OSPAR COMMISSION

Assessment of discharges, spills and emissions from offshore oil and gas operations on the United Kingdom Continental Shelf, 2016-2020

Offshore Oil & Gas Industry Series

2022

OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. The Contracting Parties are Belgium, Denmark, the European Union, Finland, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. Les Parties contractantes sont l'Allemagne, la Belgique, le Danemark, l’Espagne, la Finlande, la France, l’Irlande, l’Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d’Irlande du Nord, la Suède, la Suisse et l’Union européenne.

Assessment of discharges, spills and emissions from offshore oil and gas operations on the United Kingdom Continental Shelf, 2016 - 2020

Contents

1. Executive Summary

This report presents the discharge, spill and emission data for UK offshore oil and gas operations during the period 2016 – 2020 and provides an assessment of that data. The annual data on which the assessment is based is provided in Appendix 2.

a. Level of Activity

The United Kingdom Continental Shelf (UKCS) is a mature oil and gas province within the OSPAR region which has been experiencing declining production for many years. Since 2016 production had declined 11% from 102,5 million toeq to 90,8 million toeq. (Fig. 1).

There has been a 12% decrease in the total number of installations mainly as a result of decommissioning of smaller southern North Sea gas installations. (Fig. 2).

Oil and gas activity to maintain production levels and maximise economic recovery of reserves had resulted in an increase in number of wells drilled up to 2018, but that has since declined due to drop in oil prices in the later part of the period and the covid-19 pandemic resulting in a 17% drop in number of wells drilled in 2020 from 2018 (Fig. 3).

b. Discharges & Spills of Oil

The total quantity of dispersed[1] oil (aliphatic oil) discharged to the sea from produced water and displacement water increased during the assessment period, from 2 017 tonnes in 2016 to 2 426 tonnes in 2020, an increase of 20% (Fig. 5) and reversing the trend from the previous 5 years. The increase is due to a mix of some installations producing more water and increasing average oil concentrations.

As in previous years, produced water and displacement water are the main contributors to the oil discharges from offshore oil and gas activities, representing 97-98% of the total amount of oil discharged to the sea during the period 2016 - 2020. Flare drop-out is a minor source of oil discharge and is not covered by OSPAR measures, though it is reported in the UK as a spill should it occur.

It should be noted that dispersed oil in displacement water contributes less than 4% of the total dispersed oil discharged.

The annual average dispersed oil content in produced water has increased over the period between 13,0mg/l in 2016 to 17,8mg/l in 2020 (Fig. 5). While this is likely due to a deterioration in performance in produced water treatment it may also be affected by changes in analytical correlation factors.

Despite efforts made to reduce the number of installations which exceed the 30mg/l performance standard for the discharge of dispersed oil in produced water, in 2020 there were 17 installations that currently don't meet the standard, up from 11 in 2016. The amount of oil being discharged in excess of the performance standard has also increased from 5,7 tonnes in 2016 to 104 tonnes in 2020 (Fig. 6). Over 80% of the excess oil discharged in 2020 is from 4 installations, one of which has since ceased production and the main contributor having significant process problems which were due to be rectified in 2021.

[1]. "Aliphatics" and "aromatics" are defined by the reference method set in OSPAR Agreement 2005-15 (Solvent extraction, Infra-Red measurement at 3 wavelengths). In that context, "aliphatics" and "dispersed oil" mean the same thing.

The total number of spills of oil to sea over the period 2016-2020 appears to be decreasing, though due to the nature of spills there is no trend in the quantity spilled each year as spills are highly variable (Fig. 7).

c. Chemicals

The use and discharge of chemicals have been regulated by OSPAR and UK national legislation since 2001, with the first national reports provided for 2003. The total quantity of chemicals used offshore decreased during the period 2016-2020 (Fig. 9). On average, during the period 2016-2020 less than 2% (by weight) of the total amount of chemicals used contains either substances on the OSPAR List of Chemicals for Priority Action (LCPA) or substances which are candidates for substitution.

The total quantity of chemicals discharged offshore has also varied year on year from a peak of 75 323 tonnes in 2019 and a low of 55 720 tonnes in 2020 (Fig. 9). On average almost 80% (by weight) of the chemicals discharged are on the OSPAR PLONOR list[2].

OSPAR Recommendation 2005/2 set environmental goals for the reduction of discharges of LCPA substances, and discharges were to be phased out by 2010. This was achieved in the UK by 2012 and other than a 3,4kg discharge of lead-based pipe dope in 2016 which was mistakenly permitted during drilling operations, there have been no discharges of LCPA since (Fig. 10).

OSPAR Recommendation 2006/3 set environmental goals on the phasing out of discharges of chemicals that are, or which contain, substances identified as candidates for substitution[3] by 2017. The quantity of substances identified as candidates for substitution (other than LCPA substances) used during the period 2016-2020 has increased by 40%, however the discharge of such substances has decreased by 34%. The difference in trends between use and discharge are mainly that while more substitution chemicals are used, particularly in well operations, that more are being shipped to shore, treated or disposed of downhole. This latter option is particularly the case for the increasing number of decommissioning well operations, which have increased sharply over the period.

d. Atmospheric Emissions

Atmospheric emissions from offshore oil and gas activities are not regulated by OSPAR measures, but are reported annually by operators. Emissions to the atmosphere have generally decreased with the exception of nmVOC emissions predominantly from Floating, Production, Storage and Offloading (FPSO) operations. These increased substantially between 2016-18, but have started to decline again, though remain higher than in 2016 (Figure 14 and Figure 15).

2. Récapitulatif

Ce rapport présente les données du Royaume-Uni sur les rejets, les déversements et les émissions des opérations pétrolières et gazières offshore pour la période de 2016 à 2020 et l'évaluation de ces données. Les données annuelles sur lesquelles l'évaluation fait fond sont fournies à l'appendice 2.

[2] Pose little or no risk to the environment - PLONOR

[3] Except for those chemicals where, despite considerable efforts, it can be demonstrated that this is not feasible due to technical or safety reasons. Demonstration of those reasons should include a description of the efforts.

a. Niveau d'activité

Le plateau continental britannique (UKCS) est une province pétrolière et gazière mature au sein de la zone maritime d'OSPAR qui connaît une baisse de production depuis de nombreuses années. Depuis 2016, la production avait diminué de 11 %, passant de 102,5 millions de tepq à 90,8 millions de tepq. (Fig. 1).

Le nombre total d'installations a diminué de 12 %, principalement en raison du déclassement des petites installations gazières du sud de la mer du Nord. (Fig. 2).

L'activité pétrolière et gazière visant à maintenir les niveaux de production et à maximiser la récupération économique des réserves s'est traduite par une augmentation du nombre de puits forés jusqu'en 2018, mais qui a depuis diminué en raison de la chute des prix du pétrole dans la dernière partie de la période et de la pandémie de covid-19 qui a entraîné une baisse de 17 % du nombre de puits forés en 2020 par rapport à 2018. (Fig. 3).

b. Rejets et déversements

La quantité totale d'hydrocarbures dispersés[4] (hydrocarbures aliphatiques) rejetée en mer à partir de l'eau de production et de l'eau de déplacement a augmenté pendant la période d'évaluation, passant de 2 017 tonnes en 2016 à 2 426 tonnes en 2020, à savoir une augmentation de 20 % (Fig. 5) et inversant la tendance des 5 années précédentes. Cette augmentation est due au fait que certaines installations produisent plus d'eau et que les concentrations moyennes de pétrole augmentent.

Comme les années précédentes, l'eau de production et l'eau de déplacement sont les principaux contributeurs aux rejets d'hydrocarbures provenant des activités pétrolières et gazières offshore, représentant 97-98% de la quantité totale d'hydrocarbures rejetée en mer pendant la période 2016 - 2020. Les rejets de torchères constituent une source mineure de rejets d'hydrocarbures et ne sont pas couverts par les mesures OSPAR, bien qu'ils soient signalés au Royaume-Uni comme un déversement s'ils se produisent.

Il convient de noter que les hydrocarbures dispersés dans l'eau de déplacement représentent moins de 4 % du total des hydrocarbures dispersés rejetés.

La moyenne annuelle de la teneur en hydrocarbures dispersés dans l'eau de production a augmenté au cours de la période : 13,0mg/l en 2016 et 17,8mg/l en 2020 (Fig. 5). Bien que cela soit probablement dû à une détérioration des performances dans le traitement de l'eau de production, cela peut également être dû à des changements dans les facteurs de corrélation analytique.

Malgré les efforts déployés pour réduire le nombre d'installations qui dépassent la norme de performance de 30mg/l pour le rejet d'hydrocarbures dispersés dans l'eau de production, en 2020, 17 installations ne respectent actuellement pas la norme, contre 11 en 2016. La quantité d'hydrocarbures rejetés au-delà de la norme de performance a également augmenté, passant de 5,7 tonnes en 2016 à 104 tonnes en 2020 (Fig. 6). Plus de 80 % de l'excédent d'hydrocarbures déversé en 2020 provient de 4 installations, dont l'une a depuis cessé sa production et dont le principal contributeur présente d'importants problèmes de traitement qui devaient être résolus en 2021.

[4]. Les "Aliphatiques" et les "aromatiques" Les aliphatiques et les aromatiques sont définis par la méthode de référence fixée dans l'accord OSPAR 2005-15 (extraction par solvant, mesure par infrarouge à 3 longueurs d'onde). Dans ce contexte, les termes "aliphatiques" et "hydrocarbure dispersé" signifient la même chose.

Le nombre total de déversements d'hydrocarbures en mer au cours de la période 2016-2020 semble diminuer, bien qu'en raison de la nature des déversements, il n'y ait pas de tendance dans la quantité déversée chaque année (Fig. 7).

c. Produits chimiques

L'utilisation et le rejet des produits chimiques sont réglementés par OSPAR et par la législation nationale du Royaume-Uni depuis 2001, avec les premiers rapports nationaux fournis pour 2003. La quantité totale de produits chimiques utilisée offshore a diminué au cours de la période 2016-2020 (Fig. 9). En moyenne, au cours de la période 2016-2020, moins de 2% (en poids) de la quantité totale de produits chimiques utilisés contient soit des substances figurant sur la liste OSPAR des produits chimiques devant faire l'objet de mesures prioritaires (LCPA), soit des substances qui sont candidates à la substitution.

La quantité totale de produits chimiques rejetée offshore a également varié d'année en année, passant d'un pic de 75 323 tonnes en 2019 à un creux de 55 720 tonnes en 2020 (Fig. 9). En moyenne, près de 80% (en poids) des produits chimiques rejetés figurent sur la liste PLONOR d'OSPAR[5].

La Recommandation OSPAR 2005/2 fixe des objectifs environnementaux pour la réduction des rejets de substances LCPA, dans le sens de la cessation de ces rejets en 2010. Cet objectif a été atteint au Royaume-Uni en 2012 et, à l'exception d'un rejet de 3,4 kg d'adhésif pour tuyaux à base de plomb en 2016, autorisé par erreur pendant des opérations de forage, il n'y a pas eu de rejets de LCPA depuis.

La Recommandation OSPAR 2006/3, telle qu'amendée, fixe des objectifs environnementaux pour tendre vers la cessation des rejets des produits chimiques d'offshore qui sont ou qui contiennent des substances ayant été identifiées comme étant candidates à la substitution[6]. La quantité de substances identifiées comme candidates à la substitution (autres que les substances LCPA) utilisées au cours de la période 2016-2020 a augmenté de 40%, cependant le rejet de ces substances a diminué de 34%. La différence de tendance entre l'utilisation et les rejets tient principalement au fait que, si l'on utilise davantage de produits chimiques de substitution, notamment dans les opérations sur puits, on en expédie davantage à terre, on les traite ou on les élimine en fond de puits. Cette dernière option est notamment le cas pour le nombre croissant d'opérations de démantèlement des puits, qui a fortement augmenté au cours de la période.

d. Emissions atmosphériques

Les émissions atmosphériques dues aux activités pétrolières et gazières offshore ne sont pas réglementées par les mesures OSPAR, mais elles sont notifiées tous les ans par les opérateurs. Les émissions dans l'atmosphère ont généralement diminué, à l'exception des émissions de nmVOC provenant principalement des opérations de type FPSO (Floating, Production, Storage and Offloading). Celles-ci ont considérablement augmenté entre 2016 et 18, mais ont recommencé à baisser, tout en restant plus élevées qu'en 2016 (Figs. 14 et 15).

3. Introduction

[5] Substances considérées comme ne présentant que peu de risque pour l'environnement, voire aucun

[6] Sauf les produits chimiques pour lesquels, malgré des efforts considérables, l'on peut démontrer que cela n'est pas réalisable pour des raisons techniques ou de sécurité. La démonstration de ces raisons devra inclure une description des efforts.

This report provides an assessment of the discharges, spills and emissions to the environment from offshore oil and gas operations in the UK sector of the OSPAR Maritime Area for the period 2016 – 2020. The purpose of this report is to assess increasing or decreasing trends in the quantities of such discharges, spills and emissions, taking account of the level of oil and gas activity in the UK sector, with the aim of demonstrating the effectiveness of OSPAR measures in the UKCS. Trends have been assessed using expert judgement and not by statistical analyses.

This report does not seek to assess the impact on the environment of these discharges, spills and emissions.

This assessment is based on data submitted by operators on the UKCS to the UK authorities, and reported by the UK in the annual OSPAR report on discharges, spills and emissions from offshore oil and gas installations. Data used in this assessment report are the best available data at the time of reporting and are appended to this report for information at Appendix 2.

Where relevant, the performance on the UKCS has been compared to the overall performance in the OSPAR area, using the following sources:

"OSPAR report on discharges, spills and emissions from the offshore oil and gas activity in 2019" (OSPAR Commission 2020)

"Assessment of the OSPAR report on discharges, spills and emissions from the offshore oil and gas activity 2009-2018" (OSPAR Commission 2020)

"OSPAR Draft 2020 annual report on discharges, spills and emissions from offshore oil and gas installations" (EAP Meeting 2022)

The operators have used procedures for sampling and analysis detailed by the Offshore Petroleum Regulator for Environment & Decommissioning (OPRED), part of the Department for Business, Energy & Industrial Strategy (BEIS), and quality assurance procedures described by OPRED and Oil & Gas UK. Accredited or accepted laboratories have been used where required.

Quality assurance of the data is undertaken by the UK before the data is submitted to the OSPAR Secretariat. Transparency and harmonisation of the reported data are achieved through the use of:

- harmonised sampling and analysis procedures;
- accredited or accepted laboratories;
- harmonised data collection format; and
- review by an Expert Assessment Panel.

Further details on UK QA/QC procedures are discussed in section 7 of this report.

4. Setting the Scene

3.1 Level of Activity

The UK is the second largest producer of oil and gas in the OSPAR region but the UKCS is a maturing basin with a long term trend of declining production, though there has been some recovery during the last few years. New fields have come into production offsetting the cessation of production from older fields and some improvements in production efficiency have increased production from a low in 2014. Overall production has declined since 2016 by 11% from a ten year high of 102,5 million toeq to 90,8 million toeq in 2020 (Fig. 1). There is still significant investment in the UKCS, including investment in exploration in new areas to the west of Shetland and significant fields have come onstream including Mariner, Culzean, Clair Ridge and Cygnus during this period.

Comparison across the OSPAR region over the 2016-2020 period is varied with decreases in Denmark (-59%), Germany (-14%), Ireland (-32%) and The Netherlands (-32%) while Norway increased production by 2%, which has resulted in an overall decrease of -6% in production across the OSPAR region.

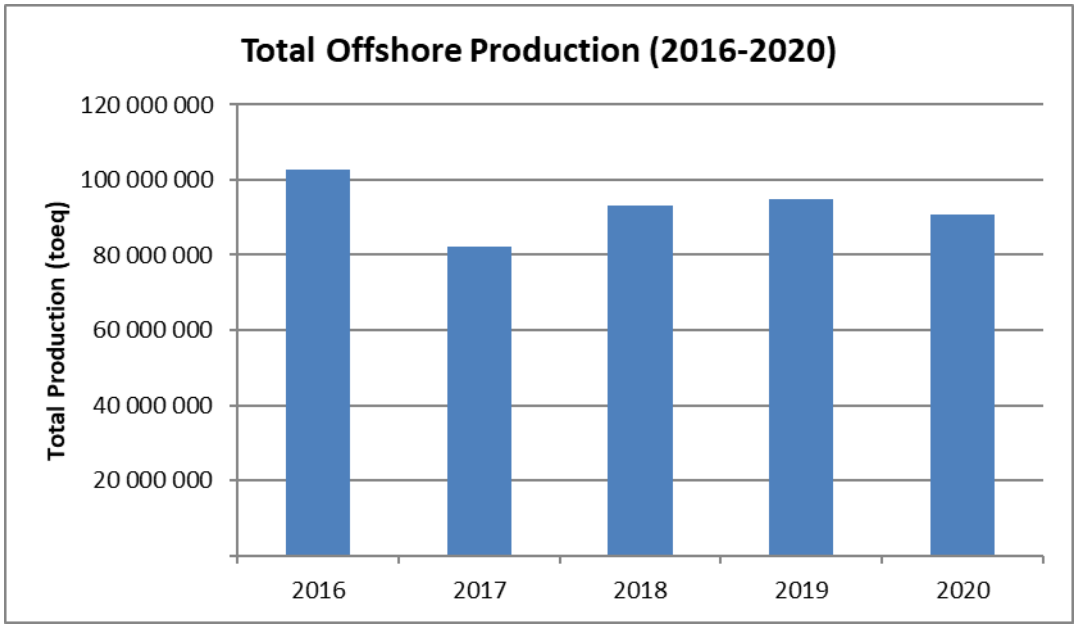


Fig. 1 – Total offshore oil & gas production on the UKCS, 2016-2020

The number of installations with discharges and/or emissions in the UK sector of the OSPAR Maritime Area decreased during the period 2016 – 2020 from a peak of 505 to 445 (Fig. 2). There was a 5% decrease in the number of subsea installations from 223 to 211 but the bulk of the change has been a 25% decrease in the number of gas installations from 185 to 147. This is due to significant cessation of production and decommissioning of small gas platforms, mostly normally unmanned, in the UK Southern North Sea from 2017 onwards.

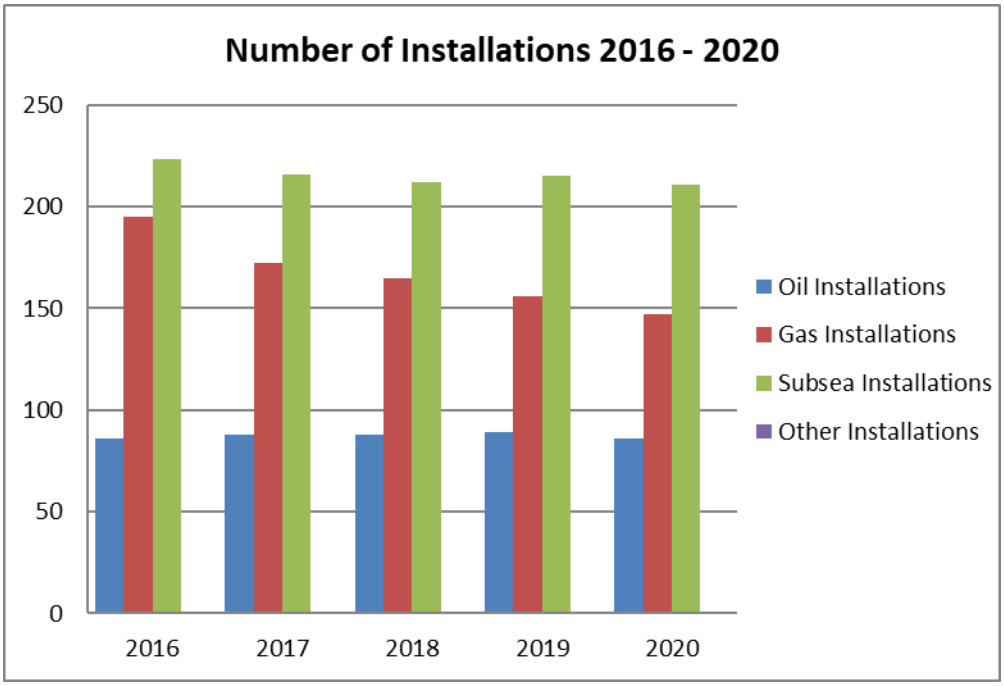


Fig. 2 – Number of Installations on the UKCS, 2016-2020

After a period of decline from 2012-2015[7] due to low oil price and high operating costs in the UKCS, the number of wells drilled nearly doubled in 2016 from 2015 with further increases through to 2018. This reflects action taken by industry to lower operating costs as well as the increase in the oil price. However, from 2018 onwards the numbers of wells drilled has decreased again due to another dip in oil price and in 2020 due to the covid pandemic. The number of Mobile Offshore Drilling Units (MODU) operating in the UKCS varies year on year but has been about 20-30 installations over the past five years.

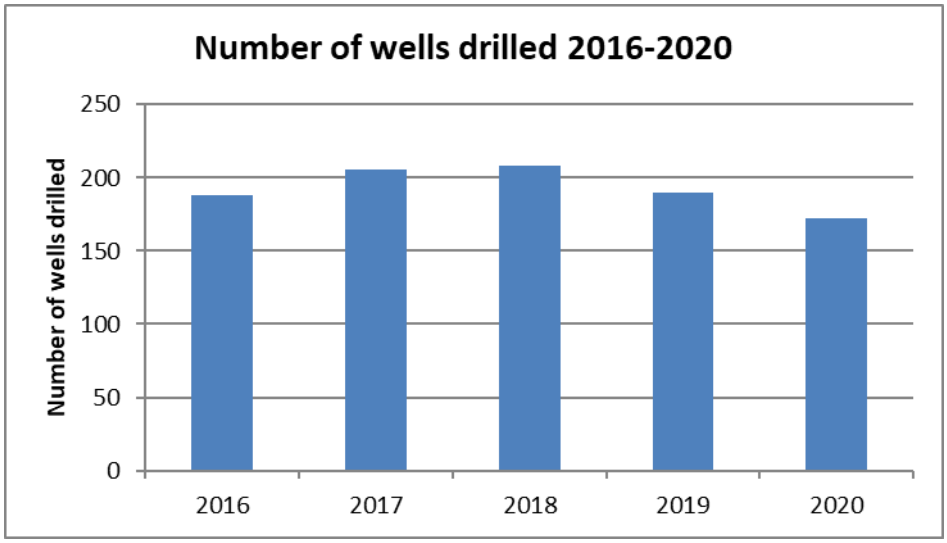


Fig. 3 – Number of wells drilled on UKCS, 2016-2020

[7] Assessment of the discharges, spills and emissions from offshore installations on the United Kingdom Continental Shelf in 2012-2016.

5. Environmental Management

OSPAR Recommendation 2003/5 to Promote the Use and Implementation of Environmental Management Systems by the Offshore Industry was introduced in 2003, with the goal that by the end of 2005 all operators within Contracting Parties jurisdiction should have in place an Environmental Management System that is in accordance with the principles of an internationally recognised standard (ISO14001 or EMAS). The UK implemented this administratively by requiring all licence operators in the UK to have an EMS in place prior to undertaking any offshore oil and gas operations. Operators could either have a certified EMS (ISO14001 or EMAS) or an EMS that was in accordance with the principles of such a standard and was independently verified by a UKAS accredited certification body on a two-yearly basis. Operators without a certified or verified EMS would not be granted relevant permits and consents to undertake any offshore oil & gas operations. Since 2006 all operators have had an EMS which meets the UK requirements.

Until 2015 BEIS required that all licence operators in the UKCS undertaking offshore oil & gas operations had an EMS prior to operations commencing. The UK changed its approach to operators following the introduction of the Offshore Safety Directive, which requires that well and installation operators are appointed by licensees. This transferred the environmental responsibilities from the licensed operators to the appointed installation and/or well operator. These environmental responsibilities include the requirement to have an EMS meeting OSPAR requirements.

Every operator with an EMS must also publish a public statement to cover any offshore oil and gas operations undertaken in the previous year. These public statements are not verified as required by EMAS, but are available from the OPRED website HERE.

6. Oil Discharges

5.1 Discharges of Oil to Sea

Dispersed oil is discharged in accordance with OSPAR Recommendation 2001/1 (as amended) which limits the dispersed oil concentration in produced and displacement water to 30 mg/l. The UK implements this Recommendation into UK law through the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005, which replaced the Prevention of Oil Pollution Act 1971. The 2005 regulations require that any discharge of oil to the marine environment is undertaken in accordance with a permit and makes it an offence to discharge oil without a permit or to spill any oil to sea. With regard to produced and displacement water discharges, operators are required to ensure that the concentrations of dispersed oil does not exceed 30 mg/l as a monthly average. Samples are taken for analysis at least twice a day for installations discharging more than 2 tonnes of dispersed oil per year, or samples are taken at least monthly for installations discharging less than 2 tonnes of dispersed oil per year.

To determine the amount of dispersed oil discharged, operators are required to quantify the amount of produced and displacement water discharged from each installation. The overall measurement uncertainty of the discharge must be within ±10%.

The Recommendation also requires that Contracting Parties should ensure that plans to construct new offshore installations, or to modify substantially existing offshore installations, should take as a point of departure the minimisation of discharges and, where appropriate, consider produced water reinjection (PWRI). All new installations have been required to consider this in their proposals to OPRED and where PWRI has not been selected, operators are required to justify the proposals, and in some cases lower monthly limits of between 15-25mg/l have been applied.

5.1.1 Produced & displacement water

The discharge of produced water and displacement water on the UKCS has declined over the 5 year period 2016-2020. Produced water has declined from about 155 million m^3 in 2016 to just under 137 million m^3 in 2020, a 12% decrease. Displacement water has decreased from a peak of approx. 739 000m3 in 2017 to 431 000 m^3 in 2020, a 31% decrease, however displacement water accounts for <0,5% of the total water discharged into the UKCS. In contrast the amount of produced water reinjected has increased from just under 48 million m^3 in 2016 to almost 75 million m^3 in 2020, a 56% increase, which continues a trend from the preceding years. Consequently in 2020, 35% of all the produced and displacement water generated on the UKCS is reinjected. These changes reflect the cessation of production of older installations with high water production rates as well as the coming on stream of new installations with produced water reinjection facilities, improved performance of some installations and/or with drier oil production during the first years of oil and gas production. It is expected that produced water discharges will increase in the years to come as these newer fields start to produce more water.

The UK trend in both produced and displacement water discharges, as well as quantities of water reinjected is largely mirrored in the OSPAR area. Similarly, the proportion of water reinjected across the OSPAR region has the same trend as in the UK. Given that the UK is one of the two main contributors, along with Norway, to the overall OSPAR figures this is to be expected.

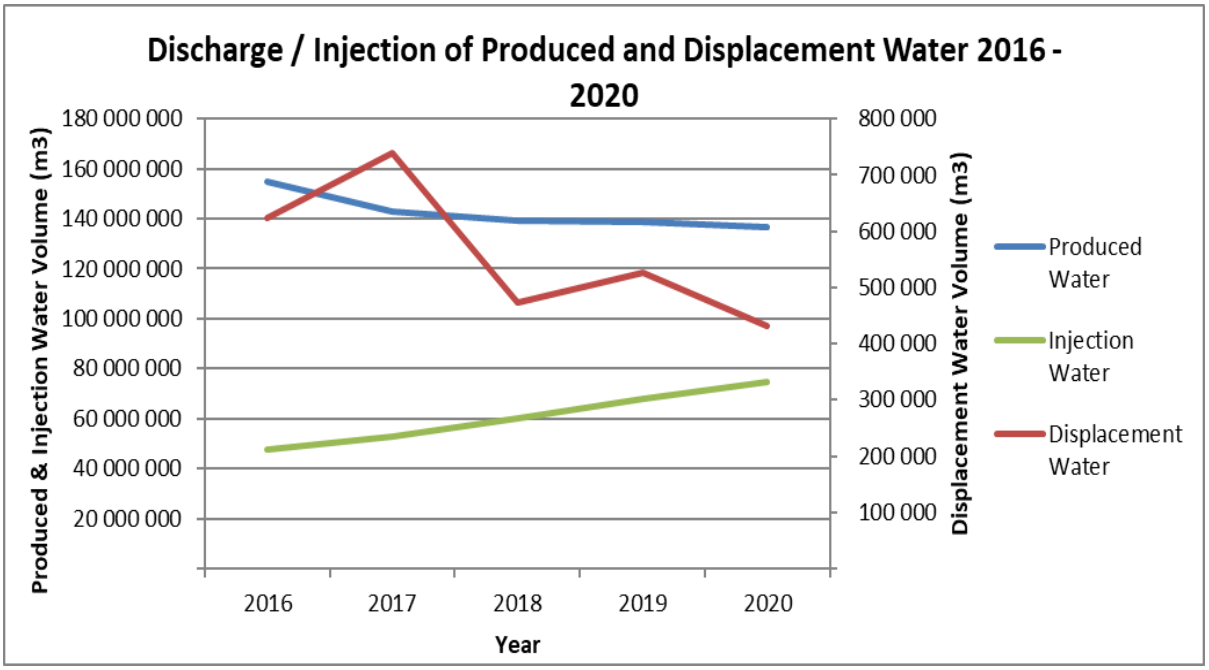


Fig. 4 – Discharge / Injection of produced and displacement water on UKCS, 2016-2020

5.1.2 Dispersed oil discharged

The total quantity of dispersed oil discharged with produced and displacement water has increased by 20% over the period from 2 017 tonnes in 2016 to 2 426 tonnes in 2020. The average concentration of dispersed oil in produced water has also trended upwards over the period from 13,0 mg/l in 2016 up to 17,8 mg/l in 2020, a 36% increase. The quantity of dispersed oil discharged is dependant on the concentration so as that has increased, so too has the amount of dispersed oil discharged, despite reducing volumes of produced water being discharged.

This increase has reversed a downwards trend over the preceding five years. Some of the increase is attributable to oil discharged in excess of the performance standard (see below) where the amount of oil discharged in excess of 30 mg/l has been increasing due to process problems on a small number of installations resulting in 2020 in the discharge of an extra 104 tonnes of oil. Two of the installations contributing to this total have since ceased production and the largest contributor is expected to improve performance during 2021. However, these installations do not account for the total increase, which is down to increasing dispersed oil concentrations as a result of deteriorating oil / water separation performance, possibly due to a lack of maintenance, sand washing or vessel capacities, etc. It should be noted that the reinjection of produced water results in the reinjection of significant quantities of dispersed oil that might otherwise be discharged and in 2020 over 23 600 tonnes of dispersed oil was reinjected, which is a double the 11 800 tonnes reinjected in 2016.

The increase in oil discharged in the UK compares unfavourably with the majority of OSPAR countries where an overall average reduction of 17% has been seen and where the average concentration is 9,3 mg/l in 2020.

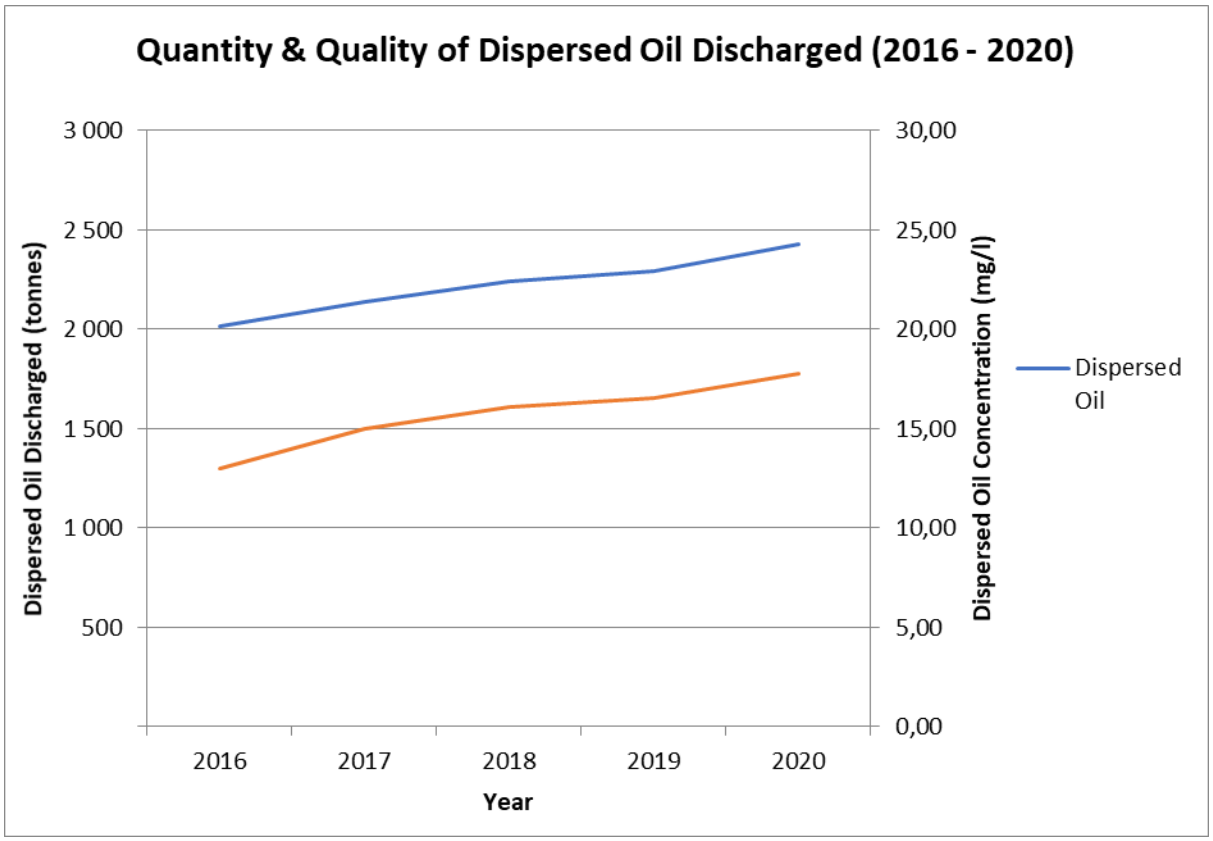


Fig. 5 – Quantity and quality of dispersed oil discharged on UKCS, 2016-2020

Recommendation 2001/1 sets a performance standard for the discharge of dispersed oil in produced water. Since 2007 OSPAR has set the performance standard at 30 mg/l. For regulatory purposes in the UK this is calculated as a monthly flow weighted average of all samples, or monthly result where only a single sample is taken. However, for reporting to OSPAR the UK calculates an annual average. While the vast majority of installations in the UK sector meet the performance standard, a number of installations (11-17 over the period) failed to meet this performance standard on an annual basis.

The quantity of dispersed oil discharged by installations that failed to meet the performance standard has increased during the period 2016-2020, from 5,7 tonnes in 2016 to 104 tonnes in 2020. The portfolio of installations which exceed the performance standard often change from year to year as individual installations have periodic process problems which need rectified. Nevertheless, there are some serial offenders. In the main these tend to be installations which mostly re-inject produced water but have process trips and discharge at >30 mg/l or gas / condensate installations with low produced water volumes. A few of the more significant contributors are FPSO's which can be impacted by winter weather affecting oil / water separation in vessels and slops tanks. Over 80% of the excess oil discharged in 2020 is from 5 installations, two of which have since ceased production and the main contributor having significant process problems which are due to be rectified in 2021. Other significant contributors are working through remediation plans in discussion with OPRED inspectors.

It should be noted that, when PWRI stops working, some installations with a high PWRI uptime may discharge produced water overboard in excess of the performance standard. This is generally for very short periods of time, but if the average of the analyses fails to meet the performance standard for the year they are still reported to OSPAR.

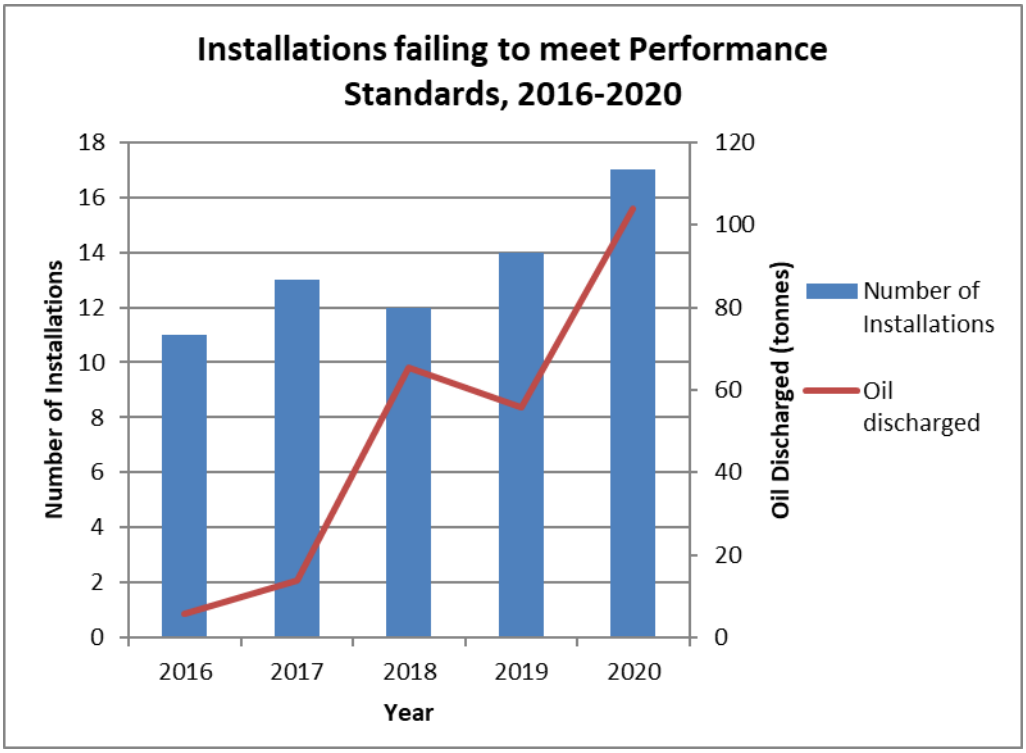


Fig. 6 – Installations failing to meet the 2001/1 Performance Standard on UKCS, 2016 - 2020

The UK also reports the dissolved oil content (as represented by BTEX components) in produced water and displacement water discharges. OSPAR does not have measures in place for regulating these discharges as the components rapidly biodegrade in seawater once discharged. The discharge of dissolved oil[8] (BTEX) during the period 2016-2020 has ranged between 2140 to 2680 tonnes per year, with a 12% increase in the amount discharged over the period reflecting the similar increase in dispersed oil.

5.2 Risk-based Approach (RBA)

In 2012, OSPAR Recommendation 2012/5 for a risk-based approach to the management of produced water discharges from offshore installations was adopted. The UK drafted guidance for industry and adopted a phased implementation plan to allow the additional assessments to be evenly spread over the 2014 - 2018 period for the 105 installations which were included at the time. The UK has adopted a substance level and whole effluent toxicity approach for the RBA assessments. The UK has requested that operators undertake the full assessment process, including dispersion modelling, so as to be able to determine a baseline for all installations with a produced water discharge. Since the start of the implementation plan a number of installations have ceased production and as of the end of 2019 all 78 installations remaining in the RBA process had been assessed, with 23 assessed to have the risk adequately controlled. In 2020, a further 11 installations have been added to the UK scheme and are due for assessment. Guidance has been developed for those installations where action is to be taken and those installations are due to submit reports outlining methods to reducing the uncertainty in RBA result and/or reducing risk from produced water discharge. These

[8] "Aliphatics" (or "dispersed oil") are regularly and frequently measured, while the sampling is much less frequent for "aromatics". Therefore data on "aromatics" may be less reliable.

installations will undertake further RBA assessment in 2023, 2024 or 2025 under a staggered timetable.

5.3 Spills of Oil to Sea

The number of oil spills to sea during the period 2016-2020 has varied over the period but there is an overall downward trend from 353 in 2016 to 191 in 2020, apart from 2018 when 345 were reported. There is typically no particular reason for the trend in the number of spills reported but it was noticed during 2020 that there was a reduction in the number of spills every month which is possibly down to the impacts of the pandemic in operations offshore. During the bulk of 2020, where the numbers of staff offshore were reduced, there was less activity undertaken which might result in a spill as well as less people on board who might identify a spill. The combination of these factors may be the reason for the reduction of reported spills in 2020.

The quantity spilled has also varied from 25,5 tonnes in 2016 up to 53 tonnes in 2017.

It should be noted that most spills are less than 1 tonne and average approx. 40 kg of oil. It is a small number of larger spills greater than 1 tonne that contribute the greatest quantity of oil to sea from spills. These constitute less than 4% of the total number of spills but typically contribute over 70% of the total oil spilled.

The number of spills and quantity spilled varies greatly across the OSPAR region and comparison of trends is not possible.

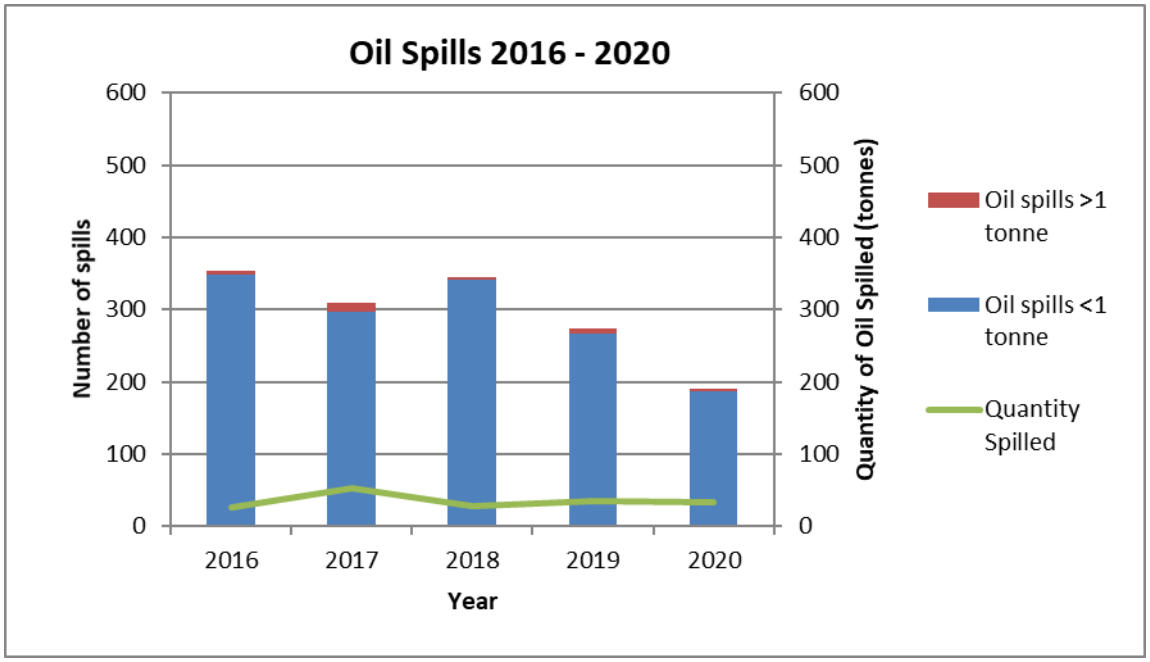


Fig. 7 – Number of oil spills and quantity of oil spilled on UKCS, 2016-2020

It should be noted that some oil spill data has not been included in the above data or this report, as the incidents are still under investigation by the UK Regulator.

5.4 Discharges of Organic Phase Fluids

OSPAR Decision 2000/3 aims to prevent and eliminate pollution resulting from the use and discharge of OPF and OPF-contaminated cuttings[9] and prohibits the discharge of cuttings contaminated with OBF[10] at a concentration greater than 1% by weight on cuttings. The UK implements this Decision under The Offshore Chemical Regulations 2002 (as amended), which controls the use and discharge of all offshore chemicals. The regulations prohibit the discharge of OPF and OPF contaminated cuttings, except in accordance with the terms and conditions of a permit issued under the regulations. The development of thermal desorption technologies (Roto-mill, hammer mill, etc), which readily achieves less than the 1% concentration limit, has resulted in a number of wells being drilled using OBF with treated cuttings discharged to sea. Over the period this has increased from 8 such wells in 2018 to 20 in 2020 (Fig. 8). Discharge concentrations must be reported and are usually less than 0,5% which is lower than the 1% by weight limit set by OSPAR.

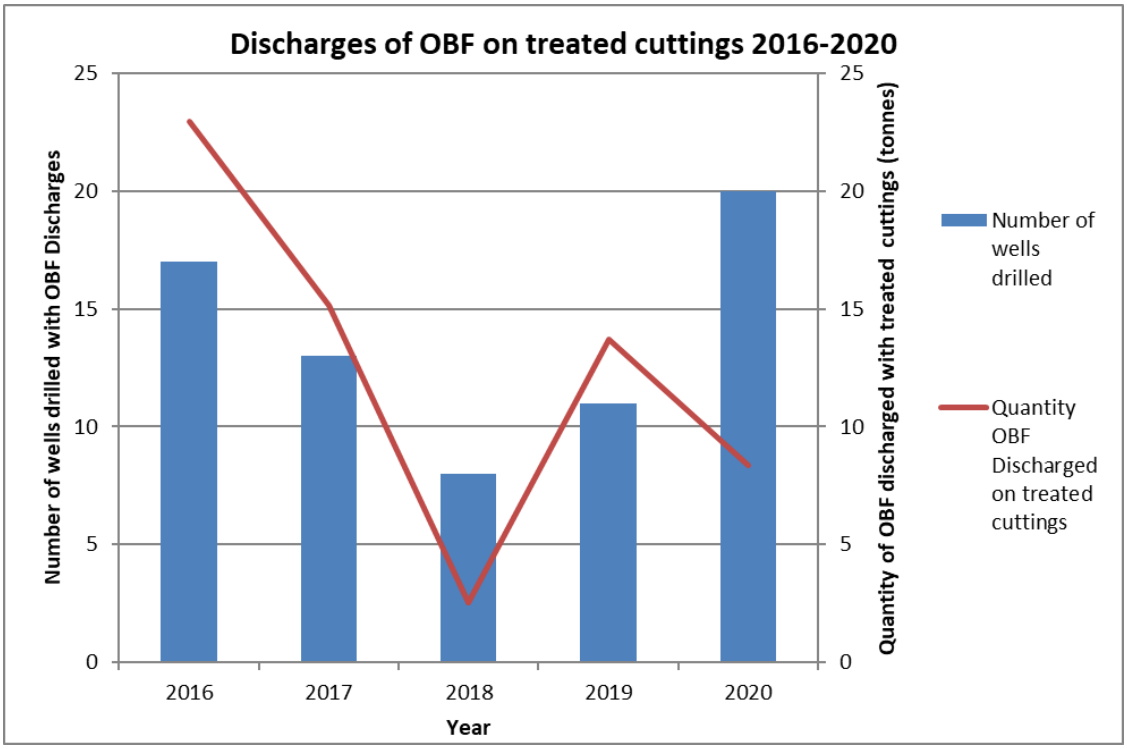


Fig. 8 – Discharges of OBF on treated cuttings on UKCS 2016-2020

7. Chemicals

Since 2001 the use and discharge of offshore chemicals have been covered by a number of OSPAR measures as listed in the Appendix 1, and these have been implemented in the UK through the Offshore Chemical Regulations 2002. The regulations require that all use and discharge of offshore chemicals requires a permit, with the permit application setting out the circumstances of use and discharge of chemicals and the quantities of chemicals to be used and discharged.

[9] OPF = Organic-phase Drilling Fluids

[10] OBF = Oil-based fluids

The regulations and associated guidance requires that chemicals are assessed for their impact to the environment using the Offshore Chemical Notification Scheme (OCNS) which is managed on behalf of the UK regulator by the Centre for Environment, Fisheries & Aquaculture Science (CEFAS), which also undertakes a similar function for the Netherlands. The OCNS uses the OSPAR Harmonised Mandatory Control Scheme (HMCS) to rank chemical products according to Hazard Quotient (HQ), calculated using the Chemical Hazard and Risk Management (CHARM) model.

Details of the categories within HMCS are detailed in OSPAR Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals (as amended).

In this report the term *substitution chemical* refers to chemicals which are or contain substances that are candidates for substitution, according to OSPAR Recommendation 2010/4. This includes chemicals or substances which are:

- on the OSPAR LCPA,
- inorganic with LC_{50} or EC_{50} less than 1 mg/l,
- have biodegradation less than 20%, or
- meets two of three criteria
  - biodegradation less than 60%,
  - BCF larger than 100 or Log $P_{ow} \geq 3$, or
  - LC_{50}/EC_{50} less than 10mg/L.

Chemicals that are considered to 'Pose Little or No Risk' to the environment are referred to as PLONOR chemicals. Chemicals that are considered to be PLONOR are detailed on the OSPAR PLONOR list[11].

Chemicals that are neither PLONOR nor candidates for substitution include those that are:

- inorganic with LC50 or EC50 greater than 1 mg/l,
- chemicals, which includes substances ranked according to OSPAR Recommendation 2000/4 and don't fall into another category.

For the purposes of this report these latter two chemical groups are combined and referred to as Ranking[12].

The goal of OSPAR Recommendation 2005/2 was that the discharge of chemicals on the OSPAR List of Chemicals for Priority Action (LCPA) would be phased out by 1 January 2010. The UK had phased out these discharges as of 2012, though small amounts of lead based pipe dope are still used in the UK for certain drilling operations. Unfortunately, in 2016 a small quantity (3,39kg) was inadvertently permitted for discharge during a drilling operation, but there have been no further discharges since.

6.1 Chemical Use & Discharge

Total use of chemicals has varied with no particular trend over the period as chemical use largely follows levels of drilling & production activity, however the average use over these five years (240

[11] OSPAR Agreement 2013-06 (as amended) - OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR)

[12] As agreed at OIC 2019: §8.4 of SR OIC 19/15/1 OIC agreed to consolidate reporting on substances into LCPA, Candidates for Substitution, Ranking and PLONOR

000 tonnes) is 12% lower than in the preceding five years (272 000 tonnes). Total discharge is similar with no real trend over the 2016-2020 period but the average is 11% lower in 2016-2020 (62 600 tonnes) than in 2011-2015 (70 000 tonnes). This is likely associated with an increase in cessation of production operations, including older installations requiring more chemical use to deal with larger volumes of produced water.

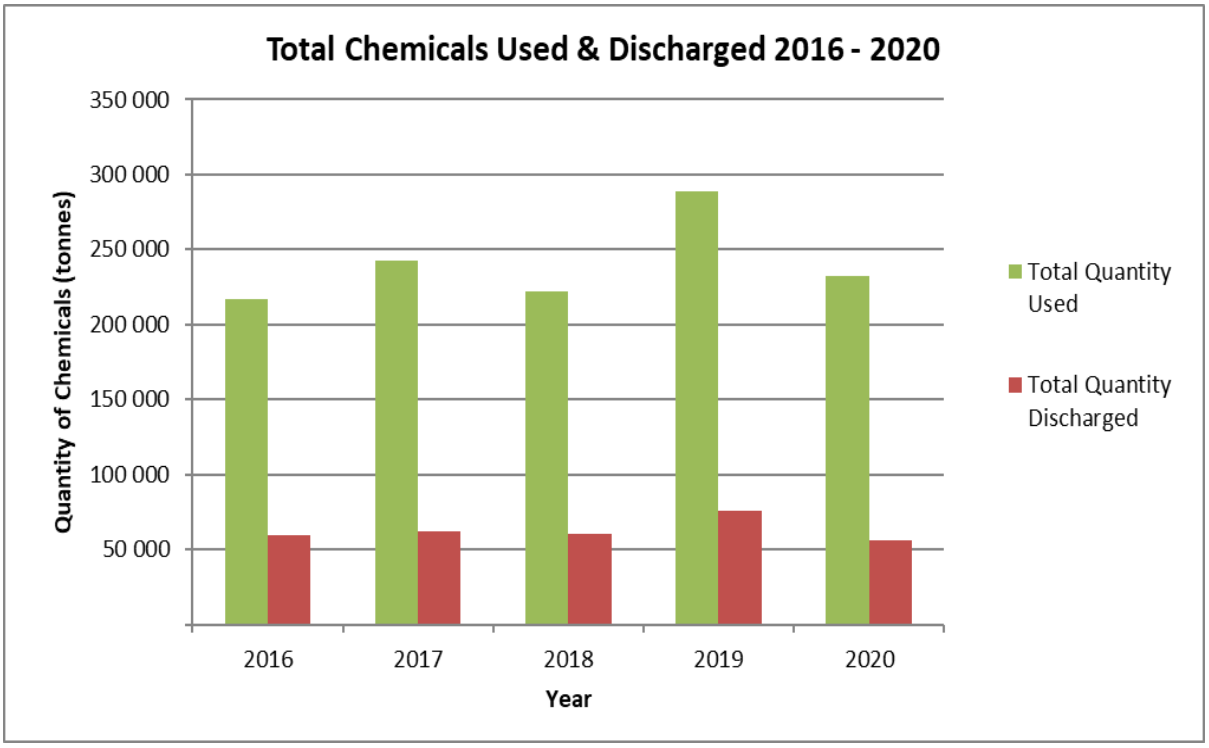


Fig. 9 – Total chemical use and discharge on UKCS, 2016-2020

6.1.1 Chemicals used

The total quantity of chemicals used offshore has varied year on year with the peak in 2019 of 288 546 tonnes used and the low of 221 621 tonnes in 2018 (Fig. 9). On average over the 2016-2020 period 67% (by weight) of the chemicals used were on the PLONOR list and another 32% (by weight) contained Ranking chemicals. Approximately 1,4% (by weight) of the chemicals used contained substitution chemicals. Comparable OSPAR figures over the same period are that on average just under 70% (by weight) of chemicals used were PLONOR and just over 29% (by weight) of chemicals used Ranking chemicals.

6.1.2 Chemicals discharged

The total quantity of chemicals discharged offshore has also varied year on year from a peak of 75 323 tonnes in 2019 and a low of 55 720 tonnes in 2020 (Fig. 9). On average over the 2016-2020 period almost 80% (by weight) of the chemicals discharged were on the PLONOR list and almost 19% (by weight) contained Ranking chemicals. Approximately 1,7% (by weight) of the chemicals discharged contained substitution chemicals.

Comparable OSPAR average figures over the same period are that on average just under 83% (by weight) of chemicals used were PLONOR and just under 17% (by weight) of chemicals discharged were Ranking chemicals

6.1.3 LCPA chemicals and candidates for substitution

The amount of LCPA substances used has varied over the five-year period ranging from 384kg in 2018 down to 107kg in 2019. There had been zero discharge of LCPA substances throughout the 2012-2015 period, however there was a 3,4kg discharge of a LCPA substance (lead based pipe-dope) associated with a discharge of water based drilling fluid, which was permitted inadvertently in 2016. No subsequent discharges of LCPA substances have occurred in the reporting period (Fig. 10). Across the OSPAR region while some LCPA chemicals are still used, their discharge, other than for a 0,45kg discharge by Denmark in 2019, has entirely ceased.

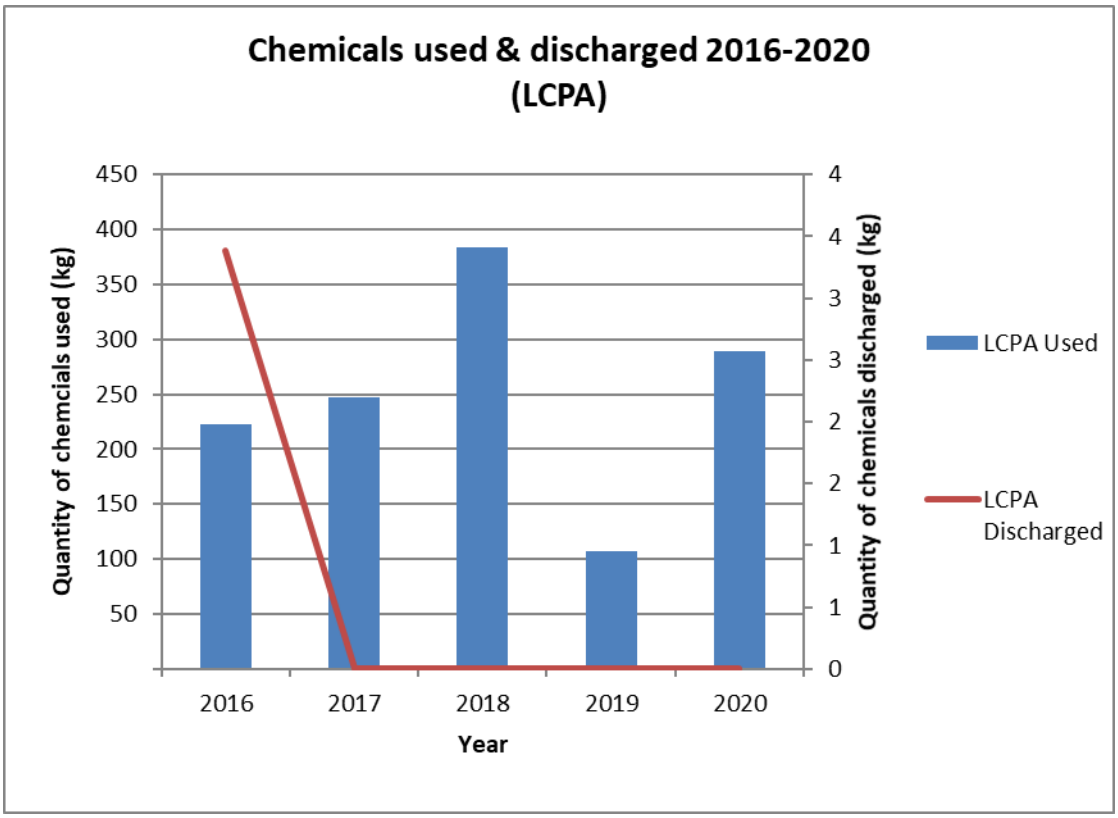


Fig. 10 – LCPA chemicals used and discharged on UKCS, 2016-2020

The quantity of substances identified as candidates for substitution used during the period 2016-2020 has increased by 40% from 2 652 tonnes in 2016 to 3 717 tonnes in 2020. However, over the same period the amount discharged has decreased by 34% from 1 292 tonnes to 859 tonnes (Fig. 11). The difference in trends between use and discharge are mainly due to more substitution chemicals being used, particularly in well operations, but that more are being shipped to shore, treated or disposed of downhole. This latter option is particularly the case for the increasing number of decommissioning well operations, which have increased sharply over the period.

Across the OSPAR region there has been a 17 % increase in the use of substitution chemicals and a 9% decrease in their discharge. There are however differences in the way Contracting Parties categorise some substances such as sodium hypochlorite, that makes a comparison of trends difficult.

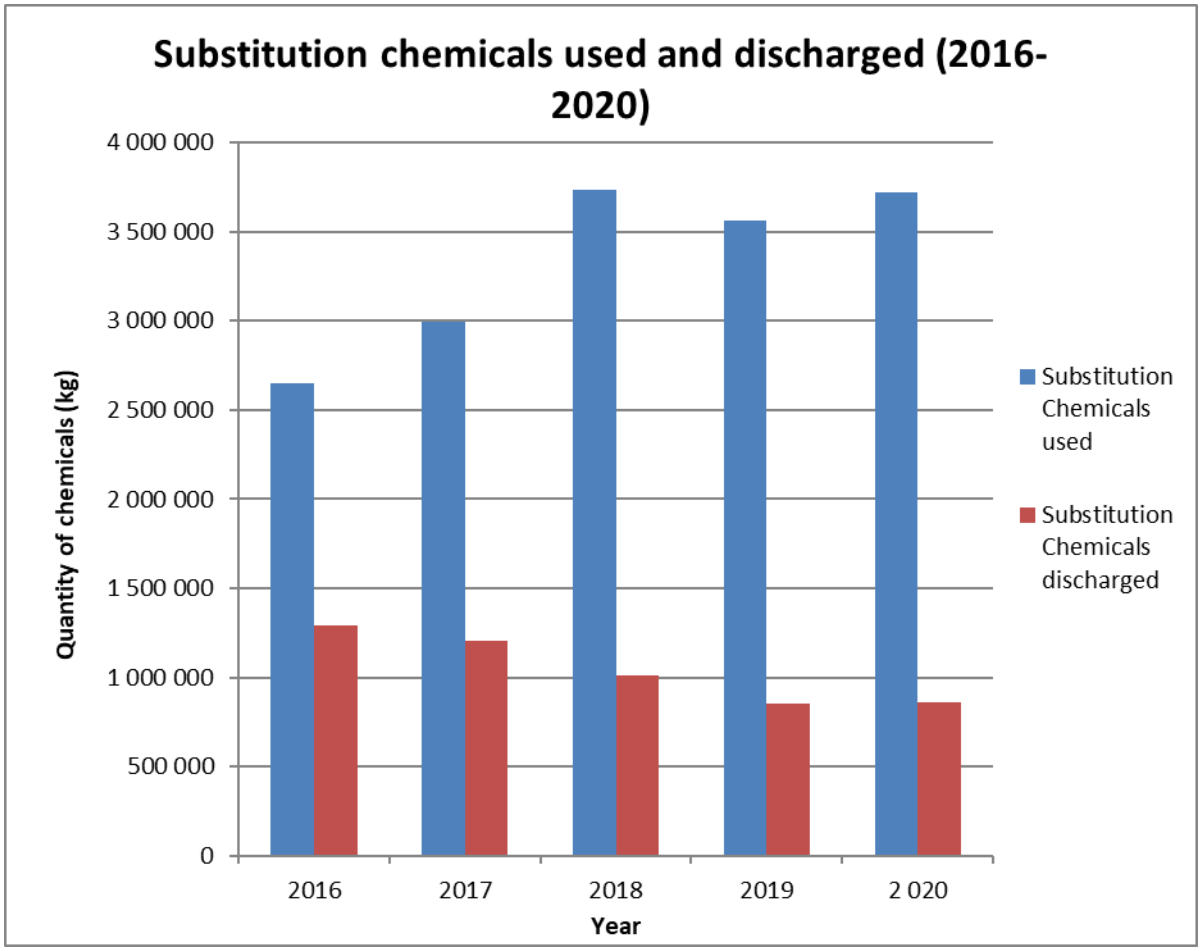


Fig. 11 – Use and discharge of chemicals which are candidates for substitution on UKCS, 2016-2020

As per OSPAR measures there was to be a cessation of the discharge of LCPA substances by 2010 and candidates for substitution by 2017, with such substances replaced by PLONOR or Ranking chemicals as they are recognised as better alternatives.

In the UK the use and discharge of Ranking substances has increased by 34% (wt) and 24% (wt) respectively between 2016 and 2020 (Fig. 12). For PLONOR substances the use and discharge has decreased by 5% (wt) and 12% (wt) respectively (Fig. 13). The increased use and discharge of Ranking substances is likely due to change out of some substitution chemicals as well as the recategorisation of some PLONOR substances as Ranking substances particularly sodium tetraborate and other boric acid containing chemicals.

Across the OSPAR region the use of Ranking substances has increased by 9% (wt) while discharge has remained the same over the period. For PLONOR substances use and discharge has decreased by 5% (wt) and 17% (wt) respectively.

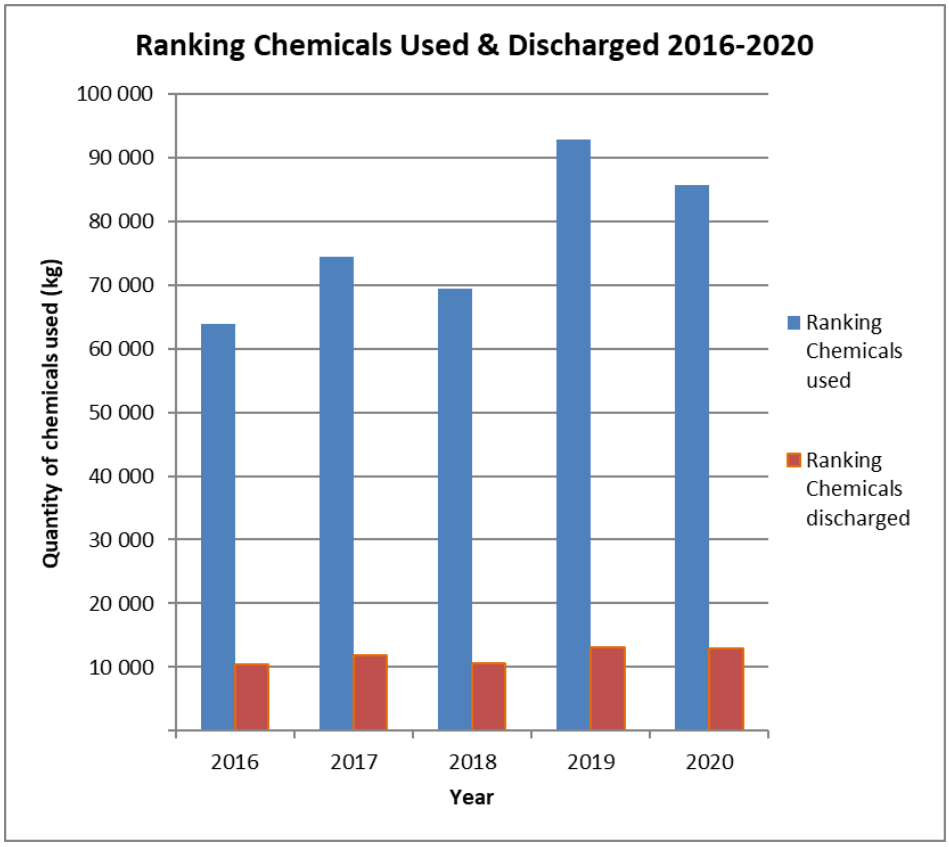


Fig. 12 – Use and discharge of Ranking Chemicals on UKCS, 2016-2020

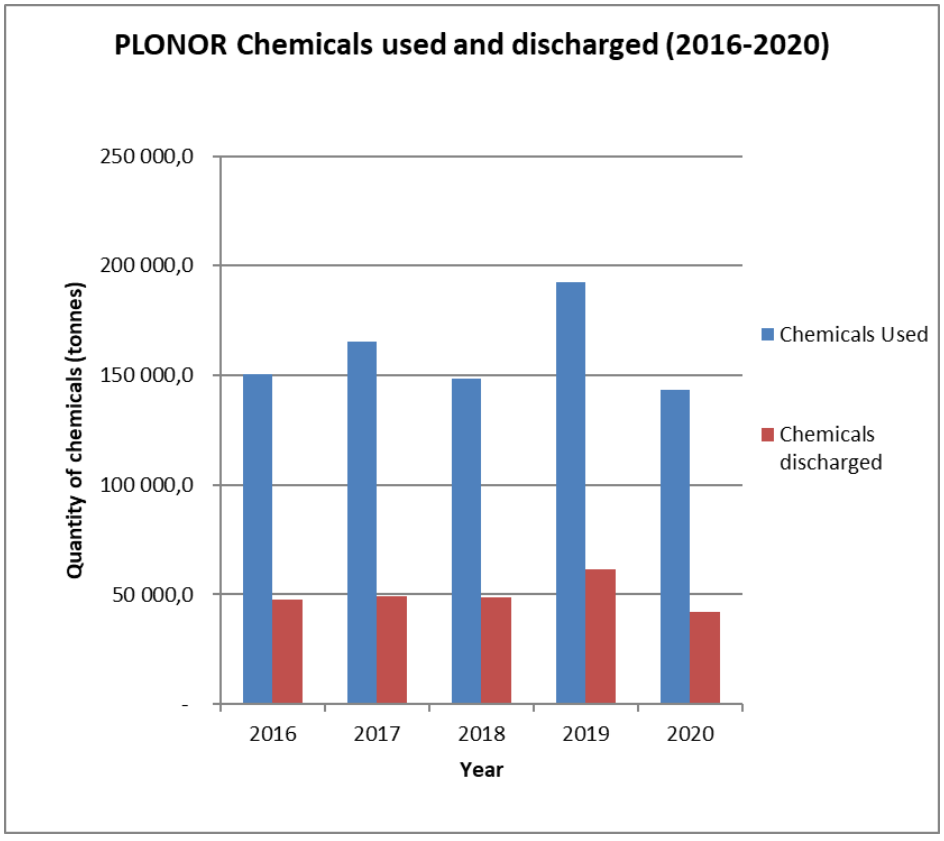


Fig. 13 – Use and discharge of PLONOR Chemicals on UKCS, 2016-2020

6.2 Plastic, Microplastic & Nanomaterial substances contained in offshore chemicals

Plastics, microplastics and nanomaterials are to be reported from 2020 onwards, so at present there is only one year of data and it is not possible to comment on any trends or comparison with other Contracting Parties.

Plastics & Nanomaterial category	Quantity used, kg	Quantity discharged, kg
Plastics	322 220	122 954
Microplastics	2 215 097	1 552 234
Nanomaterials	NI	NI

For the UK data it should be noted that

1. Not all registered products have been recertified prior to the HOCNF update that allows substances to be identified as Plastic, Microplastic, and Nanomaterial so reported figures are likely to be underestimates;
2. Nanomaterials have been reported as NI (No Information) as there is insufficient data available on which to base a reasonable estimate; and
3. Microplastics includes the total quantity of the coated proppant, which means the coating and particle that is coated is reported as a microplastic, as per the OSPAR definition. This results in a greater quantity of microplastic being reported than the quantity of plastics. If the coated proppant is excluded the quantity of microplastics used and discharged is 175 710 kg and 67 790 kg respectively.
4. The quantity of plastics reported includes the quantity of microplastics reported excluding any proppant material. Some nanomaterials may also be a plastic.

6.3 Chemical Spills[13]

The number of chemical spills to sea during the period has decreased by 40% over 2016-2020 from 246 to 147. The reasons for the significant dip from 2019 to 2020 are likely to be similar to that for oil in that reduced offshore activity during the pandemic resulted in less opportunities for spills to occur or be identified.

The total quantity spilled has generally trended downwards from 575 tonnes in 2016 to 254 tonnes in 2020, except for 2019 when 729 tonnes of chemicals were spilled (Fig. 13).

On average over the period less than 16% of the total number of spills were individually greater than 1 tonne spills, but they contributed up to 94% of all the chemicals spilled from offshore oil and gas installations in the UKCS. Given the random nature of spills no conclusions can be drawn about the quantity of chemicals spilled, either in the UK or across the OSPAR region.

[13] For chemical spills the quantity spilled uses the data from Table 5 of the Annual Report on discharges, spills and emissions from offshore oil and gas installations, which includes the water which forms part of the chemical product. The quantity of chemicals spilled by HMCS categorsition reported in Table 7c of the Annual Report removes the water from the chemical products.

The vast majority (greater than 98%) of chemicals spilled were either on the PLONOR list or were Ranking substances. Less than 2% of chemicals spilled were substitution chemicals. During the period 2016 – 2020 there were no spills of LCPA chemicals.

It should be noted that some chemical spill data has not been included in the data as the incidents are still under investigation by the UK regulator.

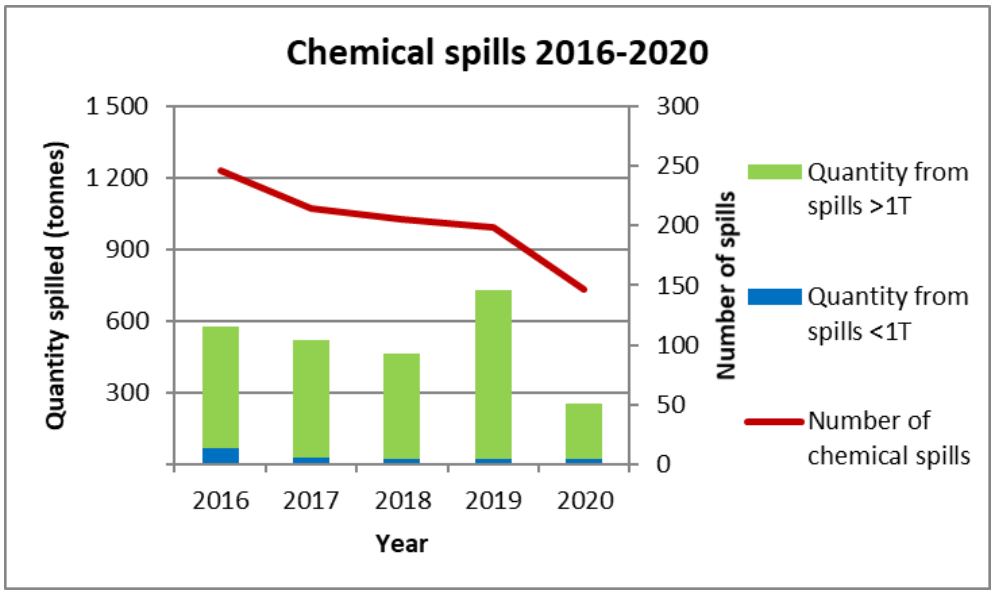


Fig. 14 – Chemical spills on UKCS, 2016-2020

8. Emissions to Air

Atmospheric emissions are not covered by OSPAR measures or harmonised measuring methodologies, but atmospheric pollutants are reported to OSPAR and, for larger installations, are regulated under relevant EU Directives that have been transposed into UK legislation. Consistency and quality of the data reported have undoubtedly improved over the past few years, particularly with regard to CO_2 emissions that are independently verified as required under of the EU ETS Directive.

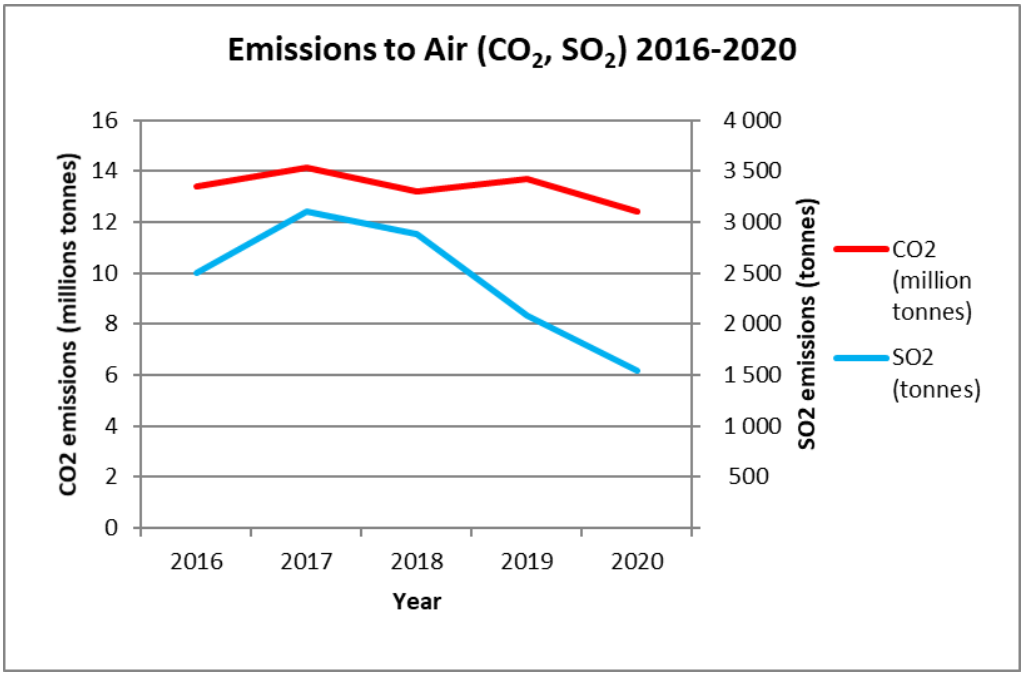


Fig. 14 – Emissions to air on UKCS (CO_2 & SO_2), 2016-2020

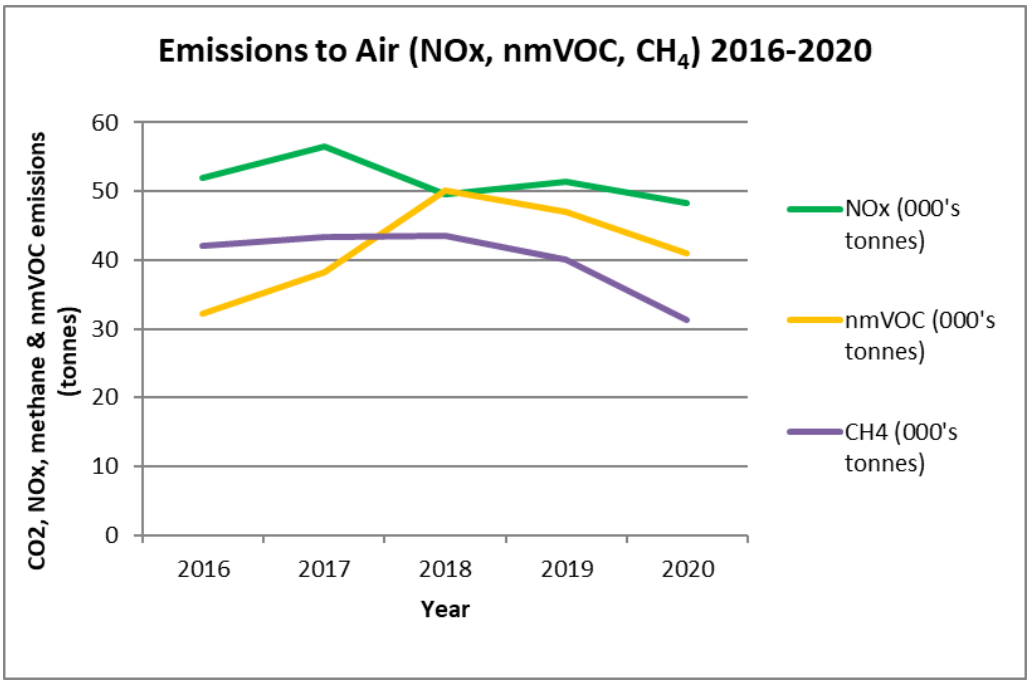


Fig. 15 – Emissions to air on UKCS (NOx, nmVOC, CH_4), 2016-2020

The majority of atmospheric emissions were generally stable, or showed a downward trend between 2016 and 2020, with the notable exception of nmVOC emissions. CO_2 emissions decreased by 8%, NOx by 7%, methane by 26% and SO_2 by 39%, while nmVOC's increased by 28%.

While there has been an overall increase in nmVOC emissions from 2016, this peaked in 2018 and has been decreasing since. nmVOC emissions are largely associated with FPSO/FSU operations and the variation is likely due to changes in the number of FPSO's operating and whether they have vapour recovery units installed as some older installations don't.

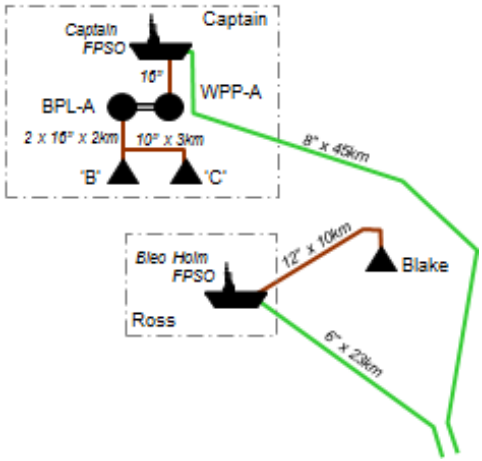
By comparison, there were similar reductions across the OSPAR region for the same period of 11% for CO_2, 12% for NOx, 3% for nmVOC, 28% for methane and 34% for SO_2.

9. Summary of Counting & QA Procedures in UK relating to OSPAR Data

8.1 Counting of Installations

There are some differences in the manner in which Contracting Parties count installations. The UK counts installations as follows:

All installations are counted, irrespective of whether there is a local discharge, on the basis that surface installations will always have emissions to air and drainage discharges to sea, and there could also be unscheduled discharges such as oil or chemical spills from all surface and subsea installations. Installations which are connected by walkways or bridges are also each counted separately. For subsea installations, rather than reporting one installation per well or cluster of well heads, the UK considers that all the subsea wells or well clusters serving a single field should be reported as one installation. For example, if a field has been developed solely as a subsea facility it will be reported as a single subsea installation, even if it has more than one well or more than one cluster of wells. It is recognised that in some cases a field can also consist of a surface facility and a number of subsea wells or well clusters that are remote from the surface facility. In such cases the UK reports the surface and subsea facilities separately. The UK uses nodal diagrams to summarise information relating to subsea fields. For example, the Captain Field consists of a Floating Production facility, two bridge-linked surface installations and two subsea drill centres (see diagram below). The UK reports this as three surface oil installations and one subsea installations as the two groups of wellheads are associated with the main field), rather than two surface oil installations and two subsea installations (i.e. one for each cluster of well heads). In a similar manner, Ross field consists of a Floating Production facility and also serves the Blake field subsea installation, and it would be counted as one surface oil installation and one subsea installations (BleoHolm FPSO and Blake).



8.2 Reporting of Dispersed Oil

In the UK operators are required to both quantify the amount of produced and displacement water discharged and determine the concentration of dispersed oil in the discharge.

Quantification of the discharge is required to meet a +/-10% uncertainty measurement which must be verified through a measurement uncertainty calculation. Measurement is typically undertaken using meters (ultrasonic, magflow or orifice meters) which must be calibrated on a regular basis to ensure the accuracy of the measurement. In some cases where it is not possible to install a meter, well test data or other mass balance approaches are used. However, these should also seek to

achieve the +/-10% measurement uncertainty, for example by suitably maintaining other measurement devices and undertaking frequent well flow testing.

The concentration of dispersed oil is determined by sampling the discharge stream on a routine basis and analysing the samples in accordance with UK Guidance. Operators are required to sample discharge streams a minimum of twice per day for discharges of greater than 2 tonnes dispersed oil per year or at least monthly for installations with discharges of less than 2 tonnes dispersed oil per year. The sampling frequency for discharges of greater than 2 tonnes dispersed oil per year is greater than the minimum required under the OSPAR Recommendation 2001/1 and some installations sample up to 4 times daily. Where operations result in process upsets sampling is undertaken more frequently.

Although spot sampling provides an indication of discharge quality, it is recognised that there can be significant variation in water quality over short periods of time and that there is a great deal of uncertainty associated with the sampling regime. Operators of installations with large discharges, and operators of new installations, are therefore encouraged to use online analysers for process monitoring to provide a real time indication of produced water quality so that any deterioration in quality can be responded to more quickly.

While operators are required to report analysis results in accordance with the OSPAR Reference method the majority of UK installations continue to undertake onsite analysis using infra-red techniques and the results are then converted to an OSPAR Reference Method result using correlation graphs, which are updated at least every 6 months.

Dispersed oil discharges are reported every month using the UK Environmental and Emissions Monitoring System (EEMS) and reports are regularly checked, including at the end of each year, to identify any anomalies. The audit trail of results from offshore analysis to reporting via EEMS is also checked during offshore inspections.

8.3 Reporting of Chemical Use & Discharge

Operators in the UK are required to record the use and discharge of all offshore chemicals included in their chemical permits, in accordance with the terms and conditions of the permit. Operators are required to report the use and discharge to the UK regulator upon completion of specific activities or on a quarterly basis. Quantification methods for chemical use and discharge vary greatly from operator to operator. Some report the quantities shipped from suppliers which may only provide a rough estimate over the quarter but will average out over the year or longer periods, while others record daily consumption from stock tanks on board the installation which provides a more accurate and consistent measurement. There is no measurement uncertainty requirement, but it is likely that this would be within +/-10% where measurement is based on stock tank levels onboard the installation.

Chemical use and discharge is reported via EEMS, and the UK regulator can run reports to compare permitted use and discharge against reported use and discharge to check for any significant variations, breaches or obvious transcription errors. The operators' chemical management systems and methods of reporting are also reviewed during offshore inspections.

8.4 Reporting of Atmospheric Emissions

Operators are required to report atmospheric emissions via EEMS on an annual basis. For larger installations, the determination of CO_2 emissions is undertaken in accordance with the installation's monitoring and reporting plan submitted under The Greenhouse Gas Emissions Trading Scheme

Regulations 2012, which sets requirements for measurement uncertainty of +/-2.5 for combustion equipment fuel sources and +/-5% for flare fuel sources. Measurement varies depending upon the type of emission, for example fuel gas used for combustion equipment and flare will usually be metered, although installations that are not included in the EU ETS may use a mass balance approach based on the amount of gas produced vs the amount exported, flared and consumed. For diesel consumption this is typically quantified by the measured reduction in tank levels on a daily basis. Atmospheric emissions are determined using standard emission factors based upon the fuel used, with samples taken to determine the composition of fuel gas on a quarterly basis.

Emissions reported to EEMS are reviewed to identify any unusual results and reports can also be run to cover a number of years to review trends. Transcription errors are often identified at this stage.

Appendix 1: OSPAR Measures associated with Offshore Oil and Gas industry

Discharges contaminated with oil

PARCOM Recommendation 86/1 of a 40 mg/l Emission Standard for Platforms[14];

OSPAR Reference Method of Analysis for the Determination of the Dispersed Oil Content in Produced Water (OSPAR Agreement number: 2005-15);

OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations (as amended);

OSPAR Recommendation 2012/5 for a risk-based approach to the Management of Produced Water Discharges from Offshore Installations (as amended)

Use and discharge of drilling fluids and cuttings

OSPAR Decision 2000/3 on the Use of Organic-phase Drilling Fluids (OPF) and the Discharge of OPF-contaminated Cuttings;

Guidelines for the Consideration of the Best Environmental Option for the Management of OPF-Contaminated Cuttings Residue (OSPAR Agreement number: 2002-8);

Chemicals used and discharged offshore

OSPAR Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals (as amended);

OSPAR Recommendation 2010/4 on a Harmonised Pre-Screening Scheme for Offshore Chemicals (as amended);

OSPAR Recommendation 2010/3 on a Harmonised Offshore Chemical Notification Format (HOCNF) (as amended);

OSPAR Recommendation 2006/3 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution 9as amended);

OSPAR Recommendation 2005/2 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Contain Added Substances, Listed in the OSPAR 2004 List of Chemicals for Priority Action.

OSPAR Agreement 2013-06 - OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR) (as amended)

[14] PARCOM Recommendation of a 40 mg/l Emission Standard for Platforms, 1986 was revoked for produced water only by OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations. However, this measure is still applicable in relation to ballast water, drainage water and displacement water from offshore installations.

Appendix 2: Data Annexes

Table 1a: Number of installations in the UK maritime area with discharges to the sea, or emissions to the air 2016-2020

2016	2017	2018	2019	2020
505	477	466	461	445

Table 1b: Number of installations by type of installation in the UK maritime area with discharges to the sea, or emissions to the air, 2016-2020

	2016	2017	2018	2019	2020
Oil	86	88	88	89	86
Gas	195	172	165	156	147
Subsea	223	216	212	215	211
Other	1	1	1	1	1
Total	505	477	466	461	445

Wells	188	206	208	190	172

Table 2: Oily aqueous discharges to the maritime area*

Table 2a: Oil discharged in displacement and produced water (in tonnes), 2016-2020

2016	2017	2018	2019	2020
2 017	2 139	2 241	2 294	2426

Table 2b: Dissolved oil discharged in displacement and produced water (in tonnes), 2016-2020

2016	2017	2018	2019	2020
2140	2 656	2586	2680	2401

* Suspected sampling and analytical error resulting in significant increase in result.

Table 2c: Total volume of produced water and displacement water discharged, and produced water injected (in m^3/year), 2016-2020

	2016	2017	2018	2019	2020
PW*	154 840 018	142 650 609	139 116 220	138 737 886	136 619 055
DPW**	623 039	738 773	473 554	526 727	431 139
IPW***	47 860 183	52 955 275	59 898 306	67 780 765	74 759 856
Total	**203 323 240**	**196 344 657**	**199 488 080**	**207 045 378**	**211 810 050**

* Produced water

** Displacement water

*** Injected produced and displacement water

Table 3: Installations which do not meet OSPAR performance standard for dispersed oil in aqueous discharges

Table 3b: Number of installations with discharges exceeding the 30 mg oil/l performance standard, valid from 2007 onwards, and quantity of oil discharged by these installations (in tonnes), in excess of the 30 mg/performance standard

	2016	2017	2018	2019	2020
Number of installations exceeding 30 mg/l	11	13	12	14	17
Quantity of dispersed oil discharged	5,7	13,81	65,44	55,74	103,9

Table 4: Use and discharges of organic-phase drilling fluids (OPF) and cuttings

Table 4a: Quantities of oil and other organic-phase fluids discharged via cuttings (in tonnes), 2016-2020

2016	2017	2018	2019	2020
Total OPF	Total OPF	Total OPF	Total OPF	Total OPF
23	15	3	14	8

Table 4b: Number of wells drilled with OPF, with discharge of contaminated cuttings to the maritime area, 2016-2020

2016		2017		2018		2019		2020	
OBF	non-OBF OPF	OBF	non-OBF OPF	OBF	Other OPF	OBF	Other OPF	OBF	Other OPF
17	0	13	0	7	1	11	0	20	0

Table 5: Spillage of oil and chemicals

Table 5a: Number of oil spills, 2016-2020 - Spills less than 1 tonne (≤ 1 T) and spills above 1 tonne (> 1 T)

2016		2017		2018		2019		2020	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
348	5	296	13	342	3	266	7	187	4

Table 5b: Total quantity of oil spilled, in tonnes, 2016-2020

2016		2017		2018		2019		2020	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
11,63	13,91	11,9	40,8	20,9	6,4	10,1	23,8	9,31	23,66

Table 5c: Number of spills of chemicals and amount of chemical spilled in tonnes/year, 2016-2020

	2016	2017	2018	2019	2020
Number of spills of chemicals	246	214	205	199	147
Tonnage of spilled chemicals	575,3	522,7	462	729	253,52

Table 6: Emissions to air, 2016-2020

CO_2 (in millions of tonnes)

2016	2017	2018	2019	2020
13,4	14,1	13,2	13,7	12,4

NO_x (in thousand of tonnes)

2016	2017	2018	2019	2020
51,86	56,52	49,52	51,37	48,35

nmVOCs (in thousands of tonnes)

2016	2017	2018	2019	2020
32,12	38,29	50,10	47,00	40,99

CH_4 (in thousand of tonnes)

2016	2017	2018	2019	2020
42,15	43,29	43,57	40,11	31,35

SO_2 (in tonnes)

2016	2017	2018	2019	2020
2 506	3 100	2 877	2 079	1 539

Table 7: The use and discharge of offshore chemicals, 2016-2020

Table 7a: Quantity of offshore chemicals used in kg/year

Pre-screening category	2016	2017	2018	2019	2020
List of Chemicals for Priority Action	223	247	384	107	289
Inorganic LC50 or EC50 < 1 mg/l*	291	298	324	165	326
Biodegradation < 20%*	1 170 337	1 417 466	2 157 142	1 820 462	1 757 826
Substance meets two of three criteria*	1 481 436	1 576 541	1 577 094	1 739 559	1 959 014
PLONOR	150 546 941	165 314 789	148 455 829	192 239 230	143 095 375
Inorganic, LC50 or EC50 > 1 mg/l	1 342 891	2 179 745	1 271 711	2 008 430	3 347 236
Ranking Substances	62 469 981	72 200 124	68 158 557	90 739 754	82 352 938
Total	**217 012 100**	**242 689 210**	**221 621 040**	**288 547 707**	**232 513 003**

* Chemicals which are candidates for substitution

Table 7b: Quantity of offshore chemicals discharged in kg/year

Pre-screening category	2016	2017	2018	2019	2020
List of Chemicals for Priority Action	3,4	0	0	0	0
Inorganic LC50 or EC50 < 1 mg/l*	119,7	20	4	107	7
Biodegradation < 20%*	472 359	508 941	505 189	433 001	374 089
Substance meets two of three criteria*	819 485	693 579	507 670	420 976	485 139
PLONOR	47 614 750	49 308 449	48 598 583	61 453 154	41 945 147
Inorganic, LC50 or EC50 > 1 mg/l	365 463	543 690	342 798	676 670	1 840 853
Ranking Substances	10 033 343	11 375 557	10 277 924	12 339 248	11 075 231
Total	**59 305 522**	**62430234,833**	**60 232 170**	**75 323 155**	**55 720 467**

* Chemicals which are candidates for substitution

Table 7c: Chemicals spilled in kg per year

Pre-screening category	2016	2017	2018	2019	2020
List of Chemicals for Priority Action	0	0	0	0	0
Inorganic LC_{50} or EC_{50} < 1 mg/l*	0	0	0	0	0
Biodegradation < 20%*	2 217	379,	106	970	284,6
Substance meets two of three criteria*	404	0,67	7	6 393	108,3
PLONOR	304 419	304 419	354 167	186 929	150 668
Inorganic, LC_{50} or EC_{50} > 1 mg/l	1 941	1 941	231,288	1 844	111
Ranking Substances	145 370	145 370	90737	48 721	56 814
Total	**454 351**	**445 515**	**237 607**	**214 956**	**96 803**

* Chemicals which are candidates for substitution

Table 8: UK total production in oil equivalents, (toeq)

2016	2017	2018	2019	2020
102 538 306	82 375 071	93 218 686	94 883 273	90 815 178

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OSPAR's vision is of a clean, healthy and biologically diverse North-East Atlantic used sustainably

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