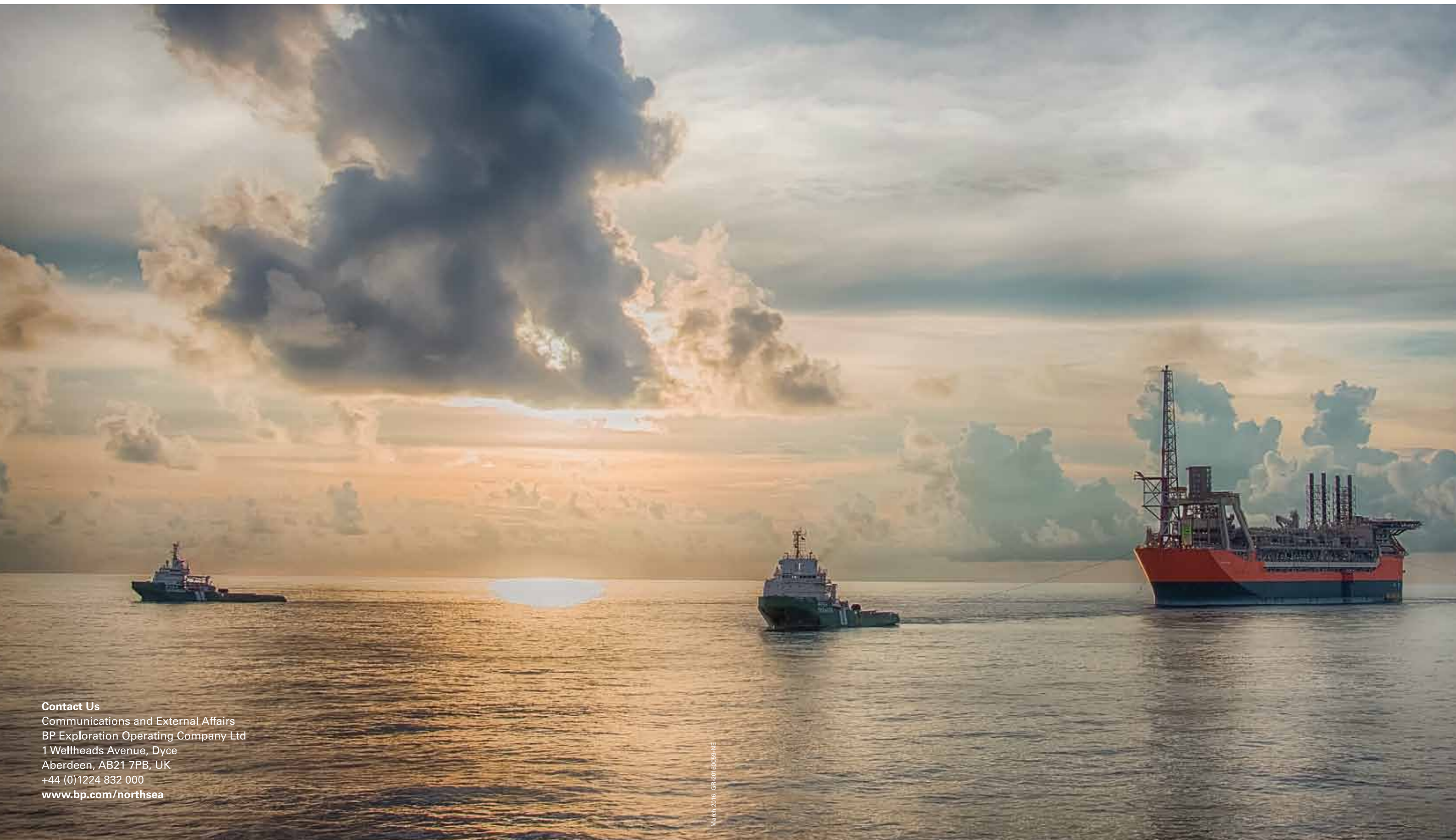


#### Useful websites

Oil and Gas Authority <https://www.gov.uk/government/organisations/oil-and-gas-authority>  
Department of Energy & Climate Change [www.decc.gov.uk](http://www.decc.gov.uk)  
Petroleum Safety Authority Norway [www.ptil.no](http://www.ptil.no)  
Environment Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)  
Scottish Environment Protection Agency [www.sepa.org.uk](http://www.sepa.org.uk)  
Oil & Gas UK [www.oilandgasuk.co.uk](http://www.oilandgasuk.co.uk)  
Norwegian Oil and Gas Association [www.norskoljeoggass.no](http://www.norskoljeoggass.no)



# North Sea Region 2016



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► Cover image: The new Glen Lyon FPSO under tow.

## Community in action

### Building community capacity

BP has strong links with the voluntary sector, supporting a range of charities providing vital services and many employees volunteer their time and skills to help make a positive difference.

BP staff gave generously to the 2015 Instant Neighbour Giving Tree Appeal, donating more than 200 gifts for local children and around 100kg of non-perishable food items for emergency food parcels for individuals in need. In addition, the BP North Sea “Challengers” or graduates contributed almost 1,000 hours of volunteering with a number of local schools, charities and community groups benefiting.

In Norway, BP employees have organised charity auctions, raffles and other activities for the annual Norwegian fundraiser, TV-Aksjonen for over 30 years. Each year, this popular televised fundraiser nominates a chosen charity with The Red Cross set to benefit in 2016.

### Developing capability

BP’s thriving Schools Link programme has been running for more than 40 years. It is a comprehensive and practical programme aimed at inspiring young people to develop their skills in science, technology, engineering and maths (STEM), as well as giving them an understanding of business, the oil and gas industry, and how to work as a team.

Feeding into every stage of education, BP North Sea is linked with more than 70 schools in Scotland and Norway. Every year, more than 8,000 pupils take part in workshops specialising in the STEM subjects.



► Crowds gather in Aberdeen’s Duthie Park for the BP Big Screen

### Connecting through culture

Since 2005, the BP Big Screens have given Aberdeen audiences the opportunity to enjoy free performances of world-class opera and ballet from the Royal Opera House in London. Last year, more than 5,000 members of the local community, BP employees and their families enjoyed a live screening of Don Giovanni in Aberdeen’s Duthie Park.

This year will mark our 27th year sponsoring the BP Portrait Award organised by the National Portrait Gallery – the most prestigious portrait painting competition in the world – and our 13th year supporting the Robert Gordon University Gray’s School of Art Degree Show, an annual highlight in the local arts calendar that showcases the work of graduating students.



► 2015 STEM in the Pipeline winners: Robert Gordon’s College



► BP Portrait Award 2015  
winner: Matan Ben-Cnaan  
with his allegorical portrait,  
Annabelle and Guy



It is my pleasure to welcome you to this overview of BP's business in the North Sea.

Last year, we celebrated the start of a seven-year drilling campaign west of Shetland with the arrival of the Deepsea Aberdeen semi-submersible rig. We also completed the safe installation of the first Clair Ridge topside modules and saw our new floating, production, storage and offload (FPSO) vessel, the Glen Lyon, begin its journey to the west of Shetland where it will serve as the hub for our Quad204 project, a major redevelopment of our Schiehallion and Loyal fields. In 2015, we also continued to deliver a renewal programme to extend the life of our existing assets, most notably a \$1 billion investment in our Eastern Trough Area Project (ETAP). Our operations in Norway remain an important part of the North Sea Region - accounting for around one third of our net production in 2015 - and we see significant growth potential in this area.

The past 12 months have not been without their challenges for BP and the wider industry, but we believe the steps we are taking now are the right ones for our business to remain competitive for the long-term. The fact remains that there are significant opportunities to maximise recovery and extend the life of the North Sea. Through our strategy, which is laid out in this publication, we are working to ensure a competitive and robust future for our business – focusing on safety and risk management; maximising the potential of our assets; and continuing to invest significantly in the future.

Over the course of 2016, we'll welcome the arrival of the Glen Lyon, take delivery of the final Clair Ridge topside modules and continue to explore around our key hubs. We will also welcome progress on the Snadd discovery in the Norwegian Sea and the Culzean development, the largest gas field discovered in the UK North Sea in more than a decade and a project BP has significant interests in. While we are committed to responding and adapting to the current industry challenges, we have a strong portfolio and I am optimistic about the future.

If we can deliver our plan to improve the competitiveness and resilience of our business in the current price environment, the North Sea will remain a significant part of BP for a long time to come.

I hope you find this publication informative as it seeks to demonstrate the potential we still have here in the North Sea.

Mark Thomas  
Regional President, BP North Sea Region

*"If we can deliver our plan to improve the competitiveness and resilience of our business in the current price environment, the North Sea will remain a significant part of BP for a long time to come."*

## Community

We passionately believe in supporting activities that strengthen the skills and abilities of people in the communities where we do business.

We are committed to going beyond our core business responsibilities to work in partnership with communities, local authorities, business organisations and voluntary groups to bring broader cultural, social and economic benefits.

Our programme focuses on participating in and contributing to communities through education partnerships; making arts and culture accessible to all; and helping to enhance the quality of life in the locations in which we operate.

Supporting local festivals and arts institutions and bringing world-class arts events to the community mean BP is adding to the Region's rich cultural diversity.

### Our goal

To bring cultural, social and economic benefits to the communities we serve

And it's not just about financial support. Every year, hundreds of BP employees and contractors volunteer their time and expertise to help make our communities a better place to live, now and in the future. The BP Employee Matching Fund encourages active fundraising and volunteering in the community and enables staff to support organisations and charities of their choice.

Each BP employee can claim match funding of up to \$5,000 (approximately £3,200 and 38,000 NOK) per year to support their fundraising and volunteering activities.

# Technology in action

## Low salinity water injection (LoSal®)

Our Clair Ridge development West of Shetland will be the first full-field EOR scheme using LoSal.

The low-salinity water interacts with the clay in the reservoir to release oil that is stuck to the clay. The use of LoSal in the Clair Ridge development has the potential to unlock an additional 40 million barrels of oil, compared to using conventional seawater for water injection.

LoSal EOR was developed by BP's enhanced recovery technology team, known as Pushing Reservoir Limits, following a decade of laboratory tests. These tests were conducted at BP's UK research centre at Sunbury-on-Thames using sandstone samples from across BP's global operations.



▶ Clair Ridge under construction West of Shetland

# Technology

Technology underpins everything we do, from operating safely to discovering and recovering more resources. BP is applying new and existing technologies across all its North Sea operating assets and continuing to progress the implementation of some pioneering techniques.

Technology has allowed us to safely access reservoirs that were out of reach 30 years ago and recover more from existing fields. It means safer, more reliable and more efficient operations, now and in the future.

Over recent years, our seismic team has been at the forefront of using new seismic acquisition techniques, such as ocean-bottom cabling (OBC) and wide azimuth towed streamers (WATS). These continue to enhance BP's ability to image and identify new opportunities within existing reservoirs and open up the possibilities to find new fields. We are also leading the way in the latest enhanced oil recovery (EOR) techniques to significantly extend the field life of our assets, including the first offshore EOR scheme using reduced salinity water injection (LoSal®).

**Our goal**

To continually improve the competitiveness of our business, to improve recovery factors and to increase the life of our fields

► Skarv FPSO walkway



# Focus

**06 Safety**

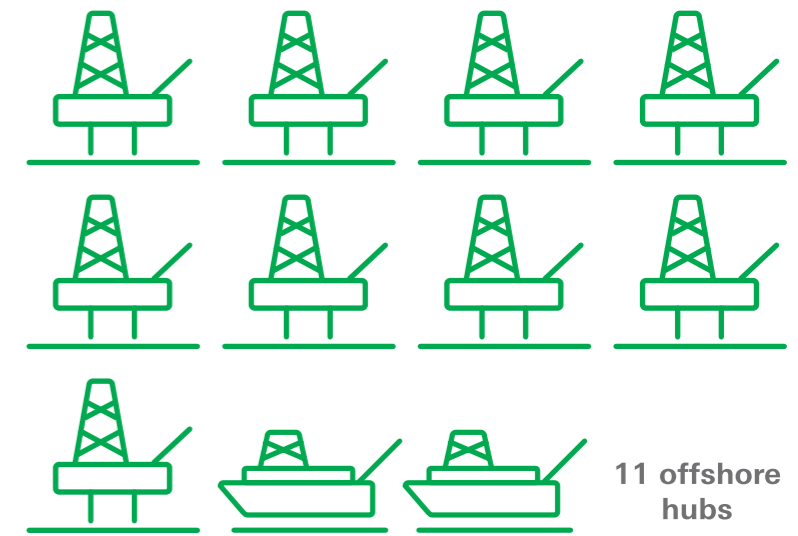
**08 Environment**

Focusing on delivering our strategy and pursuing value over volume, we are working with our partners to build a safe, competitive and robust future business.

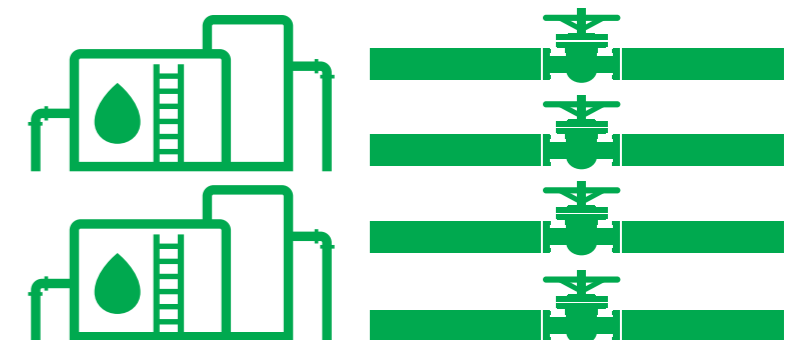
Our North Sea strategy is underpinned by a relentless focus on safety and risk management, and on the active management of our portfolio to ensure that we remain competitive in the current price environment and prioritise value over volume.

We are proud of the high-value portfolio we have today, but we are clear that our licence to operate it only exists by prioritising safety every day. This rigorous management of risk helps to not only protect our people and the environments in which we operate, but also the enduring value we create.

Operating in technically demanding geographies, we are sensitive to local environments and work hard to avoid, minimise and mitigate environmental impacts.



2 terminals and 4 pipeline systems





## People in action

### Training tomorrow's technicians today

BP is committed to investing in the next generation of talent for our industry.

We have been part of the Oil and Gas Technical Apprentice Programme (OGTAP) for a number of years; the programme provides a highly effective and efficient means of attracting and developing new technicians.

The apprentice programme plays a key role in helping us to bring fresh talent into the industry, enabling BP to support and invest in the technicians of tomorrow.

Trainees on the programme receive the technical knowledge and experienced mentoring they need to flourish in their discipline. Recruiting successful individuals who have completed their apprenticeship in to BP has now become our main source for trainee technicians in the North Sea Region.



## Safety

Safety is at the heart of everything we do; it is our number one priority. It is driven by leadership and applied through BP's Operating Management System – a set of processes, standards and practices that helps us to consistently deliver safe, reliable and compliant operations.

We know that it's not just what we do but how we do it that's important. Safety is one of the five values that guide all BP people, while our Code of Conduct sets out the basic rules for operating safely, responsibly and consistently.

We take the welfare of our people seriously and strive to create and maintain safe and healthy working environments. We have put in place processes that support our efforts to continuously improve and to reinforce a culture of 'safety first' behaviour. How we manage hydrocarbons is fundamental to running safe and reliable operations. Rigorous application of our procedures, systems and processes is critical to ensuring the integrity of our operations, preventing process safety incidents, and ensuring no harm to our people.

### Our goals

To maintain a safe operating culture and capability

To drive safety improvements through our Operating Management System





## Safety in action

### Bruce platform achieves zero recordable injuries

A successful safety campaign by the Bruce platform earned the team two prestigious awards in 2015, including a top honour from industry body Oil & Gas UK.

Faced with the challenge of improving the site's total recordable injury frequency (TRIF) rate, Bruce's health, safety and environment team developed an ambitious improvement programme that brought about a fundamental culture shift in every crew member's approach to safety.

The Bruce team developed a four-point plan that involved:

- Giving people the skills to deliver safety messages more effectively;
- Developing good habits that built safety into daily routines;
- Improving communications that provide better performance feedback;
- Helping leadership explain their safety vision more clearly.



► Bruce platform

As a result, the Bruce team reduced its TRIF rate from 1.14 in 2012 to zero – a first for the platform since production began in 1998.

The team also achieved no high-potential incidents for more than 2,000 days and reached two years without a recordable injury. Their efforts were recognised both in-house and externally in 2015 when they won the BP Helios Award for Safety and the Workforce Engagement prize at the annual Oil & Gas UK Safety Awards.

## People

BP is a leading employer in a vital sector and a place where the brightest minds come together to find new ways of solving complex challenges that make a difference to the energy industry and economy.

Our performance as a company depends on maintaining and developing an engaged, skilled workforce and our culture is based on respect for one another. We value the strengths, abilities and talents that different people bring to our organisation, and we reward our people on merit. The foundation for this is a set of shared values that guides us in our everyday work. BP values safety, respect, excellence, courage and a one team approach. We believe this enables us to create a working environment where everyone can make a difference and give their best. We hold ourselves to the highest ethical standards and adhere to our Code of Conduct, which outlines our expectations for everyone who works at BP.

### Our goals

To embrace diversity at all levels of the organisation

To be the employer of choice for the best and brightest talent in the industry



► Bruce OIM Jack Cameron and the health, safety and environment team accepting their BP Helios award from Bernard Looney

“We could only have been successful if absolutely everyone on Bruce got involved - this was about the 168 people on the platform looking out for each other day in, day out.”

Bruce Offshore Installation Manager (OIM) Jack Cameron

# Environment

We are committed to minimising our impact on the environment and, while environmental challenges and opportunities differ depending upon the lifecycle stage, our overarching goal of no damage to the environment remains the same.

The North Sea oil and gas sector is subject to strict environmental regulation, and we are committed to complying with these at all times. We work closely with regulators to constantly review what we do, how we do it, and how we can do it better. Our Operating Management System is designed to drive continuous improvement in our regulatory compliance and environmental performance.

This system is certified to the international environmental management standard ISO 14001; it is subject to regular internal and external audit; and requires recertification every three years. One of the key focus areas in 2015, was the implementation of the new Offshore Safety Regulations.

These regulations require us to look at the potential for a major environmental incident and manage that in a similar way to how safety concerns are managed. This activity was completed for one of our assets, in conjunction with the new Offshore Safety Directive Regulator and has confirmed that our operational controls, (for example, spill prevention and control), remain robust. Over the next two years the remainder of our assets will transition to this new scheme.



**Our goal**

To cause no damage to the environment

# Investing for the future

**22 People**

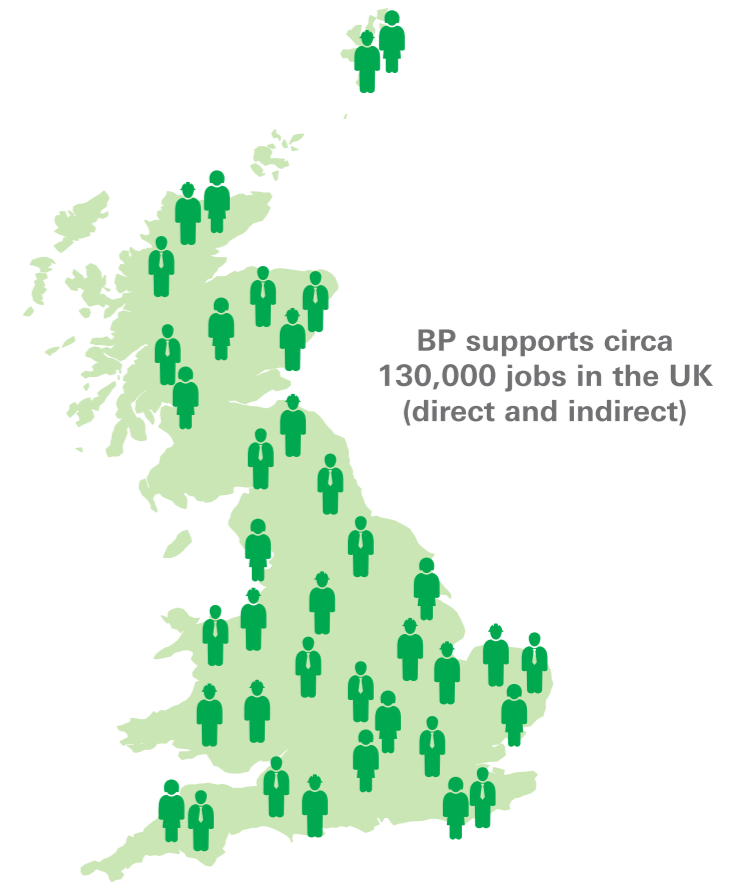
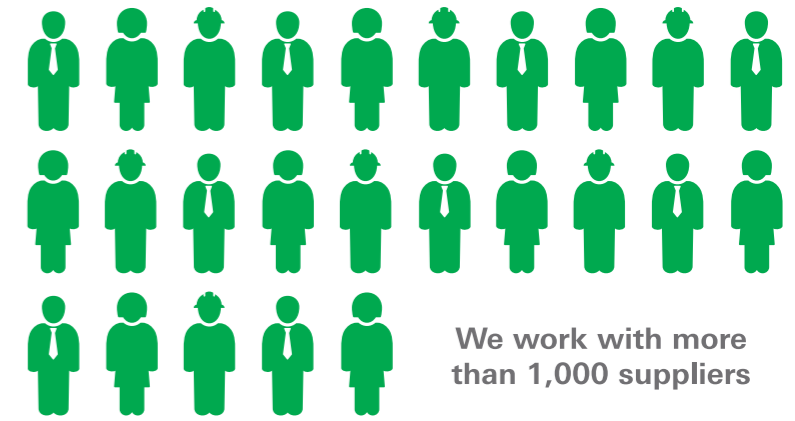
**24 Technology**

**26 Community**

Developing long-term opportunities is a vital part of realising the North Sea's potential.

Developing opportunities beyond the existing base is vital for the continued energy supply of the UK and Norway. With an ongoing commitment to major projects, targeted exploration and appraisal programmes, and new licenses around our core hubs, we are continuing to invest at significant levels in our North Sea business to maximise production and access new reserves.

In addition to new field developments and redevelopments, we are conducting major renewal programmes on existing assets and have an exciting hopper of future investment opportunities which we are working hard to make competitive. The people we employ, the technology we use, and the communities in which we serve are central to our continued success in the Region.





## Environment in action

### One Team working to map sensitive marine environments

We conduct environmental monitoring to identify potential changes to habitats and species near our operations.

Historically, this has been achieved offshore using dedicated survey vessels to obtain physical seabed samples which are subsequently analysed in a lab onshore. Although useful, there are limitations to this sampling technique; it samples a relatively small area, it doesn't provide accurate data on epifauna (organisms living on the seabed surface) which are often the designated features of protected areas, and it is costly, with vessel charter costing up to £1million per survey.

BP's environmental team worked with marine survey experts to identify and trial alternative sampling techniques to overcome these challenges and complement conventional methods. As a result, BP identified the opportunity to use an Automated Underwater Vehicle (AUV), which is already a technique deployed to map the seabed prior to the installation of subsea equipment. An AUV can cover 500,000 square metres of seabed in 400 metres water depth in 16 hours.

Using an AUV we were able to acquire some 38,000 images of the seabed west of Shetland, providing a wealth of data, without disturbing the seabed. These have now been added to a Geographical Information System (GIS) and are being analysed to identify the abundance and distribution of epifaunal species, such as deep sea sponges, and for habitat mapping. So far the initial analysis from these surveys indicate the presence of small glass sponges and other epifauna.

Over time we hope data obtained from this and other non-intrusive techniques will help us build a more accurate picture of the seabed, contributing both to science and the responsible management of our marine resources.

Working closely with colleagues across different disciplines proved to be a scientifically robust and cost-effective way to gather environmental data from a wide sample area which would not have been possible using conventional grab sampling techniques.

**“This data will enhance our understanding of the marine environment and enhance how we manage our activities offshore, demonstrating our commitment of no damage to the environment.”**

**BP North Sea environmental advisor Melanie Netherway**



▶ Porpoise whales visit BP FPSO vessel

## Ula



The Ula field has been in production since October 1986 and is expected to produce into the 2020s. Linking the Tambar, Blane and Oselvar fields to the Ula platform has given access to gas to inject into the Ula reservoir. This has enabled increased oil recovery and extended the life of the field. We are continuing to look for additional gas and for ways to optimise the asset's water-alternating gas reservoir injection scheme. Application of well intervention technology and perforation has resulted in doubling of production from the key producing well at Ula.

### Quick fact

**Ula sees significantly improved recovery**  
rates through its water-alternating gas injection system

## Valhall



Valhall has been producing for more than 30 years and, with the switch-over to the completely new facilities completed in January 2013, it has the potential to continue producing towards 2050. The redevelopment of Valhall includes a new production, utilities and accommodation platform and a pioneering power-from-shore system. This huge project has been one of BP's most complex ever redevelopments. 2015 saw the completion of supplementary work associated with the redevelopment project.

### Quick fact

**Valhall is 100% powered**  
from shore

## Forties Pipeline System (FPS)

The Forties Pipeline System (FPS) is an integrated oil and associated gas transportation and processing system, which has played a major role in the development of the Central North Sea over nearly 40 years. Continued investment in technology and reliability, together with responsible management, has enabled FPS to remain the single most important piece of oil and gas infrastructure in the UK, bringing a significant proportion of the UK's oil production to the mainland. An enhanced gas separation project at the Kinneil terminal, completed in 2014 provides further capability and flexibility to meet the needs of current and future FPS customers.



**Quick fact**  
**Transports over 40%**  
 of UK oil production

## Skarv

The Skarv field is located in the Norwegian Sea, approximately 210 kilometres off the coast of Sandnessjøen, close to the Arctic Circle. The Skarv field was brought onstream in 2012 and is a very important hub for BP, contributing significantly to regional production. The development includes a new highly-advanced FPSO vessel; purpose-built for harsh waters, five subsea templates, and a gas export pipeline.



**Quick fact**  
**BP's most northerly Norwegian field**  
 with expected 25 years of field production life

## Maximising the base

### 12 Our portfolio

Maximising the performance of our existing asset base is a core strategic priority.

Our strengths in managing giant fields and high-value assets are central to realising the significant opportunities that remain in the North Sea.

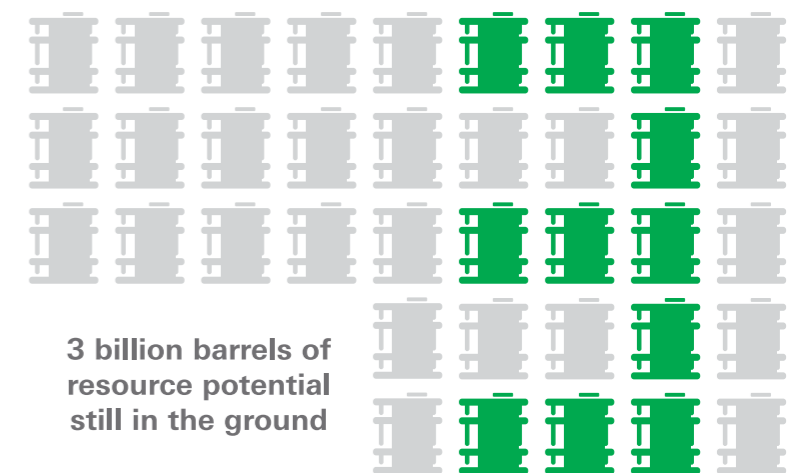
This involves investing in our infrastructure to ensure safe and reliable production over the long term, and managing our reservoirs to maximise recovery. Our portfolio includes infrastructure installed in the 1970s, 1980s and 1990s, which we need to maintain and upgrade so that it continues to produce for longer. Our renewal programme, which will enable long-term maintenance work to be carried out in parallel with drilling and other activities, will help us to maximise production and increase oil and gas recovery.

While the first element of our 'maximising the base' strategy is to ensure that we produce more reliably, the second is to ensure that, ultimately, we produce more from our reservoirs. One of the main ways we can do this is via enhanced oil recovery techniques. Another way is more sophisticated use of seismic imaging, which helps us to obtain better definition of our reservoirs and, therefore, enables better targeting of our wells.

5 billion barrels produced to date



More than 20 producing fields in operation



3 billion barrels of resource potential still in the ground

## Our portfolio

In recent years, we have refocused and refreshed our portfolio; bringing new fields on stream, selling interests in assets that were no longer consistent with our strategy and investing significantly in those that are.

Our portfolio today is smaller but stronger, with less operating complexity, reduced risk, and better potential to increase and sustain returns.

### Schiehallion



The £3billion Quad204 project is designed to completely redevelop and maximise production from the Schiehallion and Loyal fields, located 175 kilometres west of Shetland. After 15 years of operating in harsh conditions and producing nearly 400 million barrels of oil, the Schiehallion FPSO required replacement to enable continued production and recovery of a further estimated 450 million barrels from the fields.

The Quad204 project includes a new state-of-the-art FPSO, the Glen Lyon (pictured); renewal of much of the subsea infrastructure network to rejuvenate the field; a seven-year drilling campaign; and the potential use of leading-edge polymer-based enhanced oil recovery (EOR) technology. Glen Lyon is expected to arrive west of Shetland later this year extending production from this key hub beyond 2035.

**Quick fact**  
**Glen Lyon has 800,000 barrels**  
 of oil storage capacity

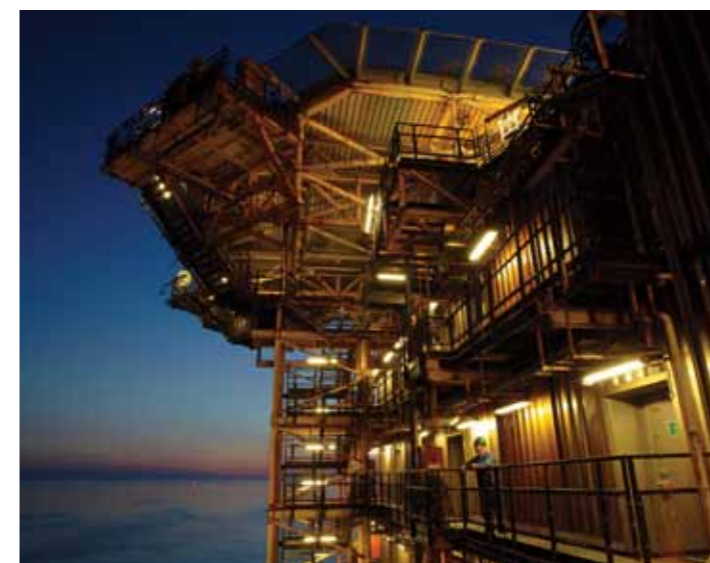
### Eastern Trough Area Project (ETAP)



The Eastern Trough Area Project (ETAP) ranks as one of the largest and most commercially complex North Sea oil and gas developments of the past 20 years. ETAP comprises nine fields, six of which (Mungo, Monan, Marnock, Machar, Mirren and Madoes) are operated by BP. The fields are tied back to a central processing facility. A \$1billion life extension project as part of the overall field development strategy got under way last year and aims to breathe new life into this vital resource. We see significant potential and remaining field life in ETAP and, through our significant investment, we expect to still be producing for decades to come.

**Quick fact**  
**\$1billion Life Extension Project**  
 commenced in 2015

### Miller (non-producing)



The Miller field was operational for 15 years, during which time it produced some 345 million barrels of oil. The field started up in June 1992 and, during the plateau years to 1997, averaged up to 150,000 barrels of oil and 225 million cubic feet of gas per day output. Production ceased in July 2007. BP is now progressing a programme, which received UK Government approval in December 2013, to decommission the Miller field and platform.

**Quick fact**  
**345 million barrels of oil**  
 produced in 15 years of operation

## Bruce

Bruce was discovered in 1974 and still provides an important source of gas for the UK. First production began in 1998 from two platforms, with a further platform added later. The high-pressure, high-temperature Rhum gas field, which is tied back to Bruce, was brought into production in 2005 and is expected to allow Bruce to continue producing beyond 2020.



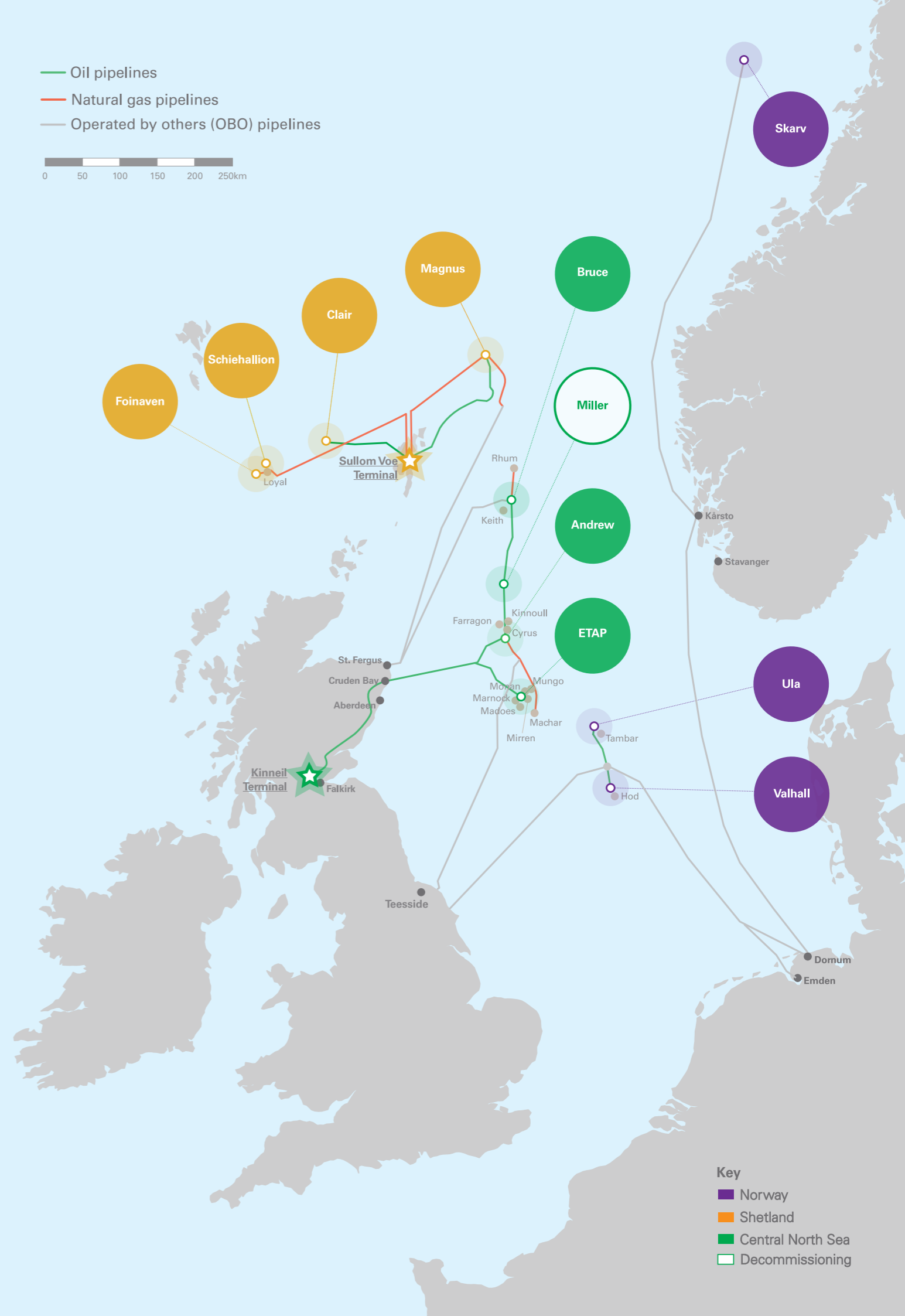
**Quick fact**  
**Rhum field accounts for up to 8%**  
 of UK gas production

## Andrew

The beginning of 2015 marked a major milestone in the history of Andrew with first oil from Kinnoull, a subsea tieback located 25 kilometres to the north of the Andrew platform. The Andrew Area Development (AAD) project is an excellent example of how we can extend the life of our existing assets and generate incremental value. Extensive new subsea infrastructure, a new 750-tonne process module, and structural strengthening of Andrew have extended the platform's ability to produce for at least another decade.



**Quick fact**  
**50,000 barrels per day**  
 Estimated peak forecast production from Andrew/Kinnoull



## Clair and Clair Ridge

With an estimated eight billion barrels of oil in place, the Clair Field is the largest oilfield on the UK Continental Shelf. The field, located 75 kilometres west of the Shetland Islands, was discovered in 1977, but it was only with significant advances in technology and innovative engineering that the first phase of development was made possible. Clair, the first fixed platform west of Shetland, started producing in 2005.

Clair Ridge, the second phase of development, involves the construction and installation of two new bridge-linked platforms, the jackets (legs) of which were installed in 2013. Last year, another major milestone in the project was achieved with the safe installation of the platform's quarters and utilities (QU) topside modules. Construction is on track to be completed in summer 2016 with the installation of the final topside modules. Final hook-up and commissioning will then commence with first oil expected at the end of 2017. We are also continuing our appraisal drilling programme to help define a possible third phase of development of the Clair field.



**Quick fact**  
**Estimated eight billion barrels**  
 of oil in place

## Magnus



**Quick fact**  
**UK's most northerly field.**  
 Located 160 kilometres north-east of Shetland

Magnus is BP's oldest platform in the UK North Sea and, despite its age, remains a key asset within our portfolio. The field has achieved strong oil recovery through the long-term application of the water-alternating gas (WAG) enhanced oil recovery (EOR) schemes. Magnus is another of BP's facilities to benefit from our renewal programme, designed to extend the life of our mature assets, while improving reliability and creating capacity for production-related activities. The Magnus Life Extension Project (MLXP) was completed in 2015. The investment will enable Magnus to deliver its reservoir potential into the future.

## Foinaven

Foinaven was the first deepwater oilfield to be developed in the UK and continues to be among BP North Sea's top-producing fields. The pioneering fast-track development was based on a network of subsea wells linked to an FPSO vessel, the Petrojarl Foinaven. A significant investment programme to renew and replace some of the subsea pipeline system was completed in 2012. BP is reviewing the potential for accessing additional hydrocarbons in the area, to extend the economic life of the hub and to ensure that Foinaven continues to produce safely and reliably for at least another decade.



**Quick fact**  
**First deepwater development**  
 on the UKCS and the first West of Shetland

## Sullom Voe Terminal (SVT)



**Quick fact**  
**One of the largest oil and gas**  
 terminals in Europe

Sullom Voe terminal (SVT) is one of the largest oil and gas terminals in Europe. BP and its partners have continually invested in the long-term capability and integrity of the terminal. This investment ensures that the terminal can continue to handle production from mature and emerging fields into the future. Built to receive oil and gas from northern North Sea fields to the east of Shetland, it now additionally serves the newer developments on the Atlantic margins west of Shetland. The SVT partners are in the process of agreeing to simplify and rationalise the terminal's facilities to reduce costs as throughput from the mature east of Shetland fields declines. At the same time, new capability to treat the higher volumes of gas expected from west of Shetland is being planned.