environmental values 2016

public environmental report

Chevron North Sea Limited

Contents

Introduction

Pursuant to OSPAR Recommendations 2003/5, operators on the UK Continental Shelf (UKCS) should produce an annual environmental statement and make it available to the public and the Department of Business, Energy and Industrial Strategy (DBEIS). This environmental report is intended to fulfil this requirement. This document covers Chevron North Sea Limited's (CNSL) operations and activities in the United Kingdom (UK), shares our offshore environmental performance data for 2016, highlights how we demonstrate our values and reinforces our mission to continually improve our performance and reduce any potential impacts from our operations.

Ingrained in The Chevron Way is our commitment to protecting people and the environment, which includes developing energy safely, reliably and responsibly. We place the highest priority on the health and safety of our workforce and protection of our assets, communities and the environment. We deliver world-class performance with a focus on preventing high-consequence incidents.

We have four environmental principles that define our commitment to operating in an environmentally responsible manner: these are 1) to include environmental considerations in decision making, 2) to minimise our environmental footprint, 3) to operate responsibly and 4) to steward our sites. We incorporate these principles into our business through our Operational Excellence Management System (OEMS). This systematic management system includes provision to identify and manage potentially significant environmental impacts and assess our activities, with the aim of improving performance. At Chevron, Operational Excellence (OE) is integral to how we run our business to achieve our vision of success.

At Chevron, we are committed to achieving our goal of zero incidents and will continue to focus on achieving world-class performance in all measures of safety and environmental stewardship. We hope you find the information in this report to be informative and useful.

About Chevron

Chevron Corporation is one of the world's leading integrated energy companies. Through its subsidiaries that conduct business worldwide, the company is involved in virtually every facet of the energy industry. Chevron explores for, produces and transports crude oil and natural gas; refines, markets and distributes transportation fuels and lubricants; manufactures and sells petrochemicals and additives; generates power; and develops and deploys technologies that enhance business value in every aspect of the company's operations.

At Chevron, we conduct our business in a socially responsible and ethical manner. We respect the law, support universal human rights, protect the environment and benefit the communities in which we work. Our Corporate Responsibility Report Highlights summarises some of these focus areas, which include environmental management, climate change and energy efficiency.

Our managing climate change risks: a perspective for investors, addresses the topic of climate change risk by providing the Company's views on long-term fundamentals of the energy industry, the processes by which we manage risks and the significant steps we have taken to manage greenhouse gases (GHGs).

Chevron 2016 Activities - UK

Existing Assets

CNSL has working interests in 11 offshore producing fields, including four operated fields (Alba, 23.4 percent; Captain, 85 percent; Erskine, 50 percent; and Alder, 73.7 percent) and seven non-operated fields (Britannia, 32.4 percent; Brodgar, 25 percent; Callanish, 16.5 percent; Clair, 19.4 percent; Elgin/Franklin, 3.9 percent; Enochdhu, 50 percent; and Jade, 19.9 percent).

Drilling

During 2016 drilling operations were undertaken using the Blackford Dolphin Mobile Offshore Drilling Unit (MODU). A single production well was safely and successfully completed in the Alder field, bringing a new stream of natural gas to Chevron's production portfolio and the United Kingdom. In addition to the Alder well, two well re-drills were also undertaken at the Captain Field.

Ongoing / Future Projects

CNSL continues to implement projects designed to sustain production and maximise the recovery from the United Kingdom Continental Shelf. Key projects include:

Captain Enhanced Oil Recovery (EOR)

The Captain EOR Project is the next development phase of the Captain Field and is designed to increase field recovery by injecting a polymer/water mixture into the Captain reservoir. Front End Engineering and Design (FEED) activities continued to progress in 2016 and included a polymer injection pilot. The company also began an expansion of the existing polymer injection system on the wellhead production platform. The scope includes six new polymer injection wells and modifications to platform facilities. Produced water is re-injected into the oil reservoir on the Captain Field. Therefore, there is no discharge to sea of produced water or polymer. At the end of 2016, proved reserves had not been recognized for this project.

Rosebank

The Rosebank Field is 80 miles (129 km) northwest of the Shetland Islands in 3,700 feet (1,115 m) of water. Chevron operates and holds a 40 percent interest in the project. FEED activities continued to progress in 2016, with a focus on engineering to improve predictability in execution cost and schedule. The selected design is a 17-well subsea development tied back to a Floating Production Storage and Offloading (FPSO) vessel, with natural gas exported via pipeline. The design capacity of the project is 100,000 barrels of crude oil and 80 million cubic feet of natural gas per day. The potential recoverable volumes at Rosebank are expected to be more than 300 million barrels. At the end of 2016, proved reserves had not been recognized for this project.

Clair Ridge

The Clair Ridge Project, located 47 miles (75 km) west of the Shetland Islands, is the second development phase of the Clair Field. Chevron holds a 19.4 percent non-operated working interest in the project. Installation and hook-up activities progressed during 2016. The design capacity of the project is 120,000 barrels of crude oil and 100 million cubic feet of natural gas per day. First production is expected in 2018. The project is estimated to provide incremental potentially recoverable oil-equivalent resources in excess of 600 million barrels. Proved reserves have been recognized for the Clair Ridge Project. The Clair Field has an estimated production life until 2050.

Operational Excellence

Operational Excellence (OE) is the systematic management of safety, health, environment, reliability and efficiency to achieve world class performance. CNSL (and Chevron globally) place the highest importance on OE – it is fundamental to the company's success and supports our commitment to protecting people and the environment.

Chevron's OE objectives are to:

- Achieve an incident and injury-free work place;
- Promote a healthy workforce and mitigate significant workplace health risks;
- Identify and mitigate environmental and process safety risks;
- Operate incident-free with industry leading asset integrity and reliability; and
- Efficiently use natural resources and assets.

The OEMS is Chevron's standard approach for achieving world-class performance and is applied by CNSL. The OEMS consists of three parts:

Leadership Accountability
Leadership is the single largest factor for success in OE. Our leaders establish the vision and set objectives that challenge the organisation to achieve world-class results. They direct the Management System Process (MSP), setting priorities and monitoring progress on plans that focus on the highest-impact items. Leaders visibly demonstrate their commitment through personal engagement with the workforce, showing concern and care for the health and safety of every individual.

Management System Process
We employ a systematic approach that drives progress toward world-class performance. The MSP is linked to the business planning process, and begins with defining a vision of success and setting objectives. Gaps between current performance and these objectives are uncovered during the assessment phase, then plans are developed to close the gaps, the plan is implemented and a review of plan implementation and performance is completed.

OE Expectations
Our corporate expectations for OE are detailed under 13 Elements. The expectations are met through processes and programmes put in place by local management. Many expectations are supported by corporate standard OE processes. Environmental issues are covered under Element 7: Environmental Stewardship, the objective of which is to strive to continually improve environmental performance and reduce impacts from our operations. OE Assurance is covered under Element 12 and includes assurance of process safety, personal safety and health, environment, reliability and efficiency. This process establishes a requirement to put in place a comprehensive internal OE Audit program. In addition to this, CNSL are audited as part of a corporate-level OE Audit program.
In support of CNSL's strong commitment to compliance, all employees and contractors are encouraged to use the Chevron Hotline to report any activities that may involve violations of the law, Chevron's Business Conduct and Ethics Code, or company policies. The Hotline provides a direct, effective and risk-free way to report such suspected violations.

Chevron's **OE Vision** is to be recognised and admired by industry and the communities in which we operate as world class in process safety, personal safety & health, environment, reliability and efficiency delivering incident free operations. CNSL vision is reflected in the following OE Policy which meets the requirements of The Corporate Major Accident Prevention Policy (CMAPP) required by The Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations 2015; The Safety Policy required by the Health & safety at Work etc. Act 1974; and The Environmental Policy required by ISO 14001 environmental management standard.

The **OE Policy** demonstrates endorsement of the OE Policy by the President and Managing Director; a commitment to assess and manage the risks and impacts associated with our operations; and a commitment to comply with legislative requirements and corporate policies.

OE Policy - Corporate Major Accident Prevention Policy (CMAPP)

Chevron

chevron upstream europe
operational excellence policy

Chevron Upstream Europe's (CUE) operational excellence (OE) vision is to be recognised and admired by the industry and the communities in which we operate as world-class performers in process safety, personal safety and health, environment, reliability and efficiency. CUE recognises the need to operate in a safe and responsible manner.

We will systematically manage OE with the aim of:
- **Identifying and reducing the risk of major accident hazards including environmental and process safety risks.**
- **Achieving an incident and injury free workplace.**
- **Promoting a healthy workplace and mitigating significant health risks.**
- **Operating incident free with industry leading asset integrity and reliability.**
- **Efficiently using natural resources and assets.**
- **Ensuring continual improvement in all aspects of our business.**

Through consistent application of OE, this policy and our Safety And Environmental Management System (SEMS), we aim to address the following:

Leadership
Our leaders are accountable for:
- Providing clear and consistent leadership in accordance with this policy and our tenets of operation.
- Ensuring clear roles, responsibilities and communications.
- Trusting and empowering their teams to apply a risk based approach to decision making in accordance with this policy.
- Creating a culture that is built on our values and behaviours, enabling safe, reliable and secure operations and environmental protection.
- Engaging with the community and other stakeholders.
- Ensuring that we comply with all applicable policies, codes and regulations and that we constructively engage in consultation with regard to proposed legislation.

Organisation
Our organisation is fit-for-purpose and is designed to:
- Achieve results in accordance with the Chevron Way.
- Ensure suitable and sufficient control of Major Accident Hazards.
- Ensure that staff and contractors are competent or their roles through the application of the CUE Competence Assurance Process.
- Encourage structured and timely decision making.
- Ensure the management of safe work.

A Strong Safety Culture
Based on:
- The Chevron Way and our tenets of operation.
- Compliance with the provisions of our safety cases and this policy.
- The identification and management of Major Accident Hazards.
- The involvement of and consultation with our staff and contractors.
- The reporting and investigation of incidents and near misses.
- The use of stop work authority.
- The recognition and reward of desired behaviours through the use of stop work authority, Performance Management Process (PMP) and our recognition and award process.
- The implementation of corporate safety initiatives.

Risk Management
Our people, at all levels of the organisation will:
- Systematically assess, prioritise and manage risk in accordance with the Chevron Way.
- Regularly review and re-evaluate risks.
- Maintain the integrity of dedicated systems through fit-for-purpose design and operating practices.
- Ensure that there are multiple, independent barriers in place to prevent Major Accident Hazards including, but not limited to, unplanned releases of hydrocarbons.

Asset Integrity Management
Our facilities, reservoirs and wells are designed and maintained to be fit-for-purpose throughout their lifecycles. This includes:
- Designing, constructing, modifying, operating and maintaining our facilities and wells to recognised safety and environmental protection standards, to avoid unplanned releases of hazardous substances and to prevent injury to people or harm to the environment.
- Minimising the potential for human error through the design and operation of our facilities.
- Maintaining the integrity of safety and environmental critical elements.
- Managing risks on a whole of life-cycle basis.
- Managing change in accordance with our management of change process.
- Compliance with all applicable codes, regulations and Chevron standards.

Monitoring and Audit
Through a process of corporate audit and workplace monitoring and audit, we will examine our processes and operations to confirm:
- That we review and revaluate our goals and our organisational capability.
- That our plans and processes are being correctly implemented.
- That we continually improve the effectiveness of our management system including our verification and well examination schemes.
- The suitability and effective implementation of this policy.

Emergency Management
While prevention is the first priority, we are prepared for an emergency and have the tools to mitigate any incident quickly and effectively:
- We maintain a fit-for-purpose command and control system, based on defined scenarios and meeting all UK legal requirements.
- We regularly test the effectiveness of the system through audits and exercises.
- We aim to prevent future incidents by identifying and eliminating their root causes.

This policy applies to all offices and facilities operated by Chevron North Sea Limited, Chevron Denmark Inc and Chevron Norge AS.

The Managing Director's Leadership Team shall champion the implementation of this policy across CUE and lead the monitoring and auditing of its ongoing effectiveness.

Every individual has a duty to ensure that they always comply with, and hold others accountable for compliance with this policy, and prevent harm to themselves and others, and to the environment. This policy is applicable without distinction between Chevron employees and contractors working for Chevron.

This policy meets the requirements of the corporate major accident prevention policy pursuant to Regulation 7 of the Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations 2015.

Greta Lydecker, President and Managing Director
Chevron Upstream Europe.

Results | **Accountability** | **Fit-for-Purpose** | **Trust & Empower**

Environmental Stewardship

The expectation of Chevron's Environmental Stewardship (ES) process is to strive to continually improve environmental performance and reduce impacts from our operations. It is applied across the life cycle of an asset and is used to identify, assess and manage potential environmental impacts and benefits. To achieve this, Chevron has implemented a step-wise process to be followed on an annual basis. First, an inventory of all emissions, releases, wastes and potentially impacted natural resources is prepared. This is followed by a procedure to identify, assess, mitigate and manage any significant risks and impacts to the environment associated with operations, emissions, releases and wastes. The outcome is an annually updated ES plan. CNSL have been preparing plans using the ES process since 2010. The management system is independently certified to the international standard (ISO) 14001 and requires CNSL to engage independent auditors who verify that our onshore and offshore operations meet requirements.

The ES plan includes objectives and targets for environmental performance, details of improvement implementation programmes and the process for tracking progress in meeting environmental objectives. The ES plan is approved by senior management and is aligned with other business and OE plans.

All CNSL operations and projects have the potential to impact on the environment and they are all subject to strict environmental regulatory controls which require CNSL to prepare and submit regulatory applications to gain approval before activities begin and during the ongoing operational activities. We monitor and report our ongoing emissions, discharges and waste streams to ensure we meet regulatory requirements and do not cause significant impact on the environment. In the event of an unplanned release/spill to sea, or a non-compliance with regulatory requirements, notification would be made to the appropriate regulatory authorities and action taken to respond to any threat of or actual pollution. Investigations of incidents are conducted to gain any learnings or actions to prevent recurrence.

The ES process is used to help provide assurance that we are protecting the environment and meeting our internal and regulatory requirements and obligations.

2016 Environmental Performance Summary

Performance Metrics

CNSL is committed to continually improving environmental performance. This is achieved by integrating environmental objectives and targets into the ES plan and regularly evaluating progress to adjust if required. CNSL sets performance targets annually for key environmental aspects (produced water, oil releases/spills, waste and air emissions) to achieve our OE objectives.

CNSL's performance against targets for key 2016 environmental focus areas is summarised in the table below:

Table 1 - CNSL 2016 Performance Metrics

		CNSL	
	Units	**Result**	Target
Oil spill volume rate	bbls/MMbbls produced	0.08	**0.5**
Energy efficiency	Chevron energy intensity[1]	312	**371**
Greenhouse gas emission rate	tonnes CO_2 equivalent (tCO_2e)/MBOE	20	**32**
CO_2 emissions	tonnes	374,116[2]	**N/A**
Oil-in-produced water mass	tonnes	73.67	**N/A**
ISO 14001 certification maintained	yes/no	Yes	**Maintain**
Environmental audits completed	percent	100[3]	**100**
Production operations waste recycling/reuse	percent	76[4]	**70**

[1] The Chevron Energy Intensity metric is the ratio of current energy use (MMBTU/D) per unit of production (MBOE/D). Lower actual figures are better.

[2] For the 2016 period, CNSL surrendered a total of 373,571 tonnes of CO_2 in allowances and credits under the EU Emission Trading System (ETS). The total represented here includes relatively small additional emissions from Erskine and fugitive, oil loading and venting emissions from Alba and Captain, all of which are out of scope for the EU ETS.

[3] Planned audits completed on Captain, Alba, Blackford Dolphin and Erskine.

[4] This metric relates to the proportion of waste from UK production operations for which waste recycling is possible. The figure excludes drilling-related wastes and waste generated from occasional operations for which there is no current alternative but disposal in accordance with applicable law. Such disposed waste streams are tracked and reported. The metric is set this way to allow meaningful comparison of year on year performance in managing our routine waste streams.

Environmental Stewardship Improvement Program

As part of the preparation of the annual Environmental Stewardship plan, improvement opportunities were identified by CNSL. These actions were grouped into improvement plans for CNSL's UK producing assets (Alba, Captain, and Erskine) and for activities associated with drilling including the use of mobile offshore drilling unit (MODU). Alder was not in scope during this review period as it was not in production.

The improvement opportunities centred around strengthening arrangements associated with prevention of, and response to, incidents and releases; produced water management; reduction of air emissions and management of waste. Progress in completing these actions was tracked throughout the year and was used as a leading measure of continual environmental performance improvement. By 2016, year-end, CNSL achieved 100% completion of its environmental stewardship high priority opportunities.

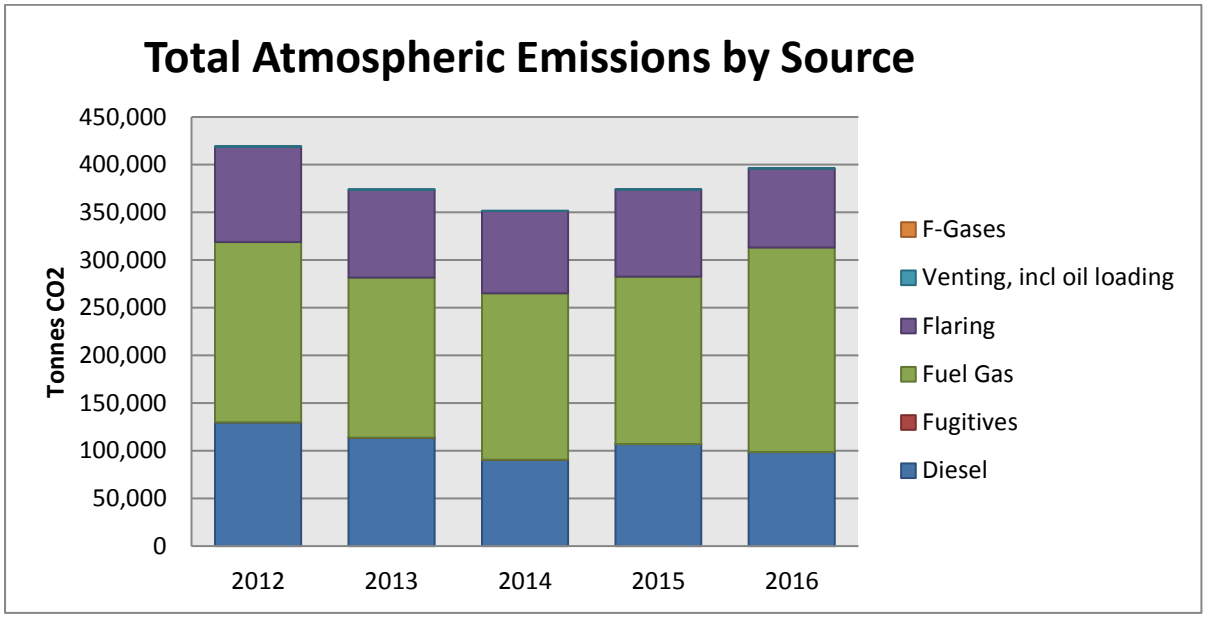
In addition to improvement opportunities raised directly via the ES process there are also arrangements in place to drive continual improvement in response to compliance audits; regulatory inspections/changes; and/or ongoing OE and asset work scopes.

Emissions

The potential environmental impacts of atmospheric emissions from oil and gas exploration and production operations include acid rain formation from oxides of nitrogen and sulphur, photochemical smog from the reaction of sunlight with nitrogen oxides and volatile organic compounds (VOCs), and the potential for climate change associated with greenhouse gases from combustion of fossil fuels.

In the UK, CNSL monitor and measure the atmospheric emissions arising from all our major sources and report these annually as part of our engagement in the European Union (EU) Emissions Trading System (ETS), in our detailed annual atmospheric reports submitted to the regulator, and additionally to our head office as part of our global Chevron corporate reporting requirements.

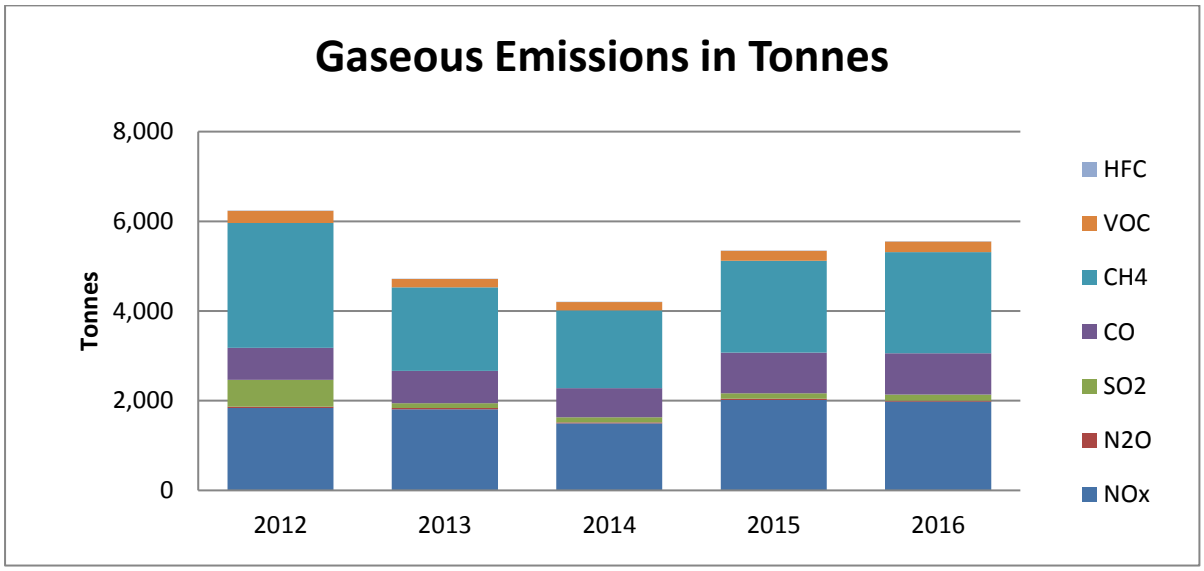
Figure 1: CNSL Annual CO2 Emissions 2012 – 2016[5]



Emissions of carbon dioxide (CO_2) from CNSL activities are mainly as a result of hydrocarbon combustion in power generation and some gas flaring from our Captain and Alba installations, and from the Alder Field via the Conoco Philips operated Britannia platform. Emissions reported as tonnes CO_2 are shown in **figure 1**. Other gaseous emissions, such as N_2O, SO_2 and CO, are also shown (**figure 2**). In 2016, CNSL continued to strive to reduce emissions arising from our operations. The increase in emissions from 2014 to 2016 shown in figures 1 and 2, corresponds with production increases.

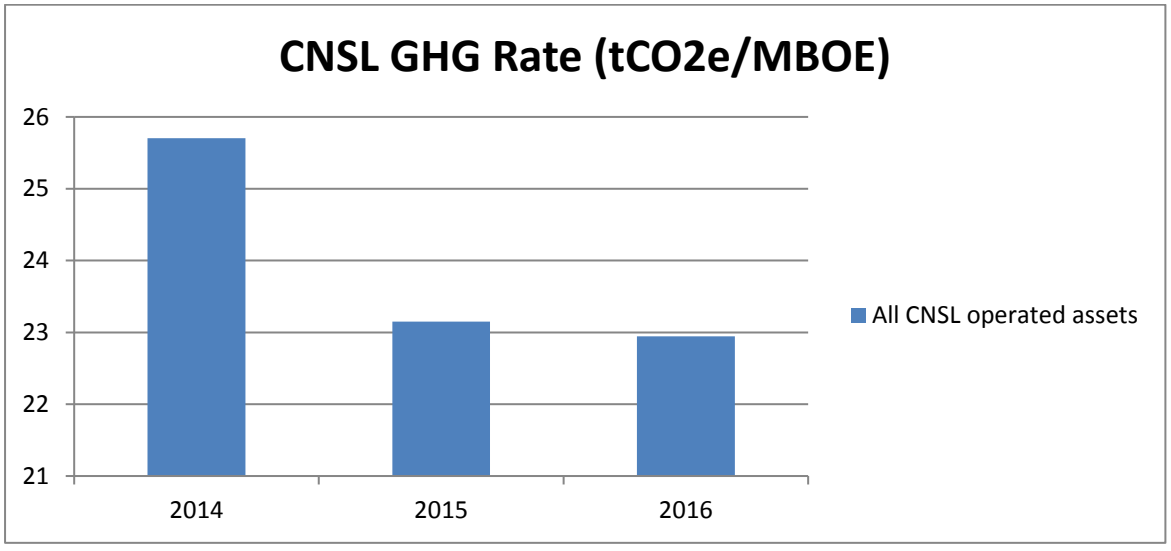
[5] ***Includes emissions from Chevron operated fields (Alba, Captain and Erskine) with atmospheric emissions only.***

Figure 2: CNSL Other Gaseous Emissions



Chevron calculates emissions in tonnes of CO_2 equivalent (tCO_2e); these numbers include gaseous emissions of Carbon Dioxide (CO_2), Nitrous Oxide (N_2O) and Methane (CH_4). As production increased in 2015-2016, emissions also increased. However, the Greenhouse Gas (GHG) rate, which is a measure of tonnes CO_2 equivalent per thousand barrels of oil equivalent (tonnes CO_2e / MBOE) (**figure 3**), shows that the mass of emissions released to atmosphere per thousand barrels decreased. This was achieved through improvements in flaring activity and better fuel utilisation.

Figure 3: GHG rate (tCO2e/MBOE) 2014-2016



Energy Efficiency

As a significant amount of energy is required to power installations and will result in various atmospheric emissions, improving energy efficiency is good environmental and business practice. The Chevron Upstream Energy Intensity (UEI) metric is a measure of total actual energy used (MMBTU/D) divided by actual gross operated production (MBOE/D).

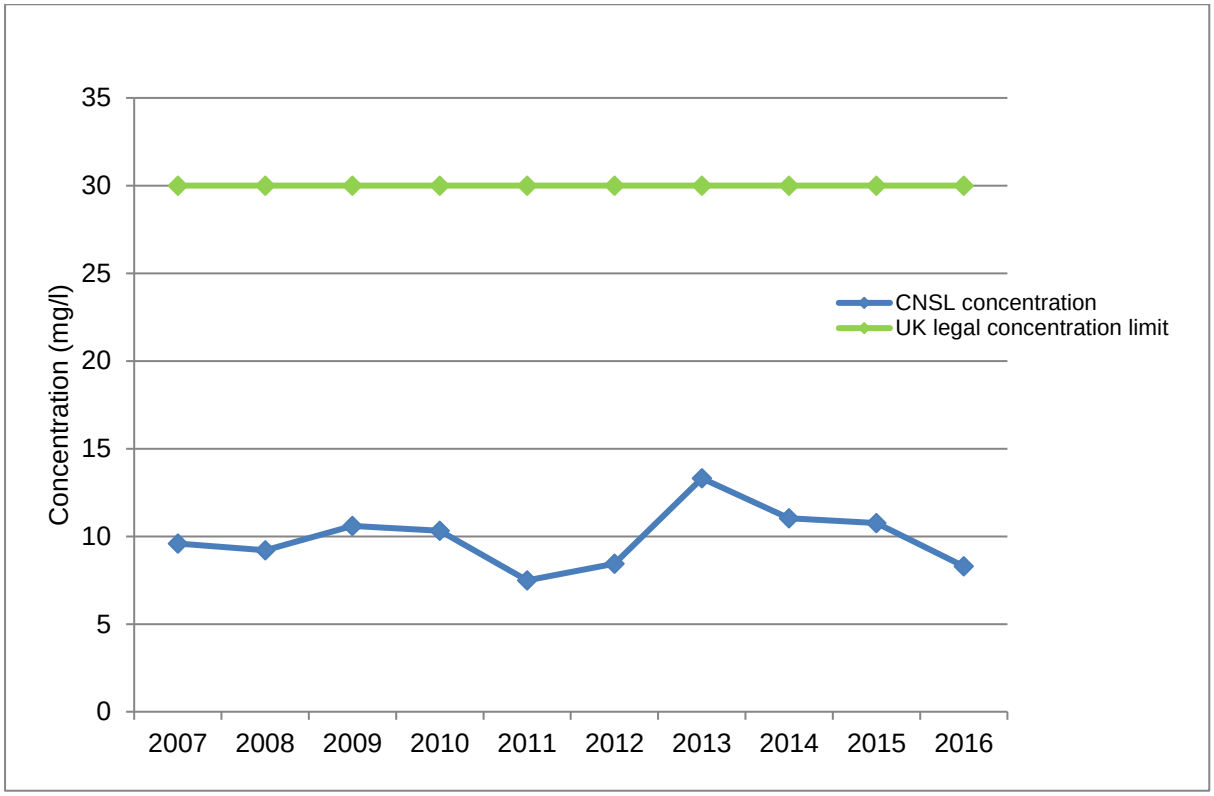
Continuous improvement requires constant focus on energy efficiency opportunities, such as designing energy efficiency into capital projects, keeping existing equipment efficient through proper maintenance and upgrading and auditing and benchmarking progress. Energy efficiency and conservation are the most immediate and cost-effective sources of 'new' greenhouse gas-free energy.

Chevron undertakes a variety of actions to reduce emissions and improve the energy efficiency of its operations. In the UK during 2016, CNSL's improvement projects continued to focus on maximising facility uptime, increasing compressor reliability and maximising use of gas turbines for power generation, thus reducing our diesel consumption. The focus areas continue to be those installations regulated under the European Union (EU) Emissions Trading Scheme (ETS).

In 2016, the CNSL Upstream Energy Intensity (UEI) was 312 against a target value of 371. This value reflects continued improved compressor performance at Captain, and ongoing optimisation of the import gas system at Alba to reduce diesel use.

Oil in Produced Water

Figure 4: CNSL Annual Average Oil-in-Water Concentration 2007 – 2016



Oil extraction results in the co-production of produced water containing hydrocarbons, some naturally-occurring materials and other substances and residues of the chemicals used in the offshore production process.

In the Captain Field, all produced water is re-injected back into the reservoir with none being discharged to sea. At Alba, produced water is treated to reduce the concentration of residual oil before being discharged to sea. Both these activities are regulated under the provisions of a permit issued by the environmental regulator the Department for Business Energy and Industry Strategy (DBEIS). Erskine produced fluids are exported and processed on the Lomond installation (operated by Shell) and produced water is discharged and reported from this location under the provisions of a discharge permit issued to Shell. The Alder Field is tied back to the Britannia Platform operated by ConocoPhillips, any water produced from it is discharged in accordance with the Britannia regulatory discharge permit.

Figure 4 provides details of the CNSL average oil in water concentration and includes discharges from the ANP and FSU installations.

In 2016, CNSL re-injected more than 50 percent (14.5 million tonnes) of total produced water. A total of 73.67 tonnes of oil in produced water was discharged into the sea at an average oil-in-water concentration of 5.68 mg/l from the Alba Field. See **Table 4** below for more information.

Produced water handling remains a key challenge at Alba because the volume of water co-produced with the oil is rising as the field matures. During 2016, several engineering projects were identified and progressed to help maintain and improve oil-in-produced water management and treatment. Further initiatives and projects are being pursued through the 2017 ES plan.

In addition to managing oil-in-water concentrations and discharge, quantities of sand are also produced with the water at Alba. Sand management is required to maintain optimal oil-in-produced water operations. In 2016, 161 tonnes of sand were removed by online washing activities.

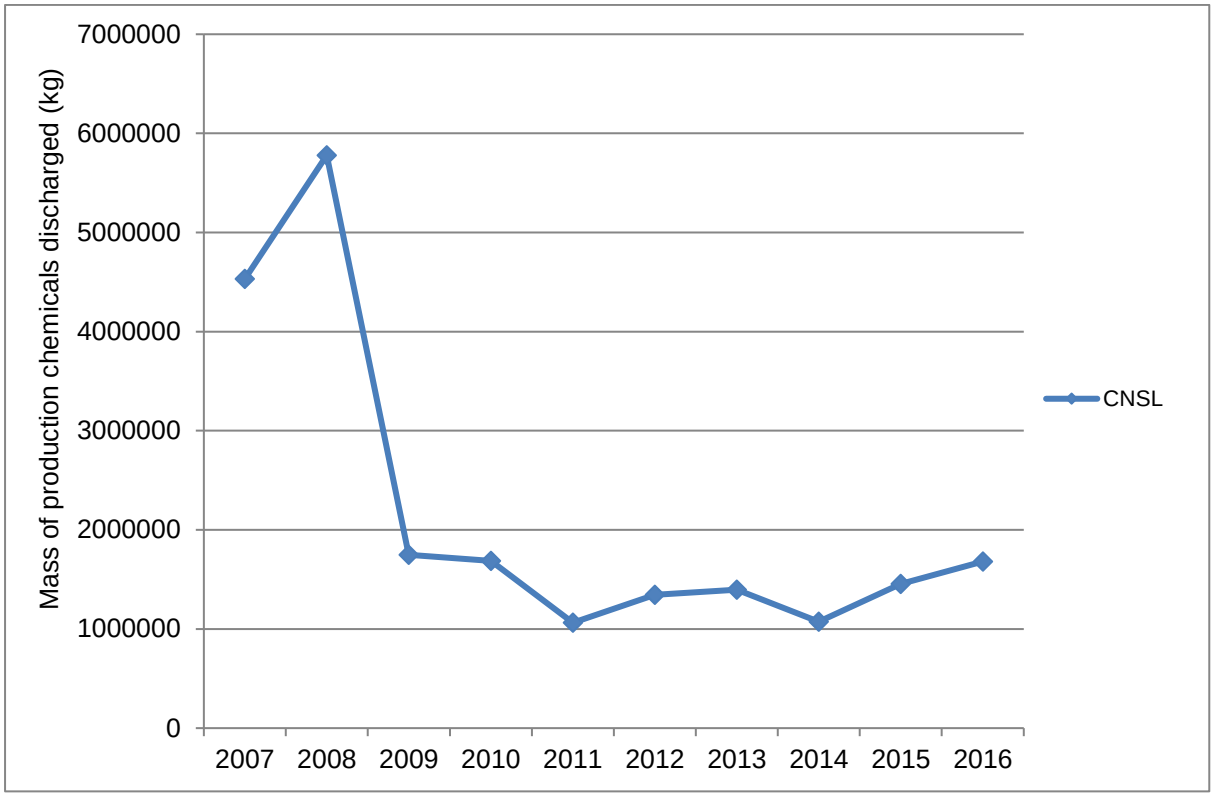
Table 4 – CNSL 2016 Oil-in-Produced Water Data

Facility	Oil-in produced water discharge concentration (mg/l)	Oil discharged (tonnes)	Water discharged (tonnes)	Water injected (tonnes)
Captain Wellhead Protector Platform (WPP)	N/A	N/A	N/A	14,614,825
Alba Floating Storage Unit (FSU)	14.67	0.393	26,721	N/A
Alba Northern Platform (ANP)	5.69	73.28	13,202,235	N/A
Total	**5.68**[6]	**73.67**	**13,228,956**	14,614,825

[6] This figure is not the direct average of the FSU and ANP discharge concentrations, but is weighted to capture the fact that there is relatively much more produced water discharge on ANP than on the FSU. Hence, the overall figure closely matches that of the ANP individually.

Chemicals

Figure 5 – CNSL Annual Mass of Production Chemicals Discharged 2007 – 2016[7]



Many different types of chemical are used and are an essential requirement in drilling and production operations – primarily to control corrosion, inhibit bacterial growth, assist with the production process, and assist with the drilling process. Due to the nature of these processes some discharge of chemicals to the sea will occur. Chemical use and discharge is strictly regulated and a permit is required before any use or discharge to sea of a production or drilling chemical can take place.

In 2016, approximately 35 percent of the production chemicals used were discharged to sea, most of which were low hazard - that is chemicals classed E or banded Gold under the regulated Offshore Chemical Notification Scheme. A breakdown of CNSL chemical use by operation is provided in **Table 5** below, with a breakdown of discharge by chemical type provided in **Table 6** below.

CNSL continues to focus on replacement of higher hazard chemicals with less hazardous substitutes where this is technically feasible. Discharge of chemicals is affected significantly by increased water production at CNSL's Alba Field as it matures. Since 1998, all water produced from CNSL's Captain Field reservoir has been used either as reinjection water for reservoir pressure maintenance or as power water for downhole hydraulic pumps; chemical discharges at this field are therefore already minimal.

CNSL discharged 1520 tonnes of chemicals from our drilling operations during 2016, approximately 15 percent of the total chemicals used in these activities. Most of these chemicals were low hazard chemicals.

[7] ***Graph shows production chemicals discharged only. Drilling activity varies considerably from year to year so inclusion of this data does not allow meaningful comparison of data.***

CNSL discharged 545 tonnes of chemicals as a result of well workover operations during 2016, approximately 51% of the total chemicals used in these activities. Most of these chemicals were low hazard chemicals.

All chemical use and discharge are subject to strict regulatory controls and are managed in accordance with internal procedures and processes.

Table 5 – CNSL 2016 Chemical Use and Discharge

Facility/operation	Mass Used (kg)	Mass Discharged (kg)
Alba Floating Storage Unit (FSU) Production Operations[8]	462	89,670
Alba Northern Platform (ANP) Production Operations	1,824,824	1,461,946
Alba Northern Platform (ANP) Platform Drilling Operations	4,698,603	346,230
Alba Northern Platform (ANP) Workover Operations	671,436	544,560
Captain Wellhead Protection Platform (WPP) Platform Drilling Operations	1,272,060	1,011,937
Captain Wellhead Protection Platform (WPP) Workover Operations[9]	387,926	0
Captain FPSO Production Operations	2,922,975	129,852
Erskine Production Operations[10]	72,153	105
Blackford Dolphin Drilling Operations	4,375,684	162,164
Alder Pipeline Operations[11]	88,221	207,968
Total	**16,314,344**	**3,954,431**

[8] No processing occurs at the FSU; therefore, little chemical is used there. The apparent discrepancy in FSU chemical use and discharge figures is as a result of the FSU receiving processed crude from the ANP, from which water which requires discharging settles out, therefore some chemicals applied at the ANP get discharged at the FSU.

[9] There is no produced water discharge at Captain, chemicals were either re-injected into the reservoir along with the produced water or remained downhole.

[10] Erskine production fluids are processed at Lomond (operated by BG/Shell), therefore discharge of chemicals used at Erskine occurs there. These chemical discharges are covered on, and reported against, BG/Shell's chemical permit for Lomond.

[11] A range of sub-sea equipment was pre-filled with chemical inhibitors onshore, and subsequently discharged as part of the installation process. Additional discharge figures relate to flow-back chemicals from the Alder well where the usage was covered in the drilling permit, but the discharge is shown under the Alder pipeline operations.

Table 6 – 2016 Chemical Use and Discharge (Detailed)[12]

Facility/operation	(kg)	A	B	C	D	E	Orange	Blue	White	Silver	Gold	Total
Alba Floating Storage Unit (FSU) Production Operations	**Used**	0	0	0	0	0	0	0	0	291	171	462
	Discharged	0	0	0	0	499	0	0	0	291	88,880	89,670
Alba Northern Platform (ANP) Production Operations	**Used**	0	0	0	8,100	46,452	0	90,410	0	168,656	1,511,205	1,824,824
	Discharged	0	0	0	5,700	46,452	0	321	0	168,567	1,240,906	1,461,946
Alba Northern Platform (ANP) Drilling Operations	**Used**	0	16,559	642,859	99,423	3,871,690	0	0	0	0	68,072	4,698,603
	Discharged	0	0	0	0	324,175	0	0	0	0	22,055	346,230
Alba Northern Platform (ANP) Workover Operations	**Used**	0	0	0	0	50,129	0	0	0	29,260	592,048	671,436
	Discharged	0	0	0	0	50,129	0	0	0	29,260	465,172	544,560
Captain Wellhead Protection Platform (WPP) Drilling Operations	**Used**	1	0	0	0	1,142,518	0	0	0	0	129,541	1,272,060
	Discharged	0	0	0	0	903,181	0	0	0	0	108,756	1,011,937
Captain Wellhead Protection Platform (WPP) Workover Operations	**Used**	0	2,200	0	0	384,189	0	0	0	0	1,537	387,926
	Discharged	0	0	0	0	0	0	0	0	0	0	0
Captain FPSO Production Operations	**Used**	0	0	0	1,053	126,791	54,127	0	1,019,668	32,251	1,689,085	2,922,975
	Discharged	0	0	0	0	126,360	0	0	0	0	3,492	129,852
Erskine Production Operations	**Used**	0	0	0	0	20,512	0	0	0	0	51,641	72,153
	Discharged	0	0	0	0	0	0	0	0	0	105	105
Blackford Dolphin Drilling Operations	**Used**	2,374	21,806	6,940	941,685	2,670,359	0	0	0	0	732,520	4,375,684
	Discharged	0	196	0	21,480	140,488	0	0	0	0	0	162,164
Alder Pipeline Operations	**Used**	0	0	0	9,154	60,655	0	0	0	12	18,401	88,221
	Discharged	0	0	0	405	195,553	0	0	0	4	12,005	207,968
Total	**Used**	**2,375**	**40,565**	**649,799**	**1,059,415**	**8,373,294**	**54,127**	**90,410**	**1,019,668**	**230,470**	**4,794,221**	**16,314,344**
	Discharged	**0**	**196**	**0**	**27,585**	**1,786,837**	**0**	**321**	**0**	**198,121**	**1,941,371**	**3,954,431**

[12] ***The Offshore Chemical Notification Scheme (UK) (OCNS) conducts Chemical Hazard and Risk Management (CHARM) assessments on chemical products that are used offshore. They use colour banding to risk rank each product, with Gold products posing the lowest potential hazard and, on the table above, Orange being the highest risk. Products not applicable to the CHARM model (i.e. inorganic substances, hydraulic fluids or chemicals used only in pipelines) are assigned an OCNS grouping, A - E. Group A includes products considered to have the greatest potential environmental hazard and Group E the least.***

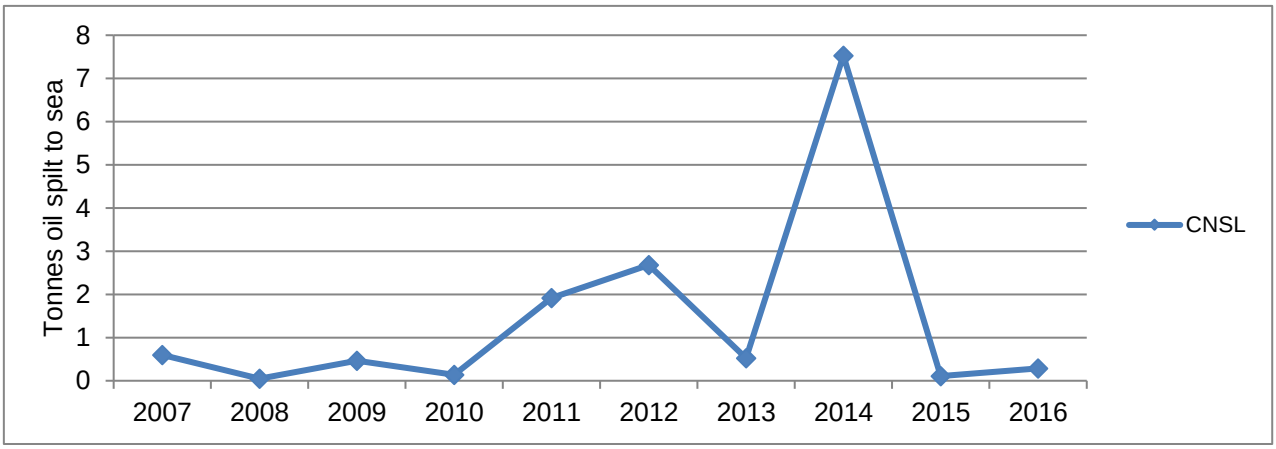
Oil and Chemical Releases/Spills to Sea

Table 7 – CNSL 2016 Oil and Chemical Releases to Sea[13]

Facility	Number of PON1s	Oil Released (tonnes)	Chemical Released (kg)
Captain Floating Production Storage & Offloading (FPSO)	2	0.0000043	0
Captain Wellhead Protector Platform (WPP)	5	0.0000101	23.50
Alba Northern Platform (ANP)	0	0	0
Alba Floating Storage Unit (FSU)	0	0	0
Erskine	2	0.2860000	1.644
Alder	2	0.0000250	449.82
Blackford Dolphin (MODU)	10	0.0000130	2708.495
Amundsen Spirit (vessel)	1	0.0000050	0
Deep Arctic DSV (vessel)	1	0.0000003	0
Total	**23**	**0.2860576**	**3183.459**

In accordance with regulatory requirements all unplanned accidental releases of oil or chemical to sea, regardless of quantity, must be reported on a Petroleum Operations Notice No.1 (PON1). A summary of the CNSL PON1 notifications for 2016 is provided in **Table 7**. The total number and volume of oil and chemical notifications by asset are detailed. The largest single release of 1651 kg of chemical was because of an ongoing release of hydraulic control fluid. Internal investigations were conducted to determine the root cause and actions taken to prevent recurrence of any release. The hydraulic control fluid is permitted for discharge to sea during normal planned operations.

Figure 6 – CNSL Annual Quantity of Oil Released to Sea 2007 – 2016[14]



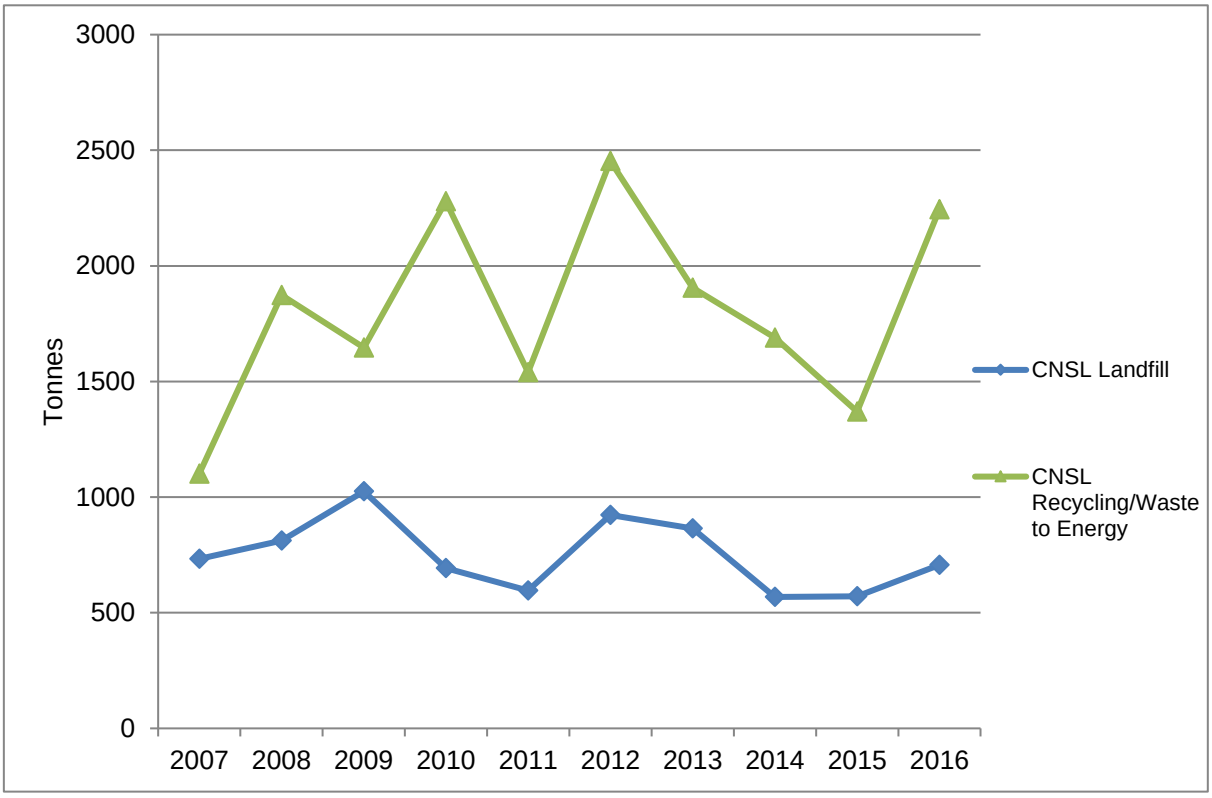
[13] ***CNSL data only includes accidental releases of oil and chemicals to sea. No Permitted Oil Discharge notifications were submitted in 2016. Three third party oil release notifications were submitted to regulatory authorities but details are not included in table 7 as these events were not associated with CNSL operated l activities.***

[14] ***2007 – 2016 CNSL data includes the maximum reported quantity released, i.e. a worst-case scenario. Since 2007, PON1 reports have required a maximum and minimum release quantity to be reported.***

Wastes

CNSL's offshore operations produce a variety of waste streams which include packaging, scrap metal and redundant chemicals. CNSL works actively both to reduce the amount of waste that it produces and to reuse or recycle what remains. Improvements in the proportion being recycled or reused have been identified – for example, wooden storage pallets are used for chipboard and plastic drums are shredded for recycling and reuse. Waste which isn't reused, recycled or send for energy production is mainly sent to landfill with small amounts being incinerated. Figure 7 provides details of the annual mass of waste produced together with disposal routes.

Figure 7 – Annual Mass of Waste 2007 – 2016[15]



CNSL works with our waste management contractor to continuously improve waste management and minimise landfill volumes. CNSL's 2016 waste production is shown in **Table 8**.

In 2016, CNSL exceeded its target of recycling 70 percent of the recyclable waste in its production and office operations (see 2016 Performance Metrics in Table 1). This target was achieved through initiatives implemented at each of our installations and by the individual efforts of members of the offshore workforce, in particular those involved in the installation Green Teams.

[15] ***Excludes drilling related waste and tank washings which distort data from a relative performance assessment perspective.***

Table 8 – 2016 Reported Total Waste Data

Category	Recycle/Waste to Energy (tonnes)	Landfill/Incinerate (tonnes)	Total (tonnes)
Special/Hazardous Waste	739.7	310.6	**1050.3**
Non-Hazardous Waste	1505.2	395.6	**1900.8**
Total	**2245**	**706.2**	**2951.1**

For the purpose of relative annual performance tracking, we do not include the drilling-related and tank washings waste streams in our target as they are extremely variable and operationally dependent, and their inclusion therefore would not allow for long-term performance tracking. These are often the largest CNSL contributor to landfill volumes and consequently we are working to reduce the quantities and potential hazards of these wastes too. The use of non-aqueous (oily) drilling fluids can be necessary when drilling in certain reservoirs or long horizontal wells.

Glossary

ANP	Alba Northern Platform
bbl	Barrel
BOE	Barrels of Oil Equivalent
BTU	British Thermal Units
CH_4	Methane
CNSL	Chevron North Sea Limited
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DBEIS	Department for Business Energy and Industrial Strategy
ES	Environmental Stewardship
ETS	Emissions Trading System
EU	European Union
FPSO	Floating, Production, Storage and Offloading
FSU	Floating Storage Unit
GHG	Greenhouse Gas
HFC	Hydroflurocarbon
MBOE	Thousands of Barrels of Oil Equivalent
MODU	Mobile Offshore Drilling Unit
MSP	Management System Process
N_2O	Nitrous oxide
NO_x	Oxides of nitrogen
OE	Operational Excellence
OEMS	Operational Excellence Management System
OPEP	Oil Pollution and Emergency Plans
OSPRAG	Oil Spill Prevention and Response Advisory Group
SO_2	Sulphur dioxide
SOSREP	Secretary of States Representative for Maritime Salvage and Intervention
t	tonnes
UEI	Upstream Energy Intensity
UK	United Kingdom
VOCs	Volatile Organic Compounds
WPP	Wellhead Protector Platform