Environmental Performance Report 2015
Offshore Operations

Contents

Section 1 Introduction

Ithaca Energy (UK) Ltd. is a subsidiary of Ithaca Energy Inc., a Canadian oil and gas exploration and development company (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 tenth 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 2015 environmental performance data together with performance against environmental targets.

Section 2 Overview of Operations and Activities in 2015

2.1 Overview

Ithaca has a solid and diversified producing asset portfolio, mainly producing oil. In 2015 the producing fields, which are a mix of operated and non-operated assets, were located across the Northern, Central and Southern North Sea and Moray Firth areas of the UK Continental Shelf.

The company also has an interest in the Wytch Farm Field located in Southern England (on/offshore oil field).

2015 was Ithaca Energy's seventh full year as a production operator in the North Sea.

In addition to existing operations at the Athena, Beatrice and Jacky Fields, operations in 2015 saw the continuation of the drilling of development wells and the installation of subsea infrastructure at the Stella Field.

2.2 Inner Moray Firth

The Inner Moray Firth contains the Greater Beatrice Area consisting of the Beatrice and Jacky Fields. The Beatrice offshore facilities include the main complex at Beatrice Alpha, which comprises a drilling and accommodation platform bridge linked to a production platform, a satellite platform at Beatrice Bravo with injection and minimum production facilities (which is not normally manned) and the Beatrice Charlie water injection platform which is no longer in use. The Jacky Field was produced in 2009 via an unmanned wellhead platform tied back by subsea flow lines to the Beatrice Alpha platform. Ownership of the Beatrice Field was transferred from Ithaca in early 2015, although Ithaca retain ownership of Jacky. Production ceased in Q4 2014.

2.3 Outer Moray Firth

The Athena field is situated in Block 14/18b in the Outer Moray Firth area. The wells were tied back to a floating production, storage and offloading (FPSO) vessel, the *BW Athena*, which was moored over the field.

2015 was the third year of production from the Athena field since the completion of start-up and commissioning operations in mid-2012. Athena ceased production in Q1 2016.

2.4 Northern North Sea

The Causeway Area consists of the Causeway and Fionn oil fields, approximately 150km northeast of the Shetland Islands. It consists of two production wells which are tied back to the TAQA operated North Cormorant platform. TAQA holds and reports on the relevant environmental permits.

2.5 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 2015, significant progress was made on development at Stella. The fifth development well was drilled and completed at Stella and the remainder of the subsea infrastructure was installed. The remainder of the operations, (including the delivery of the *FPF-1* production installation) is expected to be completed, and production to begin, in 2016.

2.6 Southern North Sea

In the Southern North Sea, Ithaca Energy 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 were tied back to the Lincolnshire Offshore Gas Gathering System (LOGGS) complex for process and export. LOGGS is operated by ConocoPhillips who held and reported on the relevant environmental permits. Anglia ceased production in Q4 2015.

Section 3 Environmental Management System

3.1 Policy

A copy of Ithaca Energy's current 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 thorough the company's Integrated Management System (IMS) of which the Environmental Management System (EMS) is part.

ITHACA ENERGY (UK) LTD.

HEALTH, SAFETYAND 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 tagets 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 recognises its obligations to identify, assess and mitigate environmental risks and actively manage the environmental performance of its field operations.

The Ithaca Energy Integrated Management System incorporates the elements of an Environmental Management System and was verified in May 2016 as meeting DECC'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 and production operation 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.

Wood Group PSN (WGPSN) was contracted to provide the engineering, construction, operations and maintenance services on the Beatrice Complex and the Nigg oil terminal facilities. WGPSN was Duty Holder for these facilities and was responsible for day to day operations on Ithaca Energy's behalf. WGPSN's EMS is certified as meeting the requirements of the ISO14001:2004 standard for environmental management systems for offshore and onshore operations (certificate of registration dated 04/03/10).

Ithaca Energy contracted BW Offshore (BWO) to act as the Duty Holder for production activities from the Athena field and they were responsible for day to day operations on Ithaca Energy's behalf. BWO's EMS is certified as meeting the requirements of the ISO14001:2004 standard for environmental management systems (certificate of registration dated 02/09/11).

Section 4 Environmental Performance

Ithaca Energy's 2015 environmental performance from drilling and installation activities is presented in Section 4.1 and that from operational activities are in Section 4.2.

4.1 Drilling and Installation Activity

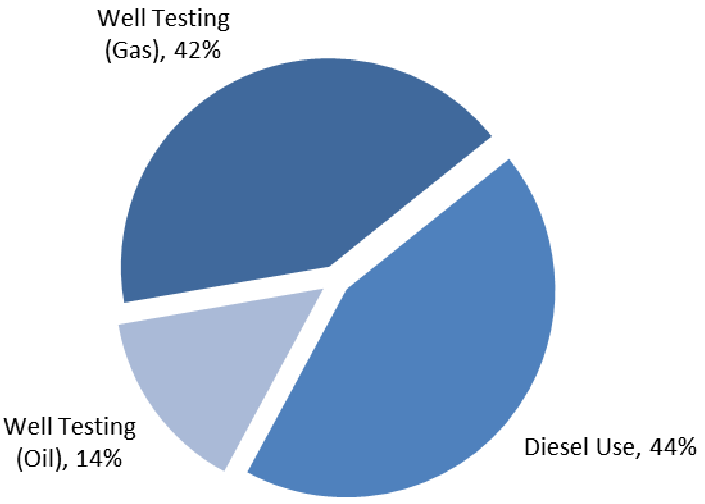
Atmospheric emissions, drilling chemical discharges and waste from the drilling and well testing of the Stella Eko-PC1 production well and subsea installation activities are presented in this section. Data was derived from the returns to the UK offshore Environmental Emissions Monitoring System (EEMS), with EEMS standard emissions factors used to calculate atmospheric emissions from drill rig fuel use and well test (Atmospheric Emissions Calculations (Issue 1.810a)).

KEY DATA	
Number of new wells drilled	1
Number of flowing well tests	1

4.1.1 Atmospheric Emissions

Atmospheric emissions generated from activity at the Stella field consisted of emissions from drilling and well testing (both oil and gas) of the development wells. Overall, CO_2 emissions were 14,070.6 tonnes, with all other gas emissions considered minor. A breakdown of CO_2 emissions showed contributions from flaring of oil and gas during well test operations was greater than from diesel consumption engines on the *Ensco 100* drilling rig.

2015 CO_2 Emissions from Drilling



KEY DATA

Stella wells	Tonnes
CO_2	14070.6
NOx	117.7
N_2O	0.6
SO_2	7.4
CO	68.4
CH_4	80.7
VOC	55.3

Note: figures rounded to 1 decimal place

4.1.2 Chemical Discharges

In 2015, drilling a fifth well at the Stella field and the subsea installation of pipelines within the Stella and Anglia fields resulted in 2,033.2 tonnes of chemicals discharged to sea. Almost all 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 Gold or Band E (the least harmful categories). Very small quantities of two OCNS Band Silver biocides used to minimise bio-fouling during subsea pipeline installation were discharged. These biocides were neither on the list of chemicals for priority action nor on the list of substances for potential concern and were not allocated a substitution warning under the UK national plan.

Thirteen discharged chemicals (eleven tracers, a corrosion inhibitor and a pipe dope) had substitution warnings (SUB). These accounted for less than 0.001% (0.006 tonnes) of the total discharged chemicals. The tracers and the corrosion inhibitor were categorised as OCNS Band Gold, with the pipe dope OCNS Band A. Five chemicals had substitution labels with UK National Plan level 1 priority (replace by end of December 2010), seven had a level 2 warning (replace by end of December 2012) and the remaining chemical had a level 3 warning which requires replacement by end of December 2014.

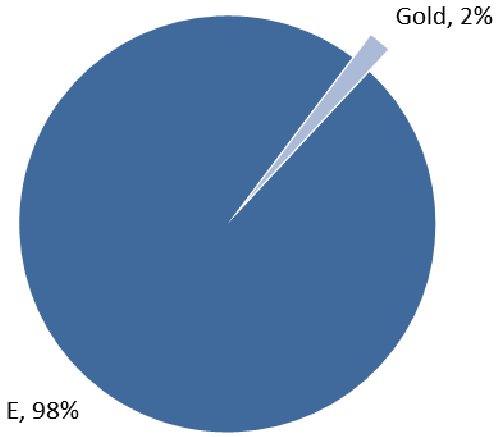
Ithaca Energy continues to seek to minimise the use of chemicals with SUB labels, and together with its contractors are exploring alternatives to these chemicals for future operations.

Discharges of fluids from well test operations during drilling of the fifth Stella well was regulated by the Oil Pollution Prevention and Control (OPPC) term permits for the *Ensco 100* drilling rig operations.

KEY DATA	
Well clean up fluids discharged (m^3)	253.9
Mean dispersed oil concentration (mg/l)	8.6
Permitted dispersed oil discharged (tonnes)	<0.1

Note: figures rounded to 1 decimal place

2015 Chemical Discharges from Drilling and Subsea Installation



KEY DATA

Stella wells	Tonnes
Band E	1997.6
OCNS Gold	34.7
SUB chemicals	<0.1
Subsea	**Tonnes**
Band E	0.8
OCNS Silver	<0.1
OCNS Gold	<0.1
SUB chemicals	0.0

Note: figures rounded to 1 decimal place

4.1.3 Waste Disposal

In 2015, 1,755.3 tonnes of oil based mud contaminated drill cuttings were generated by the drilling programme and returned to shore for drilling fluid recovery and treated, and were disposed of at a licensed facility. The vast majority (90%) of these cuttings were either rock chippings or were used to re-wet processed solids and were sent to landfill. The remainder constituted of recovered oil which was recycled and then blended with other waste oils to be used as burning fuel.

4.1.4 Oil and Chemical Spills

There were no accidental oil or chemical spills during drilling, well testing or subsea installation activities.

KEY DATA	
Number of oil spills	None
Total quantity oil spills (tonnes)	None
Number of chemical spills	None
Total quantity chemical spills (tonnes)	None

4.2 Offshore Production Operations

This section reports on emissions, discharges and waste arising from production of the Beatrice, Jacky and Athena Fields for which Ithaca Energy was licensed operator. Ithaca Energy is the licensed operator of the tie-back Anglia Field and the Causeway Area Fields and for which the operators of the host facilities (Conoco-Phillips and TAQA respectively) hold the responsibility for reporting against environmental permits.

The Beatrice Complex consists of the Beatrice Alpha, Bravo and Charlie, and Jacky platforms. All hydrocarbons from Beatrice and Jacky were processed on Beatrice Alpha. Ownership of Beatrice was transferred from Ithaca, and production ceased, in Q1 2015.

Athena's first full calendar year of production was in 2013. Hydrocarbons produced by this field were processed on board the *BW Athena* FPSO. Athena ceased production in Q1 2016.

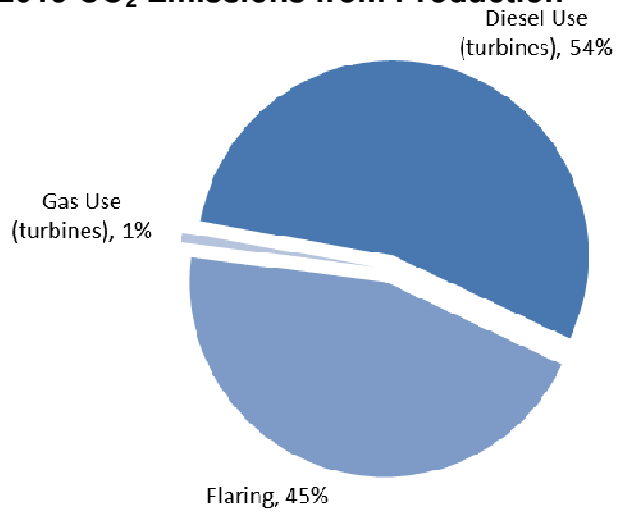
Data was derived from the returns to the UK offshore Environmental Emissions Monitoring System (EEMS), with EEMS standard emissions factors used to calculate atmospheric emissions from fuel use (Atmospheric Emissions Calculations (Issue 1.810a)).

4.2.1 Atmospheric Emissions

Ithaca Energy generated 56,058.5 tonnes of CO_2 emissions in 2015, almost all of which originated from operations on Athena. All other atmospheric emissions were comparatively minor. Total emissions at Athena in 2015 were 15% lower than in 2014. Over half the emitted CO_2 came from emissions generated by diesel turbines (54%), with the remaining 45% from flaring of natural gas. A very small amount (1%) came from turbines using gas.

Diesel consumption on the Beatrice complex is generally low, since power is supplied by the onshore grid via a substation at Dunbeath and a submarine cable to the Alpha platform. The Beatrice Wind Farm Demonstration Project, operated by Talisman and consisting of two 5MW wind turbines, also provides power to the Beatrice complex.

2015 CO_2 Emissions from Production



KEY DATA

Stella wells	Tonnes
CO_2	56058.5
NOx	139.9
N_2O	2.9
SO_2	38.1
CO	69.6
CH_4	162.7
VOC	20.8

Note: figures rounded to 1 decimal place

4.2.2 Chemical Discharges

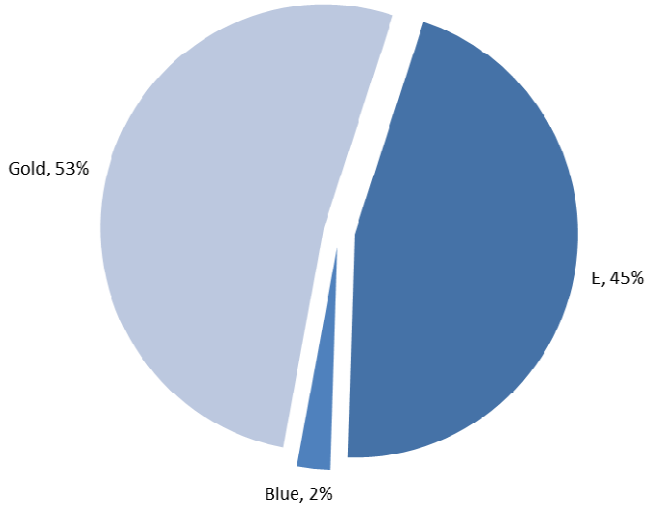
In 2015, Ithaca Energy discharged 24.3 tonnes of chemicals from production operations, 22 tonnes from Athena and 2.3 tonnes from the Beatrice Complex. This was just 14% of total discharges in 2014, largely as a result of the hand-over of Beatrice early in the year. The total discharges from Athena over the two years are comparable.

Approximately 98% of the discharged chemicals from Athena and Beatrice were either OCNS Band E or Gold. Additional chemicals used and discharged on Athena included an OCNS Blue biocide to prevent bacterial growth in the subsea infrastructure. This chemical had a total discharge of 0.6 tonnes.

Approximately 22% and 5% respectively of the discharged chemicals from Athena and Beatrice complex had SUB warning labels.

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

2015 Chemical Discharges from Production



KEY DATA

Athena	Tonnes
Band A	0.0
Band E	11.0
OCNS Blue	0.6
OCNS Gold	10.3
Chemicals with SUBs	4.8

Beatrice Complex	Tonnes
Band A	0.0
Band E	0.0
OCNS Gold	2.3
Chemical with SUBs	0.1

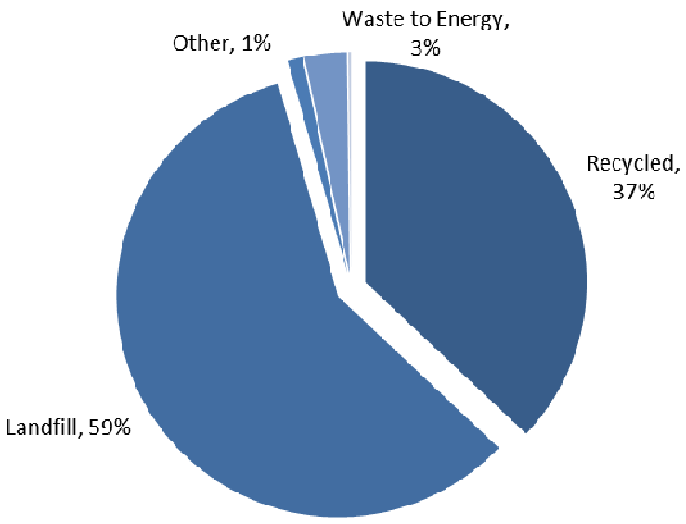
Total Discharges	Tonnes
Chemicals	24.3
SUB chemicals	4.9

Note: figures rounded to 1 decimal place

4.2.3 Waste Disposal

In 2015, Ithaca Energy generated 76.4 tonnes of operational waste material (Groups I, II and III). Routine operations at *BW Athena* produced 64.2 tonnes, approximately 15% less than in 2014, with the remainder being generated by the Beatrice complex in Q1 2015. Of the total operational waste produced by Ithaca Energy, 40% was recycled, converted to energy or incinerated, 59% was sent to landfill and 1% (other) were liquids and water removed from sludges/liquids/tank washings and subsequently treated onshore and discharged under consent.

2015 Operational Waste from Production



KEY DATA

Athena	Tonnes
Waste Reused	0.0
Waste Recycled	21.8
Waste to Energy	1.9
Waste Incinerated	0.2
Waste to Landfill	40.8
Other	0.0

Beatrice Complex	Tonnes
Waste Reused	0.0
Waste Recycled	6.6
Waste to Energy	0.4
Waste Incinerated	0.0
Waste to Landfill	4.0
Other	0.8

Note: figures rounded to 1 decimal place

4.2.4 Oil and Chemical Spills

In 2015, Ithaca Energy reported 2 chemical spills and one oil release to sea during production operations. The oil release occurred at Athena. There was one chemical spill at each of Fionn and Athena.

On the *BW Athena*, seal failures at turbines and pumps caused the loss of 0.07 tonnes of lubricating oil to sea, while a failure of the hydraulics and the open system solenoid caused the loss of 600kg of Oceanic HW540 E in January 2015.

A small amount of Transaqua HT2 was lost at the Fionn subsea tie-back in March 2015. This incident is now closed.

Ithaca Energy investigated the causes of each spill and steps were implemented to prevent re-occurrence.

KEY DATA	
Number of oil spills	1
Total quantity oil spills (tonnes)	0.07
Number of chemical spills	2
Total quantity chemical spills (tonnes)	0.6

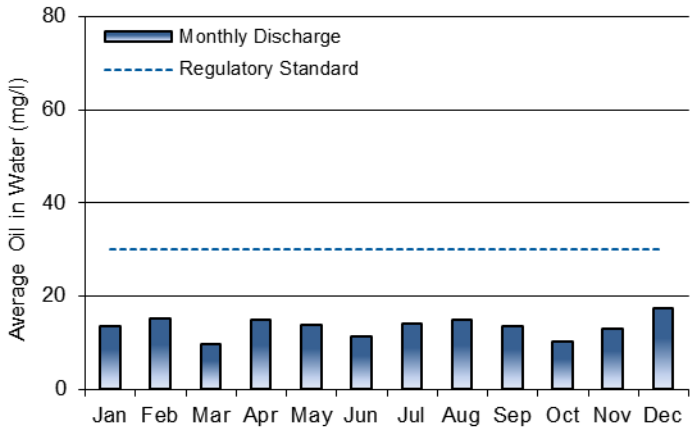
Note: figures rounded to 1 decimal point

4.2.5 Produced Water Discharges

Produced water discharges in 2015 were almost exclusively from *BW Athena*, after the transfer of operatorship of Beatrice early in the year. Over the year, the Athena field generated a total of 184,820m^3 of produced water, a considerable increase from 2014. 89% (164,129m^3) of this produced water was fed into the produced water re-injection system. The remaining 20,691m^3 of produced water was discharged with average oil in water (OIW) content of 13.37mg/l over the year, with a highest monthly average of 17.2mg/l in December.

OIW concentrations were only recorded at Beatrice OIW in January 2015, before the asset transfer. The OIW for this month was 16.74mg/l, with a total of 0.75 tonnes of oil discharged in 44,692m^3 of water.

2015 Athena Complex Produced Water Discharges



KEY DATA

na	
er discharged	20,691.1
n OIW entration (mg/l)	13.4
ischarged es)	0.3

: figures rounded to 1 decimal place

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 2015 corporate targets relate to all of Ithaca Energy's offshore operations. Specific environmental performance targets were set for the Athena offshore operations. Environmental performance targets were not set for the Beatrice Complex as the assets were expected to be transitioned to Talisman in January of 2015. The targets and associated performance are detailed in the two tables that follow.

2015 CORPORATE PERFORMANCE TARGETS

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

Target	Performance
Establish HSE improvement plans with Duty Holder contractors	Achieved as planned
Develop and implement new Ithaca Compliance Register	Achieved in July 2015
Review and update Ithaca IMS to include requirements of new Offshore Safety Case Regulations	Achieved as planned
Achieve full compliance with Audit Schedule	Completed as planned
Complete Management visit programme to operated assets	Completed as planned.
Quarterly HSE performance management review	Completed as planned.

2015 ATHENA PERFORMANCE TARGETS

For the Athena FPSO production operations in 2015, Ithaca Energy set the following performance targets.

Key Performance Indicator	Performance
Complete training associated with hydrocarbon release reduction plan for Athena FPSO and fully implement plan.	Achieved in Q3 2015
Complete new Competency Assurance Procedure and fully implement on board Athena FPSO	75% Achieved
Review and revise all Environmental Management System (EMS) documentation applicable to Athena FPSO	Achieved

Abbreviations

BWO	BW Offshore
CO_2	Carbon dioxide
DECC	Department of Energy and Climate Change
EEMS	Environmental emissions monitoring system
EIP	Environmental Improvement Plans
EMS	Environmental management system
E-Rep	Environmental-Representatives
FPSO	Floating Production, Storage and Offloading
HS&E	Health, safety and environmental
IMS	Integrated Management System
ISO 14001:2004	International standard for environmental management systems
KPI	Key performance indicator
LOGGS	Lincolnshire Offshore Gas Gathering System
LTOBM	Low toxicity oil based mud
mg/l	Milligrammes per litre
OCNS	Offshore Chemical Notification Scheme
OCR	Offshore Chemical Regulations
OIW	Oil in water
OPPC	Oil pollution prevention and control
OSPAR	Oslo and Paris conventions
PLC	Programmable logic controller
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
WGPSN	Wood Group PSN