

# REPSOL SINOPEC RESOURCES UK LIMITED

2022 ENVIRONMENTAL STATEMENT



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**At Repsol Sinopec we recognise that emissions reduction and energy transition is a societal shift to a lower-carbon future and that we must play our part. We are focused on emissions management and reducing the carbon intensity of our operations and are aligned to the 2050 Net Zero goal.**

In 2022, we further reduced our greenhouse gas emissions (expressed as CO<sub>2</sub> equivalent) by 113,000 tonnes, which remains in line with Phase 1 of our Emissions Reduction Roadmap.

Our total mass of oil and produced water discharged to sea also reduced, with overall oil in water performance remaining within regulatory limits. In parallel, we are implementing further improvements to water handling facilities. Chemical use and discharges remained consistent with the previous year.

The number of accidental oil and chemical spills in 2022 also remained consistent with the previous year, with unplanned spills being thoroughly investigated and rectified.

We continued to work with our waste management vendor and subcontractors through 2022, which has led to a further reduction in waste generated versus the previous year. Furthermore, through onshore sorting, the volume of waste to landfill was reduced.

Despite these improvements, we continue to set ourselves demanding year on year environmental improvement targets.



Darren Stoker  
**Chief Technical Officer**

# UK OPERATIONS



## Fields and Installations

Our principal UK operating areas, (shown below) encompass a total of 49 fields, 11 operated assets and two onshore terminals detailed in Tables 1 and 2.



## Oil & gas production

Oil reservoirs contain a mixture of oil, water and natural gas. A primary purpose of an offshore production platform is to separate out the extracted 'well fluids' into these three separate components using separation vessels. Once the oil has been separated from the gas and water, it is pumped to shore via subsea pipelines; or, in the case of oil from the Ross and Blake fields, shipped to shore. The gas is dried and then compressed. Some of the gas, where possible, is used to generate power to run the process equipment on site and the remainder of the gas is exported via pipeline to the UK mainland (see Table 1), used for gas lift, or flared.

The proportion of oil, gas and water produced from reservoirs changes over time. Oil and gas production will decrease and the volume of water will increase. The separated water, known as produced water, is managed, cleaned and processed to reduce oil droplets prior to discharge to sea.

## Drilling

As the fields mature and more information about the reservoirs becomes available, more wells may be drilled or existing wells revisited. This can be done either from the platform, or with mobile drilling rigs. Geological information and production tests determine how many wells are needed to produce the oil and gas efficiently.

**HYDROCARBON EXPORT ROUTES** Table 1

Installation	Oil	Gas
Arbroath	Via Montrose	Via Montrose
Auk	Via Fulmar	N/A
Beatrice <sup>1</sup>	Nigg Oil Terminal <sup>2</sup>	N/A
Bleo Holm	Shuttle Tanker	Frigg Pipeline
Buchan <sup>#</sup>	Forties Pipeline	N/A
Claymore	Flotta Pipeline	N/A
Clyde	Norpipe Pipeline	SEGAL System
Fulmar	Norpipe Pipeline	SEGAL System
Montrose	Forties Pipeline	CATS Pipeline
Piper B	Flotta Pipeline	Frigg Pipeline
Saltire <sup>1</sup>	Via Piper B	Via Piper B
Tartan <sup>1</sup>	Flotta Pipeline	Frigg Pipeline

**FIELDS & INSTALLATIONS** Table 2

FIELD	BLOCK	INSTALLATION
Arbroath	22/17n, 22/17s, 22/18 & 22/18n	Arbroath
Arkwright	22/23a	Arbroath
Auk	30/16n,t	Auk
Auk North <sup>2</sup>	30/16n,t	Fulmar
Beatrice <sup>2</sup>	11/30a	Beatrice Complex <sup>1, 2</sup>
Beaully	16/21	Balmoral <sup>#</sup>
Blake	13/24a,b	Bleo Holm
Brechin	22/23a	Montrose
Buchan <sup>2</sup>	21/01	Buchan <sup>#</sup>
Burghley	16/22	Balmoral <sup>#</sup>
Carnoustie	22/17s	Arbroath
Cayley	22/17s	Montrose
Chanter <sup>2</sup>	15/17	Piper B
Claymore 14/19	14/19	Claymore
Claymore 14/20b	14/20b	Claymore
Clyde	30/17b	Clyde
Duart <sup>2</sup>	14/20b	Tartan <sup>1,2</sup>
Enoch	16/13a	Brae*
Flyndre	30/13 & 30/14	Clyde
Fulmar <sup>2</sup>	30/11b & 30/16s	Fulmar <sup>3</sup>
Galley <sup>2</sup>	15/23	Tartan <sup>1,2</sup>
Godwin	22/17n & 22/17s	Arbroath
Halley <sup>2</sup>	30/11b & 30/12b	Fulmar <sup>3</sup>
Hannay <sup>2</sup>	20/05c	Buchan <sup>#</sup>
Highlander <sup>2</sup>	14/20	Tartan <sup>1,2</sup>
Iona <sup>2</sup>	15/17	Piper B
Leven	30/17b	Clyde
Medwin	30/17b	Clyde
Montrose	22/17n & 22/17s	Montrose
Nethan	30/17b	Clyde
Orion	30/18	Clyde
Petronella <sup>2</sup>	14/20	Tartan <sup>1,2</sup>
Piper	15/17	Piper B
Ross	13/27 & 13/29	Bleo Holm
Saltire <sup>2</sup>	15/17	Saltire <sup>1, 2</sup>
Scapa	14/18	Claymore
Shaw	22/22a	Montrose
Tartan <sup>2</sup>	15/16	Tartan <sup>1,2</sup>
Tartan North Terrace <sup>2</sup>	15/16b	Tartan <sup>1,2</sup>
Tweedsmuir	21/01c	Piper B
Wood	22/18	Montrose
Andrew*	16/27a	Andrew*
Balmoral*	16/21a,b & c	Balmoral*
Blane	30/03	Ula*
Glamis*	16/21a	Balmoral <sup>#</sup>
MacCulloch*	15/24b	North Sea Producer <sup>#</sup>
Stirling*	16/21b,c	Balmoral <sup>#</sup>
Wareham*	SY/88b, SY98a & SZ/8a	Onshore
Wytech Farm*	SY/88b, SY98a & SZ/8a	Onshore

\* Not operated by the company therefore data is not included in this report.

<sup>#</sup> Installation no longer at location

<sup>1</sup> Installation Not Normally Attended (NNA)

<sup>2</sup> Field / Installation no longer in production

<sup>3</sup> Installation acts as production hub for Clyde and Auk, but with no native production

# ENVIRONMENTAL MANAGEMENT

The company has an integrated Safety and Environmental Management System (SEMS). The environmental elements of the system have been independently verified as meeting the requirements of the Oslo-Paris Convention (OSPAR) Recommendation 2003/5 to promote the use and implementation of Environmental Management Systems by the offshore industry.

## Minimise impact and continuous improvement

Our environmental commitment, as outlined in our corporate HSE policy, is to minimise our impacts and always comply with the law or the company's standards, whichever are higher. All environmental aspects including climate change, air quality, water quality and waste are issues that receive constant attention to minimise our environmental impacts. The environmental impacts from oil and gas exploration and production activities have been minimised as far as practicable through the design of the installations and subsequent modifications made to plant and process.

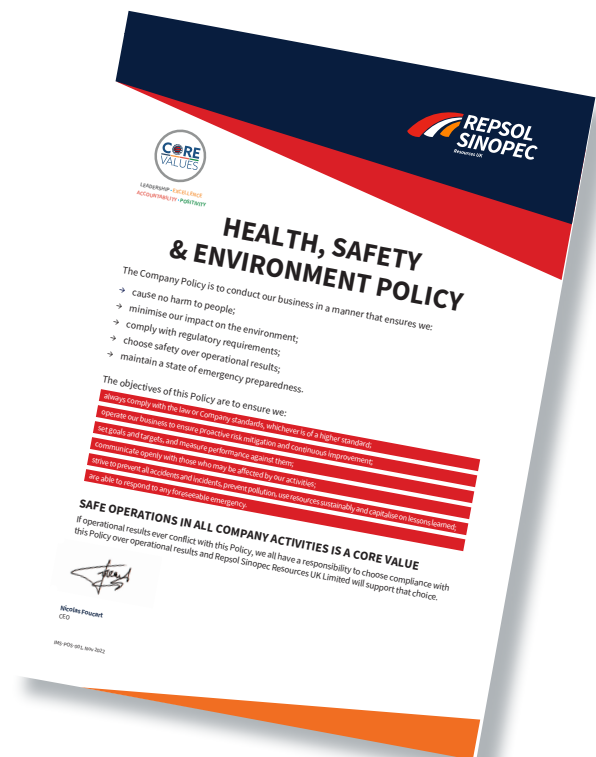
## We follow a two-phase environmental management strategy

The first phase consists of the identification and characterisation of our environmental impacts to determine their significance and how to manage them. This considers local environmental sensitivities, company and legislative performance standards and stakeholder concerns.

The second phase involves the development and implementation of environmental management strategies that are integrated with business and operational systems, and are integral to all company performance improvement objectives: such as safety, installation integrity and security of supply.

## Targets and objectives

Our Executive Committee sets annual environmental targets against which performance is tracked. Each is set with a view to achieving the overarching objective of continuous improvement. To ensure all of our installations work towards achieving the targets, a performance contract is agreed with the site leadership team and company personnel.



Our Corporate HSE Policy

## Permits and consents

Our conduct in the North Sea is governed by a range of legislation and we are required to hold a number of permits and consents that authorise our operations. These permits and consents come with detailed operating conditions to which we must adhere.

We track and investigate non-compliance (permit breaches) to measure and continually improve the effectiveness of our systems, processes and procedures.

# ENVIRONMENTAL MANAGEMENT BY DESIGN AND MAINTENANCE

**Our installations are designed and maintained to minimise their environmental impact.**

**Primary impact mitigation measures have been integrated into the design of the facilities and include:**

- Closed system processes to safely contain reservoir fluids in vessels and flow lines under all process conditions.
- Pressure, temperature, flow control and shutdown systems to maintain safe operating conditions at all times.
- Bunding of areas with a potential for spills.

**Secondary defence measures are those that relate to the operation of the facilities and include:**

- Corrosion prevention and monitoring programmes and preventative maintenance programmes ensure that vessels, flow lines, valves, fittings and equipment remain in a safe operating condition.
- Consideration of all potential accident/emergency scenarios to ensure procedures and resources are in place for prevention, control and mitigation.
- Procedures to minimise operational leaks and spills and ensure availability of clean-up equipment to deal with spillages.
- Training of personnel to operate and maintain the above safeguards in good working order.

**ENVIRONMENTAL PERFORMANCE**

# **GREENHOUSE GAS EMISSIONS**





The company recognises the importance of emissions management and reducing the carbon intensity of its operations. It is the company's expectation that all our operations are conducted in a manner that strives for good emissions management seeking emissions reduction in line with or better than the 2050 Net Zero emissions goal.

The Company is following its own road map to the 2050 Net Zero emissions goal. Whilst this is aligned to the Oil and Gas UK's Road Map to Net Zero, it details the key steps the Company believes it will need to take in order to achieve Net Zero.

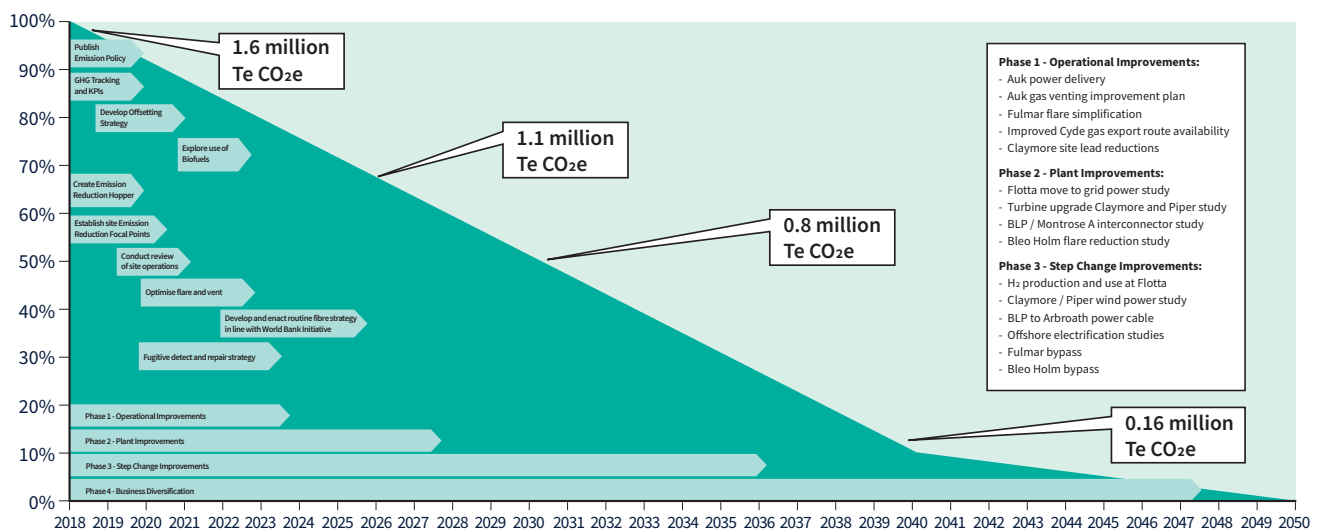


Figure 1  
Emission Road Map to Net Zero 2050

One such step has been the development and publication of a Greenhouse Gas (GHG) emissions management policy, which has a purpose to establish and communicate the leadership commitment to Emissions Management and the 2050 Net Zero emissions goal by the board, Executive Committee (ExCom), Executive Management Team (EMT), Senior Management, Employees and Key Contractors. Furthermore, the Company has incorporated the Net Zero goal into its corporate strategy. Additionally, each of the Company's operational sites have an Emission Reduction Action Plan (ERAP) which meet the requirements of the NSTA's Stewardship Expectation 11, the North Sea Transition Deal and OEUK's Methane Action Plan.

Since 2018 the Company has executed a number of emission reduction initiatives which have helped reduce atmospheric emissions. These are summarised in the publication Repsol Sinopec Resources UK 2022 Carbon Emissions Report.

The Company continues to explore opportunities for emissions' reductions across our portfolio, these opportunities fall into 4 broad improvement categories:

**Phase 1 - Operational Improvements:** Delivering emissions reductions by changing the way we operate our existing plant and equipment

**Phase 2 - Plant Improvements:** Delivering emissions reductions by plant upgrades and operational philosophies

**Phase 3 - Step Change Improvements:** Delivering emissions reductions by larger scale changes such as platform electrification, deployment of renewable power sources, CCS and hydrogen

**Phase 4 - Business Diversification:** Delivering emissions reductions by diversifying from oil and gas production

**2022 Emissions Performance:**

The extraction and processing of oil and gas is energy intensive. During normal operations, installations burn natural gas and diesel for power. In addition, any natural gas extracted from the reservoir, which cannot be used or exported, must be flared for safety reasons.

The level to which different GHG's contribute to Climate Change depends on the gas. For example, 1 tonne of methane (CH<sub>4</sub>) has a much higher global warming potential than CO<sub>2</sub>. To fully reflect the impact of our operations, GHGs are combined and expressed as tonnes of CO<sub>2</sub> equivalent (CO<sub>2</sub>e). In this report all references to CO<sub>2</sub>e figures assume one tonne of CH<sub>4</sub> to be equivalent to 25 tonnes of CO<sub>2</sub>. We also use Production Carbon Intensity, that is, the tonnes of CO<sub>2</sub>e produced per unit of production (1000 Barrels Oil Equivalent (BOE)) as a measure of production efficiency from a climate change perspective.

# GREENHOUSE GAS EMISSIONS



Figure 2

CO<sub>2</sub> Equivalent emissions and production intensity annual trend (2019 - 2022)

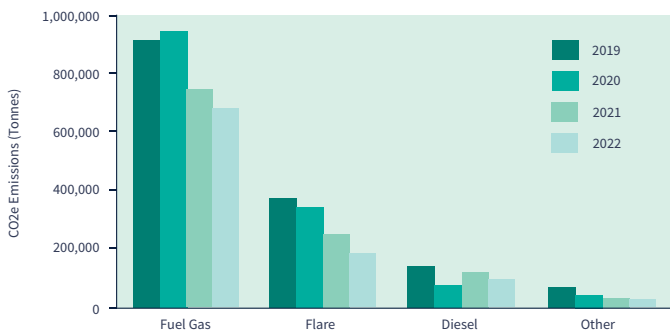


Figure 3

CO<sub>2</sub> Equivalent emissions by source stream (2019 - 2022)

Figure 3 shows the contribution of CO<sub>2</sub>e from each source stream over the last 4 years. The company continues to optimise the use of fuel gas and avoid using diesel, however a number of unplanned shutdowns over the course of the year has contributed to the reduction in emissions from fuel gas and contributed to the emissions from diesel. As with previous years, emissions from flare performance continues to improve. Whilst the previously mentioned unplanned shutdowns contributed to this, across the assets there has been a continued focus on minimising flare through compressor tuning, identifying flare sources and reducing, where possible, improved performance of gas sweetening plant. “Other” includes emissions from venting and fugitive emissions also continue to decrease, again this is due to maintaining steady operations, reducing cold flaring / venting in favour of hot flaring (whilst hot flaring continues to have a CO<sub>2</sub> emission, the amount of CH<sub>4</sub> emitted is much less than cold flaring / venting).

## Emissions from Drilling

Repsol Sinopec Resources UK implemented the drilling of Blake B8Y well with Stena Don MODU, that lasted during June – September 2022. Actual CO<sub>2</sub> emissions, that resulted from this project, were much lower than forecasted in project permit applications:

- CO<sub>2</sub> emissions from combustion engines – 6,120 tonnes (vs. forecasted 9,901 tonnes)
- CO<sub>2</sub> emissions from well clean-up flare operations – 13.7 tonnes (vs. forecasted 6,742.8 tonnes)

## 2022 ETS Performance

The UK Emissions Trading Scheme (UK ETS) came into force in 2021, after the withdrawal of the UK from the European Union. The premise of the UK ETS is fully-aligned with that of the European Union Emissions Trading Scheme (EU ETS) which was complied with prior to 2021. The UK ETS is the primary financial means used to incentivise the reduction of CO<sub>2</sub> emissions from larger industrial installations. The basic principle is that at the end of each year qualifying installations must surrender an “emissions allowance” for each tonne of CO<sub>2</sub> emitted. Some emission allowances are issued free of charge to the installation at the beginning of the year, with the remainder required to be purchased.

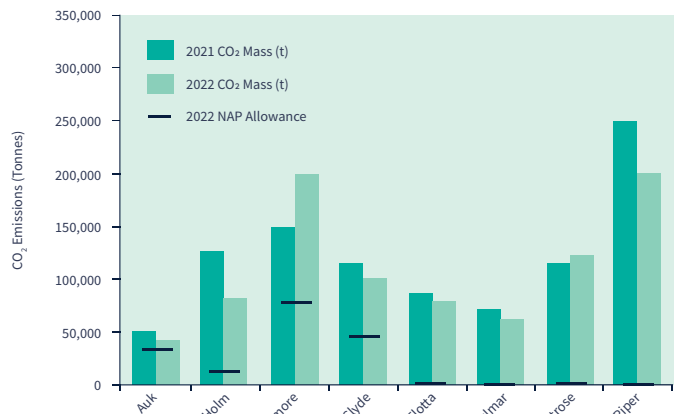


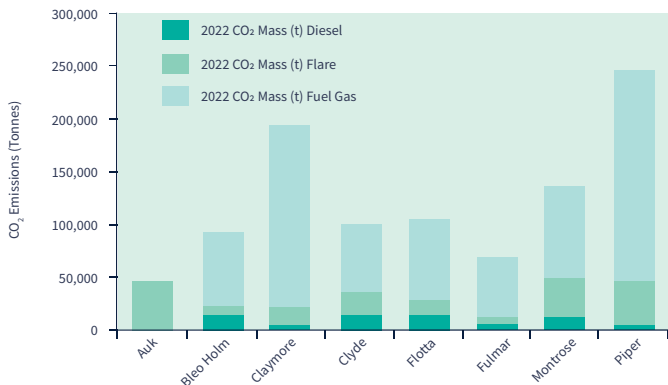
Figure 4

2021 / 2022 UK ETS CO<sub>2</sub> emissions and free allowance per installation

Figure 4 shows the total installation emissions against the total free allowance provision. UK ETS qualifying emissions relate to CO<sub>2</sub> resulting from combustion only and does not take into account the CO<sub>2</sub> equivalency for methane and other uncombusted GHG's. This shows that not all sites qualify for a free allowance allocation. For example, our onshore terminal, Flotta, is deemed an electricity generator as it exports to the grid. At the time of applying for free allocation under Phase IV of the ETS; Fulmar's operational mode was changing, and it was determined that the installation would qualify for very little if any at all allowances. Therefore, a decision was made not to apply and hence it does not receive an allocation.

# GREENHOUSE GAS EMISSIONS

**Figure 4** also highlights that the majority of installations have either maintained or reduced the quantity of UK ETS qualifying CO<sub>2</sub> emissions emitted in 2022 compared to 2021. The reduction in CO<sub>2</sub> emissions from 2021 to 2022 by Bleo Holm is a result of the extended shutdown in early 2022. Claymore has returned to normal operations after a shutdown in 2021 and the increased CO<sub>2</sub> emissions in 2022 reflect that change.



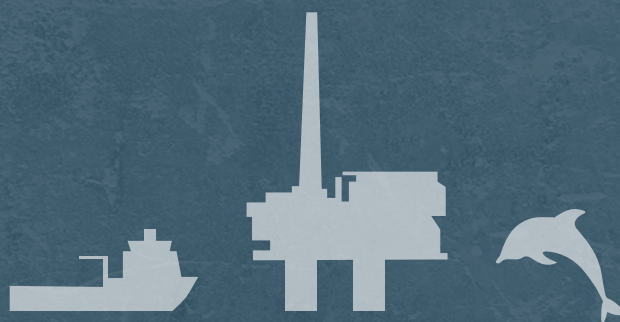
**Figure 5**

2022 UK ETS CO<sub>2</sub> emissions by source stream split per installation

As the data has shown the majority of assets have reduced the quantity of UK ETS qualifying CO<sub>2</sub> emissions emitted in 2022 (when compared to 2021). **Figure 5** highlights the individual contribution of the source streams that contribute to the total CO<sub>2</sub> emissions. The company is continually striving to optimise hydrocarbon fuel use and flaring activities in order to proactively reduce CO<sub>2</sub> emissions, in line with our GHG Emissions Management Policy and drive to ensure a more sustainable business moving forward.

**ENVIRONMENTAL PERFORMANCE**

**DISCHARGES  
TO SEA**

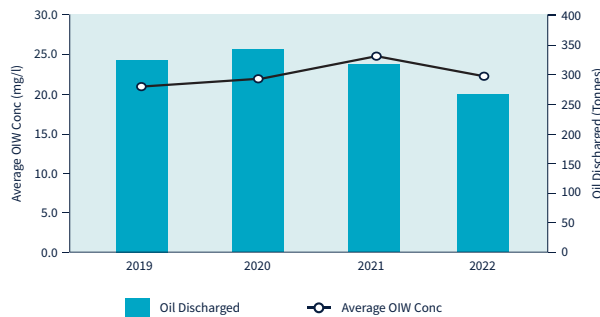


# OIL IN PRODUCED WATER (OIW)

The fluid extracted from our oil wells contains a mixture of oil, entrained gas and water. The primary function of our offshore installations is to separate the oil, gas and water before sending the oil onshore and either reusing the produced gas as fuel, using it to aid lift in wells, or combusting it in the flare. The water is treated before it is safely discharged to sea.

To protect the marine environment, industry regulators place strict limitations on both the concentration and quantity of oil discharged in produced water, with a drive towards minimising these discharge concentrations. At these low concentrations, the entrained oil quickly disperses and is broken down by weathering and/or is biodegraded by marine microorganisms. The UK government enforces a standard, internationally agreed, emission limit value of 30 mg of oil per litre of produced water discharged (flow weighted average over one month), to which all our offshore installations must adhere to.

The total volume of produced water discharged from our assets during 2022 was 11,968,980 m<sup>3</sup>. This discharge contained 264 tonnes of dispersed oil at an average concentration of 22.08 mg/l.



**Figure 6**  
Annual Average Oil in Water Concentration (mg/l) and Total Mass of Oil Discharged to Sea (tonnes)

**Figure 6** shows an 18.4 % decrease in the total mass of oil discharged to sea in 2022 relative to 2021. This decrease in mass is directly linked to not only the volume of produced water discharged, but also the concentration of oil within each discharge stream. Across our installations we saw a modest 7.1 % decrease in produced water volume on the previous year. This can be linked to wells being offline and both Bleo Holm and Piper having periods of production outage in Q1 and Q4 respectively.

**Figure 6** presents a 12.1 % decrease (3.05 mg/l) in the Company average OIW discharge concentration for 2022 compared to 2021. This decrease can be attributed to prolonged asset outages as well as improvements in produced water management such as Clyde's new produced water polishing skid. Any OIW discharges in excess of 100 mg/l were notified to the environmental regulator as OPPC non-compliances and are generally attributed to process upsets and/or poor separation facilities linked to deteriorating weather in the case of Bleo Holm FPSO. The Company average OIW discharge continued its downward trend, with the average concentration (22.08 mg/l) remaining below the permitted limit of 30 mg/l (av). In 2022 a reduction in the company average OIW concentration correlated with a reduction in the oil mass discharged to sea.



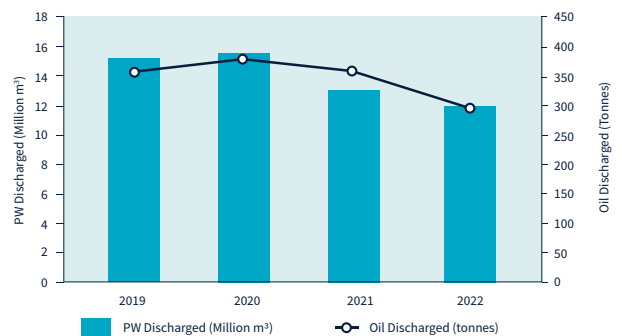
**Figure 7**  
Installation Oil in Produced Water Performance

**Figure 7** illustrates the annual average OIW concentrations for each operating installation in 2022 with 2021 as a comparison. With the exception of Bleo Holm, all other installations achieved better than the 30 mg/l threshold for discharges to sea in 2022.

The North Sea is a harsh environment and inclement weather/sea states are not uncommon, during such instances the Bleo Holm FPSO experiences vessel rolling. The rolling motion has a consequence on the effectiveness of the separation system resulting in the inability to efficiently polish the discharge stream. As a result, during such periods, higher than normal concentrations of oil are discharged within the produced water stream. This ultimately had a knock-on effect to the annual average OIW concentration for the installation, which for 2022 was 40.83 mg/l.

The elevated OIW values experienced by Montrose and the Montrose BLP throughout 2021 have been effectively managed in 2022 with their yearly average OIW concentration (28.3 mg/l) dropping below the 30 mg/l threshold level.

The Company proactively monitors OIW compliance across the sites and where relevant Produced Water Improvement plans are generated to support the return of sites into compliance. Such improvement plans are in place for Bleo Holm.



**Figure 8**  
Annual Discharge Mass of Oil and Volume of Produced Water

**Figure 8** highlights a decrease in mass (59.5 tonnes) of oil discharged to sea throughout 2022 in comparison to 2021. Correlated to this is a 7.1 % reduction (912,486 m<sup>3</sup>) of produced water discharged in 2022 compared to 2021. This reduction when comparing against 2021 can be attributed to shutdowns of the Piper Installation in Q4 and Bleo Holm in Q1/2 of 2022.

Due to the nature of produced water, discharges can occasionally give rise to an oil sheen on the sea surface around the installation. Periodically, either due to poor plant performance resulting in sustained higher oil in waters, or calm weather, sheens can extend larger distances from the discharge point. Any notifications of sheens reported on our installations are investigated, and, if necessary, steps taken to rectify the cause. Where these sheens are considered more significant than normal, and extend outside the Installation 500 m zone, we are required to notify the environmental regulator via a PON1 Permitted Discharge Notification (PDN). During 2022 the Company raised no such notifications which were attributed to significant sheens extending beyond the 500 m for our Installations.

# PRODUCTION CHEMICALS

The Company uses a variety of chemicals within the offshore production process. Chemicals are used to maintain and operate subsea infrastructure, improve the flow of fluids from the reservoir, aid separation, prevent corrosion and prevent or remove deposited solids within vessels and flow lines. Production chemicals are then either exported with oil to shore, degraded within a closed loop system or discharged to sea in the produced water stream.

The use and discharge of production chemicals offshore is tightly regulated through the approval of a chemical permit for each installation or activity: production operations, pipeline operations, well intervention and drilling activities. An approved permit will incorporate regulatory limits for each chemical used and discharged and is issued under the Offshore Chemical Regulations (OCR) 2002, as amended. These regulations implement the OSPAR Decision 2000/2 on Harmonised Mandatory Control System (HMCS) for the Use and Reduction of the Discharge of Offshore Chemicals on the UK Continental Shelf. Fundamental to this, HMCS requires the comprehensive testing, ranking, hazard assessment and management of chemicals and the substitution of chemicals where less hazardous alternatives are available. The Company ensures all production/operation chemicals used during our offshore activities are used under permit and undergo the associated assessments. Chemical use is managed through internal assurance activities including permit compliance and reviewed for opportunities to improve environmental performance. Usage and discharge rates are reported back to the environmental regulator on a quarterly basis, or at the end of the term for non-production permits.

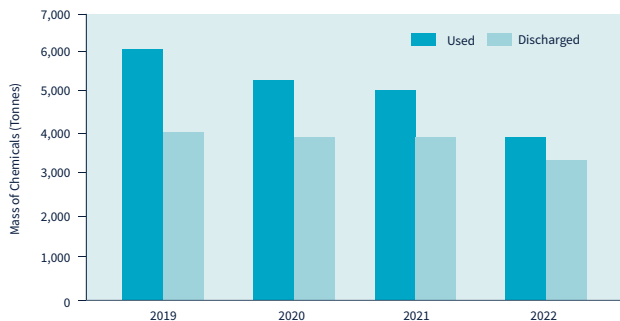


Figure 9  
Production Chemicals Used and Discharged

Figure 9 illustrates that there has been a decrease in production chemical use and discharge in 2022 as compared to 2021. The decrease can primarily be associated with extended production outages (in the region of 2-4 months) on the Bleo Holm, Clyde and Piper assets. A return to operation of the Piper amine plant and a water injection system outage, also contributed to the overall decrease in chemical use and discharge in 2022.

Platforms showing an increase in chemical use and discharge during 2022 included Montrose and Claymore. Montrose increased the use of corrosion inhibitor after a chemical was swapped-out for one with a reduced environmental impact, in early 2022. Claymore operated with increased plant up-time in 2022 as compared with 2021 and had a corresponding increase in chemical usage as a result.

There is a focus to operate our assets on 'steady state production' and minimise 'start ups' as this optimises chemical application. In 2022, this contributed to an overall reduction in chemical use and discharge.

Some of the production chemicals used and discharged have a substitution (SUB) warning. This means they contain components, or a component, that may present a hazard to the marine environment.

An important part of the HMCS is the phasing out and replacement of these harmful chemicals for more environmentally acceptable alternatives.

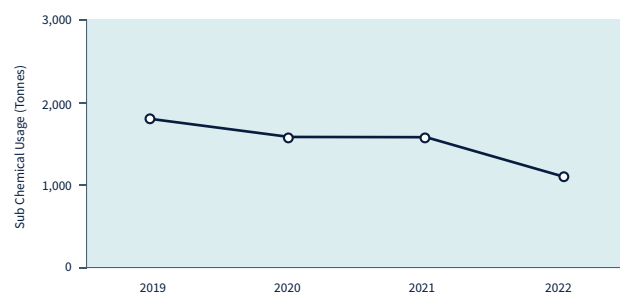


Figure 10  
Usage of Chemicals with Substitution Warning 2019 - 2022

Figure 10 shows a decrease in the use of chemicals with SUB warnings in 2022 compared to previous years. The reduction in the use, and associated discharge, of chemicals with a SUB warning in 2022 can primarily be attributed to production downtime on Bleo Holm, Clyde and Piper. The 2022 reduction also captures the corrosion inhibitor swap-out on Montrose.

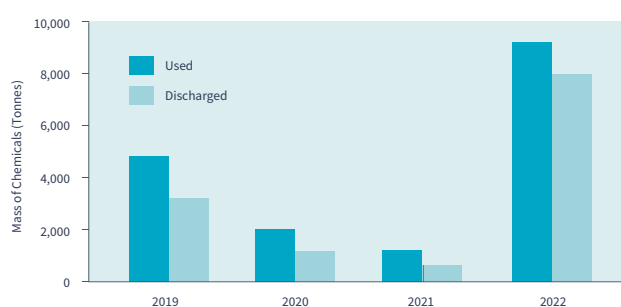
To reduce the number of chemicals with a SUB warning used on our installations we work closely with chemical vendors to seek alternatives. Part of this process assesses performance, overall hazard and volumes used and discharge route. These aspects drive the calculated Risk Quotient (RQ) reflecting environmental impact as a whole and allow prioritisation of swap-out.

Internal Assurance Reviews on an installation/permit basis focus on SUB warning chemical use, with both existing and alternative vendors, seeking to identify newly developed chemistries and implement field trial assessments where laboratory-based evaluation indicates comparable performance and reduced environmental impact. It should be noted however, that where bespoke chemicals were developed to uniquely address specific production issues; this is often challenging and change timelines can be lengthy. Periodic reassessment of chemical RQ and SUB classification occasionally results in established chemistries gaining SUB warning categorisation. The Company commits to reduce the number of chemicals with a SUB warning by reviewing options regularly and reporting progress to the industry regulator annually.

# DRILLING, WELL INTERVENTION AND PIPELINE CHEMICALS

During 2022, the Company continued Drilling, Well Intervention and Pipeline Operations. Chemicals are required to facilitate well interventions and ensure safe handling of drilling and subsea pipelines operations. All chemicals used in these operations undergo a planned selection and approval process to optimise the integrity and performance of the processes they are used in. Where possible, ‘greener’ products are introduced and brought into use where efficiency and safety of operations is not compromised

**Figure 11** indicates that total chemical consumption across drilling, well interventions and pipelines offshore operations saw a significant increase in 2022 compared to three previous years. Respectively, 2022 saw an increase in chemicals discharge.



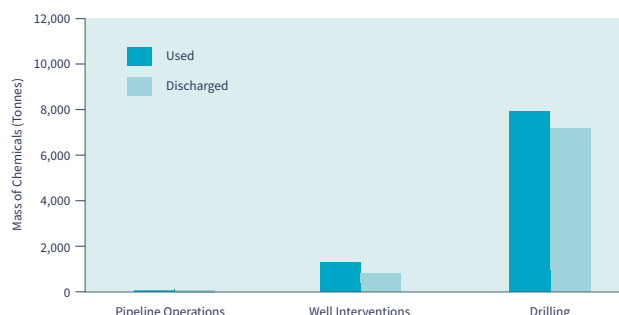
**Figure 11**  
Total Chemicals Used and Discharged During Drilling, Well Interventions and Pipeline Operations

This increase directly correlates to new drilling programmes as compared to 2019 – 2021. In 2022, drilling was resumed by re-infilling Piper Bravo wells 15/17-B20 (G-Target) and 15/17-B21 (D-Target) and Blake well 22/22a-B8y. All three wells were completed and brought to production. Subsea pipeline was constructed to tie Blake well 22/22a-B8y to Blake Manifold which constitutes part of Bleo Holm FPSO production system.

Buchan & Hannay Phase 1 Plug and Abandonment (P&A) was completed for Buchan J2 West and Exploration & Appraisal (E&A) 03 and Hannay H01 & H02 wells. Routine well interventions were carried out across all assets as planned. Annual well maintenance routine works include: scale inhibitor squeeze injection, scale soak operations, annulus top-ups, pressure testing and flushing of lines.

As shown in **Figure 12**, the main portion of chemical use and discharge resulted from drilling operations. Decommissioning was also a key focus in 2022. Buchan and Hannay Phase 1 Plug and Abandonment (P&A) scope, that is reflected here as part of Well Interventions, was completed in the end of 2022 and contributed to chemical use and discharge volumes. Subsea wells interventions scope, that included Tree Valve Integrity Testing (TVIT) and minor remediation and rectification works, also contributed to chemical use and discharge in this category. The subsea pipeline, that was installed to tie in Blake 22/22a-B8y well to Blake Manifold, demonstrates a minor profile compared to chemical use and discharge resulting from drilling and routine well intervention operations.

Routine well intervention activities are undertaken in support of steady production and well safety and integrity. Chemicals utilised for the removal of scale and solids build-up in wells account for a significant volume used in the well maintenance. This activity is essential to production as it helps to ensure that no restrictions occur within the flowlines. Chemicals are also required to protect the well and pipework from corrosion. Whenever seawater is injected, it is dosed with biocide to ensure there is no bio-risk present to the well.



**Figure 12**  
2022 Chemical Use and Discharge by Operation

Drilling operations use large quantities of chemicals, however these are used on a one-off project basis and only for a limited period of time. In 2022, all drilling programmes were implemented with Water Base Mud (WBM) and drill fluids were discharged offshore in accordance with the permits received.

Phase 1 P&A activities also have a one-off project impact, however much less intense than that of the drilling process. In contrast to drilling, well intervention chemicals are used on routine basis, however in significantly smaller quantities. Generally, these are routed back to the host production installation, where discharge occurs along with produced water (PW). And finally, pipeline operations, that are mainly associated with new wells tie-in or subsea well intervention, will discharge most chemicals through flushing, barrier testing and disconnection activities, and the quantities involved are minor.

All chemicals disposal options are subject to careful selection, assessment and approval. During drilling, the pre-selected and approved chemicals are mixed with seawater and circulated within the well, thus forming part of the drilling process. In the initial stage of drilling, when seawater is mixed with viscosifying chemicals to assist the drilling process, such fluids are not discharged, but collected at the topside of the drilling rig/platform and transported to shore for further treatment and disposal via an approved waste management route. However, in further well circulation with seawater, when mostly clean fluids are returned, or the chemicals are approved for discharge, such fluids from well clean-up process are discharged offshore.

As with Production Operations, reducing the number of chemical products used, that contain a substitution (SUB) warning, is a continual focus area for the Company. However, it may happen that due to the very specific nature of chemicals used during complex well drilling and other activities, alternative products, that provide the same or improved performance, are often limited or not yet available on the market. The Company continues to work closely with chemical vendors, suppliers and drilling contractors to test and replace chemicals subject to substitution, where it is operationally feasible and does not compromise safety and integrity of the wells.

**ENVIRONMENTAL PERFORMANCE**

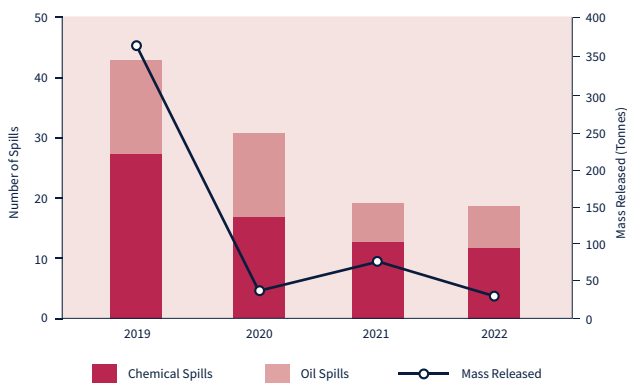
**ACCIDENTAL  
RELEASES**





The first Golden rule of the Company is to prevent oil, gas and chemical leaks. Assuring plant integrity and raising awareness of spill risks is critical to the prevention of spills across our assets. Alongside this, ensuring individuals are competent to perform their duties and following the Company operating procedures is imperative for adherence to environmental permit requirements. If spills do occur, they are thoroughly investigated and corrective action is taken.

In 2021, the decrease in the number of spill events was presumed to be correlated with the reduction in offshore activities as a result of the global pandemic. With activity returning to pre-pandemic levels, it would be more appropriate to compare the number of spills to 2019 numbers. **Figure 13** shows a significant decrease of around 60% from 2019 to 2022, in the total mass released from reportable spill events. The number of spill events in 2022 and 2021 are comparable, with 1 fewer chemical spill and 1 additional oil spill reported in 2022.



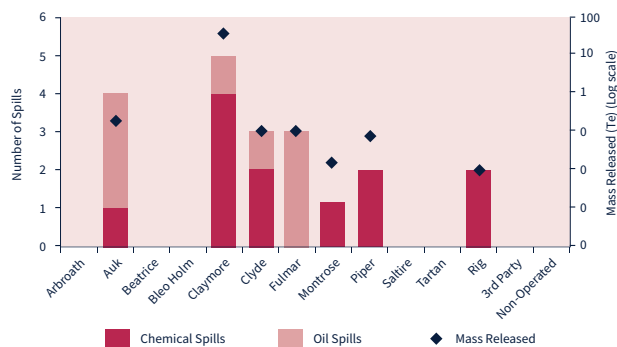
**Figure 13**

Overall total number of oil and chemical spills, and mass released 2019 - 2022

Uncontrolled releases of hydraulic control fluid from our subsea systems contribute towards a significant number of our reportable incidents and was responsible for 55 % of the total tonnage released from spill events in 2022. The relatively high volume of hydraulic control fluid lost can be attributed to aging systems and their design (these systems are designed to be operated to failure). Under normal operations, these systems can discharge 100 % of the control fluids. Although, any uncontrolled releases from these systems are always reported to the environmental regulator as a spill event. Note: hydraulic control fluids are comprised primarily of water.

Computer modelling of hydraulic fluid loss is conducted as part of our environmental impact assessment(s) and results show that only an instantaneous loss of several hundred tonnes could have a discernible impact on the environment. The uncontrolled release of hydraulic fluids, oil and other chemicals in 2022 occurred over a protracted period of time and modelling predicts that there is no significant impact on the receiving marine environment.

The Company adheres to regulatory requirements to notify the regulator and communicate corrective action plans, along with timescales for rectification.



**Figure 14**

Reported spill events with associated mass released in 2022

Oil or chemical spills are typically less than 0.1 t of fluid on each occasion – as can be seen in **Figure 14**. For example, a reportable oil spill event on Fulmar occurred when a maintenance operation generated a venturi effect on a tank containing a mix of water and hydrocarbons. A maximum of 118 kg of oil was released. Taken together with two other Fulmar spill events, a total of 119 kg (0.119 t) of oil was released in 2022.

After caisson cleaning operations, pin hole leaks allowed produced water to be released on Auk. Produced water is a mix of water and oil. Taken together with two other Auk spill events, a total of 13.2 kg (0.0132 t) of oil was released in 2022.

The ongoing losses of hydraulic control fluid from Claymore in 2022 are an exception and this released a total of 31.72 t. This loss is attributed to two faults of the subsea hydraulic control line supplies or valves - both were repaired in 2022. These losses, identified in **Table 3**, are the only instances of spills greater than 1 tonne.

**Table 3 - 2022 Spill Mass > 1 tonne**

Location	Brief Details	Hydro-carbon / Chemical	Mass Released (Tonnes)
Claymore	Subsea hydraulic release on the CASWI hydraulic ring main	Chemical	17.39
Claymore	Subsea hydraulic release from a leaking jumper cable.	Chemical	14.32

As well as operating offshore installations, the Company operates two onshore terminals, which also experience environmental incidents on occasion. Such incidents are reported to and regulated by the Onshore Environmental Regulator, Scottish Environment Protection Agency (SEPA). During 2022, there were no such reportable incidents at either of the Company's onshore terminals.

**ENVIRONMENTAL PERFORMANCE**

**WASTE  
MANAGEMENT**



Waste Management is a key focus area for the Company and the energy industry. Extraction of oil and gas along with increased decommissioning activities leads to inevitable use of materials, energy consumption and waste generation.

In conjunction with our environmental policy, we have set targets for waste management and continue to explore opportunities to reduce the volume of waste generated by our activities. This can include the removal of waste streams or improvements in efficiency; resulting in fewer resources required and less waste generated.

By applying the waste hierarchy, we can prioritise opportunities to reduce, reuse, recycle, recover energy and responsibly dispose of waste. This can harness and maximise the value of waste as a resource, minimise the use of energy, minimise the consumables involved in moving and processing the waste and reduce volumes being sent to landfill. Waste is generated from a variety of sources including our onshore office and sites, offshore facilities and activities such as: maintenance, replacing components / equipment, repairs, drilling and the packaging of consumable products. Waste is also generated in the decommissioning and removal of offshore installations and infrastructure which are no longer involved in producing hydrocarbons. These waste materials may no longer be of use to the company but can be of value to third parties.

All waste materials generated offshore are segregated by type and shipped to shore for treatment, reuse, recycling, or safe disposal by licensed waste companies. In compliance with legislation and best practice, the company has controls in place for the safe handling, storage, treatment and disposal of waste arising from activities. We aim to continually improve in this area by minimising the associated impacts related to waste generation.

Figure 15 represents the percentage of waste sent through disposal routes for the total volume of waste generated offshore in 2022, with 54% of all company waste being recycled, compared with 47% in 2021.

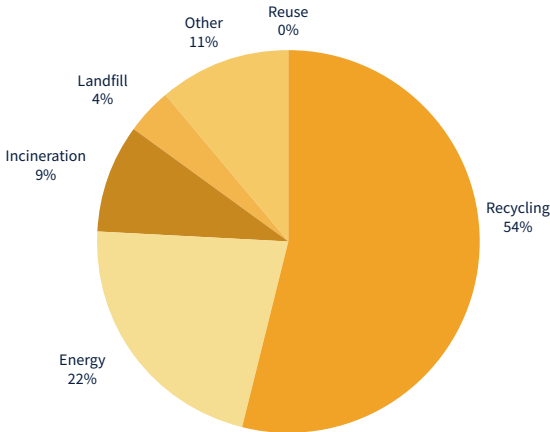


Figure 15  
2022 Percentage of Waste by Disposal Routes

As can be seen in Figure 16 there was an overall reduction in waste produced in 2022 from previous years. This can be attributed to a reduction in overall operational activity and planned worksopes in 2022 due to the Global pandemic and restricted POB off and onshore. Whilst managing these risks the company continued to operate with reduced offshore personnel with a focus on safe production and priority operational worksopes.

Figure 16 shows a comparison over a 4-year period (2019 to 2022) of the total waste generated by the Company’s offshore activities. Operational waste generated in 2022 fell slightly. This decrease was certainly influenced by the industry recovering from the global pandemic and economic factors. Managing COVID-19 risks alongside the strategy for improved shut down efficiencies, with fewer and shorter annual shutdowns of installations throughout the year,

prevented any spike in associated waste volumes. Additionally, the reduction of Platform and rig-based plug and abandonment activity in 2021 continued into 2022, thereby reducing any likely contribution to operational waste volumes.

In 2022, the company had a decrease in the volume of hazardous waste being treated onshore as shown in Figure 16, this can be explained by activities and worksopes that were conducted in 2021. The preparation of Tartan Alpha Installation for Not Normally Attended (NNA) Mode throughout 2021 involved worksopes such as the flushing and cleaning of a number of vessels with the contents being sent onshore for disposal. Additionally, the Claymore shutdown in 2021, included several vessel clean outs as well as the cleaning of the Scapa Hydrocyclones with the material being sent onshore for disposal. These activities did not continue in 2022 and no similar worksopes were undertaken meaning waste production decreased.

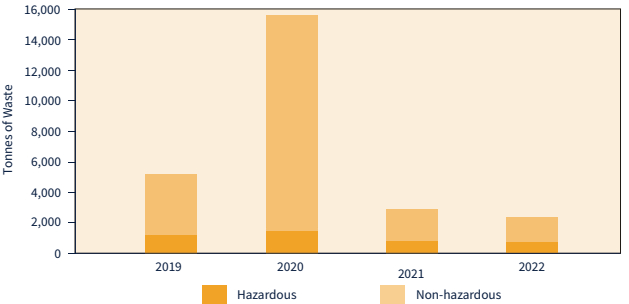


Figure 16  
Tonnage of Waste Generated per Year

Figure 17 shows a decrease in the percentage of operational waste to landfill in 2022 when compared with previous years. In addition to the offshore activities detailed above, this decrease can also be attributed to increased efficiency of waste sorting offshore. Furthermore, the waste disposal supply chain continued to carry out additional sorting onshore. This has resulted in an increase in routing waste from landfill to ‘Waste to Energy’, where waste is being utilised as a resource for power generation.

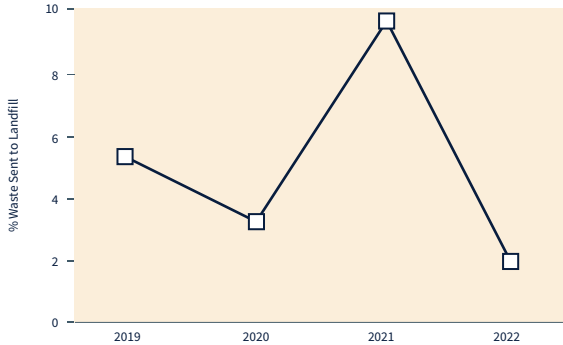


Figure 17  
Percentage of Waste Sent to Landfill

# WASTE MANAGEMENT

## Decommissioning Waste:

As Beatrice, Saltire and Tartan are now no longer in production, all waste from those assets is now classed as decommissioning waste. These assets are now in Not Normally Attended (NNA) mode so only manned on a campaign basis. Due to this, waste production from these assets is greatly reduced in 2022. Total waste from these assets amounted to 116.1 tonnes, 73 tonnes of which was recycled.

In addition, there were two well abandonment projects conducted in 2022, Buchan and Hannay Phase 1 and Exploration and Appraisal (E&A) Well Abandonment, where a total of 8 wells were plug and abandoned.

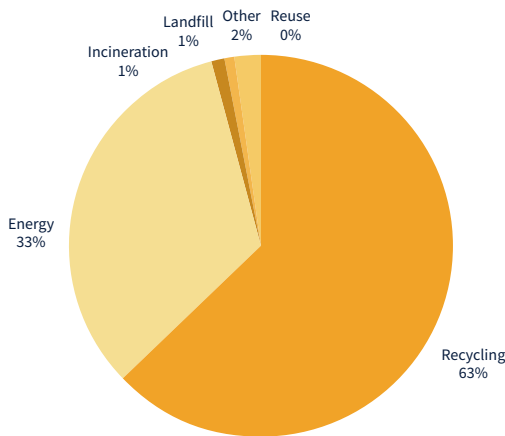


Figure 18

2022 Percentage of Waste by Disposal Routes from Decommissioned Assets

## Continual Improvement:

In 2022, the Global pandemic continued to result in a reduction of operational activities and personnel numbers offshore. Even so, a focus has remained on waste management and ensuring that the waste hierarchy was applied offshore. As mentioned above the NNA Assets (Beatrice, Saltire and Tartan) are only manned on a campaign basis so produce low levels of decommissioning waste as they prepare for final removal and disposal. The decommissioning of these assets, their associated subsea infrastructure and well plug and abandonment activities are managed on a project-by-project basis which include project specific waste management plans.

We recognise that re-using equipment can be a cost-effective and sustainable alternative to purchasing new equipment, as it reduces the need for new materials and resources. It can also help to reduce the overall environmental impact of offshore activities by minimising waste and promoting resource efficiency. Due to this increased emphasis on identification and enactment of appropriate reuse opportunities, the role of a Technology Development and Re-Use/Repurpose Advisor was created in 2022. Part of this role involves looking specifically at opportunities for Reuse in our upcoming and currently decommissioned assets, including the offshore infrastructure and equipment as well as onshore areas including spares and material in storage.

The re-use of equipment can also contribute to the circular economy in several ways:

- Firstly, by reusing equipment instead of disposing of it, we can reduce the amount of waste generated and thereby conserve natural resources.
- Secondly, by re-using equipment, we can avoid the energy and materials required to manufacture new equipment, which can help reduce greenhouse gas emissions and other negative environmental impacts associated with production.
- Finally, the re-use of equipment can create economic opportunities by extending the life of equipment and reducing the need for new equipment purchases. This can benefit RSRUK by reducing costs and potentially providing new revenue streams for businesses that specialise in the refurbishment and maintenance of equipment.

When reviewing the possibility of re-use, there are several considerations which we must remain aware of throughout the process. **Figure 19** provides an overview of the key questions which will be explored in each re-use initiative. The Company is committed to promote the 'Circular Economy' and will continue to explore opportunities for waste and extend the life span of materials and products in other ways and forms.



Figure 19

Re-Use Initiative Considerations

# APPENDICES

## GLOSSARY

<b>av</b>	Average
<b>BLP</b>	Bridge Linked Platform
<b>BOE</b>	Barrels of Oil Equivalent
<b>CH<sub>4</sub></b>	Methane
<b>CO</b>	Carbon monoxide
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2</sub>e</b>	Carbon dioxide equivalent
<b>COP</b>	Cessation of Production
<b>DSV</b>	Dive Support Vessel
<b>EU ETS / UK ETS</b>	European Union Emissions Trading Scheme / UK Emissions Trading Scheme
<b>FPSO</b>	Floating Production, Storage, Offload vessel
<b>GHG</b>	Greenhouse Gas
<b>HMCS</b>	Harmonised Mandatory Control System
<b>KPI</b>	Key Performance Indicator
<b>mg/l</b>	Milligram / Litre
<b>NAP</b>	National Allocation Plan
<b>N<sub>2</sub>O</b>	Oxides of Nitrogen
<b>NM VOC</b>	Non-Methane Volatile Organic Compounds
<b>NNA</b>	Not Normally Attended
<b>NO<sub>x</sub></b>	Oxides of Nitrogen
<b>OBM</b>	Oil Based Mud
<b>OCR</b>	Offshore Chemicals Regulation 2002
<b>OIW</b>	Oil in Produced Water
<b>OPPC</b>	The Offshore Petroleum Activities (Oil Pollution and Control) Regulations 2005
<b>OPRED</b>	Offshore Petroleum Regulator for Environment and Decommissioning
<b>OSPAR</b>	The Convention for the Protection of the marine Environment of the North East Atlantic
<b>PDN</b>	Permitted Discharge Notification
<b>PW</b>	Produced Water
<b>RQ</b>	Risk Quotient
<b>SEMS</b>	Safety and Environmental Management System
<b>SEPA</b>	Scottish Environment Protection Agency
<b>SO<sub>x</sub></b>	Oxides of Sulphur
<b>SUB</b>	Substitution
<b>The Company</b>	Repsol Sinopec Resources UK limited
<b>The Regulator</b>	Department for Business, Energy & Industrial Strategy (OPRED)

# 2022 DATA TABLES

2022 Data Table 1	Atmospheric Emissions (Tonnes)			
	SITE	CO <sub>2</sub> e	CO <sub>2</sub>	N <sub>2</sub> O
Arbroath Platform	3,068	2,701	9	140
Auk A Platform	41,642	39,615	1	66
Beatrice	30	29	0	0
Blane	-	-	-	-
Bleo Holm	87,891	82,444	6	140
Claymore A Platform	-	192,993	15	140
Clyde Platform	-	99,426	6	409
Flotta Terminal *	92,437	88,599	6	76
Fulmar A Platform	81,484	75,535	6	168
Montrose A Platform	139,524	133,139	9	140
Nigg Terminal	65	63	0	0
Piper B Platform	211,497	191,353	14	627
Ross FPSO Bleo Holm	-	-	-	-
Saltire A Platform	387	12379	0	0
Tartan A Platform	4,968	3,973	0	36
Pipeline Operations	-	-	-	-
Mobile Drilling / Well Interventions	-	-	-	-
Rigs	-	-	-	-
<b>Total</b>	<b>975,764</b>	<b>910,249</b>	<b>72</b>	<b>1,942</b>

2022 Data Table 2	Produced Water			Chemicals (Tonnes)		Waste Generated (Tonnes)		Spills		
	SITE	Average Oil In Water (mg/l)	Total Water Volume (m <sup>3</sup> )	Oil Discharged Weight (Te)	Used	Discharged	Hazardous	Non-Hazardous	# Oil Spills	# Chemical Spills
Arbroath Platform	-	-	-	182	8	21	47	-	-	-
Auk A Platform	16	954,803	15.53	67	55	50	41	3	1	0.25
Beatrice	-	-	-	0	0	1	29	-	-	-
Blane	-	-	-	-	1	-	-	-	-	-
Bleo Holm	41	1,161,765	47.43	968	838	53	159	-	-	-
Claymore A Platform	26	3,266,598	49.92	1,236	944	96	246	1	4	31.73
Clyde Platform	-	412,547	10.63	348	281	31	145	1	2	0.09
Flotta Terminal *	-	-	-	-	-	15	573	-	-	-
Fulmar A Platform	28	-	-	21	15	30	108	3	-	0.12
Montrose A Platform	-	1,205,545	34.12	660	616	71	277	-	1	0.02
Nigg Terminal	21	-	-	-	-	0	21	-	-	-
Piper B Platform	21	4,967,722	106.68	551	411	124	362	-	2	0.07
Ross FPSO Bleo Holm	-	-	-	-	-	-	-	-	-	-
Saltire A Platform	-	-	-	0	0	4	25	-	-	-
Tartan A Platform	-	-	-	0	0	24	33	5	-	-
Pipeline Operations	-	-	-	2	4	-	-	-	-	-
Mobile Drilling / Well Interventions	-	-	-	8,978	7,797	-	-	-	-	-
Rigs	-	-	-	-	-	-	-	-	2	-
<b>Total</b>	<b>22</b>	<b>12,881,466</b>	<b>264</b>	<b>13,011</b>	<b>10,965</b>	<b>520</b>	<b>2,066</b>	<b>8</b>	<b>12</b>	<b>32.27</b>

\* Flotta is not included in company produced water figures

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