bp

North Sea Region

2022 Annual Environmental Statement

ForeWord

bp's ambition is to become a net zero company by 2050 or sooner and help the world get to net zero.

I'm hugely privileged to lead our North Sea business, where our mission is to support this ambition by producing safe, reliable oil and gas with lower operational emissions and lowest practicable environmental impact.

At bp we're in action on the 10 aims we set ourselves to get to net zero: five to help us become a net zero company, and five to help the world meet net zero.

These include:

Aim 1 - To be net zero across our entire operations on an absolute basis by 2050 or sooner

Aim 4 - To install methane measurement at all our existing major oil and gas processing sites by 2023, publish the data, and then drive a 50% reduction in methane intensity of our operations.

This document sets out the progress we're making towards these aims in the North Sea and I'm pleased to say we continue to see an improving trend across key areas.

For example, in 2022:

- We decreased routine flaring in our operations by 74% compared to the 2019 baseline.
- We delivered a 32% reduction in our greenhouse gas (GHG) emissions against the 2019 baseline, making a significant contribution to the challenging target, set at group level, of 20% by 2025.
- We reinjected 76% of the total produced water, compared to 55% reinjection achieved in 2019.

In addition to this continual improvement, we're progressing plans to make a step change in lowering emissions from our oil and gas operations in the North Sea.

We're exploring options to replace power from gas turbines offshore with electricity from shore or other renewable energy sources and following through on plans to eliminate routine flaring across bp's operations by 2030, in line with the World Bank Zero Routine Flaring initiative.

While this report focuses on our oil and gas operations in the North Sea, bp is transforming into an integrated energy company and we often describe Aberdeen as a microcosm of bp's strategy. In this city we've called home for nearly 60 years, we're investing to deliver home-grown energy now **and** growing new low carbon opportunities in the form of the Morven offshore wind project, east of Aberdeen, and a green hydrogen production facility in partnership with Aberdeen City Council.

I'm proud to work alongside a talented team of colleagues in the North Sea, eager to play their part in the energy transition and bp's journey to net zero.

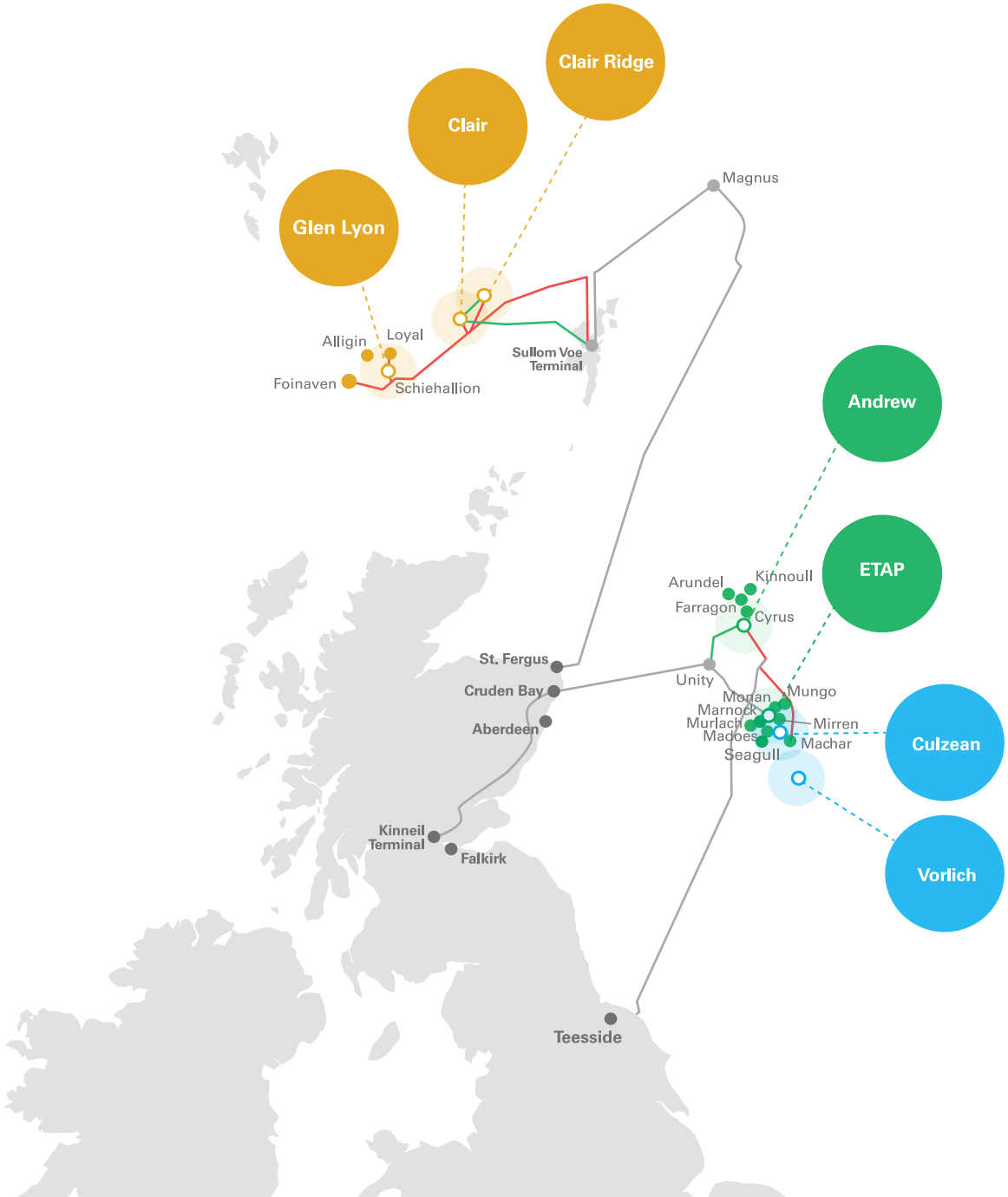
Thank you for taking the time to read this report.

Doris Reiter, Senior Vice President North Sea

Introduction

This is the annual environmental statement for the bp entities, which operated in the United Kingdom Continental Shelf (UKCS) in 2022. It fulfills the requirements of OSPAR Recommendation 2003/5 to promote the use and implementation of environmental management systems by the offshore industry.

The statement covers offshore installations operated by bp entities and installations owned and operated by third parties while providing services to bp entities in the North Sea. It does not include information on our operated by others portfolio. The data provided in this report was previously reported to the UK environmental regulator (OPRED) via the Environmental Emissions Monitoring System (EEMS).

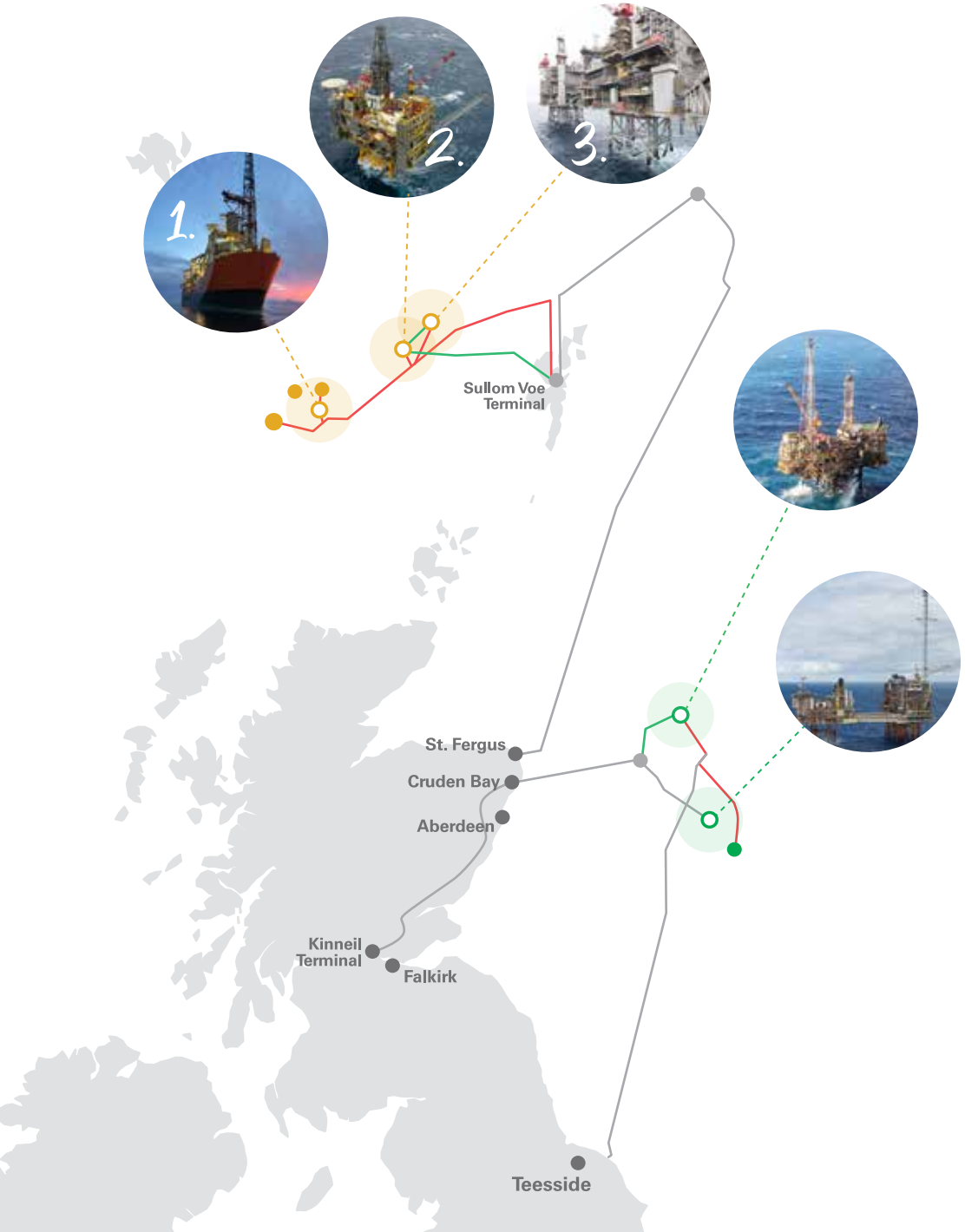


bp North Sea *portfolio*

bp has been operating in the North Sea for nearly 60 years, helping to provide a reliable source of energy to consumers around the world.

Our plans in the North Sea will see us continue to invest to produce resilient hydrocarbons that are aligned with bp's strategy – that is oil and gas that can be produced with lower operational emissions, safely, reliably, and competitively, maximizing the resources and infrastructure around our portfolio.

Today, we continue to provide a home-grown source of energy through a strong portfolio focused around five key oil and gas production hubs in the central North Sea and west of Shetland.



1. Glen Lyon

The Schiehallion Area incorporates the Schiehallion, Loyal and Alligin fields located around 175 kilometres west of the Shetland Islands.

The fields are developed through the Glen Lyon floating production, storage and offloading (FPSO) vessel. 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 maximize production from the fields.

2. Clair Phase 1

With an estimated seven billion barrels of oil in place, the Clair field is the largest oilfield on the UK Continental Shelf.

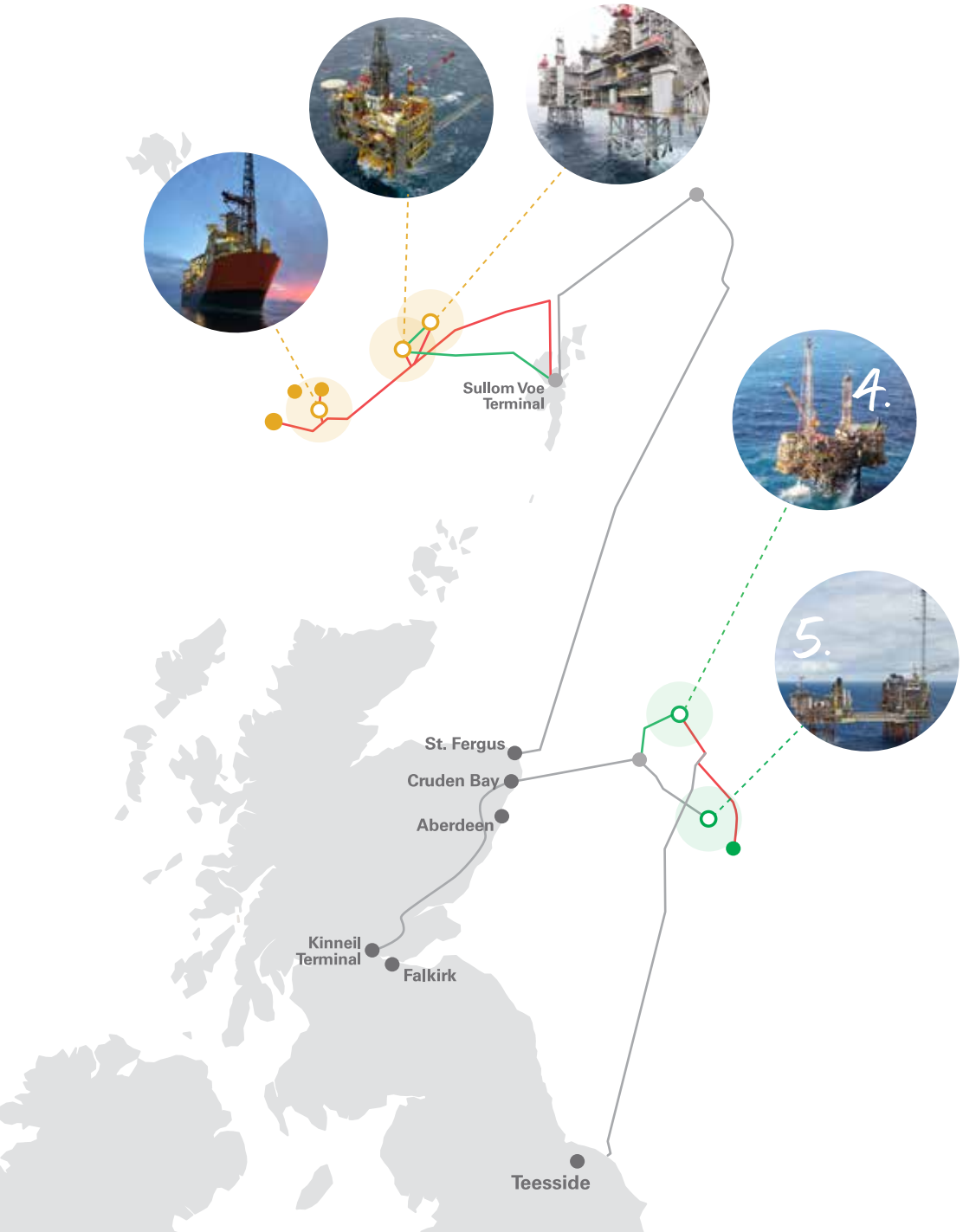
The field, located 75 kilometers west of Shetland, was discovered in 1977, but challenging reservoir characteristics and the technological limits of the time meant it was the mid-1990s before the field saw extensive drilling and 2001 before bp and partners approved a development plan.

Production from the Clair field began in 2005 through the Clair Phase 1 platform which was the first fixed platform west of Shetland.

3. Clair Ridge

The 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. bp and partners are now considering options to unlock future energy potential from the Clair field through a third phase of development.

In 2022, bp, along with other west of Shetland operators, signed a memorandum of understanding to explore electrification options for west of Shetland oil and gas interests, including at Clair. Electrification could significantly reduce emissions associated with offshore operations.



4. Andrew

The Andrew area includes the Andrew, Arundel, Cyrus, Farragon and Kinnoull fields, which all produce through the Andrew platform in the central North Sea. Production started in 1994. As the Andrew platform approaches cessation of production, bp is operating the facility under a late life business model that seeks to ensure safe and reliable operations through the facility's final years.

5. Eastern Trough Area Project (ETAP)

ETAP, in the central North Sea, ranks as one of the largest and most commercially complex oil and gas developments in the North Sea; multiple fields with varying ownership sharing a central processing facility (CPF).

bp operates all the ETAP fields; Machar, Madoes, Mirren, Monan, Marnock and Mungo. A normally unattended installation (NUI) over Mungo stands around 20 kilometres east of the ETAP CPF. Apart from Mungo, which has surface wellheads on the NUI, all other ETAP fields are connected to the CPF via subsea infrastructure.

In partnership with Neptune Energy, bp is developing the Seagull field, which is due to begin production through the ETAP CPF in 2023. bp is also pursuing other opportunities to sustain production at ETAP, including the Murlach field, while exploring options to electrify the ETAP CPF to significantly reduce operational emissions.

Foinaven (not operational)

The Foinaven field is located 190 kilometres west of Shetland in water depths of up to 500 metres. It was the first deepwater development on the UKCS and the first west of Shetland. Oil and gas was produced through the Petrojarl FPSO vessel.

In April 2021, bp announced it would be retiring the Petrojarl Foinaven from operations as the vessel had reached the end of its design life. It was safely removed in 2022. bp is considering options for the future of the Foinaven field.

Non-operated interests

bp holds non-operated interests in the TotalEnergies Culzean development and the Ithaca Energy Vorlich field, both in the central North Sea.

Environmental management

The North Sea oil and gas sector is subject to strict environmental regulation. We work closely with regulators to continuously review what we do, how we do it and how we can do it better. Our operating management system, which includes our environmental management system, is a set of integrated procedures and processes designed to drive continuous improvement in our operations, including regulatory compliance and environmental performance. Our North Sea operations were independently attested against the requirements of ISO14001:2015 in September 2022, which concluded:

- The operating management system is in conformance with the requirements of ISO 14001:2015 and has addressed each of the individual management system elements.
- The operating management system is in place and is being implemented throughout the North Sea organization.

Our environmental & carbon sustainable goals

bp aims to produce oil and gas with the lowest possible environmental impact, whilst striving to improve people's lives and the communities in which we work.

We aim to achieve this by:

- Transitioning to a net zero company by 2050 or sooner.
- Striving for compliant, conformant and sustainable operations through robust compliance management, responsible use of natural resources, strong relationships with local communities and care for others.
- Managing risk through an efficient and dynamic system, which uses digital, technology and an agile mindset to embed learning.

In 2022 we completed a number of activities in support of our environmental goals, including:

- Published our first carbon plan including asset specific emissions reduction action plans and methane action plans to support the North Sea Transition Authority (NSTA) Net Zero Stewardship Expectation 11.
- Completed drone surveys for all manned assets to collect top-down methane measurements.
- Installed a new flare tip on Clair Phase 1.
- Implemented a new environmental reporting tool for managing our environmental data.
- Completed external ISO14001 attestation at our North Sea headquarters and Andrew platform.
- Completed environmental seabed survey at Schiehallion field.
- Continued support for INSITE Programme (Influence of Man-Made Structures in the Ecosystem). The programme supports independent science leading to a greater understanding of the influence of man-made structures on the North Sea ecosystem.

2023 environmental objectives and key results

Area	Objective
Compliance and conformance	Maintain environmental regulatory compliance and conformance with our internal requirements
Sustainability – Net Zero	Sustain carbon plan and support delivery of emissions reductions across the region
Sustainability - People & Planet	Support implementation of the Sustainability Plan within the region
Development, efficiency & enhancement opportunities	Improve efficiency of environmental and social delivery

Unpermitted releases

bp seeks to avoid unpermitted releases to the environment. However, while conducting operations, hydrocarbons and chemicals can be accidentally released. The number and mass of such releases is monitored, recorded and investigated internally, with the intention of preventing similar events occurring in the future. All releases are reported to the regulator.

In 2022, we reported 36 unpermitted releases from offshore installations to the regulator (figure 1), of which 23 were chemical and 13 were hydrocarbon, with a total mass of 3.18 tonnes released to the marine environment.

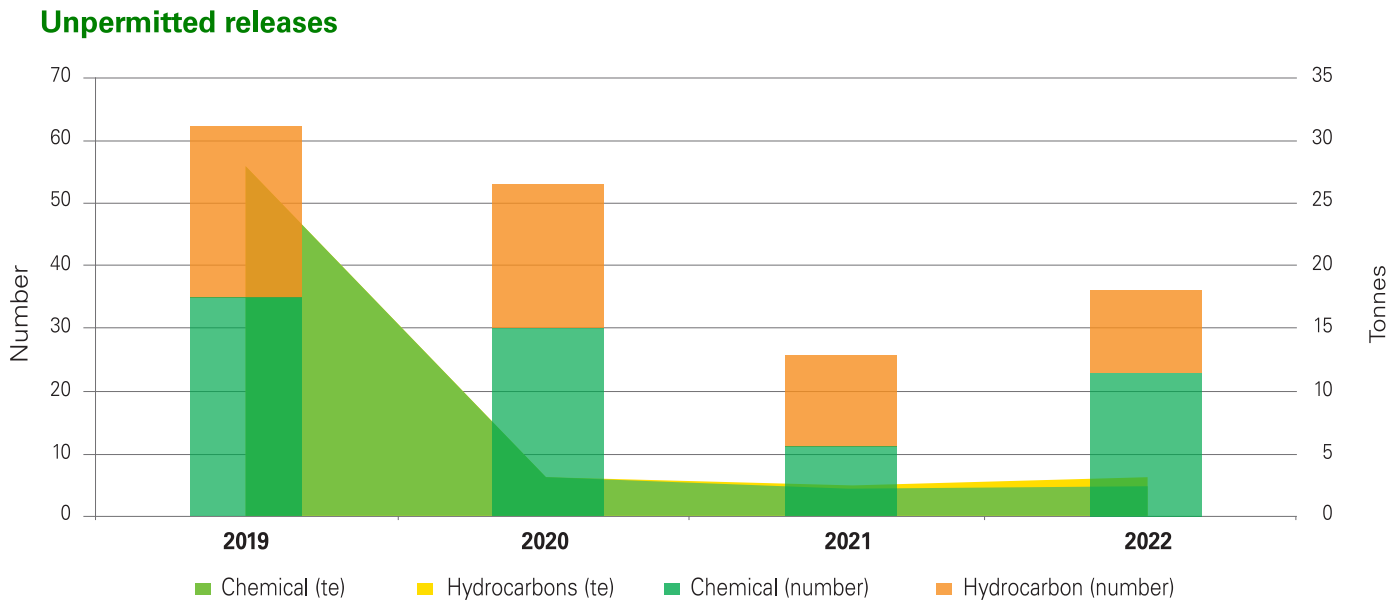


Figure 1: Total number of unpermitted releases of hydrocarbons and chemicals between 2019 and 2022.

Atmospheric emissions

Atmospheric emissions occur in operations, mainly through combustion of fuel gas to generate power and through flaring. They are tracked and reported as per internal and regulatory requirements. 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.

Greenhouse gas emissions[1] (Aim 1)

bp remains committed to decarbonising our operations and playing our part to achieve the targets set out in the North Sea Transition Deal (NSTD). We have made significant progress in reducing emissions across our North Sea operated portfolio.

The intent of Aim 1 in bp's sustainability framework, is to get to net zero across our entire operations on an absolute basis by 2050 or sooner. bp is targeting a 20% reduction in its Aim 1 operational emissions by 2025 and aiming for a 50% reduction by 2030 against a 2019 baseline (GHG CO_2e). The bp North Sea region closed 2022 with an overall 32% reduction in GHG emissions against our North Sea 2019 baseline (figure 2).

Our GHG emissions intensity[2] overall performance in the North Sea shows a decreasing trend (figure 3), as a result of improved plant reliability, resizing of pumps, changes to compressor seals, reduced flaring throughout our operations and the Foinaven FPSO sail away. Clair Phase 1 was the exception during 2022, where emissions intensity was impacted due to planned turnaround and reduced production, which occurred during the second half of the year.

[1] GHG emissions are reported in CO_2 equivalent (CO_2e) which is calculated as the sum of CO_2 emissions and methane emissions based on their relative global warming potential.

[2] GHG emissions intensity is calculated as a ratio of the GHG emissions (tonnes) divided by the production output (thousands boe).

Greenhouse gas emissions

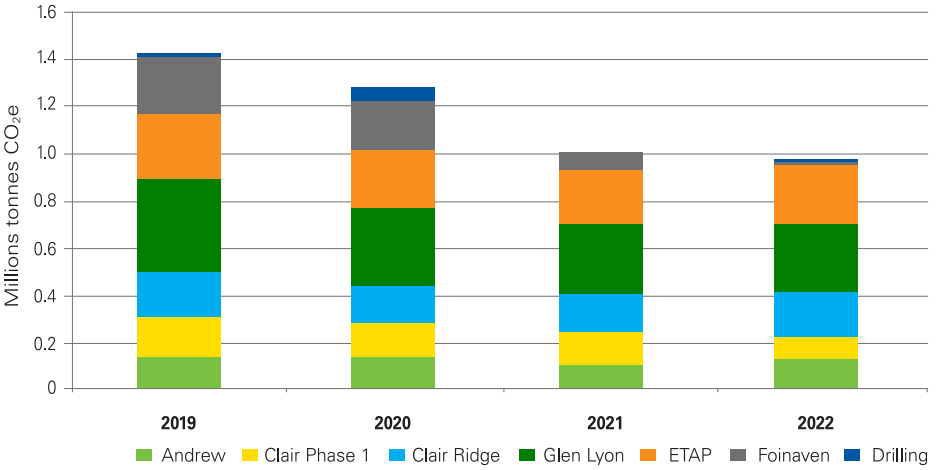


Figure 2: Total greenhouse gas emissions between 2019 and 2022.

Greenhouse gas intensity

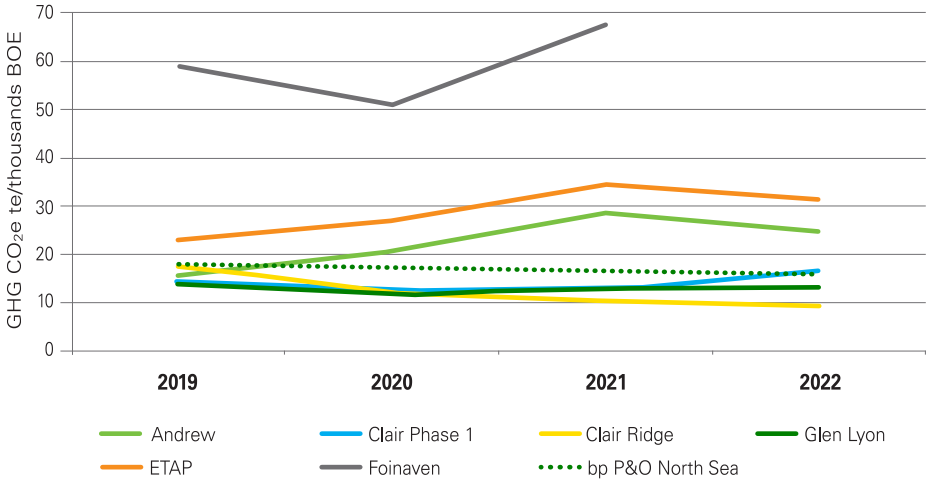


Figure 3: GHG intensity (tonnes of CO2 equivalent per 1,000 boe) between 2019 and 2022.

Flaring

Flaring of gas from offshore installations is essential for safety reasons. bp seeks to minimize flaring from operations to reduce emissions, maximize gas production and ensure compliance with consented flaring limits.

In 2022, less than 32,000 tonnes of gas was flared (figure 4), a 74% decrease from our North Sea 2019 baseline. This reduction was achieved by delivering flare gas and vapour recovery projects, compression train reliability, well temperature reduction and optimizing shut down / start up processes

Total production gas flared

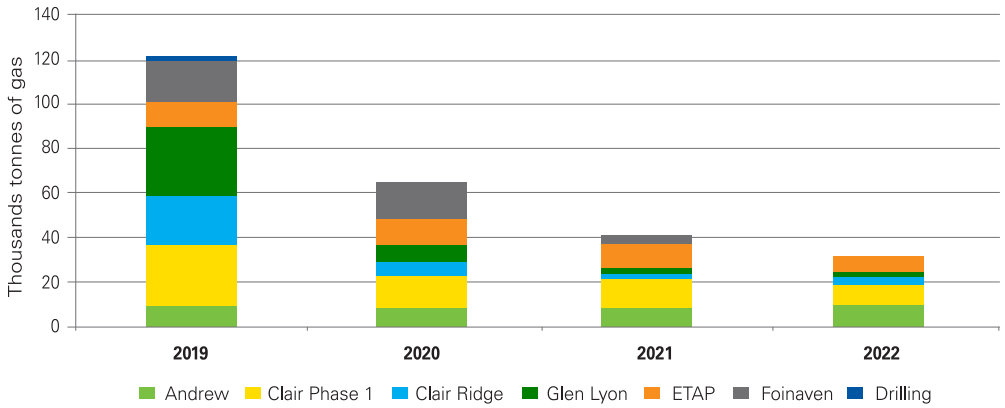


Figure 4: Total production gas flared between 2019 and 2022.

> In line with the industry aim to meet the World Bank Zero Routine Flaring initiative, the North Sea region has plans in place to eliminate routine flaring on all bp-operated production facilities by 2030.

Sustainable Emission Reductions

An important aspect of reducing operated emissions is delivering Sustainable Emissions Reductions (SERs), which are designed 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 2022 our SERs delivered circa 30 thousand tonnes CO_2e through 36 interventions, such as spinning reserve reduction, plant optimization and efficiency measures.

Sustainable Emissions Reductions (tonnes CO_2e)				
Asset	**2019**	**2020**	**2021**	**2022**
Andrew	3,495	6,681	3,115	11,889
Clair Phase 1	x	1,375	4,875	5,181
Clair Ridge	x	1,625	325	1,797
ETAP	3,000	20,750	7,250	1,951
Foinaven	x	x	700	x
Glen Lyon	1,000	10,750	16,743	9,697
Total	7,495	41,181	33,008	30,515

Table 1: North Sea SERs delivered between 2019 and 2022.

Carbon performance management

bp has in place a robust carbon performance management plan to support progress towards our Aim 1 targets. This comprises three key processes:

1. Installed emissions capacity
2. Emissions forecasting
3. Carbon bridge

Installed emissions capacity (IEC)

IEC is the lowest agreed rate of absolute emissions achievable using the resources currently available to the production facility, when under optimum operating conditions. The IEC approach sets carbon dioxide (CO2) targets derived from power demand for the planned production delivery, whilst emissions from flare and venting are calculated using the minimum design volumes. The offshore team feed directly into each element and effectively own the performance target. Weekly reviews are conducted to further embed carbon management into day-to-day operations.

bp uses the IEC process across its North Sea portfolio to support decision making, identify areas for improvement and drive alignment on GHG emissions as part of production management.

Emissions forecasting

Improved methodology for the forecasting of GHG emissions was introduced in 2022, with a bottom-up approach that improves accuracy and standardizes the process across our North Sea portfolio. By understanding energy users and flaring activity to meet associated production plans, each asset is able to build a more accurate forecast of emissions. This is useful, not only in planning and strategy, but also performance management as bp becomes a carbon lean operator.

Carbon bridge

Carbon bridge was also introduced in 2022, where overall carbon performance is displayed in the same format as production and water injection. The aim is to deliver operational understanding and embed carbon management in routine decision making. The bridge format is used for this purpose and is the tool to guide discussions on carbon management and help inform decision makers.

Methane emissions (Aim 4)

Methane emissions refer to releases of hydrocarbon gas (normally methane-rich in terms of composition) direct to the atmosphere, which has not been fully combusted. Common sources of methane emissions are fugitive emissions[3], venting[4] and the uncombusted flared gas. As an industry, methane emissions have historically been calculated and reported as opposed to direct measurements.

Part of bp's Aim 4 from our sustainability framework is to install methane measurement at all our existing major oil and gas processing sites by 2023.

Since 2019, we have completed 'top down' methane measurements for all our offshore installations in the North Sea using remote drone surveys. These surveys remotely monitor asset level methane from our production facilities using a fixed-wing drone fitted with advanced SeekOps sensors. Data from the flights was then used to create a two-dimensional map of methane emissions for each asset. We have also focused on the delivery of Aim 4 methane measurement solutions for combustion and flaring sources, which we aim to complete in the North Sea region by the end of 2023.

> bp global methane reduction efforts have been recognized as gold standard by the Oil and Gas Methane Partnership 2.0- a voluntary United Nations Environment Programme (UNEP) initiative.

> I successfully led the ETAP methane drone measurement flight, alongside an onshore support team. The drone flew to ETAP and circled the platform using a pre-programmed route, providing us with a broader view of our methane emissions.
>
> **Offshore Chapter Lead**
> **(Global Sustainability Network)**

[3] Fugitive emissions typically occur at very low activity levels but carry a much higher emissions factor compared, for example, to fuel or flare gas.

[4] Venting refers to the routing of hydrocarbon gas to an unignited flare tip (also called cold venting) or direct escape to atmosphere from process equipment (i.e. from storage tanks).

Produced water

Fluids produced from oil producing wells often contain large quantities of water as well as hydrocarbons. During processing, hydrocarbons are separated for export and the water, containing trace amounts of oil, is either reinjected into the reservoir or discharged to sea in accordance with the installation's oil discharge permit.

bp aims to minimize its oil discharge to environment by having produced water reinjection facilities on all our operated offshore installations, except for Andrew. As a result, 76% of total water produced by our operated facilities during 2022 was reinjected into the reservoirs (figure 5).

Produced water

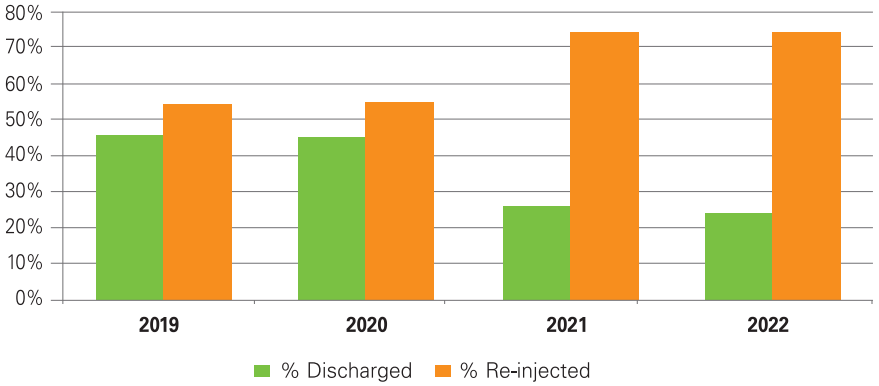


Figure 5: Total produced water reinjected and discharged ratio between 2019 and 2022.

Average oil concentration in produced water

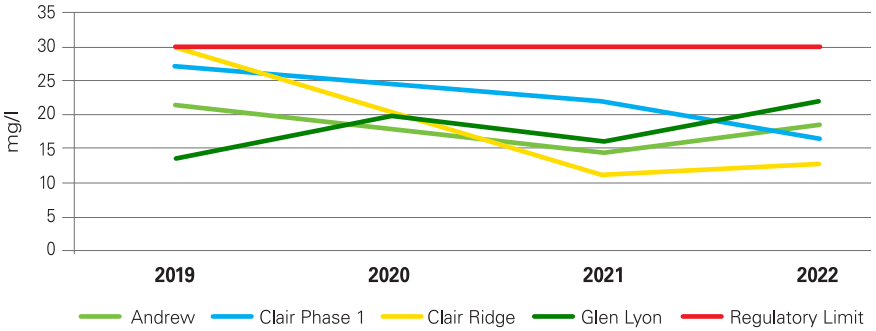


Figure 6: Annual average oil in produced water discharge between 2019 and 2022

Oil discharge permits are issued by the regulator and require the monthly average concentrations of oil dispersed in produced water to remain below 30 milligrams per litre (mg/l). All our operations in the North Sea have remained below this limit in 2022, as shown in figure 6. ETAP installation reinjects 100% of its produced water and therefore has no associated discharge to the marine environment.

The increase in the oil in produced water discharges in 2022 was associated with the Andrew installation- due to an increase of the total water produced volume and operational challenges with the water polishing systems (figure 7).

Total oil discharged in Produced water

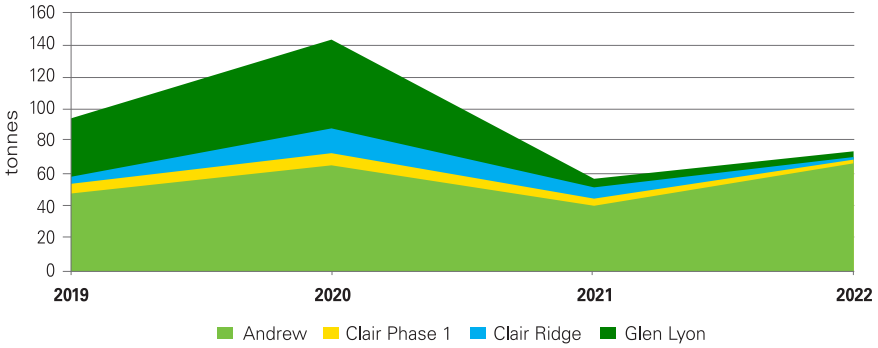


Figure 7: Total oil discharged in produced water between 2019 and 2022.

Chemicals

Chemicals are used during offshore operations to improve the flow of fluids, facilitate the separation of materials, prevent degradation and fouling of process equipment and in control systems. Subsea operations also use chemicals for flushing of pipelines to remove hydrocarbons before maintenance and inspection activities and for use in hydraulic control systems. The composition of these chemicals is diverse and their usage and discharge are permitted by the regulator. bp strives to limit its chemical discharges to marine environment and many of the chemicals used in our production operations are not discharged to the marine environment (figure 8).

As seen in figure 9, most of the chemical discharges (57%) from bp production operations were classed as posing little or no risk to the marine environment (PLONOR) and 18% were chemicals with a substitution warning (SUB[5]). While chemical requirements on Glen Lyon are higher than our other installations due to the specific properties of the produced fluids, the majority of the chemicals discharged were classed as PLONOR.

bp has been working with our chemical suppliers to assess further reduction in the use and discharge of chemicals that carry a substitution warning. This has resulted in the removal of four chemicals with substitution warnings from our production chemical permits in 2022.

Production chemicals used

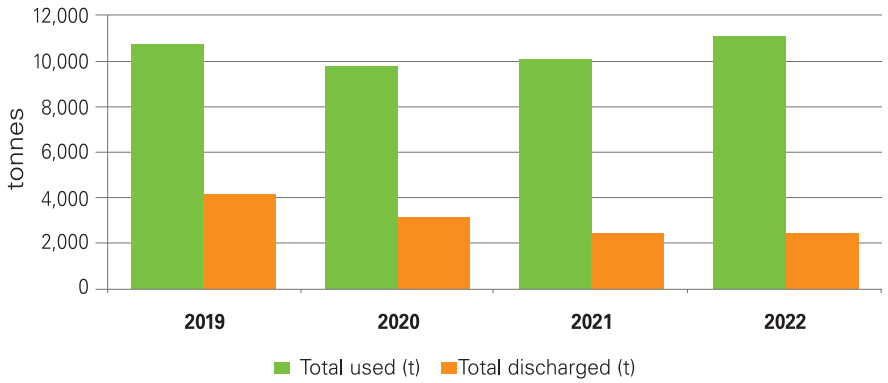


Figure 8: Total permitted production and subsea chemical use and discharge between 2019 and 2022.

Chemicals discharged

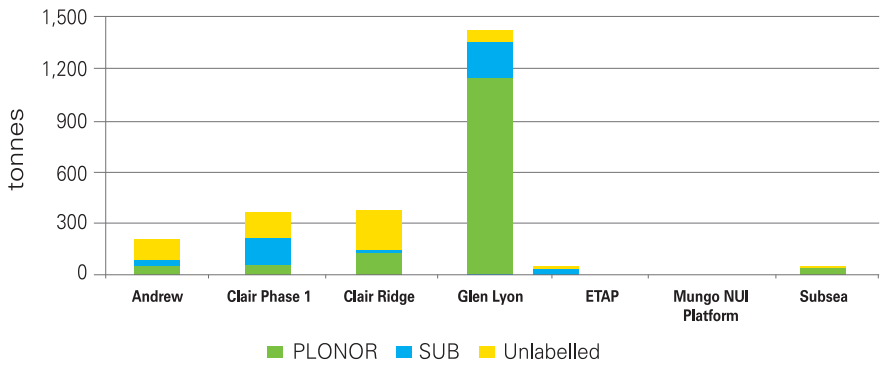


Figure 9: Total permitted production chemicals discharged during 2022.

[5] Offshore operations in the UK are required to comply with an OSPAR harmonised pre-screening scheme and comply with REACH recommendation to replace chemical substances identified as candidates for substitution (SUB). Substances are flagged with a substitution warning based on their toxicity, bioaccumulation, and biodegradability.

Operational waste (tonnes)

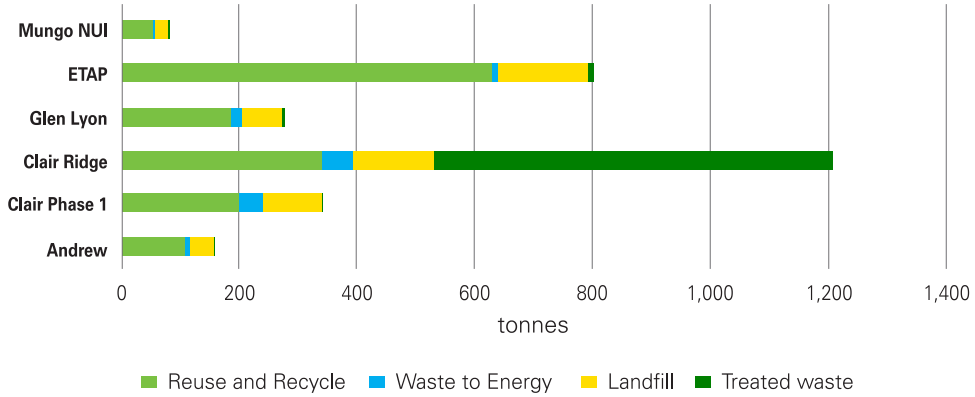


Figure 10: Total waste reported during 2022.

Special waste (tonnes/year)

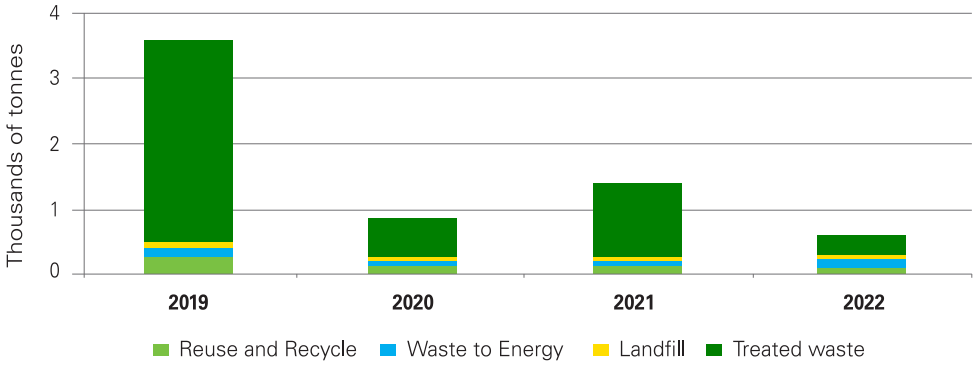


Figure 11: Special waste reported between 2019 and 2022.

Operational waste

Waste from offshore installations is sent to shore for treatment and disposal. Where possible, the preference is for waste to be reused, recycled and used in waste-to-energy facilities. During 2022, 53% of our offshore waste was either reused or recycled and 18% was sent to landfill (figure 10).

The large quantity of treated waste on Clair Ridge is attributed to waste liquids and sludges, including those fluids generated from tank washing activities. This waste is sent for treatment where the material is physically and chemically treated to remove contamination and then discharged to sewers.

Special waste (wastes with hazardous properties) includes paints, hazardous chemicals, oils, batteries, aerosols, heavy metals, wax from pigging operations and oily waste. Quantities of special waste generated by bp's North Sea installations decreased by 83% in 2022 compared to 2019, mostly associated with a decrease of liquids and sludges sent for treatment from Clair Ridge (figure 11).

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 bp operated installations are shown in figure 12.

General waste (tonnes/year)

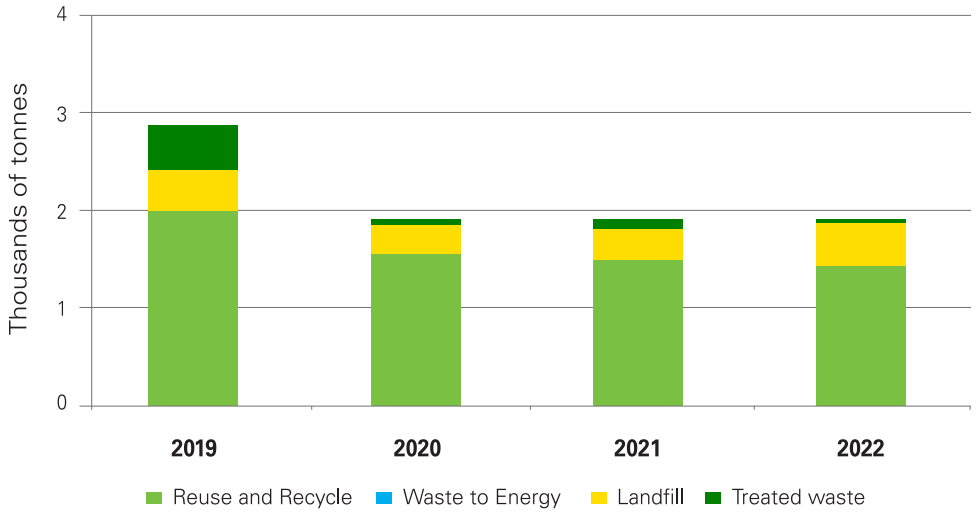


Figure 12: General waste reported between 2019 and 2022.

"The first sustainability change we made as a team was the removal of all single use plastic shoe covers on ETAP, replacing them with reusable / washable cotton overshoes shoes. This made a huge saving in cost, but more importantly, in single use wastage. Prior to this change, one individual could go through up to 10 single use covers in one day- now they potentially use the same reusable pair for their full three-week trip."

Offshore Chapter Lead (Global Sustainability Network)

Drilling and well intervention summary

During 2022, bp drilled and completed four platform wells from Clair Ridge. The Well Enhancer light well intervention vessel completed two well interventions at the Foinaven and Schiehallion fields.

As part of drilling and intervention operations, approximately 9,800 tonnes of chemicals were used, of which approximately 2,000 tonnes were discharged in accordance with environmental permits as shown in figure 13 below. Of the discharged chemicals, 96% by weight were classed as PLONOR.

The Clair Ridge platform reinjected approximately 1,200 tonnes of cuttings and discharged a further 2,400 tonnes of water-based mud to the marine environment in 2022.

Drilling waste includes special wastes such as hazardous completion, workover and drilling fluid additives. Drilling waste generated by drilling activities on Clair Ridge have been included in Section 8.

Drilling cuttings and chemicals

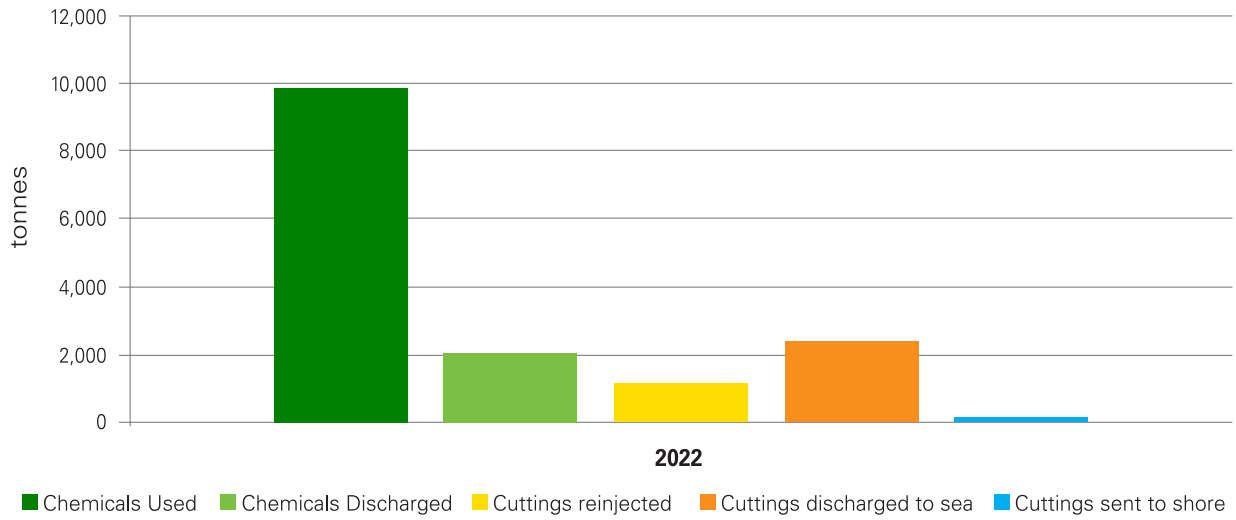


Figure 13: Drill cuttings (reinjected, discharged and disposed to landfill) and drilling chemicals used and discharged in 2022.

bp North Sea UK HSE Policy

bp's commitment to **health, safety** and **environmental** (HSE) performance

Our HSE goals are simply stated:

no accidents, no harm to people and **no damage to the environment.**

We strive to be a safety leader in our industry, a world-class operator, a good corporate citizen and a great employer. Nothing is more important to us than the health, safety and security of our workforce and the communities in which we operate, and behaving responsibly towards our shared environment. We must be vigilant, disciplined and always looking out for one another.

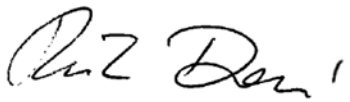
We are committed to:

- complying with applicable laws and company policies and procedures
- systematically managing our operating activities and risks
- reporting our HSE performance
- learning from internal and external HSE events

In the North Sea our mission is to achieve zero life changing injuries, zero serious process safety events and have the lowest possible environmental impact, emissions, and methane intensity. We therefore expect all staff and contractors to stop work when there is an unsafe act or condition, non-compliance with legislation or when unable to meet bp requirements.

Everyone who works for bp has a part to play in meeting our HSE commitment. Our Safety Leadership Principles are an important guide on how we can achieve this. Together we:

1. Genuinely care about each other
2. Will not compromise our focus on safety
3. Encourage and recognize speak up
4. Understand how work actually happens
5. Learn why mistakes occur and respond supportively



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19 October 2022 (updated 3 yearly)

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