



# **SPIRIT ENERGY**

**ENVIRONMENTAL PERFORMANCE  
REVIEW 2019**



## FOREWORD

I am pleased to share Spirit Energy's Environmental Performance Review for 2019.

As a full-cycle exploration and production company, Spirit Energy is committed to exploring new ways to provide growth and add value for our shareholders as a lean, agile and sustainable business. We understand the importance of minimizing our impact on the environment and take our responsibility of safeguarding the environment seriously.

Spirit Energy adheres to a robust Environmental Policy which captures our responsibilities in relation to environmental stewardship and our commitment to the continual improvement of our environmental performance. We use an integrated approach which embeds the environmental management of our operations into our business management practices.

We believe that having detailed, accurate, and timely data enables us to proactively manage our impact. To obtain this data, we have dedicated resources in our environment team to manage our emissions inventory, water use data and waste generation. All improvements in performance are planned and managed within the annual improvement planning cycle. These improvements are approved by senior leadership and aligned with business operational plans.

2019 was a busy year, with our teams across the UK, Norway, the Netherlands and Denmark producing close to 46 million barrels of oil equivalent (mboe). We participated in eight exploration and appraisal wells, with seven encountering hydrocarbons. And, our reserves to production ratio improved to an estimate of 6.2, attributable to the field life extension project on Statfjord and positive revisions of Kvitebjorn, Cygnus and South Morecambe. Additionally, investment in our Morecambe assets with a focus on developing better ways of working resulted in improved production efficiency of 77% in 2019 versus 32% the year prior. This demonstrates well our commitment to refining our capabilities in safely operating mature assets

For Spirit Energy, sustainability means running our operations in a safe, responsible, efficient and profitable way. Our industry is faced with responsibility of supplying reliable and affordable energy products and at the same providing solutions to climate change. We are taking steps to embed responsible climate change management into all that we do. Working closely with industry, including our fellow operators and supply chain partners, the safety of our people and our environmental responsibilities remain foremost in our minds and a critical part of our strategy.

Gerry Harrison

EVP HSE, Subsurface and Non-Operated Production



## HEALTH, SAFETY, ENVIRONMENT AND SECURITY POLICY

At Spirit Energy creating an incident free workplace is our top priority. All employees and business partners are required to comply with this policy and our commitments outlined below.

We are committed to:

**Assessing**, understanding and managing our HSES risks and impacts

**Enabling** the creation of a positive culture holding each other accountable, helping us to: achieve our HSES goals; support business growth; and realise our vision of an incident free workplace

**Proactively** supporting employee health and safety, seeking ways to protect the environment, including the prevention of pollution, efficient use of resources and the reduction of waste and carbon emissions

**Empowering and encouraging** personnel to work in a safe way

**Intervening** if we believe that the work environment or task is unsafe or may cause environmental damage, or we see an unsafe act

**Learning** from our successes and incidents, and freely sharing lessons with business partners

**Working with stakeholders**, suppliers and business partners in the pursuit of good practice in HSES

**Continually improving** and setting measurable objectives and targets in business plans to enhance HSES performance

**Developing** and testing prioritised incident response and recovery plans to protect our people, the environment and minimize business impact

**Ethically conducting our business** and complying with regulatory and other applicable requirements

Our HSES management system enables the delivery of these policy commitments, is structured in line with recognised good practice, and is routinely assured. Independent certification to ISO 14001 shall be maintained for our environmental material operations.

Our performance is reviewed regularly, and relevant results published.

**Chris Cox**

**Chief Executive**

## OUR OPERATIONS

Our operations are organised into three asset groups – the North Sea (including facilities in both the UK and the Netherlands), Morecambe Bay and Norway.

This review covers the 2019 performance of the operated assets which are within the OSPAR region.



### North Sea Assets

Our operated assets in the North Sea include the Chestnut oil field, located in the central part of the UK North Sea, which has been in production since 2008 and is produced via the Hummingbird Spirit floating production, storage and offloading (FPSO) vessel. In the Southern North Sea, operated assets include facilities in the Netherlands and UK sectors, such as the manned fixed platform at J6-A and the not -permanently manned installation (NPAI) at York. Our portfolio also includes six further NPAIs and one subsea asset.

In addition to routine operations at these facilities, in 2019 we carried out exploratory campaigns at Andromeda, as well as infill drilling operations at Chiswick in the Greater Markham Area and at Chestnut. Our activities also included progress on decommissioning the A Fields (Alison, Annabel, Ann and Audrey) and Ensign.



### Morecambe Assets

The combined fields of Morecambe Bay continue to provide a significant portion of the UK's gas supply, having produced more than 6.5trillion cubic feet of gas for UK homes and businesses since coming on stream in 1985. The asset also includes the Barrow Gas Terminals, which process all the gas from Morecambe Bay.

The Morecambe Bay fields are produced via three bridge-linked installations, forming the Central Morecambe platform, as well as seven NPAIs and two subsea tiebacks.

Decommissioning of two NPAIs in Morecambe Bay, DP3 and DP4, began in 2019 reducing our footprint in the region as we remove infrastructure which is no longer required. Following work to reroute all gas formerly processed at the South Morecambe Terminal at the Barrow Gas Terminals to the nearby North Morecambe Terminal, work to remove redundant equipment at the South Morecambe Terminal is now complete.



### Norway Assets

Operated assets in Norway include the producing Vale field, which flows back to the Statoil Heimdal platform, while the Oda field also came on stream ahead of time and under budget in March 2019 following development drilling in 2018. In our non-operated portfolio, our interests include stakes in major Norwegian fields such as Statfjord, Kvitebjørn, Heimdal and Valemon.

## OUR ENVIRONMENTAL MANAGEMENT SYSTEM

The Spirit Energy Environmental Policy outlines our responsibilities in relation to environmental stewardship and our commitment to continually improve our environmental performance. The environmental management of our operations are integrated within health and safety as well as the business management activities. This integrated system ensures the embedding of environmental requirements into business practices for maximum benefit.

The following key impacts and risks are managed within routine operations:

- Carbon dioxide emissions from power generation and flaring
- Oil discharged in produced water
- Chemical use and discharge to sea
- Waste generation and disposal
- Unplanned events – emissions, discharges and permit non-compliances

Performance is reported to the regulators and within Spirit Energy to operations and senior management and a number of other forums such as to the Carbon Disclosure Project. Performance data is also available on one of our shareholders website ([www.Centrica.com](http://www.Centrica.com)).

Improvements in performance are planned and managed within the annual improvement planning cycle. These improvements are approved by senior leadership and aligned with business operational plans. Maximum benefit from strategic initiatives and improvements can be achieved across the exploration and production business through this planning process.

The activities in our operated assets from exploration to decommissioning are certified to the Environmental Management System ISO14001<sup>1</sup>. Our ISO14001:2015 certificates were transitioned to the updated standard as per requirement.

This report summarises the performance and initiatives of Spirit Energy's exploration and production operations in 2019 and the planned improvements in 2019-2020 as required by OSPAR<sup>2</sup>.

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<sup>1</sup> ISO 14001 is an internationally recognised standard for environmental management systems

<sup>2</sup> OSPAR Recommendation 2003/5 to Promote the Use and Implementation of Environmental Management Systems by the Offshore Industry

## OUR PERFORMANCE

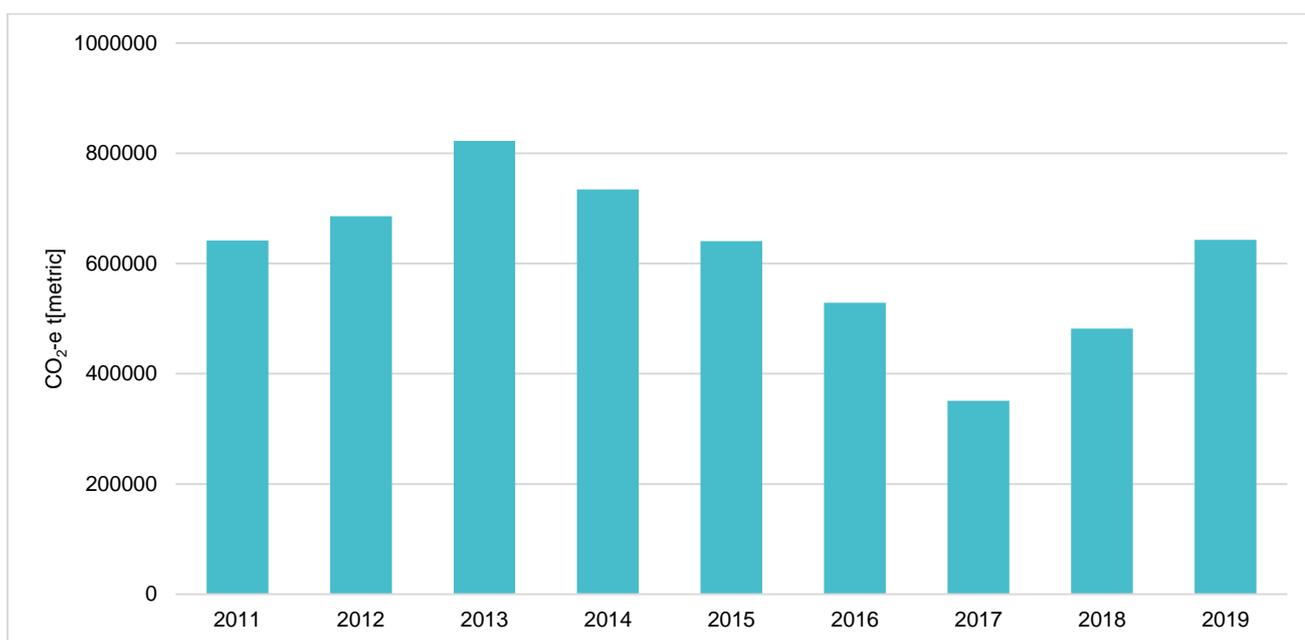
The environmental performance of our activities in 2019 is summarised below and presented in detail in the Appendix.

### Carbon dioxide emissions

The emissions from our offshore and onshore installations are shown from 2011 to 2019 in Figure 1 and in Figure 2 for our higher emitting facilities. Emissions data for all of our operated assets are in the associated Appendix.

The majority of emissions to atmosphere from our installations are from gas-fired turbines used for power generation and gas compression. The lack of process and compression equipment on the smaller NPAs results in considerably lower emissions from these installations.

**Figure 1 – Historical carbon dioxide emitted (EU ETS)**

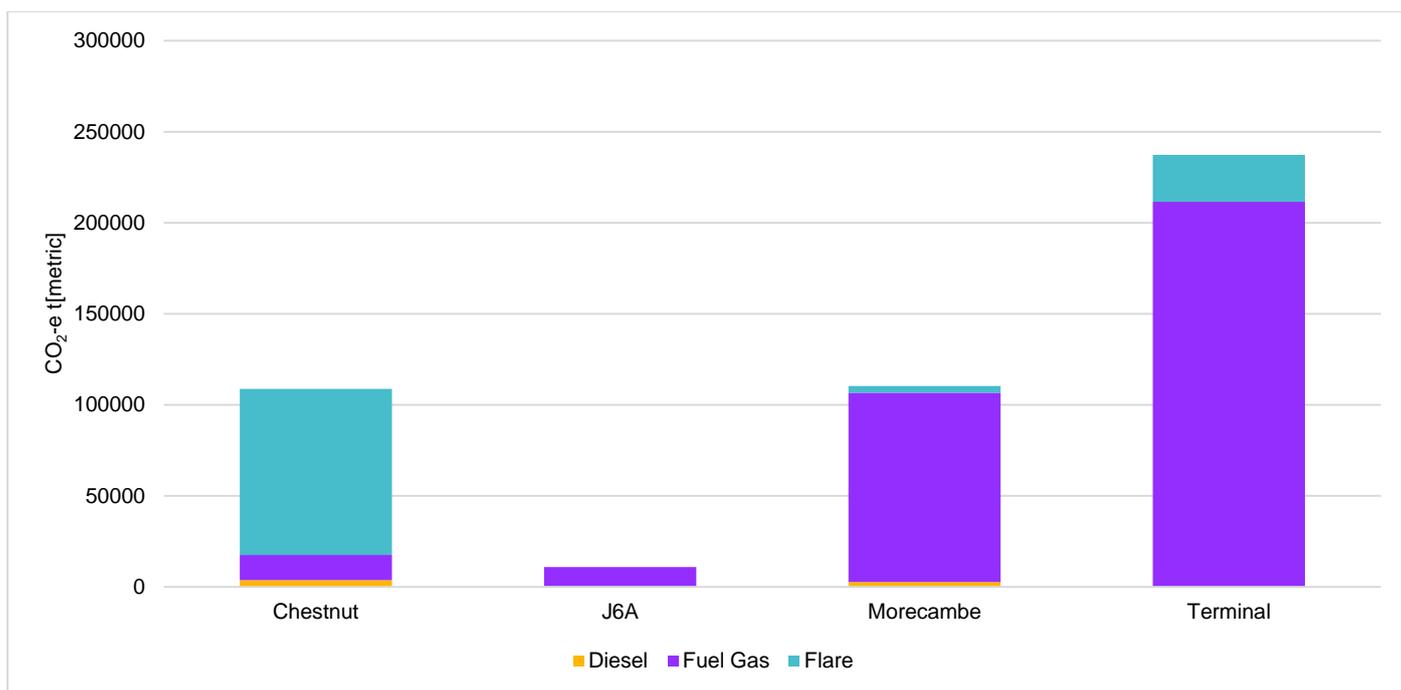


In 2019, the asset emissions were impacted by the following:

- Production at Morecambe in 2017 was unusually low due to extended shutdown. The increase in emissions in 2019 reflects the return to more normal production levels.
- Decrease in emissions at Hummingbird FPSO for 2019 in comparison to 2018 emissions due to production from the additional well at Chestnut.

Carbon dioxide from the combustion emissions at the Hummingbird Spirit FPSO, Morecambe Bay, J6-A in the Greater Markham Area (GMA) and the Barrow Gas Terminals are part of the EU Emissions Trading System (EU ETS). In 2019 Chestnut and the Barrow Gas Terminals met the ETS free allowances limits however Morecambe was above its free allowance as in partial cessation.

**Figure 2 – Carbon dioxide emitted in 2019 (EU ETS)**



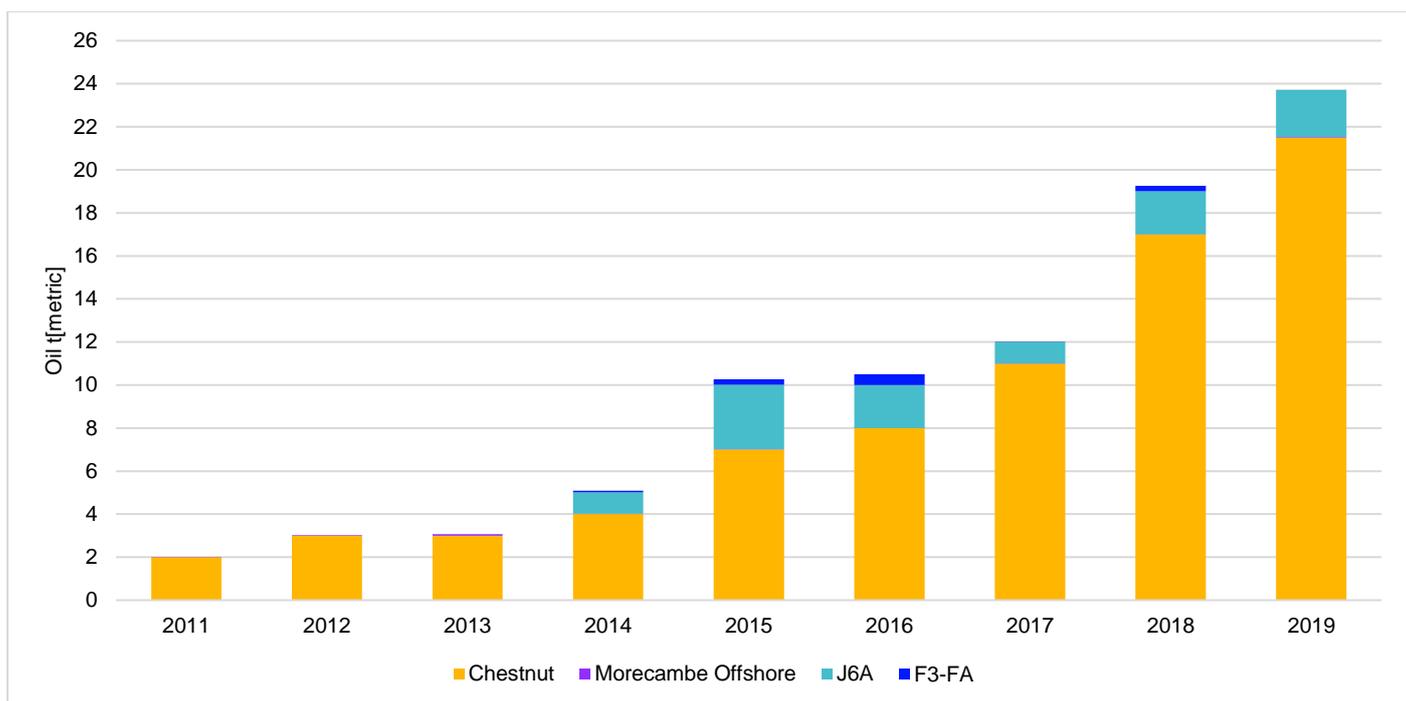
**Oil discharged in produced water**

Oil is discharged to sea in produced water following treatment at the Hummingbird Spirit FPSO (Chestnut field) where the OPPC permit is managed by Teekay, South Morecambe, J6-A and F3-FA facilities. The total oil in produced water discharged from these facilities over the past eleven years is shown in Figure 3.

The oil discharged in produced water from our assets has continued the increasing trend. In 2019 we generally discharged more oil to sea in produced water than 2018 due to:

- Production upsets on J6A resulted in discharges of oil in produced water in exceedance. The discharge of oil has been managed through process stabilization and filtration of the water prior to discharge. The oil in water discharges are Field tests and the re-engineering of the produced water system were planned for later in 2019.

Figure 3 – Oil discharged to sea 2011 -2019



### Chemical use and discharge to sea

The amount and type of chemicals used for our offshore operations differ depending on the activities and reservoir types, for example the rock type to be drilled, well design and production functions.

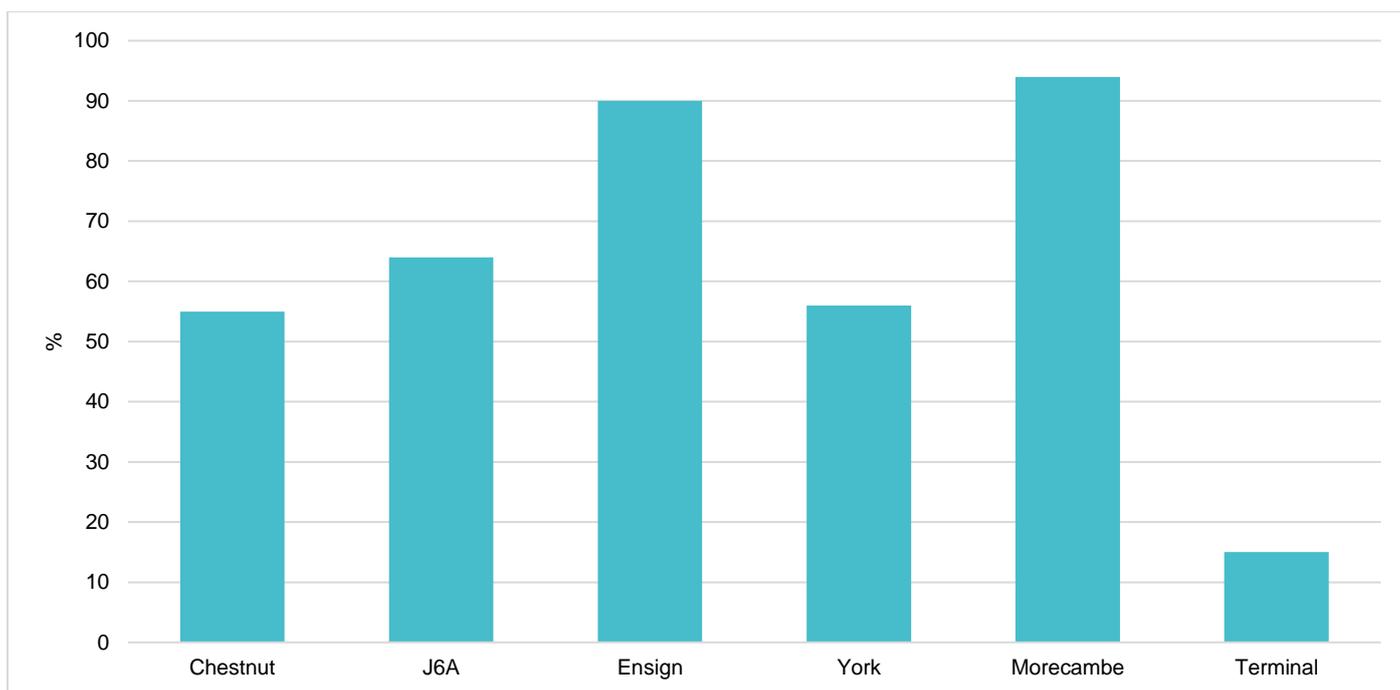
The majority of the substitution or red chemicals are permitted for contingency use in the well activities and on the Hummingbird FPSO for Chestnut, however only a small amount these chemicals were discharged. Work continues to identify replacement products across our activities and is summarised for the UK in the review of the technical justifications for chemicals flagged for substitution carried out within Spirit Energy.

### Waste generation and disposal

Waste is a key area for environmental impact, from the potential for contamination from hazardous wastes to long term impacts of waste such as plastics in our environment. As decommissioning activities including well plug and abandonment are increasing in our operations schedule, we are working with the operations to minimise the production of waste e.g. through disposal of cleaning fluids downhole.

The average recycling<sup>3</sup> percentage of all production, well operation development and decommissioning projects was 75% in 2019. We continued the focus on waste production and management in production, wells and projects into 2020.

<sup>3</sup> Reuse, recycling and waste to energy

**Figure 4 – 2019 waste recycled from producing installations**

### Unplanned events

In 2019 there was 14 spills to sea, the same as the previous year 2018, however there were three more permit non-compliances an increase from 23 in 2018 to 26.

### Spills to sea

We reported 14 spills to sea from Spirit Energy assets in 2019, with the majority being small chemical releases or hydraulic fluid. The largest spill was 53kg of hydraulic fluid due to failed small bore tubing. Investigations were carried out as standard practice into all the releases and lessons learnt captured where appropriate e.g. equipment changeout and increase in assurance activities.

### Other regulatory non-compliances

Of the 13 non-compliances submitted in 2019, only three were against the chemical regulations in the UK which is a decrease from 2018. One was due to the incorrect chemical used for line flushing and the other two were produced water sampling errors.

The 10 remaining non-compliances comprised 9 OPPC and one failure to notify BEIS of partial cessation in production by 2017. The 9 oil-to-sea non-compliances included 7 operational issues (seven at the Chestnut Hummingbird FPSO and 2 on J6A in Netherlands). The Chestnut issues were due to the processing of returns. The J6A problems were due to ongoing produced water issues on that platform.

All events have been investigated and addressed at both asset and cross asset basis to ensure learnings are captured for Spirit Energy.

## Onshore Performance

### Barrow Gas Terminals

The Barrow Gas Terminal operates under an Environment Permit which is regulated by the Environment Agency (EA) and an annual performance report is submitted to the EA for the site.

Emissions to air from the process and discharges to water are monitored and managed within the limits specified in the permit. Any deviation from these limits is investigated to prevent a reoccurrence.

In 2019 there were five notifications to the EA following environment events on site.

- In March a notification was made following the draining of a vessel to the closed drains, a non-return valve failed on the system allowing the effluent to discharge into a tanker loading bay on site. All of the effluent was contained on site.
- Also in March & May Hot Oil heaters A and B were found to breaching the permit NOx emission limit following monitoring exercises. Monthly monitoring was carried out following these events to confirm compliance with the permit limit.
- In May the NOx emissions from the Rivers Acid Plant rose slightly above the permit limit following a failure of the ammonia injection pumps which control the NOx emission from the plant. The issue was resolved after 3 days.
- In November an effluent was accidentally discharge to sewer. The event was fully investigated and a number of new controls measures are now in place to prevent a re-occurrence.

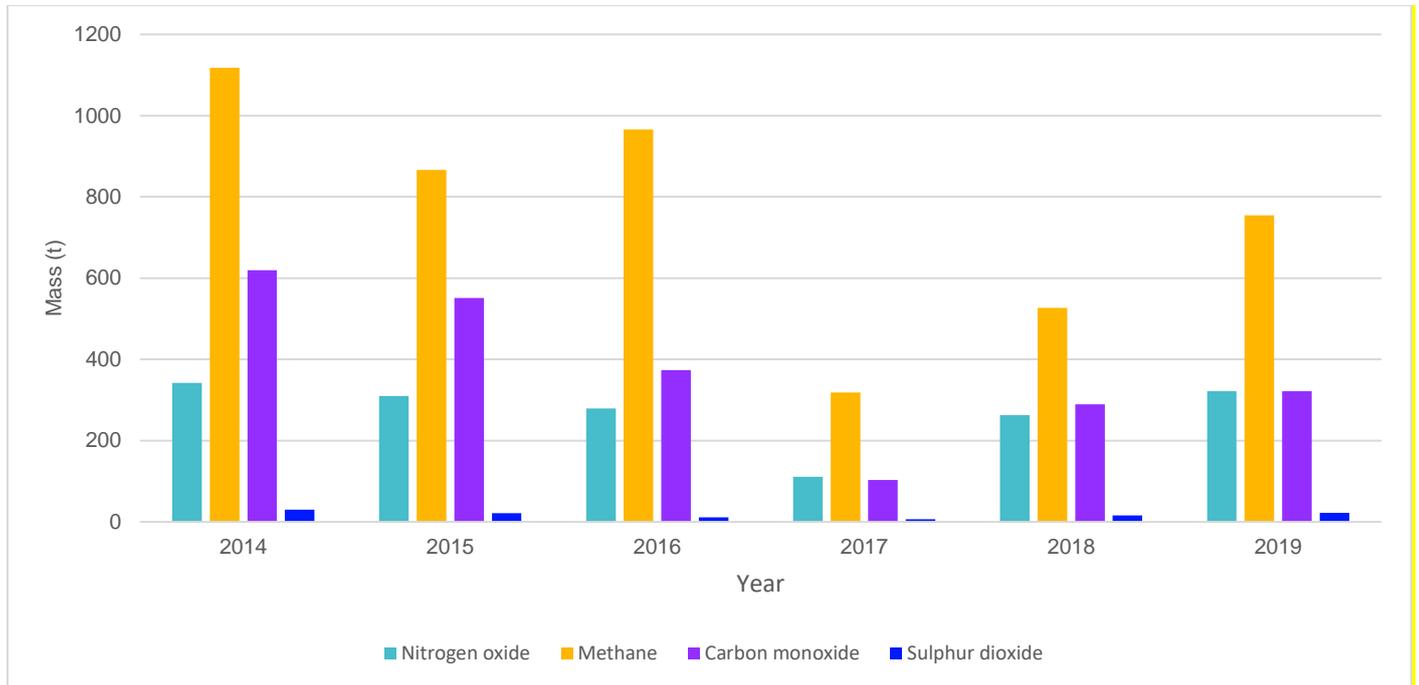
The £11.2m project to install a Catalytic Convertor to treat the nitrogen oxide emissions from the North Morecambe Terminal Field Gas Compressor was commissioned in Q3 2019. This will reduce the emissions of NOx and CO from the Field Gas Compressor, which is the largest source of these emissions on site, by over 80%.

The demolition of the South Morecambe Terminal was completed in early 2020. The Project team had to work around a large colony of nesting gulls and in the summer of 2019, we supported Natural England and the Cumbria Wildlife Trust in their efforts to colour mark over 100 gulls nesting on site at the time. This work is part of a long-term project designed to monitor the health of lesser black-backed and herring gull populations across North West England. The site's close proximity to the estuary means it is a popular location for them and, by attaching a uniquely coded metal ring to each bird's leg, their movements (distance, direction and duration of travel) and survival can be more accurately recorded and monitored, aiding conservation efforts.

Work also began on the Condensate Tanker Loading Project which will see the decommissioning of the Condensate Storage Facility in Barrow Docks and the condensate produced loaded on to road tankers at the Terminals. This project will eliminate one of the risks of a major environmental event by reducing the inventories stored on site.

Emissions to air from the Barrow Gas Terminals are shown in the graph below. The low emissions in 2017 and 2018 reflect extended shutdown periods, whilst the 2019 emissions reflect more stable production through the year.

**Figure 5 – Emissions of Nitrogen oxides, methane, carbon monoxide and sulphur dioxide from the terminal**



## 2019-2020 ENVIRONMENTAL IMPROVEMENT PLANS AND PERFORMANCE

	Initiative	Progress
Risk management – environmental integrity	Continued cross-asset focus on the management of regulatory compliance.	Audit and assurance focus on spill prevention, chemical and oil management and oil spill response. Audits will be carried out on atmospheric emissions in 2020.
Reporting and Performance	Common reporting system across the E&P business and review all performance metrics.	The standalone online observations reporting tool is now embedded in throughout the business.  In 2019/20 planned enhancements to our internal reporting tool to streamline our internal reporting and will be rolled out in 2020.
Awareness and training	Improvements in environmental awareness across North Sea and Morecambe assets	The environmental messages procedure for capturing lessons learnt are embedded in the business and distributed to operations as applicable.  The use of the Energy Institute modules has been implemented both for Spirit Energy staff and contractors e.g. for rig or vessel activities. The access to the modules will be further embedded in the competency management systems in 2020
Carbon/energy management	Development of carbon savings and energy efficiency opportunities	We continued reporting the carbon intensity of our major emitting installations in 2019. The ESOS reviews will be conducted on the Morecambe assets again in 2019 and highlighting further opportunities for energy efficiency.
Waste management	Development of waste key performance indicator and opportunities for improvement.	A cross asset waste KPI was developed and reported to the assets throughout 2017 and 2018. This has provided better understanding of our waste production. We will be focusing on the waste to energy, landfill and liquid treatment in 2019/2020.
Maintenance of social licence	Energy Transition	Developing a roadmap to support the 2050 net zero timeline.

# APPENDIX

## Performance Data

Key indicator	Morecambe		North Sea					Norway	
	South Morecambe	Total of 7 NPAIs and subsea infrastructure <sup>5</sup>	Chestnut	J6-A	F3-A	Total of 6 NPAIs and subsea infra-structure	Wells and Projects <sup>2</sup> Operations	Vale	Well Operations
Annual average oil in produced water mg/l	3.5	N/A	26.6	17.7	0	N/A	N/A	N/A	N/A
Tonnage of oil in produced water to sea	0.002	N/A	21.5	2.2	0	N/A	N/A	N/A	N/A
CO <sub>2</sub> from combustion for power generation and compression (t)	110,085 <sup>1</sup>	N/A	17,518 <sup>1</sup>	77263 <sup>1</sup>	0	904	N/A	N/A	N/A
CO <sub>2</sub> from flaring (t)	3,265	N/A	91,282	N/A	0	N/A	N/A	N/A	N/A
Number of substitution chemicals permitted *	1		N/A <sup>3</sup>	0	0	1	84	1	0
Amount of permitted chemicals discharged (t)	1961kg		N/A <sup>3</sup>	118.7	0	5514kg	2586	0	2328kg
Percentage of permitted chemicals discharged with a SUB warning (%)	0%		N/A <sup>3</sup>	0	0	0	0.15	0	0
Waste amount (t)	314		82	140	0	31	13192	N/A	N/A
% of total waste reused/recycled/waste to energy	94%		65	64	0	71	96	N/A	N/A

1 ETS Verified Data

2 Project data included

3 Note Teekay took over the management of the chemical permit in 2019

4 Norwegian chemical classification is red.

5 Of the 7 NPAI's, DP3 and DP4 began decommissioning 2019

The NPAIs have no discharge of produced water to sea and the power generation on the facilities is diesel driven below 20MW which produces limited emissions. Subsea infrastructure emissions/discharges and waste are managed via the host installations unless there is an intervention activity at the subsea location.

**Unplanned event data**

Key indicator	Morecambe		North Sea					Norway	Well Operations
	South Morecambe	Total of 7 NPAIs and Subsea Infrastructure	Chestnut	J6-A	F3-A	Total of 6 NPAIs and Subsea Infrastructure	Wells and Projects	Vale	
Number and total litres of oil released to sea	1 (2l)	0	0	0	0	0	1 (0.8l)	0	0
Number and total litres of chemicals released to sea	1 (2l)	1 (94l)	0	0	0	4 (30l)	2 (<0.1)	0	0
Number of environmental permit non-conformances	0	0	8	2	0	1	2	0	0

Morecambe Other = Five DP, Calder and Millom West NPAIs, subsea infrastructure for Rhyl and Dalton

North Sea NPAIs = Ensign, York Chiswick, Grove, A-fields and Babbage

North Sea Subsea Infrastructure = Trees, A-Fields, Eris/Ceris, Seven Seas, Kew

Our fields are produced back to the following facilities:

- A-fields back to Conoco-Phillips LOGGs platform
- Trees fields to the Marathon Brae Alpha platform
- Vale field to the Statoil Heimdal platform.

