



Environmental Performance Report 2018

Offshore Operations



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Section 1 Introduction

Ithaca Energy (UK) Ltd. (Ithaca Energy) is a North Sea oil and gas operator (www.ithacaenergy.com). The company's principal focus is the exploration and development of oil and gas reserves in the North Sea on the United Kingdom's Continental Shelf (UKCS).

This is the thirteenth annual environmental performance report for offshore operations.

Section 2 of the report provides a general description of the company and its activities; Section 3 provides an overview of Ithaca Energy's environmental management system, environmental policy and high level environmental objectives; and the final section presents 2018 environmental performance data for relevant operations, together with performance against environmental targets.

Section 2 Overview of Operations and Activities in 2018

2.1 Overview

Ithaca Energy has a solid and diversified producing asset portfolio, mainly producing oil. The producing fields, which are a mix of operated and non-operated assets, are located across the Northern and Central North Sea areas of the UK Continental Shelf.

In 2018, Ithaca Energy divested its interest on the Wytch Farm Field located in Southern England (on/offshore oil field).

2018 was Ithaca's tenth full year as a production operator in the North Sea.

2.2 Northern North Sea

Ithaca Energy has working interests in the EnQuest operated Dons area in Block 211/18, and the Broom Field in Block 2/4, in the Northern North Sea.

The Don Southwest and West Don Field developments consist of subsea production wells, supported by water injectors, which are tied back to the *Northern Producer* floating production facility and exported to the EnQuest operated *Thistle* platform. Onward export is via the Brent pipeline system to the Sullom Voe oil terminal in the Shetland Islands. Broom consists of subsea production and water injector wells, tied back to the *Heather A* platform, with onward export, via the Ninian pipeline system to the Sullom Voe terminal.

As Installation Operator, EnQuest Heather Limited holds and reports on the relevant environmental permits for both the *Northern Producer* and the *Heather A* platform.

The Causeway Area consists of the Causeway and Fionn oil fields, approximately 150km northeast of the Shetland Islands in Blocks 211/22 and 211/23 in the Northern North Sea. It consists of two production wells and a water injection well which are tied back to the TAQA operated *North Cormorant* platform. TAQA holds and reports on the relevant environmental permits.

2.3 Central North Sea

The Greater Stella Area covers four Blocks, 29/10a, 29/10b, 29/10d and 30/6a, and includes the Stella, Harrier, Hurricane and Helios Fields.

In addition to existing production operations at the Stella Field, operations in 2018 saw the tie-in of a new production well at Harrier (drilled in 2017) into the facilities at the *FPF-1* floating production facility, with the installation of a new pipeline, controls umbilical and manifold. Production commenced from Harrier in 2018.

Petrofac Facilities Management Limited became Installation Operator of the *FPF-1* in Q3 2018 (Section 3.2) and holds and reports on the relevant environmental permits; Ithaca was operator of the *FPF-1* prior to the appointment of Petrofac Facilities Management Limited and the environmental performance for the period to the end of July 2018 has been included in Section 4 below.

The Ithaca operated Cook Field is located in Block 21/20a and is a subsea tie back to the Anasuria Operating Company's (AOC) *Anasuria* Floating Production, Storage and offloading (FPSO) vessel. As Installation Operator, Petrofac Facilities Management Limited holds and reports on the relevant environmental permits for the *Anasuria* FPSO.

Ithaca also has a working interest in the Pierce Field in Block 23/22, a subsea development tied back to the *Haewene Brim* FPSO. As Installation Operator, Pierce Production Company Limited holds and reports on the relevant environmental permits for the *Haewene Brim* FPSO.

2.4 Southern North Sea

Ithaca is operator of the Anglia Field (Blocks 48/18b, 48/19b and 48/19e), comprising of a normally unmanned wellhead platform and subsea wells which are tied back to the Lincolnshire Offshore Gas Gathering System (LOGGS) complex for process and export. LOGGS is operated by ConocoPhillips who hold and report on the relevant environmental permits. Anglia ceased production in Q4 2015.

2.5 Decommissioning

The Athena Field is situated in Block 14/18b in the Outer Moray Firth area. Athena ceased production in Q1 2016. Ithaca Energy submitted a decommissioning programme for the Athena Field infrastructure and this was approved in 2017.

The Inner Moray Firth contains the Greater Beatrice Area consisting of the Beatrice and Jacky Fields. Ownership of the Beatrice Field was transferred from Ithaca Energy in early 2015, although Ithaca Energy retain ownership of Jacky. The Jacky Field was produced in 2009 via an unmanned wellhead platform tied back by subsea flow lines to the Beatrice Alpha platform. Production ceased in Q1 2015.

Ithaca Energy submitted a decommissioning programme for the Jacky Field infrastructure and this was approved in 2018.

Section 3 Environmental Management System

3.1 Policy

A copy of Ithaca Energy's Health Safety and Environmental (HS&E) Policy Statement is included below. The policy is endorsed by the Chief Executive Officer of Ithaca (Energy) UK Ltd on behalf of the Board of Directors. It acknowledges Ithaca Energy's HS&E responsibilities in relation to its business activities and includes commitments to continual improvement, assessment and management of the risks and impacts associated with operations, to meet legislative requirements and accepted best practice and a willingness to openly communicate these principles to company personnel and the general public.

The HS&E Policy is implemented through the company's Integrated Management System (IMS) of which the Environmental Management System (EMS) is part.



HEALTH, SAFETY AND ENVIRONMENTAL POLICY

ITHACA ENERGY (UK) LTD. is committed to proactively achieving excellence in Health, Safety and Environmental (HS&E) performance across all of our operations. We consider our HS&E performance and the health, safety and security of those who work for, with and alongside us as central to our business success.


ITHACA will comply with applicable legislation and guidance.

In order to meet our commitment ITHACA will:

- Provide competent resource to implement this policy and to develop and maintain our HS&E systems.
- Provide effective leadership, training and mentoring to sustain and develop workforce HS&E competency and skills and maintain a positive HS&E culture.
- Define clear responsibilities and accountabilities for HS&E issues within the company.
- Set realistic HS&E objectives and targets and develop action plans to measure these as a contribution towards continual improvement of our HS&E performance.
- Ensure HS&E performance is prominent in the selection of our contractors
- Assess and manage operations through all stages to minimise risk of harm to people, the environment and facilities
- Communicate and consult with stakeholders and the public and have regard for their interests when planning activities.
- Ensure that appropriate plans and resources are in place to respond to incidents and emergencies.
- Investigate incidents, implement recommendations to prevent re-occurrence and share lessons learned.

To support our commitment to HS&E performance ITHACA will develop and maintain effective HS&E systems which will be independently verified against relevant ISO and other recognised standards. HS&E systems will be subject to periodic and management review to ensure ongoing compliance and improvement.

This policy applies to all company activities and ITHACA employees, and contractors and other associates engaged in work on our behalf, have a responsibility to comply with it and prevent harm to themselves and others and damage to the environment.



Les Thomas, CEO ITHACA ENERGY (UK) LTD
On behalf of the Board of Directors

12th March 2016

3.2 Environmental Management System

Ithaca Energy recognizes its obligations to identify, assess and mitigate environmental risks and actively manage environmental performance of its field operations.

The Ithaca Energy Integrated Management System incorporates the elements of an Environmental Management System and was last verified in May 2018 as meeting BEIS's Guidance for Environmental Management System Requirements in relation to OSPAR Recommendation 2003/5.

The scope of the EMS covers upstream, offshore and operated assets for which Ithaca Energy is the Licensed Operator. It encompasses oil and gas exploration and appraisal (E&P), development, production operation and decommissioning activities carried out by Ithaca Energy in UKCS blocks for which it is the Licensed Operator, including those third party activities conducted on their behalf or over which they have influence, and for which they are ultimately responsible for the environmental performance.

The EMS comprises the following major elements:

- **HSEQ Policy and Planning** – policy and principles are set, with links to relevant legislation and management of activities through efficient and systematic planning, with objectives and processes established to deliver the company policy.
- **HSEQ Implementation and Operations** – management of activities through implementation of the processes
- **Checking & Corrective Actions** - monitoring and measurement of activities against environmental policy, objectives, targets, legal and other requirements, and reporting of the results
- **Management Review** – review of performance and taking actions to continually improve performance of the environmental management system

In order to ensure that the commitments made in the IMS are fulfilled, responsibilities are assigned for initiating, executing and checking. Environmental responsibilities are assigned through line management and specific personnel are assigned objectives, targets and actions relevant to their particular function. Ithaca Energy has access to specialist advice and support on environmental issues.

Ithaca Energy undertakes its operations by selecting specialist contractors for key activities such as production operations management and drilling management. The EMS formally describes the environmental responsibilities of Ithaca Energy staff and contractors in complying with Ithaca Energy's HS&E policy.

Ithaca Energy has appointed Petrofac Facilities Management Limited to act as the Installation Operator for production activities from the FPF-1 and is responsible for day to day operations on Ithaca Energy's behalf. As part of their business management system, Petrofac Facilities Management Limited's environmental management system is certified to the ISO 1400:2015 International Standard.

Section 4 Environmental Performance

Ithaca Energy's 2018 environmental performance from relevant offshore activities is presented below.

4.1 Drilling and Pipeline Activity

Ithaca undertook no drilling activity during 2018 and had no drilling related environmental reporting.

Two pipeline scopes of work were undertaken by Ithaca during 2018; the installation, tie-in and commissioning of the Harrier production pipeline, and the flushing and cleaning of the Anglia production lines. Environmental reporting from these were for chemical use and discharge only.

4.1.1 Chemical Discharges

The 2018 subsea work programme resulted in 4.8 tonnes of chemicals discharged to sea. Almost all (>99%) chemical discharges were listed by OSPAR as posing little or no hazard to the marine environment (PLONOR) and/or belonged to the offshore chemical notification scheme (OCNS) Band E, with the remaining (0.9%) Band Gold (E and Gold being the least harmful categories). None of the discharged chemicals had a substitution warning (SUB).

Ithaca Energy continues to seek to minimise the use of chemicals with SUB labels, and together with its contractors are exploring alternatives to these chemicals for future operations.

4.2 Offshore Production Operations

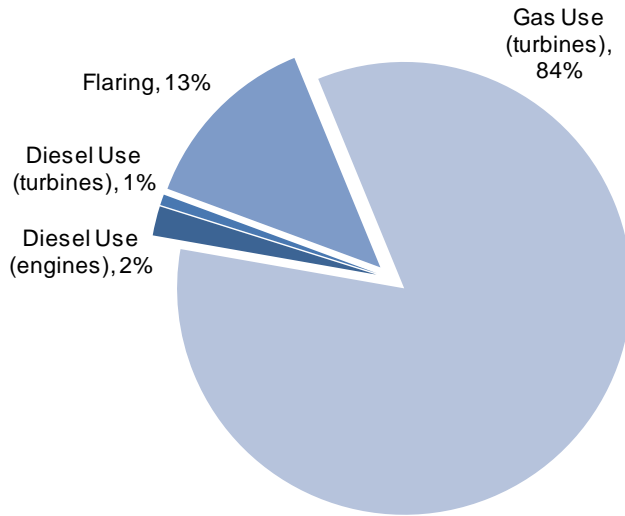
This section reports on emissions, discharges and waste arising from production of the Stella/Harrier Fields via the FPF-1 to the end of July 2018; Petrofac Facilities Management Limited, as appointed Installation Operator is responsible for the environmental reporting from the FPF-1 installation after this date.

Data was derived from the returns to the UK offshore Environmental Emissions Monitoring System (EEMS), with EEMS standard emissions factors used to calculate atmospheric emissions from fuel use (Atmospheric Emissions Calculations (Issue 1.810a)).

4.2.1 Atmospheric Emissions

Ithaca Energy generated 76,334 tonnes of CO₂ emissions from operations at the *FPF-1* up to July 2018. The emitted CO₂ was generated mainly by gas turbines (84%), followed by flaring (13%) with a small contribution (2%) from diesel engines. All other atmospheric emissions were comparatively minor.

2018 CO₂ Emissions from Production



KEY DATA

Stella	Tonnes
Diesel Use (engines)	1,603.2
Diesel Use (turbines)	588.8
Flaring	10,052
Gas Use (turbines)	64,089.7

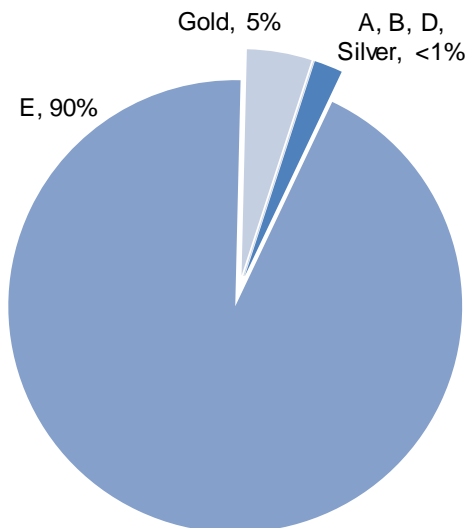
Note: figures rounded to 1 decimal place

4.2.2 Chemical Discharges

Between the beginning of January and the end of July 2018, Ithaca Energy discharged 222 tonnes of chemicals from production operations at the FPF-1. 95% of the discharged chemicals were either OCNS Band E or Gold. Less than 1% of the discharged chemicals from production operations had SUB warning labels.

Ithaca Energy regularly reviews its chemical usage, and the chemicals noted above with SUB warning labels are prioritised for replacement where technical alternatives exist.

2018 Chemical Discharges from Production



KEY DATA

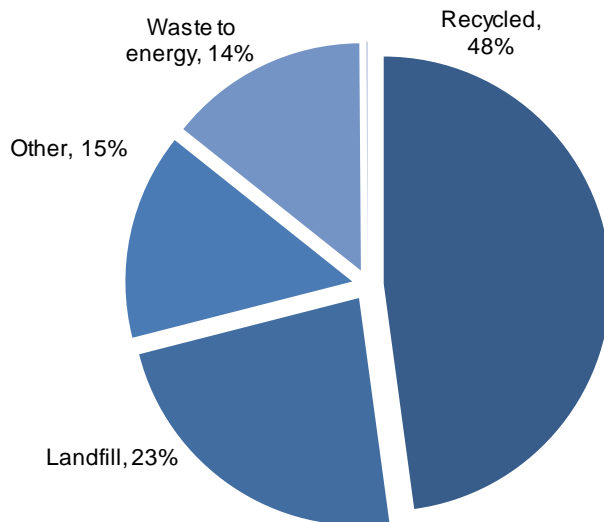
Stella	Tonnes discharged
Band A	<0.1
Band B	0
Band C	0
Band D	4.5
Band E	207.2
OCNS Silver	0
OCNS Gold	10.3
Chemicals with SUBs	0.9

Note: figures rounded to 1 decimal place

4.2.3 Waste Disposal

Between January and July 2018, Ithaca Energy generated 107 tonnes of operational waste material (Groups I, II and III) from the *FPF-1*. Of the total operational waste produced, 48% was reused or recycled, 23% was sent to landfill, 14% was “waste to energy” and 15% (other) were chemicals and paints, and liquids and water removed from sludges/liquids/tank washings and subsequently treated onshore and discharged under consent.

2018 Operational Waste from Production



KEY DATA

FPF-1 Installation	Tonnes
Waste Reused	0
Waste Recycled	51.2
Waste to Energy	15.2
Waste Incinerated	0.1
Waste to Landfill	24.8
Other	15

Note: figures rounded to 1 decimal place

4.2.4 Oil and Chemical Spills

There were five oil spills during production activities for the period to end of July 2018, three of which were of hydraulic oil from equipment issues in the closed hydraulic system, the greatest of which was 0.24 tonnes, and two of crude oil, the greatest of which was 0.26 tonnes from a Xmas Tree. During the same period there were five chemical spills of TEG (triethylene glycol), all from a bursting disc/PSV failure, the greatest of which was 1.9kg.

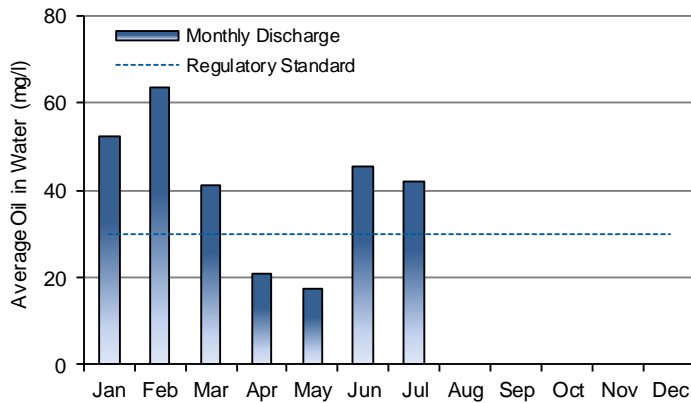
KEY DATA

Number of oil spills	5
Total quantity oil spills (tonnes)	0.7
Number of chemical spills	5
Total quantity chemical spills (tonnes)	5.7

4.2.5 Produced Water Discharges

Produced water discharges from January to July 2018 from the *FPF-1* generated a total of 53,047m³ of produced water, which was discharged to sea, with average oil in water (OIW) content of 40.3mg/l over the month.

2018 FPF-1 Produced Water Discharges



KEY DATA

Athena		
Water discharged (m ³)		53,047
Mean OIW concentration (mg/l)		40.3
Oil discharged (tonnes)		2.1

Note: figures rounded to 1 decimal place and mean concentration is based on 7 months (January to July) and not the full 12.

4.3 Performance against Environmental Targets

Ithaca Energy senior management along with the Health, Safety and Environment Manager set and review corporate targets annually, taking account of all planned exploration, development and production activities for the coming year. The 2018 corporate targets relate to all of Ithaca Energy's offshore operations. Specific environmental performance targets are set for the *FPF-1* (Stella and Harrier) offshore operations. The targets and associated performance are detailed in the tables that follow.

2018 CORPORATE PERFORMANCE TARGETS

The table below summarises Ithaca Energy's performance against corporate environmental targets.

Target	Performance
Re-verification of Ithaca Energy (UK) Environmental Management System (EMS) against the requirements of OSPAR Decision 2003/5	Achieved
Conduct Well Integrity Management System (WIMS) review and update. Conduct gap analysis and implement identified improvements to Duty Holder/Well Operator interface management	Achieved
Complete 2 Emergency Response exercises and implement lessons learned	Completed as planned
Achieve Zero (0) Dangerous Occurrences, as defined in RIDDOR 2013, Schedule 2, Part 6	Achieved

2018 FPF-1 PERFORMANCE TARGETS

For the Stella and Harrier Fields, Ithaca Energy set the following performance targets.

Key Performance Indicator	Performance
Achieve consistent compliance with Oil Pollution Prevention and Control Permit limits for <i>FPF-1</i> by July 2018	Target not fully achieved, carried forward into 2019
Agree <i>FPF-1</i> HSE plan for 2018 with Installation Operator and monitor it during the year to 100% completion	Achieved
Deliver recorded and communicated quarterly HSR and Management <i>FPF-1</i> visit	Achieved

Abbreviations

CO ₂	Carbon dioxide
EEMS	Environmental emissions monitoring system
EMS	Environmental Management System
FPSO	Floating Production, Storage and Offloading
HS&E	Health, safety and environmental
IMS	Integrated Management System
ISO 14001:2015	International standard for environmental management systems
mg/l	Milligrammes per litre
OCNS	Offshore Chemical Notification Scheme
OIW	Oil in water
OPPC	Oil pollution prevention and control
OSPAR	Oslo and Paris conventions
PON 1	Petroleum operations notice number 1 – format for reporting oil and chemical spills
Q1 Q2 Q3 Q4	Quarter of the year
SUB	Candidate for substitution
UKCS	United Kingdom Continental Shelf