OSPAR COMMISSION

Netherlands Assessment of Discharges, Spills and Emissions from Offshore Oil and Gas Installations in 2013 -17

Offshore Oil & Gas Industry Series

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State Supervision of Mines
Ministry of Economic Affairs, Agriculture and Innovation

Contents

Executive Summary

This report presents the discharge, spill and emission data for the Netherlands offshore oil and gas operations during the period 2013 – 2017 and provides an assessment of that data. The annual data on which the assessment is based are provided in Appendix 1.

a. Level of Activity

The Netherlands Continental Shelf (NLCS) is a mature oil and gas province within the OSPAR region which saw a 50% reduction in production between 2013 and 2017.

The number of installations on the NLCS has decreased by 16% in the last five years; drilling activity peaked in 2015 but then declined in 2016-2017.

b. Discharges & Spills of Oil

The total quantity of dispersed[1] oil (aliphatic oil) discharged to the sea from produced water increased during the period 2013 – 2017, from 60 tonnes in 2013 to 85 tonnes in 2017, an increase of 42%. By comparison, during the same five-year period the annual amount of dispersed oil discharged to sea in the OSPAR region as a whole did not vary considerably.

Oil spillages during the same period ranged from 0.004 to 0.8 tonnes, with no clear trend apparent.

The majority of installations in the NL sector meet the OSPAR oil-in-water performance standard of no more than 30mg/l, but occasional failures are seen. The maximum annual number of such failures was two in 2013 and again in 2015. All installations met the performance standard in 2014 and 2017. No trend is apparent with regards to the failures.

c. Chemicals

The use and discharge of chemicals have been regulated by OSPAR protocols since the start of 2001, and these have been incorporated into Netherlands national legislation since 2003.

Although there was no clear trend in the scale of overall chemical use and discharge over the period studied, significant reductions were seen with respect to hazardous chemicals. The discharge of substitution chemicals decreased from approximately 24 tonnes in 2013 to approximately 3.5 tonnes in 2017. This represents an 86% reduction in the discharge over the five-year period. Less than 0.05% (by weight) of the chemicals discharged in 2017 contained substances which are candidates for substitution. Environmental goals for the discharges of chemicals that are, or which contain substances identified as candidates for substitution were set out in OSPAR Recommendation 2006/3, which targeted their phasing out by 2017.

OSPAR Recommendation 2005/2 sets environmental goals for the reduction of discharges of substances from OSPAR's List of Chemicals for Priority Action (LCPA), which were to be phased out by 2010. No LCPA substances were discharged in The Netherlands in the 2013-2017 period.

[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.

d. Atmospheric Emissions

Atmospheric emissions from offshore oil and gas activities are not regulated by OSPAR measures, but are reported annually by operators.

Récapitulatif

Le présent rapport comporte des données portant sur les rejets, déversements et émissions provenant des activités pétrolières et gazières offshore des Pays-Bas entre 2013 et 2017 ainsi que leur évaluation. Les données annuelles sur lesquelles se fonde l'évaluation se trouvent dans l'appendice 1.

a. Niveau d'activité

Le plateau continental néerlandais (NLCS) est une région pétrolière et gazière arrivée à maturité de la zone OSPAR, la production a diminué de 50% entre 2013 et 2017.

Le nombre d'installations sur le NLCS a diminué de 16% au cours des cinq dernières années, les activités de forage ayant culminé en 2015 puis décliné entre 2016 et 2017.

b. Rejets et déversements d'hydrocarbures

Le volume total d'hydrocarbures dispersés[2] (hydrocarbures aliphatiques) rejetés en mer, provenant de l'eau de production, a augmenté entre 2013 et 2017, passant de 60 tonnes en 2013 à 85 tonnes en 2017, ce qui correspond à une augmentation de 42%. A titre comparatif, la quantité annuelle d'hydrocarbures dispersés en mer dans l'ensemble de la zone OSPAR au cours de la même période n'a pas beaucoup varié.

Les déversements d'hydrocarbures au cours de la même période varient entre 0,004 et 0,8 tonnes, aucune tendance apparente n'étant relevée.

La majorité des installations du secteur néerlandais répondent aux normes de performance d'OSPAR en ce qui concerne les teneurs en hydrocarbures dans l'eau, à savoir inférieures à 30mg/l, mais on relève certains échecs. Le nombre annuel maximum de ces échecs a été de deux en 2013 ainsi qu'en 2015. Toutes les installations répondent aux normes de performance en 2014 et 2017. On n'a relevé aucune tendance apparente des échecs.

c. Produits chimiques

L'utilisation et le rejet de produits chimiques sont réglementés par des protocoles OSPAR depuis le début de 2001 et ceux-ci ont été intégrés à la législation nationale néerlandaise depuis 2003.

On n'a relevé aucune tendance évidente de l'ampleur de l'utilisation et des rejets de produits chimiques dans l'ensemble au cours de la période étudiée mais on a relevé des réductions

[2] Les hydrocarbures « aliphatiques » et « aromatiques » sont définis par la méthode de référence énoncée dans l'Accord OSPAR 2005-15 (Extraction par solvant, mesure par infrarouges à 3 longueurs d'onde). Dans ce contexte, les termes « hydrocarbures aliphatiques » et « hydrocarbures dispersés » ont le même sens.

significatives en ce qui concerne les produits chimiques dangereux. Les rejets de produits chimiques de substitution ont diminué, passant d'environ 24 tonnes en 2013 à environ 3,5 tonnes en 2017, ce qui représente une réduction de 86% des rejets au cours d'une période de cinq ans. Moins de 0,05% (en poids) des produits chimiques rejetés en 2017 contenaient des substances candidates à la substitution. Les objectifs environnementaux pour les rejets de produits chimiques qui sont, ou qui contiennent, des substances candidates à la substitution ont été fixés par la Recommandation OSPAR 2006/3 concernant leur élimination progressive d'ici à 2017.

La Recommandation OSPAR 2005/2 fixe des objectifs environnementaux pour la réduction des rejets de produits chimiques figurant sur la Liste OSPAR de produits chimiques devant faire l'objet de mesures prioritaires (LCPA), qui devaient être éliminées progressivement d'ici à 2010. Aucun produit chimique de la LCPA n'a été rejeté aux Pays-Bas entre 2013 et 2017.

d. Emissions atmosphériques

Les émissions atmosphériques provenant des activités pétrolières et gazières offshore ne sont pas réglementées par les mesures OSPAR mais elles sont notifiées tous les ans par les opérateurs.

1. Introduction

This report provides an assessment of the discharges, spills and emissions to the environment from offshore oil and gas operations in The Netherlands sector of the OSPAR Maritime Area for the period 2013 – 2017. 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 Netherlands sector, with the aim of demonstrating the effectiveness of OSPAR measures in the NLCS. Trends have been assessed using expert judgement and not by statistical analyses.

This assessment is based on data submitted by operators on the NLCS to The Netherlands authorities, and reported by The Netherlands 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 preparing the report and are appended to this report for information at Appendix 2.

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

“Assessment of discharges, spills and emissions from offshore oil and gas operations on the Netherlands Continental Shelf, 2010-2014” (OSPAR Commission 2016)

“Draft OSPAR report on discharges, spills and emissions from offshore oil and gas installations in 2015”

“Draft OSPAR report on discharges, spills and emissions from offshore oil and gas installations in 2016 (Data in Excel form)”

“Draft OSPAR report on discharges, spills and emissions from offshore oil and gas installations in 2017 (Data in Excel form)”

The operators have used procedures for sampling and analysis detailed by OSPAR Agreement 2005-15. Accredited or accepted laboratories have been used.

Details of Netherlands QA/QC procedures are discussed in section 7 of this report.

2. Setting the Scene

2.1 Level of Activity

The Netherlands is currently the third largest producer of oil and gas in the OSPAR Region; however, between 2013 and 2017 a fall of 50% was seen. By contrast, the offshore production in the whole OSPAR region during the same period remained fairly constant.

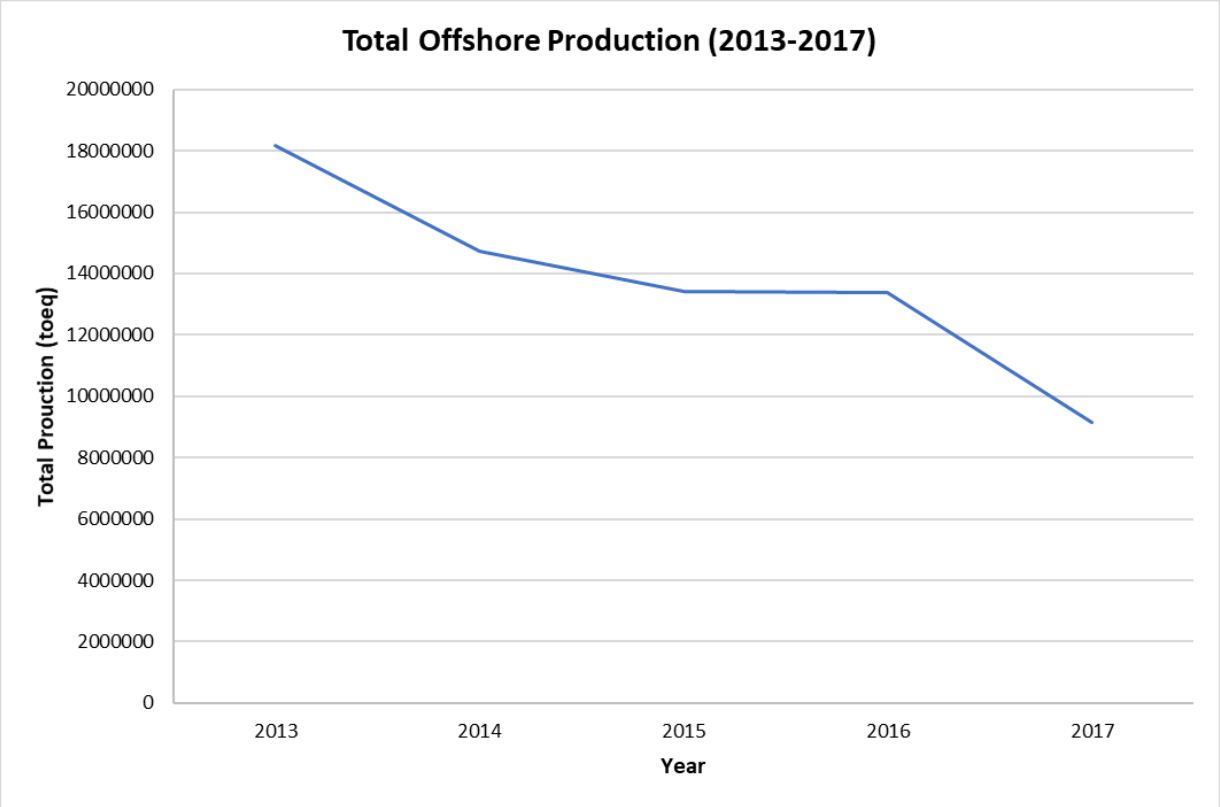

Fig. 1 – Total offshore oil & gas production in the NLCS, 2013-2017

The number of installations with emissions and discharges in The Netherlands sector of the OSPAR Maritime Area (excluding drilling installations) remained static during the period 2013–2015 but decreased in 2016-2017 (Figure 2). The overall decrease for the five-year period is 16%.

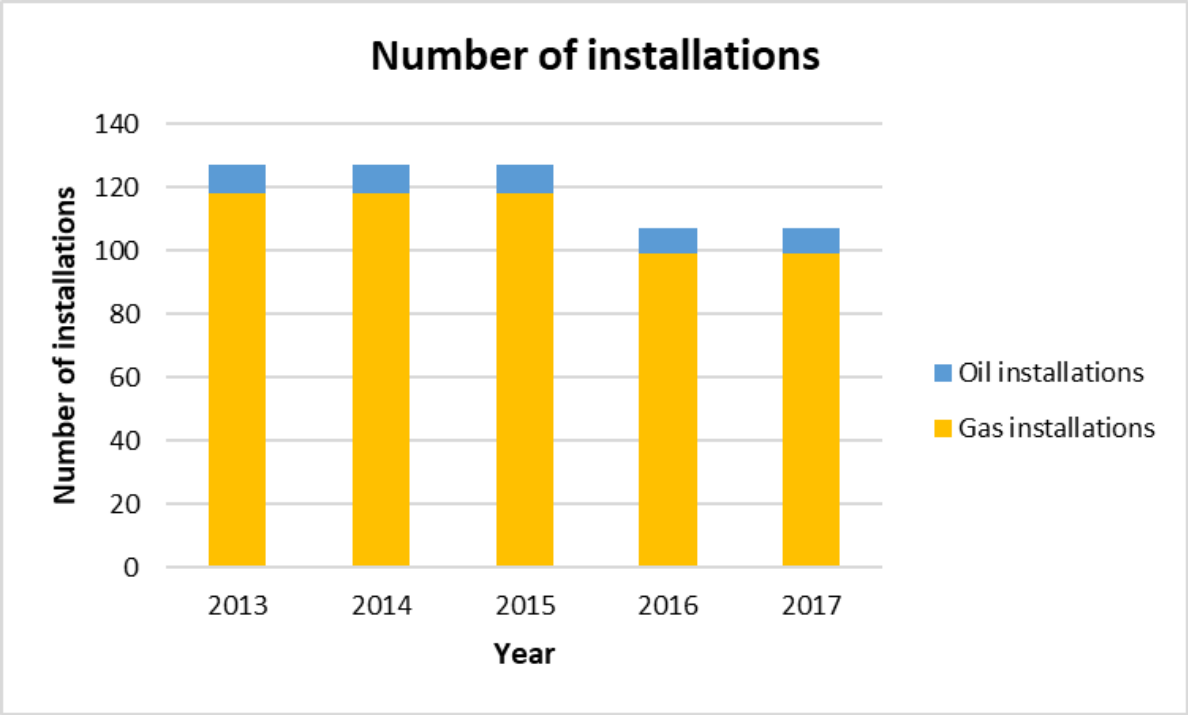

Fig. 2 – Number of Installations on the NLCS, 2013-2017

Since 2011 drilling activity has been measured by the number of wells drilled in each calendar year. The number of geological sidetracks is also included in the report. Data held by SSM confirms that 81 wells were drilled between 2013 and 2017; the number of wells drilled was lowest in 2017 (only 6 wells drilled). By contrast, the number of wells drilled in the OSPAR region as a whole during the same five-year period was highest in 2017.

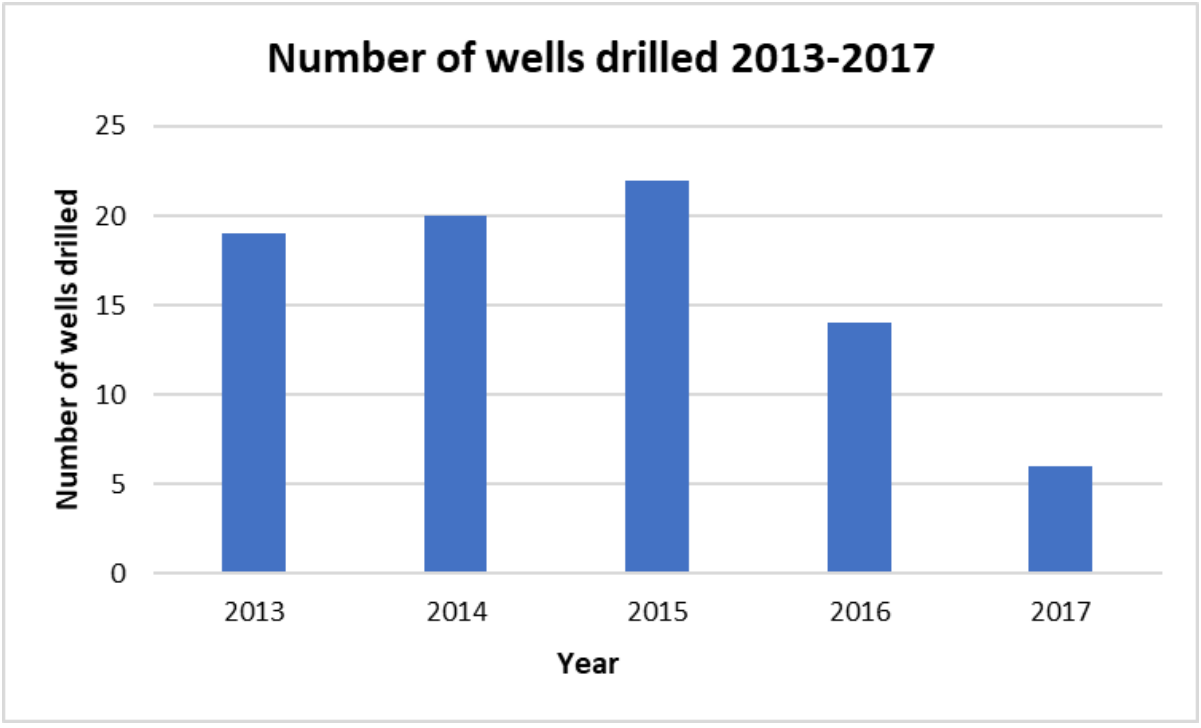

Fig. 3 – Number of wells drilled on NLCS, 2013-2017

3. 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 NL implemented this administratively by requiring all licence operators in the NL 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 on a two yearly basis by a certification body accredited by the RvA (the national accreditation body for The Netherlands). Since 2005 all operators have had an EMS which meets the NL requirements. Of the 11 licence operators in The Netherlands currently undertaking offshore oil & gas operations, 6 are certified to ISO14001 while the remaining 5 have an EMS which has been verified to conform to the principles of ISO 14001.

Every operator with an EMS must also publish a public statement to cover any offshore oil and gas operations undertaken in the previous year.

4. Oil Discharges

4.1 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 30mg/l. The Netherlands implements this Recommendation into law through the Mining Act, Mining Decree and the Mining Regulations of 2003 (as amended). Article 40 of the Mining Act requires that offshore operations are conducted under a permit, Article 80.1 of the Decree forbids the discharge of oil and oil-containing mixtures, whilst the detailed requirements are stipulated under Article 9.1 of the Regulations. With regard to produced and displacement water discharges, operators are required to ensure that concentrations of dispersed oil do not exceed 30mg/l as a monthly average, but up to 100mg/l is allowed during the four hours following start-up operations. Samples are taken for analysis on every other day for installations discharging more than 2 tonnes of dispersed oil per year, whilst samples are taken at least weekly 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. To facilitate this calculation, the flow rates of the relevant discharges must be determined with an uncertainty of not more than ±5%.

OSPAR Recommendation 2001/1 (as amended) also requires that Contracting Parties should ensure that plans to construct new offshore installations, or plans 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).

The Netherlands had addressed this requirement through an Environmental Covenant agreed between the Netherlands Government and the offshore industry.

4.1.1 Produced & displacement water

Produced water discharges in The Netherlands have varied considerably between 2013 and 2017. The smallest and largest volumes of discharged produced water were recorded in adjacent years (2.2 million cubic meters in 2015 and 6.4 million cubic meters in 2016 respectively) (Figure 4). Discharges at the end of the five-year period were 60% higher than those at the start. By comparison during the same five-year period, the produced water discharges in the OSPAR area increased between 2013 and 2015 but then gradually decreased to their original levels over the next two years.

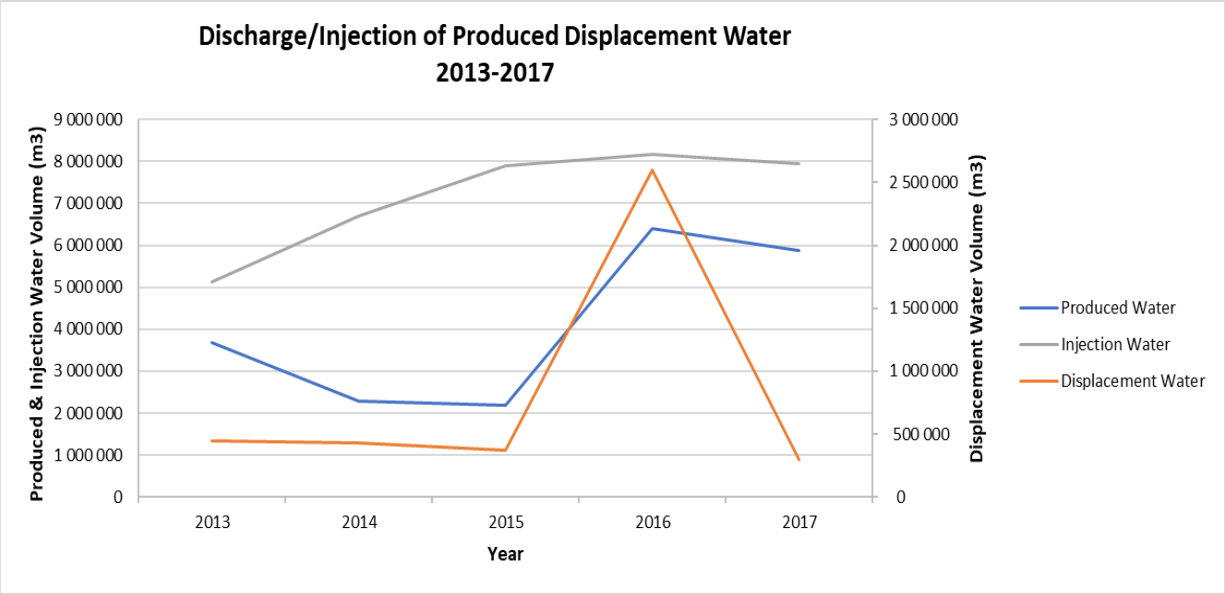

Fig. 4 – Discharge / Injection of produced and displacement water, 2013-2017

In The Netherlands, the total quantity of injection water increased between 2013 and 2017; quantities injected at the end of the five-year period were 55% higher than those at the start. No clear trend was apparent for the injected water in the OSPAR region during the same period.

Displacement water discharges in The Netherlands decreased between 2013 and 2015 but peaked in 2016. They decreased again in 2017. By comparison during the same five-year period, the displacement water discharges in the OSPAR area increased between 2013 and 2015 but then decreased over the next two years.

4.1.2 Dispersed oil discharged

The total quantity of dispersed oil discharged with produced and displacement water on the NLCS gradually increased from 60 tonnes in 2013 to 85 tonnes in 2017 (42% increase). Although there was an overall increase, it is worth noting that only 37 tonnes of dispersed oil were discharged in 2014

(Figure 5). By comparison, the total quantity of dispersed oil discharged with produced and displacement water in the OSPAR region did not vary significantly ranging from 4 001 to 4 050 tonnes although in 2015 the figure recorded was 4 523 tonnes.

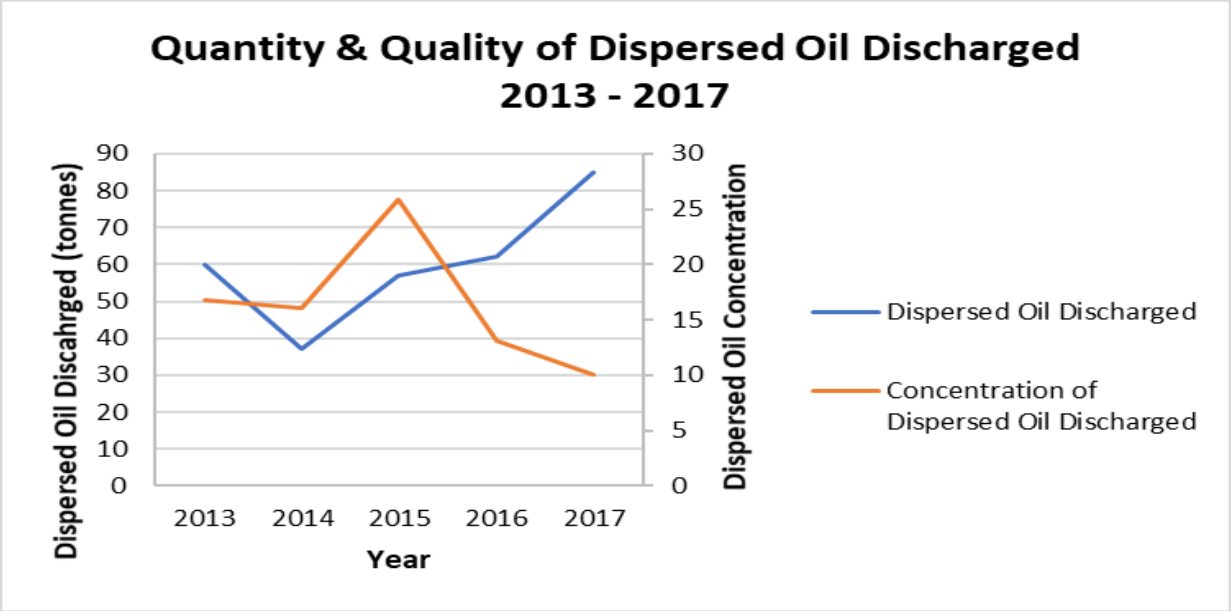

Fig. 5 – Quantity and quality of dispersed oil discharged on NLCS, 2013-2017

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 30mg/l. While the majority of installations in the NL sector meet the performance standard, a small number of installations occasionally fail to do so, as shown in Figure 6. The number of installations which failed to meet the standard varied from zero in 2014 and 2017 to two in 2013 and 2015, with no clear trend apparent.

There is likewise no trend evident in the quantity of dispersed oil discharged by installations that failed to meet the performance standard during the period 2013 – 2017.

For regulatory purposes in the NL this [i.e. dispersed oil concentration] 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 NL calculates an annual average.

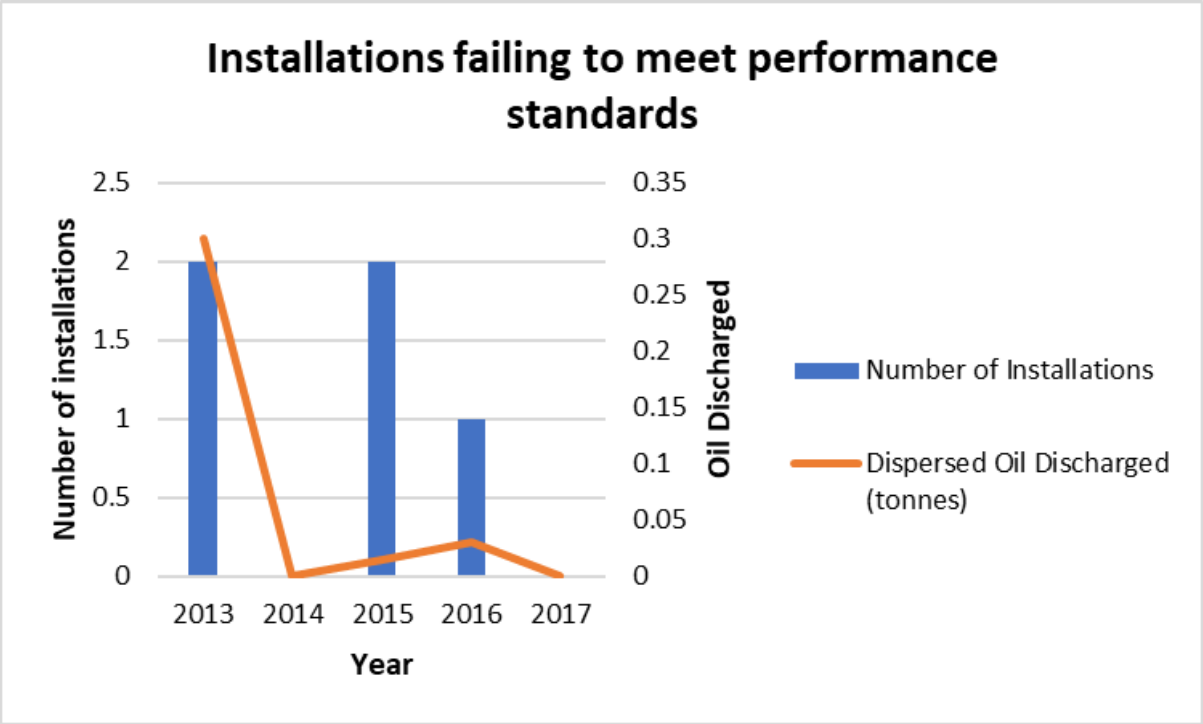

Fig. 6 – Installations failing to meet the 2001/1 Performance Standard, 2013 – 2017

The Netherlands also reports the dissolved oil content (as represented by BTEX components) in produced water and displacement water discharges as required under the NL Mining Regulations. OSPAR does not regulate these discharges as the components rapidly biodegrade in seawater once discharged.

The discharge of dissolved oil (BTEX) between 2013 and 2017 has varied considerably, but without any clear trend being apparent. The smallest and largest tonnages were recorded in adjacent years (48 tonnes in 2015 and 73 tonnes in 2016 respectively). Dissolved oil discharge in the OSPAR region as a whole also varied during the 5-year period; the highest discharge was observed in 2013 (6 074 tonnes) while the second highest was noted in 2017 (5 084 tonnes).

4.2 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 NL has prepared guidance for industry and adopted a phased implementation plan to allow the assessments to be evenly spread over the 2015 - 2018 period. The NL will use a whole effluent toxicity approach for the RBA assessments, with additional measures required only if the WET risk assessment indicates an unacceptable risk. If this should occur, Substance-based Risk Assessment will be necessary, and will identify the source of the risk and direct appropriate risk reduction measures. For the first cycle of assessments, Substance-based Risk Assessment is a requirement, to enable the authorities to compile a dossier for each platform.

The NL competent authorities will decide on the assessment programme in collaboration with the operators, such that approximately one third of the platforms are assessed each year. Priority will be

given to platforms in sensitive areas (e.g. Natura 2000 sites) with those of lower perceived risk following.

4.3 Spills of Oil to Sea

The number of oil spills to sea during the period 2013 - 2017 has varied year on year from as low as 9 spills in 2017 up to 22 spills in 2016 (Figure 7). The quantity spilled has also varied from as low as 0.004 tonnes in 2017 up to 0.8 tonnes in 2015 and again in 2016. Overall, there is no distinct pattern in the number of oil spills, and likewise no trend is evident in the total quantity of oil spilled. Similarly, the number of spills and especially quantity spilled shows considerable variation across the OSPAR region and any comparison of these data cannot be regarded as meaningful.

In total, the amount of oil spilled on the NLCS (2.6 tonnes) was 0.86 % (wt) of the amount of dispersed oil discharged with produced and displacement water in the same 5 -year period (301 tonnes).

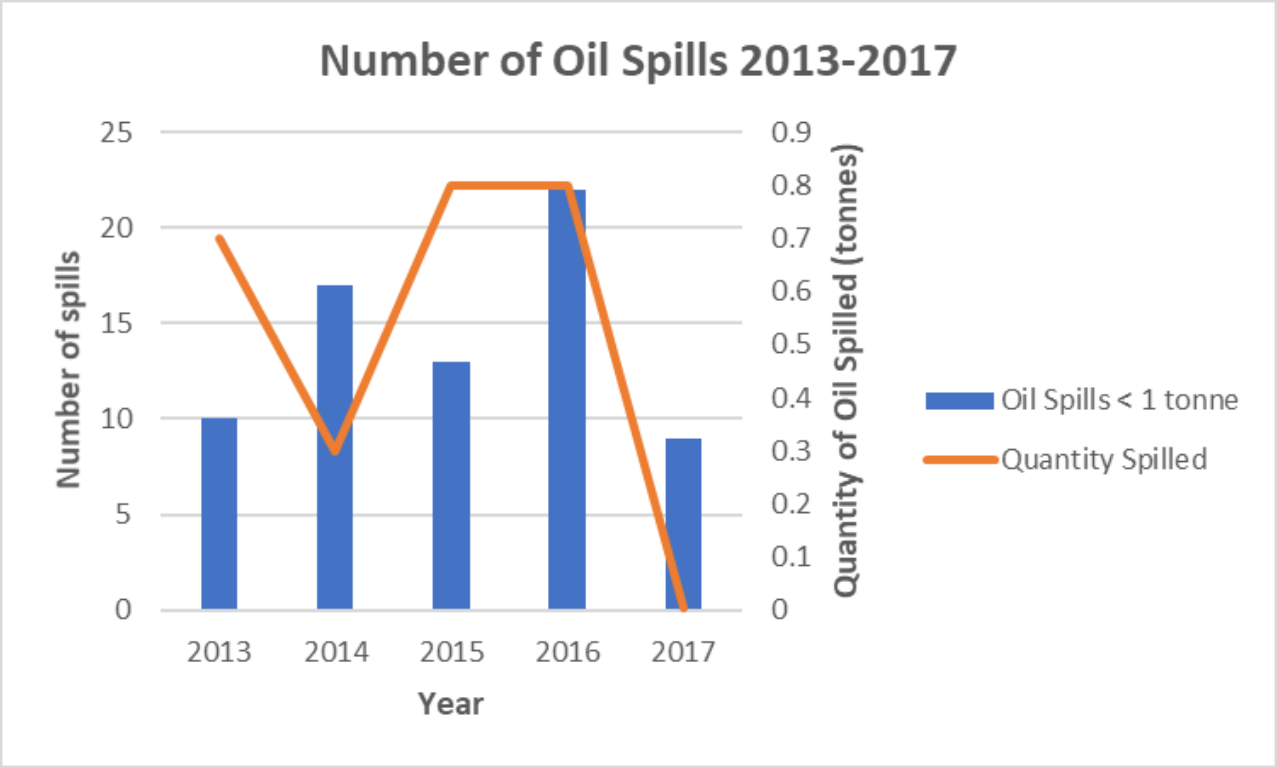

Fig. 7 – Number of oil spills and quantity of oil spilled in NLCS, 2013-2017
(Note: No spills > 1tonne occurred in this period)

4.4 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[3] and prohibits the discharge of cuttings contaminated with OBF[4] at a concentration greater than 1% by weight on cuttings. The Netherlands implements this Decision under Articles 9.1 and 9.2 of The Mining Regulations 2003 (as amended), which control the use and discharge of oil-containing mixtures and chemicals respectively.

As a result, no discharge of organic phase fluids was recorded for the period assessed.

5. Chemicals

The use and discharge of offshore chemicals have been covered since 2001 by a number of OSPAR measures as listed in Appendix 1. In the Netherlands, these requirements are written into Article 9 of The Mining Regulations 2003, which include the requirement that chemicals should be registered through submission of HOCNF forms.

Registration is managed on behalf of The Netherlands' authorities by the Centre for Environment, Fisheries & Aquaculture Science (CEFAS), which also undertakes a similar function for the UK. The procedure is documented under a protocol that is accessible via the Cefas web site (https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/). Following registration, chemical products are ordered by function and ranked according to Hazard Quotient (HQ), calculated using the Chemical Hazard and Risk Management (CHARM) model. Products for which CHARM is not applicable are ranked by the separate OCNS system.

In this report the term *substitution chemical* refers to chemicals which are or contain substances that are candidates for substitution, according to OSPAR Recommendation 2017/1. This includes chemicals or substances which are:

- on the OSPAR LCPA/LSPC or subject to Authorisation or relevant restrictions under REACH
- 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.

The goal of OSPAR Recommendation 2006/3 is for discharges of substitution chemicals to have been phased out by 2017, although an exception can be made for chemicals with no identified alternative.

[3] OPF = Organic-phase Drilling Fluids

[4] OBF = Oil-based fluids

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 Netherlands has implemented this recommendation in full.

5.1 Chemical Use & Discharge

Total usage of chemicals on the NLCS decreased by 63% between 2013 (44 339 tonnes) and 2017 (16 599 tonnes) although a high usage figure was observed in 2015 (69 012 tonnes). The overall figures for discharges also decreased by 53% during the same period although discharges peaked in 2014 (Figure 8).

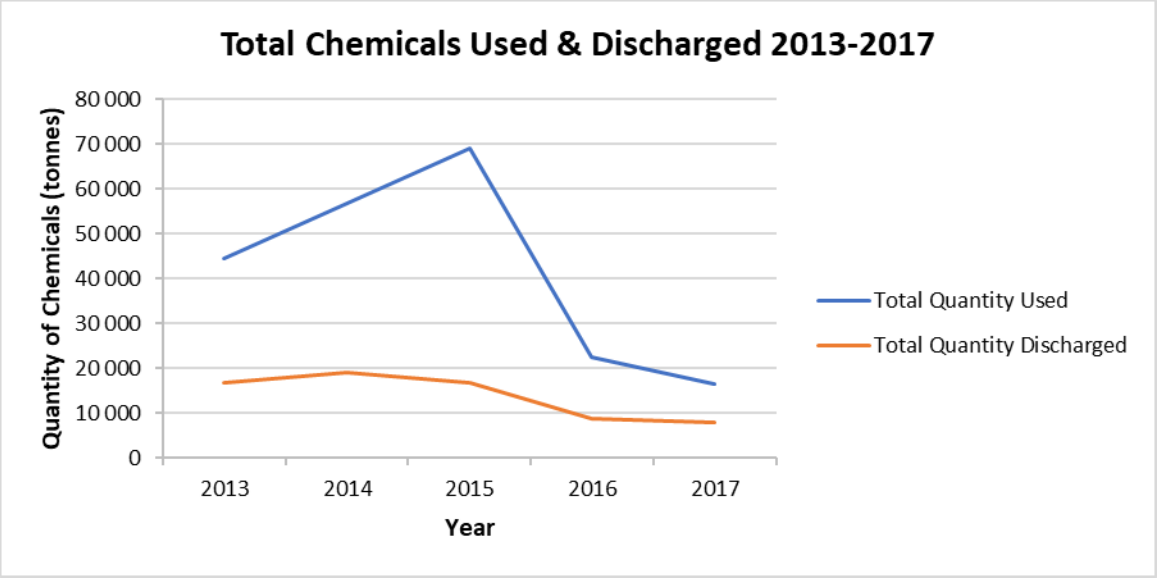

Fig. 8 – Total chemical use and discharge on NLCS 2013-2017

5.1.1 Chemicals used

The total quantity of chemicals used in the Dutch sector in 2017 was 16 599 tonnes. 81% (by weight) of the chemicals were on the PLONOR list and another 18% (by weight) contained no substances which are candidates for substitution. Comparable OSPAR average figures for 2017 are that 69% (by weight) of chemicals used were PLONOR listed and a further 30% (by weight) did not contain substances that are candidates for substitution.

5.1.2 Chemicals discharged

The total quantity of chemicals discharged to the sea in 2017 was 7 918 tonnes, 95.39 % (by weight) being included on the PLONOR list and another 4.56% (by weight) being chemicals that do not contain candidates for substitution. Less than 0.1% (by weight) of the discharged chemicals contained substances which are candidates for substitution. Comparable OSPAR average figures for 2017 are that 81% (by weight) of chemicals discharged were PLONOR and a further 18% (by weight) did not contain substitution chemicals.

5.1.3 LCPA chemicals and candidates for substitution

Chemicals containing LCPA substances have not been used in the Netherlands since 2004 with one exception; 300 g of a chemical containing just 10 g of Lead were used (without discharge) by a Dutch operator in 2013*. By comparison, the majority of Contracting Parties have followed suit although the UK permits the use of certain applications of lead in pipe dopes. Discharge is however forbidden.

The discharge of substitution chemicals gradually decreased from approximately 24 tonnes in 2013 to less than 4 tonnes in 2017, an 86% reduction (Figure 9). This compares favourably to the OSPAR region as a whole where discharges of substitution chemicals fell from approximately 1 512 tonnes in 2013 to 1034 tonnes in 2014, increased again over the next two years and then decreased to 1 342 tonnes in 2017. The 2017 discharges were only 11% lower than those observed in 2013.

*It is noted that this usage was not mentioned in OIC 16/7/5, which recorded quantities to the nearest whole kilogram

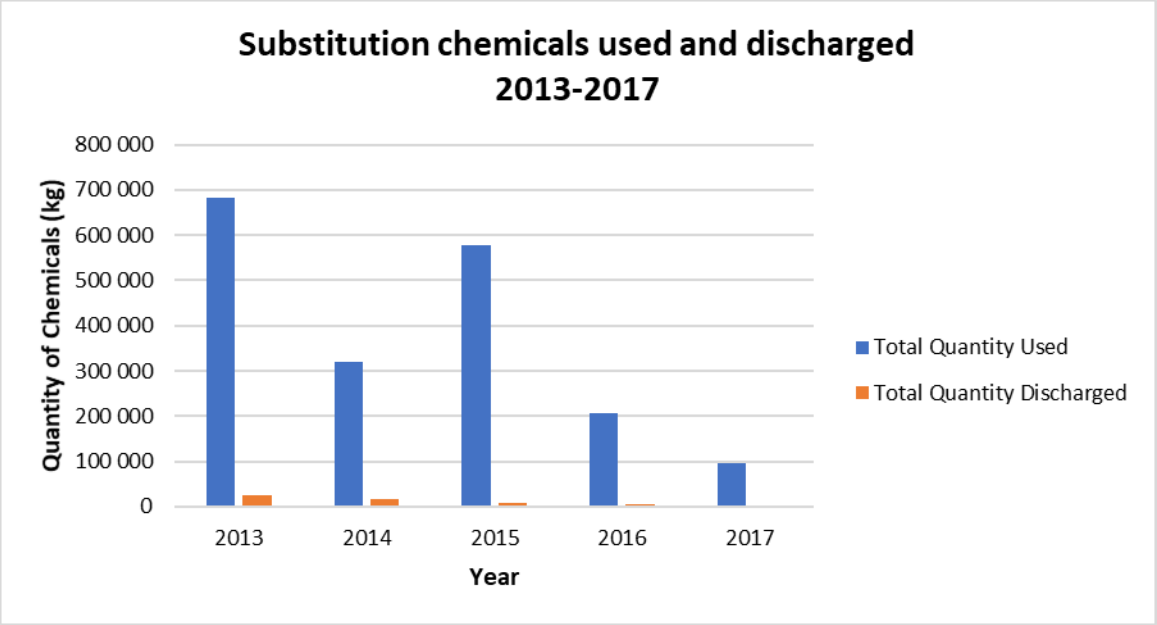

Fig. 9 – Use and discharge of chemicals which are candidates for substitution 2013-2017

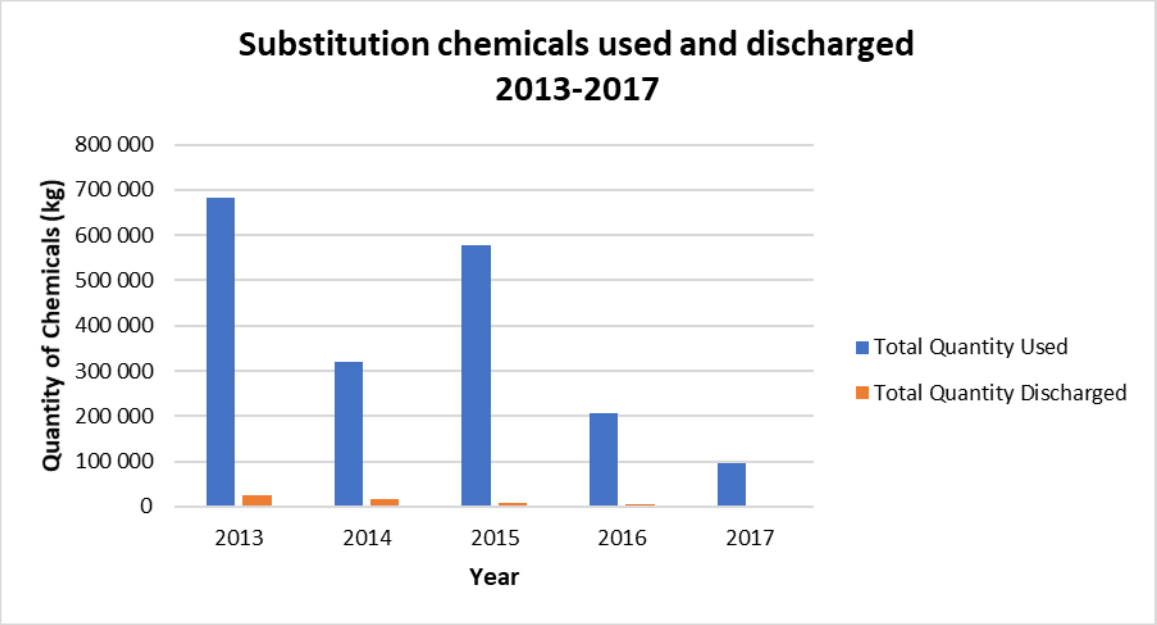

Fig. 10 – Use and discharge of chemicals with no Substitution Warnings, 2013-2017

5.2 Chemical Spills

The number of chemical spills to sea during the period 2013 - 2017 ranged from 4 to 19, whilst the total quantity spilled ranged from 837 kg up to 59 tonnes (Figure 11). These figures include any water that is used in the chemical formulations. There are no clear trends in the frequency or quantity of spills, either in The Netherlands or across the OSPAR region.

Excluding any water that is used in the chemical formulations, the substances spilled can be broken down into those on the PLONOR list (81%) or which did not contain candidates for substitution (5%), with substitutable chemicals comprising the remaining 14%.

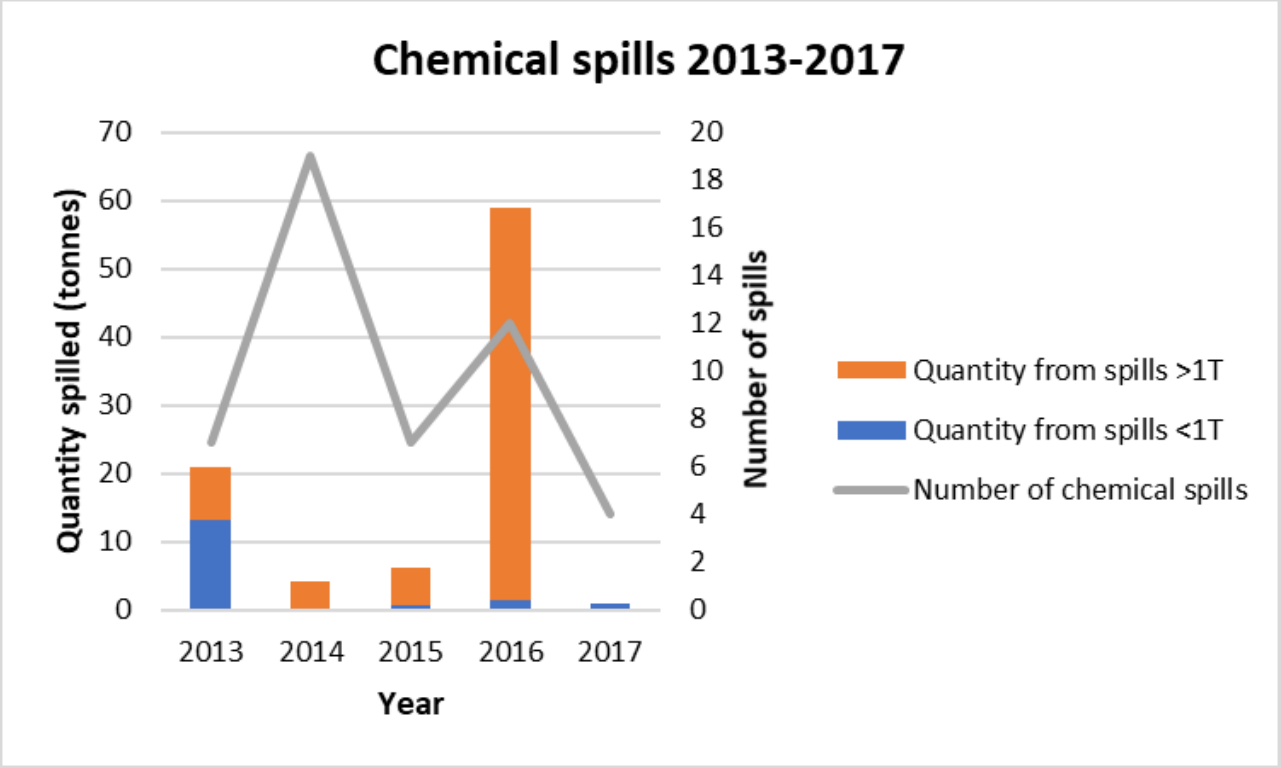

Fig. 11 – Chemical spills on NLCS 2013-2017

6. 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 NL legislation.

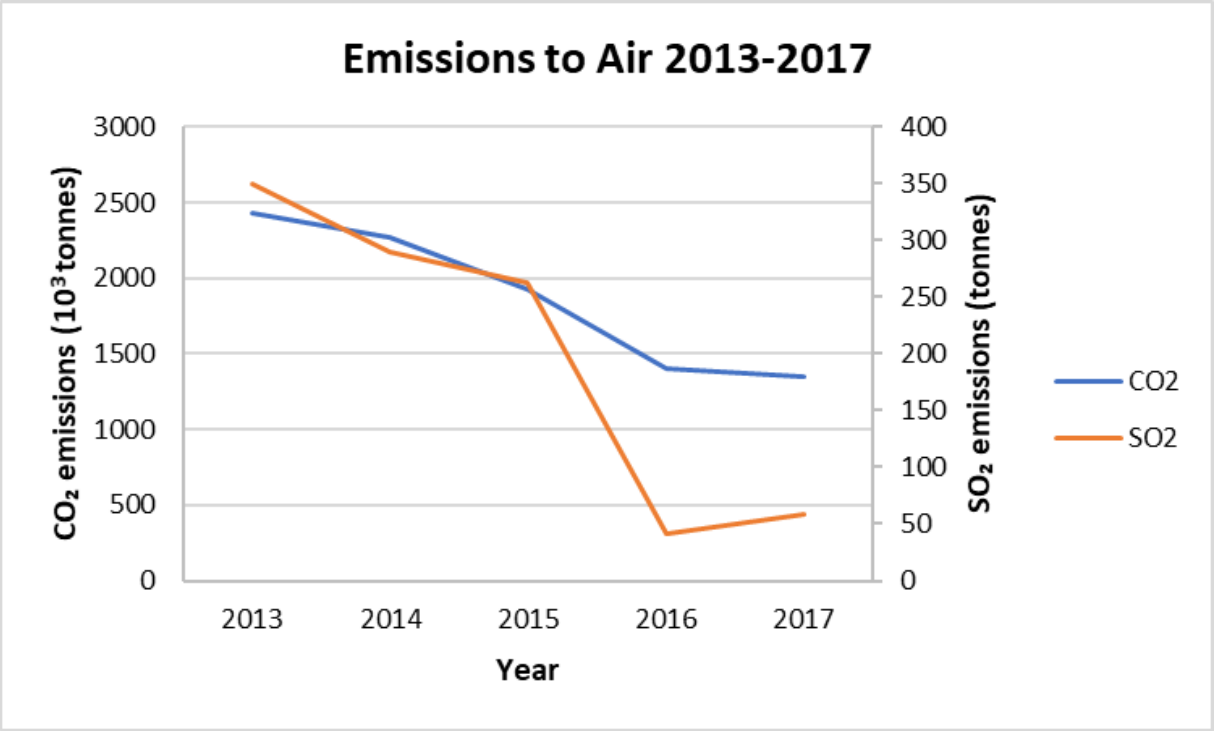

Fig. 12 – Emissions to air on NLCS (CO_2 & SO_2), 2013-2017

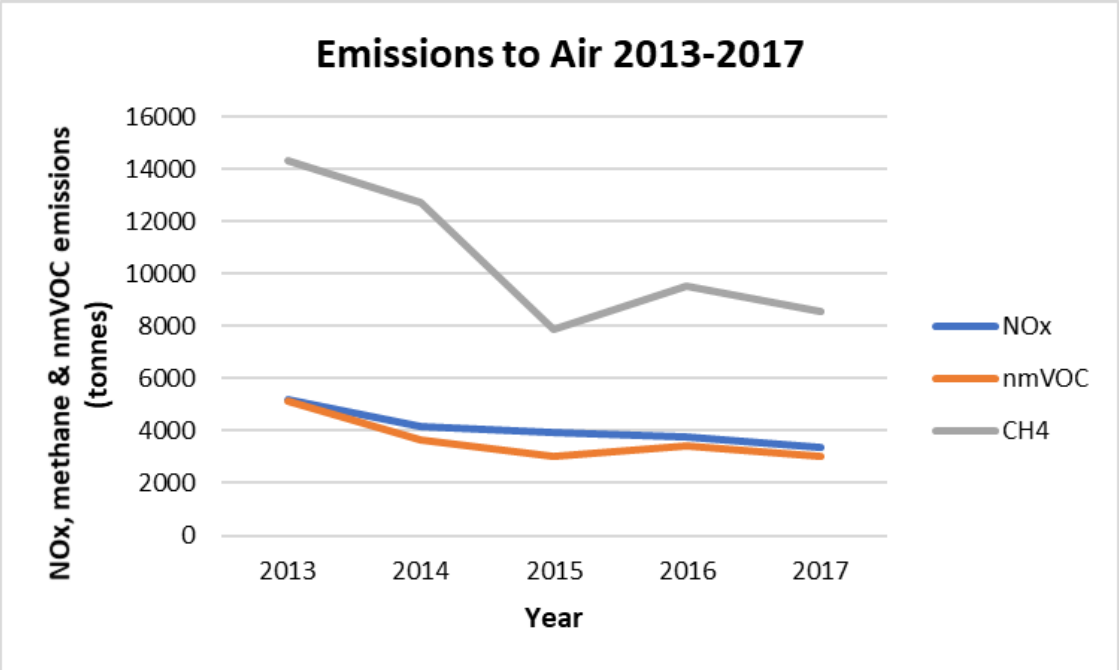

Fig. 13 – Emissions to air on NLCS (NOx, nmVOC, CH_4), 2013-2017

Atmospheric emissions on the NLCS showed reductions between 2013 and 2017 for sulphur dioxide (83%), carbon dioxide (44%), NOx (35%) and VOCs (41%). Methane emissions also decreased by 40% overall during the same period. The NL reductions of carbon dioxide and NOx compare favourably with the OSPAR region as a whole where emissions of the two gases remained fairly constant. The favourable comparison also applies to the NL reductions of sulphur dioxide and VOCs emissions as no clear trend was observed for these gases across the OSPAR region. However, it is worth noting that the methane emissions for the whole OSPAR region have decreased by 18%, which is less than half of the Netherlands' figure.

7. Summary of Counting & QA Procedures in The Netherlands relating to OSPAR Data

7.1 Counting of Installations

The Netherlands 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 NL considers that all the subsea wells or well clusters serving a single field should be reported as one installation.

7.2 Reporting of Dispersed Oil

In the NL 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 +/-5% uncertainty measurement, using a flow meter that is situated downstream of the last oil/water separator at a location where the flow is as homogeneous as possible.

The concentration of dispersed oil is determined by sampling the discharge stream on a routine basis and analysing the samples. Operators are required to sample discharge streams a minimum of every other day for discharges of greater than 2 tonnes dispersed oil per year, which is comparable to the minimum of 16 samples per month required by OSPAR Recommendation 2001/01 for discharges on this scale. For installations with discharges of less than 2 tonnes dispersed oil per year, the Netherlands requirement for (representative) weekly sampling goes beyond the requirements of the OSPAR Recommendation, which stipulates only that the samples should be representative.

Dispersed oil discharges are reported every month to SSM 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 to SSM is also checked during offshore inspections.

7.3 Reporting of Chemical Use & Discharge

Operators in the NL 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 NL regulator upon completion of specific activities or on a quarterly basis.

Chemical use and discharge is reported to SSM and the NL 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.

7.4 Reporting of Atmospheric Emissions

Operators are required to report atmospheric emissions by an electronic reporting format 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 European 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.

Emissions reported to SSM are reviewed to identify any unusual results and reports can also be run to cover a number of years to review trends

8. 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[5]

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

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

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: 2002-08)

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 2017/1 on a Harmonised Pre-Screening Scheme for Offshore Chemicals

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

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

[5] 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.

9. Appendix 2: Data Annexes

Table 1a: Number of installations in The Netherlands maritime area with discharges to the sea, or emissions to the air 2013-2017

2013	2014	2015	2016	2017
127	127	127	107	107

Table 1b: Number of installations by type of installation in The Netherlands maritime area with discharges to the sea, or emissions to the air, 2013-2017

	2013	2014	2015	2016	2017
Oil	9	9	9	8	8
Gas	118	118	118	99	99
Subsea	0	0	0	0	0
Other	-	-	0	0	0
Total	**127**	**127**	**127**	**107**	**107**
Wells drilled	19	20	22	14	6

Table 2: Oily aqueous discharges to the maritime area*

Table 2a: Oil discharged in displacement and produced water (in tonnes), 2013-2017

2013	2014	2015 (GC-FID)	2016 (GC-FID)	2017 (GC-FID)
Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
60	37	57	62	85

Dispersed Oil Concentration (mg/l)

2013 (GC-FID)	2014 (GC-FID)	2015 (GC-FID)	2016 (GC-FID)	2017 (GC-FID)
16.8	16.0	25.9	13.1	10

Table 2b: Dissolved oil discharged in displacement and produced water (in tonnes), 2013-2017

2013	2014	2015	2016	2017
BTEX	BTEX	BTEX	BTEX	BTEX
54.5	49	48	73	45.55

Table 2c: Quantity of displacement and produced water discharged daily to the sea (in m^3/day), 2013-2017

2013	2014	2015	2016	2017
11298.20	7425.18	7002.18	24653.85	16894.89

Table 2d: Total volume of produced water and displacement water discharged, and produced water injected (in m^3/year), 2013-2017

	2013	2014	2015	2016	2017
PW*	3 678 521	2 277 430	2 180 316	6 402 666	5 871 399
DPW**	445 321	432 759	375 481	2 595 990	295 237
IPW***	5 138 137	6 690 997	7 901 668	8 177 772	7 942 000
Total	**9 261 979**	**9 401 186**	**10 457 465**	**17 176 428**	**6 174 578**

* 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 3a: 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)

	2013	2014	2015	2016	2017
Number of installations exceeding 30 mg/l	2	0	2	1	0
Quantity of dispersed oil discharged	0.3	0	0.014	0.03	0

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), 2013-2017

2013	2014	2015	2016	2017
Total OPF	Total OPF	Total OPF	Total OPF	Total OPF
0	0	0	0	0

Table 4b: Number of wells drilled with OPF, with discharge of contaminated cuttings to the maritime area, 2013-2017

2013		2014		2015		2016		2017	
OBF	Other OPF	OBF	Other OPF	OBF	Other OPF	OBF	Other OPF	OBF	Other OPF
0	0	0	0	0	0	0	0	4	0

Table 5: Spillage of oil and chemicals

Table 5a: Number of oil spills, 2013-2017 - Spills less than 1 tonne (≤ 1 T) and spills above 1 tonne (> 1 T)

2013		2014		2015		2016		2017	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
10	0	17	0	13	0	22	0	9	0

Table 5b: Total quantity of oil spilled, in tonnes, 2013-2017

2013		2014		2015		2016		2017	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
0.7	0	0.3	0	0.8	0	0.8	0	0.004	0

Table 5c: Number of spills of chemicals, 2013-2017 – Spills less than 1 tonne (≤ 1 T) and spills above 1 tonne (> 1 T)

2013		2014		2015		2016		2017	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
6	1	16	3	5	2	8	4	4	0

Table 5d: Amount of chemical spills in tonnes/year, 2013-2017

2013		2014		2015		2016		2017	
≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T	≤ 1 T	> 1 T
13.3	7.7	0.191	3.945	0.732	5.553	1.482	57.4	0.837	0

Table 6: Emissions to air, 2013-2017

CO_2 (in millions of tonnes)

2013	2014	2015	2016	2017
2.43	2.27	1.93	1.40	1.35

NO_x (in thousands of tonnes)

2013	2014	2015	2016	2017
5.22	4.17	3.95	3.75	3.385

nmVOCs (in thousands of tonnes)

2013	2014	2015	2016	2017
5.14	3.67	3.02	3.45	3.031

CH_4 (in thousands of tonnes)

2013	2014	2015	2016	2017
14.33	12.74	7.88	9.56	8.562

SO_2 (in tonnes)

2013	2014	2015	2016	2017
350	290	263	42	58.6

Table 7: The use and discharge of offshore chemicals, 2013-2017

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

Pre-screening category	2013	2014	2015	2016	2017
List of Chemicals for Priority Action	0.01	0.00	0.00	0.00	0.00
Inorganic LC50 or EC50 < 1 mg/l*	0.00	0.00	0.00	0.00	0.00
Biodegradation < 20%*	150 205.31	203 370.36	464 791.23	155 039.71	59 975.44
Substance meets two of three criteria*	531 899.50	116 197.15	114 339.27	52 087.59	35 127.06
PLONOR	34 616 137.80	12 819 428.20	49 608 208.53	17 848 041.13	13 436 194.41
Inorganic, LC50 or EC50 > 1 mg/l	309 021.30	42 614 128.50	1 009 744.20	147129.69	25 9500.67
Ranking Substances	8 731 380.23	950 654.34	17 814 944.20	4 422 648.09	2 808 237.52
Total	**44 338 644.15**	**56 703 778.55**	**69 012 026.93**	**22 624 946.21**	**16 599 035.10**

* Chemicals for substitution

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

Pre-screening category	2013	2014	2015	2016	2017
List of Chemicals for Priority Action	0.00	0.00	0.00	0.00	0.00
Inorganic LC50 or EC50 < 1 mg/l*	0.00	0.00	0.00	0.00	0.00
Biodegradation < 20%*	912.66	1 094.31	1 234.99	260.99	653.56
Substance meets two of three criteria*	23 194.54	16 641.75	6 655.74	5 825.69	2 746.27
PLONOR	595 552.65	578 460.81	16 128 611.09	83 13 274.40	7 553 982.41
Inorganic, LC50 or EC50 > 1 mg/l	16 144 242.20	18 269 434.51	119 708.43	62 313.95	45 175.94
Ranking Substances	50 794.16	81 834.64	460 649.40	272 207.33	316 095.93
Total	**16 814 696.21**	**18 947 466.02**	**1 671 6859.65**	**8 653 882.37**	**7 918 654.11**

* Chemicals for substitution

Table 7c: Chemicals spilled in kg per year

Pre-screening category	2013	2014	2015	2016	2017
List of Chemicals for Priority Action	0.00	0.00	0.00	0.00	0.00
Inorganic LC_{50} or EC_{50} < 1 mg/l*	0.00	0.00	0.00	0.00	0.00

Biodegradation < 20%*	0.00	5.70	1.04	9 175.00	0.00
Substance meets two of three criteria*	0.00	0.00	0.38	0.00	0.00
PLONOR	223.60	430.52	5 167.79	47 321.60	500.00
Inorganic, LC_{50} or EC_{50} > 1 mg/l	256.01	1152.60	0.00	19.00	0.00
Ranking	0.00	11.30	48.70	2 100.00	0.00
Total	**479.61**	**1 600.12**	**5 217.91**	**58 615.60**	**500.00**

* Chemicals for substitution.

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

2013	2014	2015	2016	2017
18 176 106	14 725 986	13 415 377	13 392 326	9 161 000

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