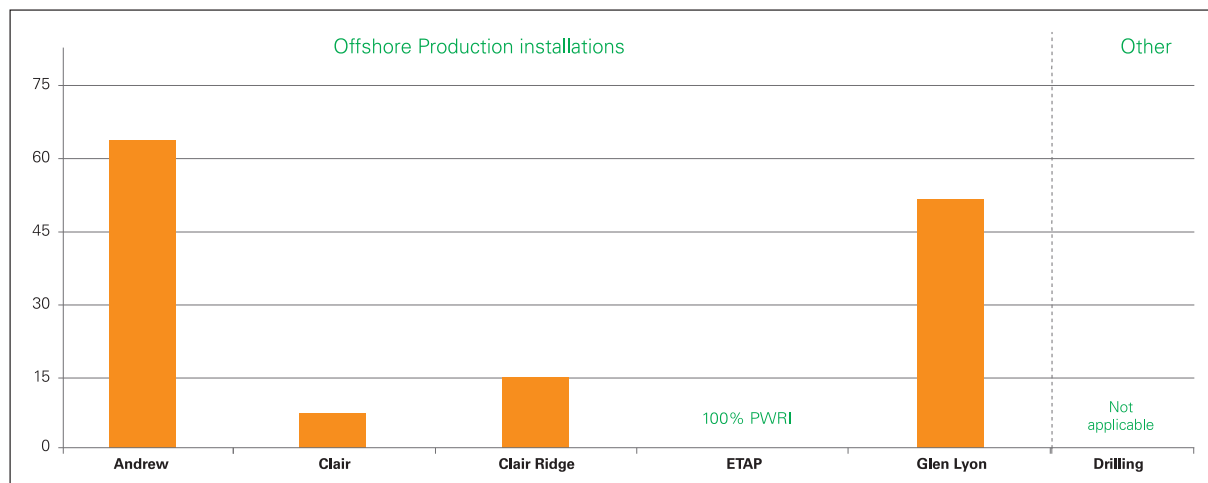


Figure 15: Total oil in produced water discharged (tonnes) within total produced water discharged (Figure 13) for bp-operated installations during 2020.

4. Waste

Waste from our operations is segregated and, where possible, reused or recycled. Special waste includes paints, hazardous chemicals, oils, batteries, aerosols, heavy metals, wax from pigging operations and oily waste. Quantities of special waste generated by bp-operated installations are shown below in Figure 16. The large quantity of special waste from Clair Ridge is due to drilling activities, and associated waste liquids and sludges. This waste is sent for treatment where the material is physically and chemically treated to remove contamination and then discharged to sewers.

Special waste from operating installations (tonnes)

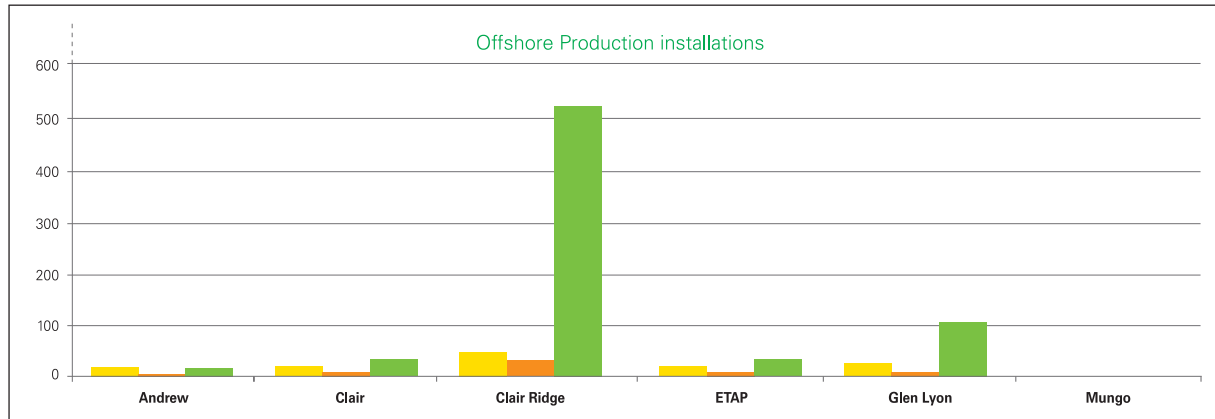


Figure 16: Special waste (tonnes) reported for bp-operated installations during 2020. Includes drilling waste from Clair Ridge only (other drilling waste shown on separate graph)

Non-special waste includes segregated recyclables (paper, packaging, wood etc.), general waste (i.e. accommodation waste) and uncontaminated scrap metals. Quantities of non-special waste generated by our operated installations are shown in Figure 17 below. A higher volume of non-special waste was generated at Clair Ridge due to drilling activities.

Non-special waste from operating facilities (tonnes)

Excludes drilling waste (shown on separate graph)

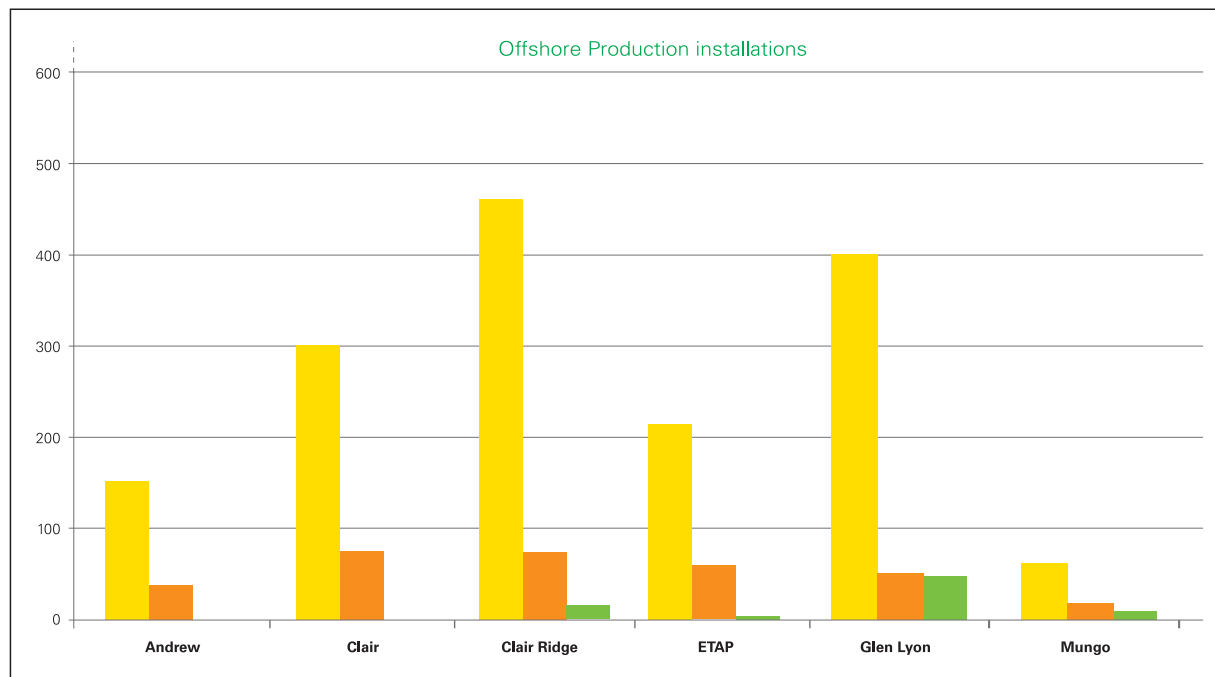


Figure 17: Non-special waste (tonnes) generated for bp-operated installations during 2020. Includes drilling waste from Clair Ridge only (other drilling waste shown on separate graph)

NOTE Waste is reported separately for the Petrojarl Foinaven FPSO vessel by the duty holder Altera Infrastructure.

5. Drilling specific environmental performance

The drilling and completion of 11 wells came to an end in 2020 and permit returns were filed with the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED). The Deepsea Aberdeen mobile offshore drilling unit (MODU) drilled and completed five wells in the Schiehallion field and three in the Loyal field. Three wells were in the Clair field and were drilled from the Clair Ridge drilling platform. The Well Enhancer Light well intervention vessel carried out two well interventions in the Machar field.

As part of drilling and intervention operations, approximately 35,500 tonnes of chemicals were used, of which approximately 19,000 tonnes were discharged in accordance with environmental permits as shown in Figure 18 below. The majority of these chemicals were completion brines and water-based mud chemicals classified by OSPAR as posing little or no risk to the environment (PLONOR). The Clair Ridge platform re-injected approximately 1,000 tonnes of cuttings in 2020.

Drill cuttings and drilling chemicals (tonnes)

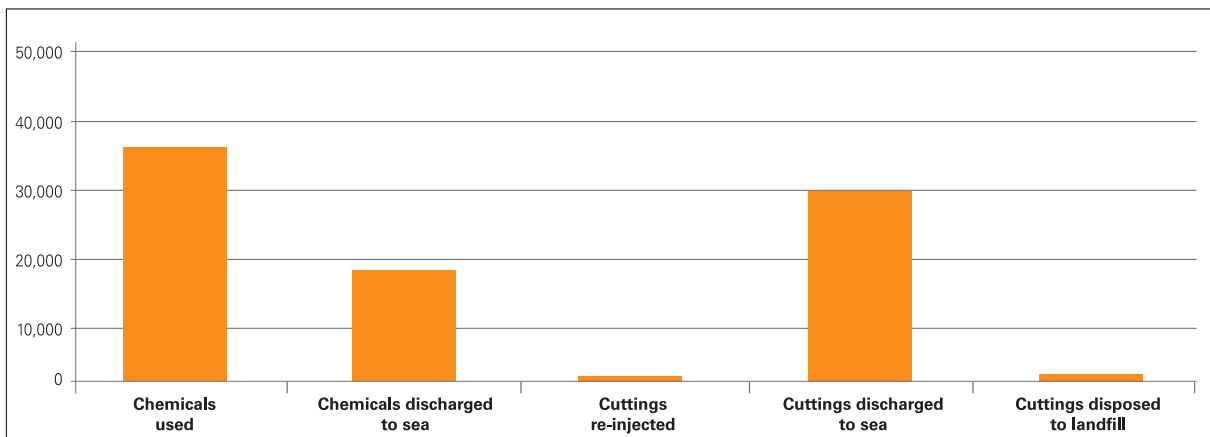


Figure 18: Total drill cuttings re-injected, discharged and disposed to landfill, and drilling chemicals used and discharged (tonnes).

Drilling waste includes special wastes such as hazardous completion, workover and drilling fluid additives. Non-special wastes are predominantly non-hazardous workover and completion drilling fluids and brines. In 2020, 97.8% of total drilling activity waste was either recycled or treated- see Figure 19 below.

Operational drilling waste from UK mobile drilling rigs owned and operated by third parties (tonnes)

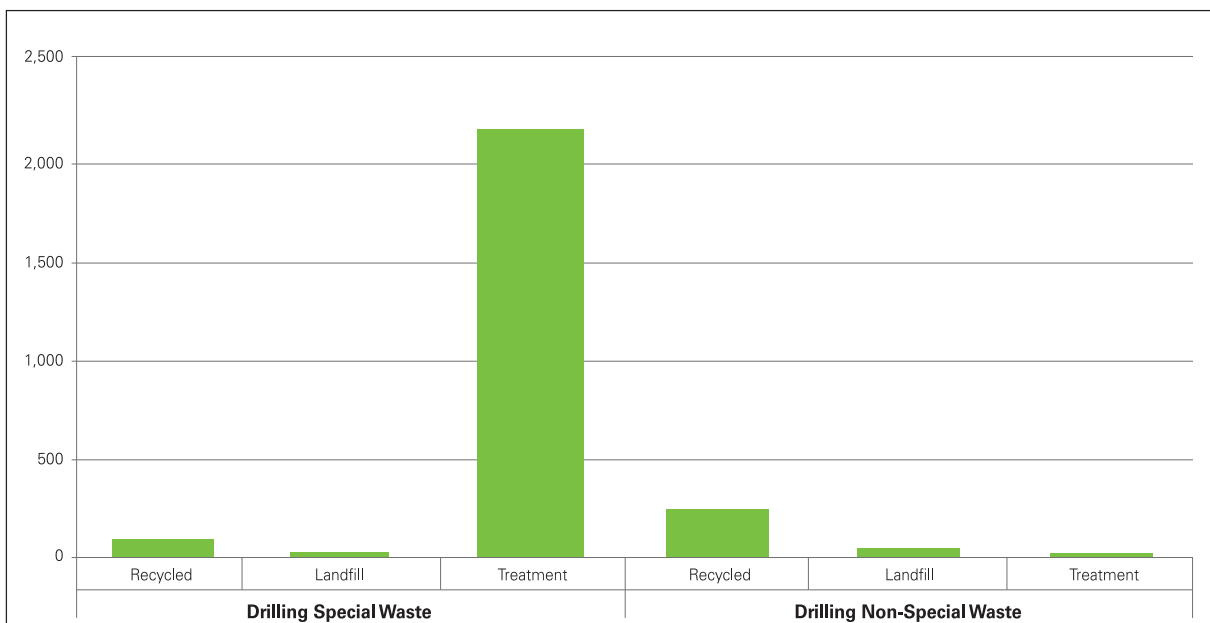


Figure 19: Special and non-special waste (tonnes) generated during third party drilling activity in 2020. Waste generated at Clair Ridge from drilling activities is included in Section 4, Waste.