



BRIEFING PAPER

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UK offshore oil and gas industry

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Summary

This Commons Library briefing paper provides a summary of the state of the UK offshore oil and gas industries and outlines the industry, the regulatory framework and key challenges and long term issues for the industry. The Government has introduced an [Energy Bill \(HL\) \(2015-16\)](#) which addresses the objective to maximise the economic recovery of oil and gas in the UK Continental Shelf (UKCS).

State of the industry

The UK offshore oil and gas industry is important to the economy. The industry supports around 375,000 jobs; it contributed some 0.8% of GDP in second quarter 2015 down from a high of 2.5% in second quarter 2008.

Production levels of oil and gas from the UK Continental Shelf (UKCS) are in decline. The remaining potential of the UKCS is dependent on the future levels of investment. The rapid fall in oil prices since the middle of 2014, from over \$100 per barrel (bbl) to below \$30/bbl at times in January 2016, has put significant pressure on the UK offshore oil and gas industry.

Volume and value of production

Oil production declined steadily between 2000 and 2014, while gas production began to fall after 2004.

Oil prices over the period have risen from \$28 per barrel in 2000 to highs of \$111 per barrel in 2001-12 before falling slightly to just under \$100 per barrel in 2014.

Against generally declining oil and gas production, rising prices over most of the period has meant industry income has remained at between £25 billion and £30 billion a year between 2000 and 2013.

Tax revenue has made an average annual contribution over the 10 years 2004 to 2014 of £7.4 billion, though it has declined rapidly in the last couple of years to just over £2 billion in 2014.

Employment in oil and gas

Oil and Gas UK reduced its [estimate](#) (in September 2015) of those employed in the oil and gas industry to 375,000 jobs from 450,000 at the start of 2014.

Oil & Gas UK [estimated](#) that at the start of 2014, the 450,000 employees comprised:

- 36,000 people directly employed
- 200,000 jobs in industry supply chains
- 112,000 jobs associated with these employees' spending in the wider economy
- 100,000 jobs associated with the export of goods and services.

Changing regulatory framework

The regulatory functions for licensing offshore oil and activities previously exercised by DECC will in future be exercised by the Oil and Gas Authority (OGA). In the *Scotland Bill (2015-16)*, regulation and licensing of offshore energy is a reserved matter, this is regardless of which country the waters belong in the UK.

The Government's [Energy Bill \(HL\) \(2015-16\)](#) responded to the need to maximise the economic recovery of oil and gas in the UK Continental Shelf (UKCS), the Bill:

- formally transfers the licensing, exploration and development functions currently carried out by the Department for Energy and Climate Change (DECC) to the Oil and Gas Authority (OGA).
- establishes the OGA as an independent regulator and a government company; it is currently an executive agency within DECC.

Recent Government announcements

In response to the oil and gas market changes, the Government [announced](#) on 28 January 2016 the following:

- a major new injection of cash into North East Scotland's economy with the signing of a new £250m UK City Deal, jointly funded by the UK and Scottish Governments.
- £20m of new funding for a second round of new seismic surveys to unlock new exploration activity on the UK Continental Shelf (UKCS). To back genuine innovation, the data will be made publically available, with £1m allocated to award innovative use of data to unlock new fields. This additional investment will also help to accelerate drilling new wells, replenishing our reserves and leading to new infrastructure projects.
- An Oil and Gas Ambassador will be appointed to help ensure the best possible access for UK companies to markets overseas, promote the North Sea around the world and boost inward investment.
- A new Ministerial group on Oil and Gas, chaired by Energy and Climate Change Secretary, has been set up to support the oil and gas industry. The group will coordinate the UK's response to the oil price and focus on exports, skills and investment.
- the Oil and Gas Authority will publish a UKCS Decommissioning plan by the early summer, as decommissioning is a fact of life in a mature basin, that will enable the £15bn Aberdeen service sector to become the centre of a new global market for decommissioning and help UK firms to be ready to capitalise on the huge opportunities that are coming in the years ahead. This will be supported by the Natural Environment Research Council who are investing up to £1m in new projects to support the development of expertise in the UK on decommissioning and its environmental management.

Long term future for offshore oil and gas

The principle long term issues surrounding the industry are:

- continuing and increasing cost pressures resulting in falling in employment
- the growing pace of decommissioning while ensuring that the remaining infrastructure supports new developments where necessary
- declining tax revenues but the need for a fiscal regime that supports investment
- a very uncertain price outlook
- competition from other sources of oil and gas in the UK and from other energy sources such as renewables

1. State of the industry

The industry body Oil & Gas UK and the Department of Energy and Climate Change (DECC) give an overview of the state of the oil and gas industry: ¹

- Oil and gas provided 68 per cent of the UK's total primary energy in 2014;
- In 2014 about 55% of *oil* was imported with the remainder from North Sea oil production;
- About 52% of *natural gas* was imported in 2014 with the remainder from UK gas production;
- In 2014 the UK oil and gas industry produced an average of 1.42 million barrels of oil equivalent every day;
- The UK is the second largest producer of oil in Europe, after Norway, and the third largest producer of gas, after Norway and the Netherlands;
- The UK oil and gas industry in 2015 supported 375,000 jobs directly and indirectly down from 450,000 at the start of 2014;
- In 2014/15 oil and gas production provided around £2.2 billion to the Treasury in taxation, the lowest in over 20 years;
- In 2014 exploration activity was significantly worse than anticipated, with only 14 of the expected 25 wells actually drilled; in the first half of 2015 it was 7 exploration wells;
- In 2014 the oil and gas industry invested £14.8 billion of capital but this was expected to fall to £10-11 billion in 2015;
- The industry spent over £1 billion on decommissioning activity in 2013, the highest annual spend on record at the time but this is expected to rise to £8 billion in 2018.

¹ DECC energy statistics and Oil & Gas UK [Economic Report 2015](#)

2. Outline of the industry

2.1 Volume and value of production

Trends since 2000 are shown below. Oil production has declined steadily between 2000 and 2014, while gas production only began to fall after 2004.

Oil prices over the period have risen from \$28 per barrel in 2000 to highs of \$111 per barrel in 2001-12 before falling slightly to just under \$100 per barrel in 2014.

Against generally declining oil and gas production, rising prices over most of the period has meant industry income has remained at between £25 billion and £30 billion a year between 2000 and 2013.

Tax revenue has made an average annual contribution over the 10 years 2004 to 2014 of £7.4 billion, though it has declined rapidly in the last couple of years to just over £2 billion in 2014.

Summary statistics for UK oil and gas production

	Industry income £million	Tax revenue (Financial years) £million	Oil production million tonnes	Gas production Twh	Brent oil price \$/barrel
2000	25,486	4,402	126.2	1,260.2	28.50
2001	24,185	5,370	116.7	1,230.5	24.44
2002	24,118	5,054	115.9	1,204.7	25.02
2003	23,562	4,223	106.1	1,196.9	28.83
2004	23,397	5,115	95.4	1,120.4	38.27
2005	28,707	9,323	84.7	1,025.2	54.52
2006	32,689	8,864	76.6	929.8	65.14
2007	30,865	7,408	76.6	838.1	72.39
2008	39,733	12,393	71.8	809.6	97.26
2009	25,665	5,921	68.2	694.0	61.67
2010	32,165	8,322	63.0	664.4	79.50
2011	36,215	10,872	52.0	526.0	111.26
2012	32,860	6,149	44.6	452.1	111.67
2013	30,280	4,671	40.6	424.2	108.66
2014	..	2,148	39.9	424.9	98.95

Sources: DECC, Energy Trends, BP Statistical Review 2015

Notes:

Income includes oil, gas and natural gas liquids

Oil production includes natural gas liquids

Crude oil price in nominal prices

2.2 Oil and gas market developments

UK oil market

Developments 2008 to 2016

The price of Brent crude oil reached an all-time high above \$145/bbl in July 2008 .

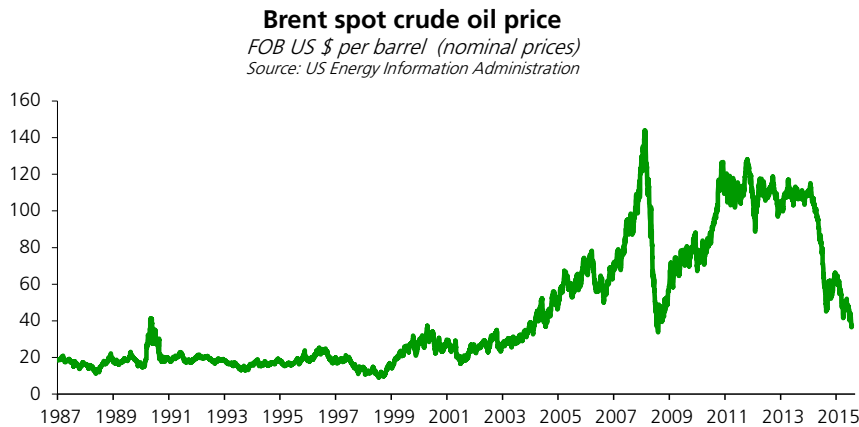
After more than three years of (unusual stability) in the range of \$100-115/bbl, Brent prices collapsed dramatically in the second half of 2014.

7 UK offshore oil and gas industry

Brent prices fell from \$110/bbl in mid-year to \$55/bbl at the end of December 2014 and was trading around \$50/bbl in August 2015, the lowest level since the first quarter of 2009 during the depths of the world recession.

The price fell further and in mid-January 2016 had dropped to \$27/bbl – the lowest levels since 2004 at the time writing.²

The following sets out Brent crude oil prices from 1987 to 2016.



This slide in crude oil prices began in mid-2014 as the slowdown in demand growth in developing countries reinforced the effect of the continuing expansion of crude oil supply in North America, largely from shale oil, leading to a rapid build-up of excess commercial stocks.

The decline in price accelerated in late-November when the Organisation of Petroleum Exporting Countries (OPEC) declined to cut its output to rebalance the market and abandoned its earlier, successful, short-term management of supply in an effort to regain market share. It is said the main reason for the policy change was to counter the effect of the increase in US oil output principally from shale oil and from lower prices for shale gas.³

Crude oil prices are typically quoted in US dollars; in assessing the impact on the UK it is important to note any changes in the sterling dollar exchange rate. In the past, periods of high dollar oil prices, have often seen a relatively higher sterling: dollar exchange rate thus reducing the impact in sterling oil prices.⁴

Outlook

The future direction of oil prices is unclear. OPEC suggested, in December 2015, that the oil price would be \$55 per barrel on average in 2015 and would grow by \$5 per barrel a year to \$80 per barrel by 2010.⁵

² For further discussion see Commons Library briefing paper [Oil Prices](#)

³ The Times [Oil production will slow to trickle as Opec tightens grip](#) 11 September 2015 [subscription required]

⁴ For further discussion of sterling of sterling oil prices see Commons Library briefing paper [Oil Prices](#)

⁵ OPEC [World Oil Outlook](#) December 2015

The Office of Budget Responsibility (OBR) in its outlook for tax revenues in March 2015 expected oil prices to average just under \$60 per barrel over the period 2015 to 2020.⁶

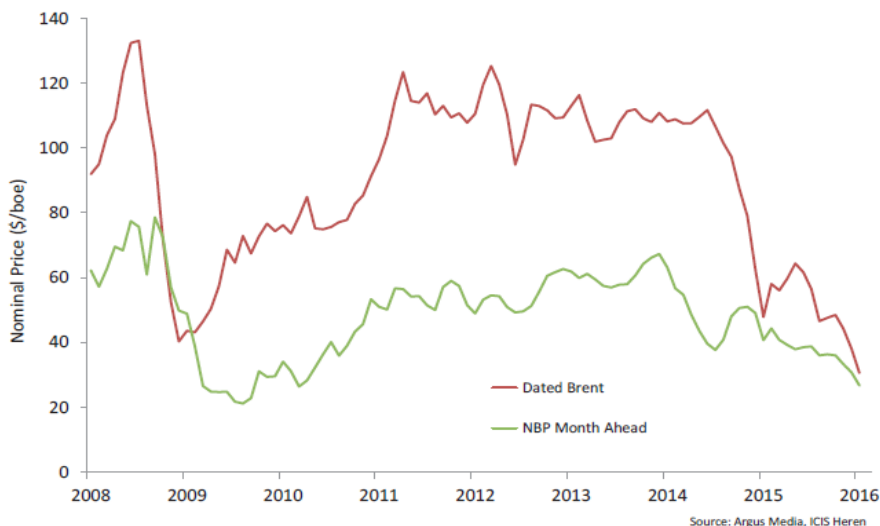
Others have suggested lower prices may persist in the short term at least. For example the Financial Times reported in late December 2015 that Goldman Sachs considered that oversupply in the market could continue until Q4 2016, which could result in a price of \$20 a barrel at some point.⁷

UK gas market

While oil prices are set in a global market, gas markets are still essentially regional in nature. The annual average UK wholesale gas price fell from 68 pence per therm (p/th) in 2013 to 50 p/th in 2014 as measured at the National Balancing Point NBP).⁸

It was until 2014 that the gas price change appeared to follow that of oil prices as shown below.

Brent oil price and wholesale UK gas prices (at National Balancing Point)



Gas prices - Changes in 2014

The Oil & Gas UK *Activity Survey 2015* said that the influence of oil prices on wholesale gas prices in 2014 has been reflected in forward winter prices because of the inclusion of oil prices with a lag in some long-term contracts in continental Europe, and the need for the UK to attract gas from the continent to meet peak winter demand. The slide in Brent prices from \$110/bbl to \$55/bbl in the second half of 2014 was accompanied by a decline in forward wholesale gas prices for delivery in

⁶ OBR *Economic and fiscal outlook* 25 November 2015 table 4.1

⁷ Financial Times *Oil benchmarks converge as low price stalls US output* 22 December 2015 [Subscription required]

⁸ Wholesale prices are those measured at what is called the National Balancing Point (NBP); licenced gas suppliers have to balance their gas 'inputs' into the gas grid and 'outputs' from the grid to customers every day and the NBP price is the clearing price on any one day

winter 2015-16 from 60 p/th to 48 p/th. If oil prices stabilise at \$50-60/bbl, wholesale gas month ahead prices are expected to settle in the range of 40-50 p/th, assuming normal weather and supply patterns.

The main reason behind the fall in wholesale gas prices from 60 p/th to 35 p/th between January and June 2014 was the extraordinarily warm weather in the winter of 2013-14. This left the entire European market with excess stocks at the end of the winter and depressed demand for storage injection in the summer months.⁹

The slide in wholesale gas prices was all the more remarkable, according to the Oil & Gas UK *Activity Survey 2015*, because it occurred against a background of persistent fears that there would be an interruption to Russian gas supplies to Europe arising from the Ukraine-Russia crisis and European and US sanctions against Russia following its annexation of Crimea in March 2014. Prices then recovered ahead of the winter 2014-15 but still reflected the effects of warmer than normal temperatures.¹⁰ Since then wholesale gas prices have remained relatively low.¹¹

Gas prices – changes in 2015

According to Oil & Gas UK *Activity Survey 2016*, the very warm 2013-14 winter was followed by a warmer-than-normal winter in 2014-15. The current winter (2015-16) is also proving to be warmer than normal and, in consequence, prompt day ahead wholesale gas price slid in early 2016 to 35p/therm - the lowest level since 2010.

2.3 Employment in oil and gas

There were an estimated 50,000 people in Great Britain directly employed in the oil and gas sector in September 2014. This includes:

- 16,600 employees working in businesses whose main activity was the extraction of crude petroleum or natural gas.
- 25,100 employees working in businesses who conduct support activities for petroleum and natural gas extraction (for example, exploration services or test drilling).
- 8,300 employees working in businesses who manufacture refined petroleum products.

Around two-thirds of these jobs were based in Scotland (33,900). The majority were based in Aberdeen City (28,500) and Aberdeenshire (4,000). Other employees in the industry are generally on the East coast of England.¹²

The above estimates only reflect direct employment and do not include other jobs connected with the oil and gas industry – for example, in companies' supply chains. Industry estimates attempt to quantify these broader employment impacts.

⁹ Oil & Gas UK *Activity Survey 2015* February 2015

¹⁰ Oil & Gas UK *Activity Survey 2015* February 2015

¹¹ Commons Library briefing paper *Energy prices* January 2016

¹² Source: ONS, Business Register and Employment Survey 2014. Figures are rounded to the nearest 100.

Research by OPITO, the skills body for the oil and gas industry, estimated that the inclusion of contractors, consultants and specialist suppliers (along with people directly employed by businesses engaged in exploration and production) raises the total number of people employed at 2013 to 131,000.¹³

Oil & Gas UK counts jobs associated with exports and employee expenditure; its latest estimate in its most recent *Economic Report 2015*, Oil and Gas UK has reduced its estimate to 375,000 jobs from 450,000 at the start of 2014.¹⁴

Oil & Gas UK estimated that at the start of 2014 the 450,000 employees comprised:¹⁵

- 36,000 people directly employed
- 200,000 jobs in industry supply chains
- 112,000 jobs associated with these employees' spending in the wider economy
- 100,000 jobs associated with the export of goods and services.

¹³ OPITO, [Labour Market Intelligence survey, 2014](#), page 9

¹⁴ Oil & Gas UK [Economic Report 2015](#)

¹⁵ Oil & Gas UK, [Economic Report 2014](#), page 90

3. Industry regulation

The section sets out the regulatory framework for maximising the exploitation of UK oil and gas. The regulation of health and safety, and the regulation of environmental protection is set out in section 4 below.

3.1 Changing regulatory framework

The regulatory functions for licensing offshore oil and activities previously exercised by DECC will in future be exercised by the Oil and Gas Authority (OGA). In the [Scotland Bill \(2015-16\)](#) regulation and licensing of offshore energy is a reserved matter, this is regardless of which country the waters belong in the UK. ¹⁶

Review by Sir Ian Wood

In June 2013, the then Secretary of State for Energy and Climate Change, Edward Davey asked Sir Ian Wood to conduct a review into the recovery of oil and gas from the UK's continental shelf (UKCS).¹⁷

The result of that review, *UKCS Maximising Recovery Review: Final Report* (the Review), was published on 24 February 2014. ¹⁸

The Review's principal recommendations can be summarised as follows:

- Government and industry should develop, and commit to, a new strategy for 'Maximising [the] Economic Recovery' of petroleum from the UKCS (a strategy referred to as MER UK).
- A new arm's length regulatory body should be created and charged with effective stewardship and regulation of UKCS hydrocarbon recovery. That body should also seek to maximise collaboration in the areas of exploration, development and production across the industry.
- The regulator should take on additional powers to facilitate the implementation of the MER UK strategy.
- Important Sector Strategies should be developed and implemented.

The Government published its response to the review in July 2014, in which it accepted all of the Review's recommendations. ¹⁹ The response also announced a call for evidence on how to implement the Review. This ran from 6 November to 31 December 2014, and the Government published its response on 20 March 2015.²⁰

The Impact Assessment produced by the Government, *Implementation of the Wood Review Proposals for UK Offshore Oil and Gas Regulation*, 5 September 2014, explains that:

¹⁶ House of Commons Briefing Paper (CBP 07205) [Scotland Bill 2015-16 \(Bill 3\)](#), 4 June 2015

¹⁷ Sir Ian Wood is the former Chairman of Wood Group, an international energy services company.

¹⁸ Wood Review, [UKCS Maximising Recovery Review: Final Report](#), 24 February 2014.

¹⁹ DECC, [Government Response to Ian Wood's UKCS: Maximising Economic Recovery Review](#), July 2014.

²⁰ DECC, [Implementing the Wood Review Recommendations](#), 20 March 2015.

The Government intends to implement all of the Review's recommendations, but full implementation will require multiple stages of legislation and policy development in order to fully incorporate stakeholder views and avoid unintended consequences. A phased approach will therefore be adopted.

Phase 1 requires primary legislation to establish the framework for MER UK Principles and to create the power for the Secretary of State to raise a levy to fund the activities of the new Regulator which cannot currently be charged for.

Phase 2 will require primary and secondary legislation to establish wider powers, an enforcement regime, setting the level of the levy itself, developing a detailed strategy for how the MER UK Principles will be implemented, and the creation and establishment of an arm's length regulator.²¹

The [Infrastructure Act 2015](#) established the framework for MER UK in primary legislation and provided the Secretary of State with the power to raise a levy to finance the Oil and Gas Authority (OGA).²²

3.2 Oil and Gas Authority

In its response to the Wood Review, the Government said that it would establish the Oil and Gas Authority (OGA) to "undertake the licensing, exploration and development functions work currently carried out by DECC".²³

It was established as an arm's length body accountable to the Secretary of State, DECC and became an executive agency on 1 April 2015.²⁴

However, the Government explained that it does not believe that an executive agency is the best long-term structure for the OGA, arguing that it would be better established as a government company:²⁵

[...] this will give the Authority greater operational independence from Government and will provide a more suitable platform to provide the arm's length regulatory certainty Industry requires to invest in exploration and production activity to maximise economic recovery from the UK's oil and gas resources.²⁶

During its transition between being an executive agency of DECC and an independent government company, the Government intends that the OGA will operate and act as closely as possible to its final form of a government company. The OGA's *Framework Document* states that "this principal has been reflected in the development of this *Framework*

²¹ Impact Assessment, [Implementation of the Wood Review Proposals for UK Offshore Oil and Gas Regulation](#), 5 September 2014, p 1.

²² Infrastructure Act 2015, section 42 and schedule 7.

²³ DECC, [Government Response to Ian Wood's UKCS: Maximising Economic Recovery Review](#), July 2014.

²⁴ House of Lords, written statement: *Establishment of the Oil and Gas Authority*, 15 June 2015, [HLWS34](#).

²⁵ The Government defines a government company as a private company, limited by shares, under the Companies Act 2006, with the Secretary of State of DECC as the sole shareholder.

²⁶ DECC, [Government Response to Ian Wood's UKCS: Maximising Economic Recovery Review](#), July 2014.

Document, so as to ensure that the OGA has sufficient operational independence to be effective from day one”.²⁷

The OGA is now an established body with a management team of eight people and offices in Aberdeen.²⁸ Progress on its main activities were outlined in September 2015.²⁹

Maximising Economic Recovery and the Principle Objective

MER UK is a strategy to achieve the “principal objective”.³⁰ This is the objective of maximising the economic recovery of UK petroleum. This will be achieved in particular through:

(a) development, construction, deployment and use of equipment used in the petroleum industry (including upstream petroleum infrastructure), and

(b) collaboration among the following persons —

- (i) holders of petroleum licences;
- (ii) operators under petroleum licences;
- (iii) owners of upstream petroleum infrastructure;
- (iv) persons planning and carrying out the commissioning of upstream petroleum infrastructure.³¹

Industry responded positively to this recommendation. The industry body Oil and Gas UK saw the recommendations as a “necessary catalyst for change” and regarded the new tripartite strategy as crucially important:

All three parties have a role to play, with the industry, the new regulator and HM Treasury sharing a common vision of the steps that must be taken to deliver the maximum economic benefit for the industry and the country in this critical next phase of the UKCS’ life.³²

The Government’s response to this recommendation, published in July 2014, was equally positive:

The Government therefore [...] supports Sir Ian’s call for a new tripartite approach to Maximising Economic Recovery of the UKCS (MER UK) between a new Authority (see recommendation 2), HM Treasury and Industry. The Secretary of State for Energy and Climate Change will remain a key partner in this approach through his role in setting the policy and strategic framework and objectives for the new Authority.³³

²⁷ DECC and OGA, [Oil and Gas Authority Framework Document](#), 1 April 2015, p 2.

²⁸ Oil and Gas Authority [website](#)

²⁹ Oil and Gas Authority [Call to Action: Six months on](#) September 2015

³⁰ As defined by section 9A of part 1A of the Petroleum Act 1998—as inserted by the Infrastructure Act 2015.

³¹ Petroleum Act 1998, section 9A.

³² Oil and Gas UK press notice, [“Wood Review Final Recommendations Can be Game Changers for UK Continental Shelf”](#), 24 February 2014

³³ DECC, [Government Response to Sir Ian Wood’s UKCS: Maximising Economic Recovery Review](#), July 2014

The [Infrastructure Act 2015](#) gives the Secretary of State a duty, in consultation with industry, to publish a strategy for the achievement of MER UK and providing the Secretary of State with a power to raise a levy to provide stable funding for the OGA.

The Act altered the Petroleum Act 1998, so that it set out the legal framework for the MER UK Strategy. It established who it applied and created the Principal Objective of “maximising the economic recovery of UK Petroleum”. It also created an obligation on the Secretary of State to produce a Strategy for enabling this objective to be met, and for the first Strategy to be produced before 12 April 2016.

In the Lords Committee Stage of the Infrastructure Bill, the Government introduced two new clauses to implement the proposals. The result was for the Act to insert the following sections into the [Petroleum Act 1998](#):

- New section 9A would provide for a principal objective of maximising the economic recovery of UK offshore petroleum and requiring the Secretary of State to produce a strategy;
- Section 9B would place a duty on the Secretary of State to carry out relevant functions in accordance with the strategy;
- Section 9C would place duties on licence holders, operators appointed under those licences and owners of upstream petroleum infrastructure to carry out certain identified activities in accordance with the strategy;
- Section 9D would place a duty on the Secretary of State to lay before Parliament a report at the end of each reporting period about performance against the strategy; and
- Sections 9F and G would make provisions about the production and revision of the strategy, with a requirement for the first strategy to be produced within one year of the date on which the sections come into force.³⁴

MER UK Strategy

On 18 November 2015 the Government began public consultation on the Draft MER UK Strategy. However, the Energy Bill, as it stands, contains amendments to the Petroleum Act 1998 which would affect the principle object of MER UK (see Library [Briefing paper](#) on the *Energy Bill 2015-16*). The [consultation document](#) on the Draft MER UK Strategy notes:

In light of the legislative timetable that currently exists to produce a Strategy by 12 April 2016, Government considers it necessary to consult on a draft MER UK Strategy that meets the requirements of Part 1A of the Petroleum Act 1998 as that Part currently stands. Government will consider the implications for the Strategy, on account of any changes to those requirements made by the Energy Bill, once the will of Parliament on these matters is settled.

On 27 January 2016, the Government published the first MER UK Strategy; it is required to be produced within 12 months of the relevant

³⁴ Commons Library Briefing paper [The Energy Bill 2015-16: Background and changes in the Lords](#)

clauses coming into force, therefore by April 2016. It was laid in Parliament for scrutiny on 28 January 2016.³⁵

The Government's [draft Strategy](#) sets out a number of obligations which would be imposed on companies involved in oil and gas operations. Most notably the strategy notes amongst its high level principles that:

- all stakeholders should be obliged to maximise the expected net value of petroleum produced from relevant UK waters, not the volume expected to be produced;

And that:

- compliance with the Strategy may oblige individual companies to reallocate value between them, matching risk to reward. However, while the net result should deliver greater value overall, it will not be the case that all companies will always be individually better off;

The implication of these statements have attracted attention. For example, CMS Law have commented that:

It is not currently clear whether this might require a company to give up value to which it is currently entitled or only to accept a lower value than it might have anticipated for some new project. We understand that the latter is the intention, and we anticipate that the final version will clarify that.

The Draft MER UK Strategy goes on to set out a range of obligations which include:

- *Central Obligation* - Relevant persons must, in the exercise of their relevant functions, take all steps necessary to secure that the maximum value of economically recoverable petroleum is recovered from the strata beneath relevant UK waters.
- *Exploration* - that exploration is carried out in a manner which is optimal for maximising the value of economically recoverable petroleum and that Licensees carry out work programmes for explorations before surrendering licences
- *Development* - infrastructure is developed in a way that meets the optimum configuration for maximising the value of economically recoverable petroleum
- *Assets Stewardship* - owners and operators of infrastructure must ensure that it is maintained in such a condition and operated in such a manner that it will achieve optimum levels of performance,
- *Technology* - that technologies, including new and emerging technologies, are deployed to their optimum effect in maximising the value of economically recoverable petroleum
- *Decommissioning* - before commencing the decommissioning of any infrastructure in relevant UK waters, owners of such infrastructure must ensure that all options for their continued use have been suitably explored, including those which are not directly relevant to the recovery of petroleum such as the transport and storage of carbon dioxide.
- *OGA Plans* - the OGA may produce a plan or plans which set out its view of how any of the obligations in this Strategy may be met.

³⁵ DECC [The Draft Maximising Economic Recovery Strategy For The UK](#) Presented to Parliament pursuant to Section 9G of the Petroleum Act 1998 as amended by the Infrastructure Act 2015

- *Relinquishing assets* - where operators decide not to ensure the recovery of the maximum value of economically recoverable petroleum from their licences or infrastructure they must relinquish or divest themselves of such licences or assets.

Operators are then provided with a number of safeguards which qualify these obligations:

- None of the obligations requires conduct which would otherwise be prohibited by other legislation (e.g. health and safety or environmental legislation).
- The strategy cannot require any person to fund activity where they will not make a satisfactory commercial return.
- OGA enter discussions with the relevant person before taking any relinquishment action.
- The Strategy cannot require conduct where the benefits to the UK are outweighed by the damage to the long term confidence of investors in oil and gas exploration and production projects in relevant UK waters.

Oil and Gas UK, the offshore industry trade body commented on the release of the draft Strategy. Oil & Gas UK's chief executive Deirdre Michie [said](#) at the time:

"The Maximising Economic Recovery (MER) UK strategy will form the cornerstone of the tripartite approach being taken by the new Oil and Gas Authority, HM Treasury and the industry to extraction of the UK's oil and gas resources.

The Secretary of State for Energy stated that energy security has to be the number one priority and that gas will play a key role in powering our future economy. It makes sense therefore to make the most of the country's own resources and the MER UK strategy, in tandem with the creation of the new Oil and Gas Authority, is designed to do just that. There are up to an estimated 20 billion barrels of oil and gas to be recovered from our offshore waters, around eight billion barrels of that is natural gas."

CMS Law [conclude](#), with respect to the Strategy, that the high level wording means that in really much will depend "upon the approach that the OGA decides to take in practice". They add any unpredictability as a result of this should be managed by the requirement of the OGA to also achieve compliance with the strategy.

Concerns that this makes for an unpredictable regulatory environment may be tempered by the OGA's own obligation to achieve compliance with MER UK (including to comply with the Strategy) and the Strategy's express reference to maintaining the long term confidence of investors. [...] The draft Strategy refers to the need for communication between the OGA and a relevant person before certain significant decisions are taken and, as the draft Strategy is developed and finalised, it seems that ongoing communication between DECC, OGA and the industry will remain key in determining the framework for successfully achieving the aims of MER UK.

Funding the OGA through a Levy

On 23 March 2015, the Government announced its intention to undertake a consultation on the specific implementation of a levy on

industry to fund the OGA. In a written statement the then Secretary of State, Edward Davey, explained that:

Whilst the Government has agreed to contribute £3 million per year for five years starting from April 2016 to ensure the OGA is well funded from the outset, the OGA's ongoing costs will be met by a combination of the extant fees and charges regime, and a new levy on industry. We agree with industry that it is important that the levy is simple, transparent and cost-reflective.

This consultation sets out details of the allocation methodology and the proposed levy rates. In line with the early focus of the OGA, we have determined that initially we will levy only offshore petroleum licence holders as (in the short term) the OGA will incur costs related to these licence holders. We intend that the OGA will begin collecting the levy in October 2015, subject to regulations.³⁶

The Government's response to its call for evidence on implementing the Wood Review stated that the levy structure and amounts would be introduced via secondary legislation under the powers contained within the *Infrastructure Act 2015*.³⁷ The Impact Assessment published alongside the consultation on the levy provided further detail, saying that:

Schedule 7 to the Infrastructure Act 2015 illustrates how the levy power may be used. As with fees and charges, levies should be designed to recover full costs. However, to ensure the levy is cost-reflective of the work carried out on behalf of licence holders, it may be appropriate to charge different levy rates to different kinds of licensees.³⁸

The Government are analysing the feedback to the consultation.³⁹ The policy intention is that regulations will be brought forward so that the collection of the levy may start in October 2015.⁴⁰

3.3 Energy Bill (2015-16)

The Government published the [Energy Bill \(HL\) \(2015-16\)](#) in the House of Lords on 9 July 2015.⁴¹

In summary the Bill (as it relates to oil and gas) will:

- formally establish the OGA as an independent regulator, which will take the form of a government company, charged with the asset stewardship and regulation of domestic oil and gas recovery.

³⁶ House of Commons, written statement: Funding of the Oil and Gas Authority: Consultation on Levy Design, 23 March 2015, [HCWS443](#).

³⁷ DECC, [Implementing the Wood Review Recommendations](#), 20 March 2015, p 24.

³⁸ [Impact Assessment, Funding the Oil and Gas Authority \(OGA\): Levy Design](#), 25 March 2015, p 8.

³⁹ DECC, ['Funding the Oil and Gas Authority: Consultation on Levy Design'](#), accessed 17 July 2015.

⁴⁰ Impact Assessment [Energy Bill – Oil and Gas Authority \(OGA\) Measures](#) 17 June 2015

⁴¹ See [House of Lords Library Note](#) on the *Energy Bill*, 17 July 2015 for a detailed description of the Bill as introduced in the House of Lords

- transfer the Secretary of State for Energy and Climate Change's existing regulatory powers on oil and gas to the OGA. The Secretary of State's regulatory functions in relation to the environment would not be transferred.
- give the OGA additional powers including: access to company meetings; data acquisition, retention and transfer; dispute resolution; and sanctions.
- introduce provisions in relation to charges for the offshore oil and gas environmental regulator's services to the industry.⁴²

The [Energy Bill 2015-16](#) has passed through the House of Lords stages. It had its Second Reading in the House of Commons on 18 January 2016 and completed its Committee Stage on 9 February 2016.⁴³

The Commons Library briefing paper [The Energy Bill 2015-16: Background and changes in the Lords](#) sets out the details of the Bill.

⁴² [Energy Bill \(2015-16\) Explanatory Memorandum](#)

⁴³ The Bill was amended during the Committee stage and the amended Bill has been published [here](#)

4. Offshore health, safety and environmental regulation

This section sets out the regulation of offshore health and safety, and the regulation of environmental protection.

Following the Piper Alpha disaster in 1988, tripartite arrangements for offshore regulation were implemented.⁴⁴

Under these tripartite arrangements it is the responsibility of the [Health & Safety Executive](#) (HSE), an executive non departmental public body of the Department for Work and Pensions, to assess and regulate the integrity and safety of offshore installations in the UK via the Health and Safety at Work Etc Act 1974 and the offshore specific suite of regulations.

The Department of Energy and Climate Change ([DECC](#)) is responsible for the environmental regulatory framework for the UKCS, and for administering and ensuring compliance with that regime in relation to offshore oil and gas exploration and production and decommissioning, including the approval of Oil Pollution Emergency Plans (OPEPs).⁴⁵

The [Maritime and Coastguard Agency](#) (MCA), an Executive Agency of the Department for Transport is responsible, if required, for deploying any counter pollution measures to minimise a pollution incident

4.1 Health and safety

The Health and Safety Executive (HSE) [Energy Division \(ED\)](#) is responsible for regulating the risks to health and safety arising from work in the offshore industry on the UK Continental Shelf (UKCS).

The UK has a detailed offshore regulatory framework aimed at preventing or mitigating the health and safety risks associated with drilling for oil and gas offshore. The main regulations include:

- [The Offshore Installations \(Safety Case\) Regulations 2005 \(SCR\)](#)—which require operators or owners of an offshore installation to prepare a safety case providing evidence that all major accident risks have been evaluated and measures taken to control risks. This must be submitted to HSE for acceptance before a rig drills in UK waters;
- [The Offshore Installations and Pipeline Works \(Management and Administration\) Regulations 1995 \(MAR\)](#)—which set out requirements for the safe management of offshore installations;
- [The Offshore Installations \(Prevention of Fire and Explosion, and Emergency Response\) Regulations 1995 \(PFEER\)](#)—which provide for the protection of people from fire and explosion, and for securing an effective emergency response;

⁴⁴ Section 3.4 has drawn on the [Memorandum](#) submitted by the Department of Energy and Climate Change, Health & Safety Executive, and Maritime and Coastguard Agency to the Energy and Climate Change Committee inquiry [Deepwater drilling - Implications of the Gulf of Mexico Oil Spill](#)/HC 450 Published 06 January 2011

⁴⁵ The regulatory framework is set out in detail on the DECC website [Oil and gas: offshore environmental legislation](#) updated 7 August 2015

- [The Offshore Installations and Wells \(Design and Construction, etc\) Regulations 1996 \(DCR\)](#)—which set out the requirements for the integrity of installations and the safety of offshore and onshore wells; and
- [Offshore Installations \(Safety Representatives and Safety Committees\) Regulations 1989](#)—which place duties on offshore installation managers, owners and operators to establish arrangements for consultation with workers. These regulations apply to the workforce on the installation regardless of their employer's identity.

The UK offshore regulatory framework was developed after the Piper Alpha disaster in 1988.⁴⁶ The framework at the same time implements the relevant [European Directive 92/91/EEC](#) on the minimum requirements for improving the safety and health of workers in the mineral-extracting industries through drilling.

The UK regulations also contain a range of additional safeguards to mitigate the health and safety risks associated with offshore drilling. These measures also reduce the risk of an oil pollution incident occurring:

- Design and Construction Regulations (DCR) requires a full assessment of subsurface conditions before drilling to identify potential hazards. DCR also requires that the well is designed, constructed, maintained and operated such that, so far as is reasonably practicable, there can be no unplanned escape of fluids from the well;
- There is a statutory requirement for wells to be notified to HSE at least 21 days prior to drilling or well intervention operations taking place, which allows specialist wells inspectors to review well design and procedures and require improvements if necessary;
- A second check is required of the design and construction of the well by a competent person, independent of the operator, to ensure that it is fit for purpose;
- An independent competent person (such as Lloyds Register) must verify the suitability and state of good repair of safety critical equipment such as blowout preventers (BOPs) on mobile drilling rigs;
- Regulations require that everyone involved in well operations has received suitable information, instruction, training and supervision;
- Weekly summaries of operations are required to be submitted by well operators to HSE Wells Inspectors; and
- HSE Wells Inspectors assess and inspect well control and well integrity arrangements and other HSE offshore specialists assess and inspect other aspects of drilling rig operations and integrity.

To apply the UK's legislation and monitor safety within the offshore oil and gas industry, HSE's Offshore Division has a team of specialist inspectors who provide expertise in the regulatory inspection; well engineering; occupational health; process safety; fire and explosion;

⁴⁶ Department of Energy. [The public inquiry into the Piper Alpha disaster](#) Cm 1310, November 1990

marine and structural; evacuation and escape; mechanical; electrical; and diving.

Health and Safety record

In the UK, the HSE publishes an [Annual Offshore Statistics & Regulatory Activity report](#).

The HSE's latest bulletin for 2013/14 sets out the rate of injury per number of workers:

- There was one fatality in 2013/14. There have been 3 fatalities in the last 5 years and 7 in the last 10 years
- The rate was 112 injuries per 100 000 workers. This continues the flat trend seen from 2007/08, which was preceded by a considerable fall from 2004/05 to 2007/08
- There were 112 over 7-day injuries, a rate of 339 per 100,000 workers

There were 393 dangerous occurrences, similar to the number last year

- In 2013/14 more than 5½ million days were spent offshore, and it is estimated that there was an offshore population of 33,060 full time equivalent (FTE) workers.
- There were an estimated 26,598 offshore workers in 2009/10, a fall of 5.76% on the 2008/09 estimate of 28,224 workers.

The HSE bulletin also sets out the main types of accident:

- Fractures accounted for over half of Major/Specified injuries (20 of 37)
- Sprains and strains accounted for just under a third of O7D injuries (34 of 112)
- Fractures, lacerations/open wounds and Contusions accounted for the majority of the remaining O7D injuries
- The distribution of severity by nature of injury is similar over the past three years

Oil leaks

The HSE bulletin provides statistics on the number of offshore hydrocarbon releases or HCRs (oil leaks).

There were 115 HCRs in 2013/14, an increase of about a fifth compared to 2012/13. This increase was due to minor releases (77, up over a half on 2012/13); the number of significant and major HCRs together has dropped year-on-year for the last 5 years. Between 2010/11 and 2012/13, HCRs dropped by around a half, and the industry set a new target to reduce HCRs by a further 50% by 2015/16. ⁴⁷

4.2 Environmental regulation

The Department for Energy and Climate Change is responsible for the framework of environmental protection measures that has been

⁴⁷ HSE [Annual Offshore Statistics & Regulatory Activity report](#) December 2014

developed to minimise the impact of oil and gas activities. This is embodied in the relevant legislation, consistent with and in large part derived from the legislation framework of the European Union.⁴⁸

In addition, the UK is a signatory to the Oslo and Paris Convention for the Protection of the Marine Environment of the North East Atlantic (the OSPAR Convention). To date, the UK has implemented and applied all of the OSPAR decisions and recommendations.

This offshore environmental protection regime covers oil and gas development throughout its life cycle, from the initial licence application to the final decommissioning of facilities. All activities that could potentially impact on the environment are subject to assessment, and significant activities are controlled through the issue of permits, consents or authorisations. There is also an inspection and enforcement regime in place to confirm compliance with the conditions included in the environmental approvals.

The regulatory regime includes:

- [The Environmental Assessment of Plans and Programmes Regulations 2004](#) —require a Strategic Environmental Assessment to be carried out before oil and gas licensing is undertaken. The SEA is subject to public consultation and evaluates both the individual and cumulative impacts of offshore oil and gas activity at a strategic level.
- [The Offshore Petroleum Production and Pipelines \(Assessment of Environmental Effects\) Regulations 1999](#) — require the operator to undertake an environmental assessment for a wide range of projects.
- [The Offshore Petroleum Activities \(Conservation of Habitats\) Regulations 2001](#) —require an Appropriate Assessment for all projects or activities that could affect the integrity of a protected habitat or species Also [Offshore Marine Conservation \(Natural Habitats, &c.\) Regulations 2007](#)
- [The Offshore Chemicals Regulations 2002 \(as amended\)](#) — control the use and discharge of all operational chemicals and implement OSPAR Decision 2000/2 on a harmonised mandatory control system for the use and reduction of the discharge of offshore chemical.
- [The Offshore Petroleum Activities \(Oil Pollution, Prevention and Control\) Regulations 2005](#)—control all deliberate oil discharges. Major discharges are waste streams contaminated with reservoir hydrocarbons eg produced water.
- [The Offshore Combustion Installations \(Pollution Prevention and Control\) Regulations 2013](#) —Transposes the relevant provisions of the Industrial Emissions Directive 2010/75/EU (“the IED”) in respect to specific atmospheric pollutants from combustion installations (with a thermal capacity rating ≥ 50 MW) on offshore platforms undertaking activities involving oil and gas production and gas and carbon dioxide unloading and storage. Also relates to control of the quantities of noxious pollutants emitted from combustion equipment on qualifying installations, and implement

⁴⁸ DECC will continue to be responsible for environmental regulation after passage of the Energy Bill 2015-16 (see [Explanatory Memorandum](#))

the Integrated Pollution Prevention and Control Directive for offshore oil and gas installations. The regulations ensure that Best Available Techniques are employed to reduce emissions.

- [The Greenhouse Gas Emissions Trading Scheme Regulations 2005 \(as amended\)](#) —authorise the emission of greenhouse gases (currently only CO₂) and implement the EU Emissions Trading Scheme.
- [The Offshore Installations \(Emergency Pollution Control\) Regulations 2002](#) — ensure that operators have appropriate measures in place to prevent oil spills and to ensure that if they occur they are handled effectively and provide for the role of the Secretary of State's Representative for Maritime Salvage and Intervention.
- [The Merchant Shipping \(Oil Pollution Preparedness, Response and Co-operation Convention\) Regulations 1998](#) — require operators to prepare and submit an Oil Pollution Emergency Plan, covering all activities where there is a risk of hydrocarbon spill and detailing the action to be taken should a spill occur.

5. Industry challenges

The sector faces a wide range of challenges, in particular much lower oil prices since mid-2014 are affecting, and will continue to affect:

- the level of investment in the UK Continental Shelf (UKCS) and the outlook for oil and gas production
- the levels of employment
- UK Government tax revenues
- UK security of oil and gas supply
- the pace of decommissioning of UKCS oil and gas fields

5.1 Maintaining investment

With the fall in the price of oil since the middle of 2014, company plans, according to Oil & Gas UK, have been under intense internal scrutiny and face significant revision, almost on an ongoing basis, as investors seek to adjust to the new business environment.⁴⁹

Oil & Gas UK say companies are continuing to constrain their investment plans for 2015 and are pursuing ambitious cost reduction and efficiency improvement programmes.⁵⁰

According to the Oil & Gas UK [Activity Survey 2016](#), capital investment in the UKCS is forecast to fall rapidly following years of record expenditure. After peaking at £14.8 billion in 2014, capital investment declined to £11.6 billion in 2015 and is likely fall to less than £10 billion in 2016.

The near-term outlook, according to Oil & Gas UK, is dominated by capital committed to ongoing developments that have already been sanctioned (£38 billion of new capital was approved from 2010 to 2014 and over one fifth of this is still to be spent), as well as non-discretionary investment required to keep existing assets operational.

Oil & Gas UK forecasts that less than £1 billion of new capital will be sanctioned in 2016. This reflects a scarcity of capital globally across the oil and gas industry, primarily due to the price fall, but also, they say, due to the lack of attractive investment opportunities on the UKCS, which is of serious concern. They warn that the basin risks another production collapse at the start of the next decade if new development opportunities do not begin to be delivered now.⁵¹

In response to the market changes the Government has announced:

- a major new injection of cash into North East Scotland's economy with the signing of a new £250m UK City Deal, jointly funded by the UK and Scottish Governments.
- £20m of new funding for a second round of new seismic surveys to unlock new exploration activity on the UK Continental Shelf (UKCS), To back genuine innovation, the data will be made publically available, with £1m allocated

⁴⁹ Oil & Gas UK [Activity Survey 2016](#) February 2016

⁵⁰ Oil and Gas [UK Economic Report 2015](#) September 2015

⁵¹ Oil & Gas UK [Activity Survey 2016](#) February 2016

to award innovative use of data to unlock new fields. This additional investment will also help to accelerate drilling new wells, replenishing our reserves and leading to new infrastructure projects.

- An Oil and Gas Ambassador will be appointed to help ensure the best possible access for UK companies to markets overseas, promote the North Sea around the world and boost inward investment.
- A new Ministerial group on Oil and Gas, chaired by Energy and Climate Change Secretary, has been set up to support the oil and gas industry. The group will coordinate the UK’s response to the oil price and focus on exports, skills and investment.⁵²

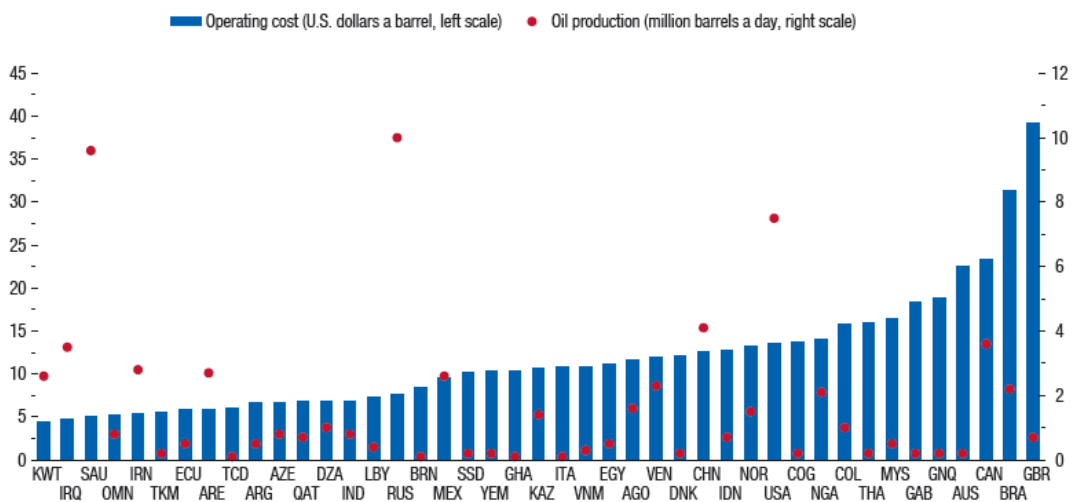
Operating Costs

The difficulties facing the UK oil industry were emphasised by the International Monetary Fund (IMF), which said the collapse in oil prices since the middle of 2014 would ‘stifle investment and hit production [in the UK] at a much faster pace than other countries’.

The IMF *World Economic Outlook* in April 2015 said:

The [...] distribution of [oil field] operating costs per barrel suggests that the North Sea, and the United Kingdom are among the most expensive places to operate oil fields. As a result, the oil price slump will affect production in those locations earlier and more intensely than in other locations.⁵³

Figure 1.SF.12. Oil Production and Operating Costs by Country



Sources: Rystad Energy research and analysis; and IMF staff calculations.
 Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

Given the high operating costs, estimated by consultants [Rystad Energy](#) when compared to other countries (as shown above), UK producers are finding it much more difficult to absorb the lower prices than say the low cost producers of Kuwait or Saudi Arabia. UK producers will have less time to reduce costs before reducing investment and even shutting in production.

⁵² DECC [Prime Minister announces further boost for UK oil and gas industry](#) 28 January 2016

⁵³ IMF [World Economic Outlook](#) April 2015

However, Oil & Gas UK estimate in their *Activity Survey 2016* (published in February 2016) that the industry has made substantial progress in reducing costs and improving efficiency. Unit operating costs, they estimate, fell from \$29.30/bbl to \$20.95/bbl in 2015 and are expected to fall by another 20 per cent to around \$17/bbl in 2016, a total of 42 per cent within two years.⁵⁴

Investment Outlook

The remaining potential of the UK Continental Shelf (UKCS) is dependent on the future levels of investment and what happens to the oil price.

Analysis from Wood Mackenzie, reported in the [Financial Times](#) [subscription required], sets out that globally 68 large exploration and recovery projects have been postponed since the oil price peak in 2014. This amounts to a \$380 billion dollars in capital spending. A representative from Wood Mackenzie commented on the analysis:

It's going to be a brutal year [...] Most companies are going to be focused on short-term survival and cutting costs.⁵⁵

A measure of the impact of the down turn in activity is the number of idle rigs now moored in the Cromarty Firth. The Financial Times quoted Bob Buskie, chief executive of the Cromarty Firth Port Authority:

In previous oil crashes there has been a sense that it will come good again — maybe in 18 months the price will bounce back. But people have lost sight of the dynamic between Saudi [Arabia] not adjusting output and America still throwing money at the fracking game. We have ended up awash with oil.

The North Sea "doesn't work at \$30 a barrel" Indeed, the number of operational rigs, having gone from 57 to 27, is now thought likely to fall to just 19 by the summer. "One by one, the operators are looking at this and saying, 'this is just not happening for us'⁵⁶

Oil & Gas UK estimates that almost 43 billion barrels of oil equivalent (boe) have been recovered over the past 46 years – 28 billion boe of oil and 15 billion boe of gas. In that time, the UKCS has changed from being dominated by a small number of very large fields in the 1970s and 1980s to a highly diverse oil and gas province of some 300 producing fields in the southern, central and northern North Sea, the Irish Sea and, more recently, west of Shetland.⁵⁷

Regarding the future recoverable potential from the UKCS current government forecasts suggest a range of 11 to 12 billion boe to be recoverable.

Even if no further capital investment is sanctioned, Oil & Gas UK expects a further 6.6 billion boe to be produced, around two thirds from the 300 fields currently in production and one third from new fields under development. In addition, companies are considering investments to

⁵⁴ Oil & Gas UK [Activity Survey 2016](#) February 2016

⁵⁵ Financial Times, [Delayed oil projects total nears \\$400bn](#), 14 January 2016 [subscription required]

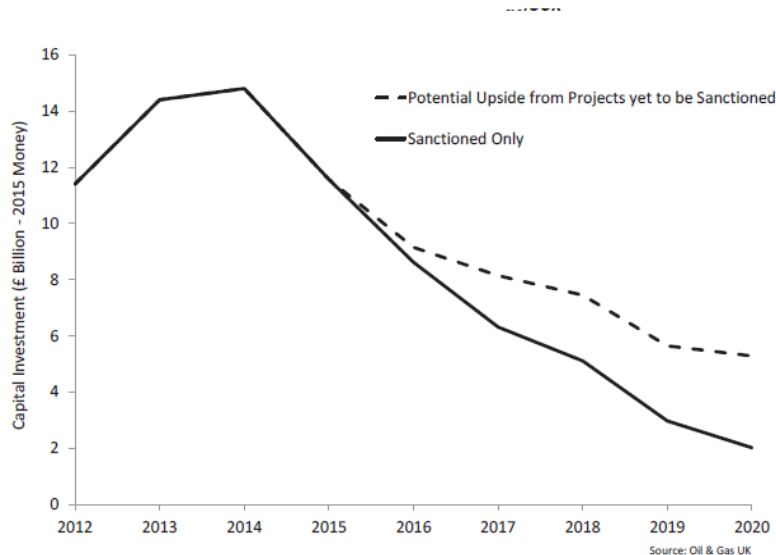
⁵⁶ Financial Times [Oil crash: idled rigs stack up as crisis grips North Sea](#) 21 January 2016 [subscription required]

⁵⁷ Oil and Gas UK [Economic Report 2015](#) September 2015

produce a further 2-5.5 billion boe of reserves. New developments account for 1-3 billion boe of this, with a further 1-2.5 billion boe due to potential, incremental investment in existing fields. This takes the remaining recoverable reserves of the UKCS to 8.5-12 billion boe, representing resources for which there is a significant degree of certainty of recovery.⁵⁸

In terms of future capital investment, as set out in the chart below, the outlook is dominated, according to Oil and Gas UK, by a small number of large developments that received a final investment decision before the oil price fall in mid-2014. This is estimated to reduce investment to £10-11 billion in 2015. The relatively few new projects coming forward has led Oil and Gas UK to forecast a rapid fall in investment in the next three years to around £6-7 billion..⁵⁹

Capital Investment Outlook



Outlook for oil and gas production

Two recent forecasts of the medium outlook for UKCS oil and gas production have been published by Oil and Gas UK in February 2016 and by DECC in March 2015.

Oil and Gas UK

Oil & Gas UK expects:⁶⁰

- a forecast production rise in 2016 of 2.3 per cent to 1.68 million boepd (611 million boe a year).
- a modest production rise in 2017 and 2018 to 1.7 million boepd with some 40 per cent anticipated to come from fields that have started production or seen significant redevelopment since 2013.

⁵⁸ Oil & Gas UK [Economic Report 2014](#) September 2014

⁵⁹ Oil and Gas UK [Economic Report 2015](#) September 2015

⁶⁰ Oil & Gas UK [Activity Survey 2016](#) February 2016

- very few new start-ups are currently scheduled post-2018, a consequence of the anticipated lack of new developments sanctioned over 2016 and 2017.
- increasing concerns that the UKCS will be exposed to another collapse in production at the start of the next decade.
- increasing challenge to slow the rate of decline at lower oil prices, a lack of free cash, the maturity of the basin and international competition for investment funds

DECC forecasts

The latest official projections for future oil and gas production, prepared by DECC at the time of the March 2015 Budget, show: ⁶¹

- UK output of oil falling further by 15% to 30% between 2015 and 2020,
- UK gas either remaining at about the same level as 2015 or declining by 40%.

Infrastructure

Infrastructure on the UK Continental Shelf is principally the processing, transport and export of the UK's offshore oil and gas resources. In the early days of production, in the 1970s and 1980s, a small number of very large fields dominated UKCS production. Today production comes from more than 300 fields operated by an increasingly diverse mix of companies who are far more independent than before with 20,000 km of pipelines connecting these fields and platforms to onshore terminals.

The extensive coverage of infrastructure in the UKCS offers a competitive advantage allowing new fields to be developed more cheaply via existing infrastructure and enabling smaller fields to be developed which would otherwise be uneconomic if developed on a standalone basis. The Wood review called for the management of the existing ageing infrastructure to be managed efficiently as part of the wider 'Maximising Economic Recovery' (MER) UK strategy. To do that it is important that all parties gain access to infrastructure on an appropriate commercial basis.⁶²

Infrastructure in those areas of the North Sea with the much older assets is under increasing pressure according to Sir Ian Wood, as maintenance costs increase and throughput diminishes. Sir Ian Wood, review says there is evidence that early decommissioning is likely to put existing infrastructure at risk. At the same time there is a need, according to Sir Ian Wood, for the development of new infrastructure particularly West of the Shetlands and in the Central North Sea which

⁶¹ DECC [UKCS Oil and Gas Production Projections](#) 18 March 2015

⁶² Ibid

should be developed on a collaborative basis either by existing incumbents or new players.⁶³

In oral evidence to the ECC Committee on 3 November 2015, the OGA said

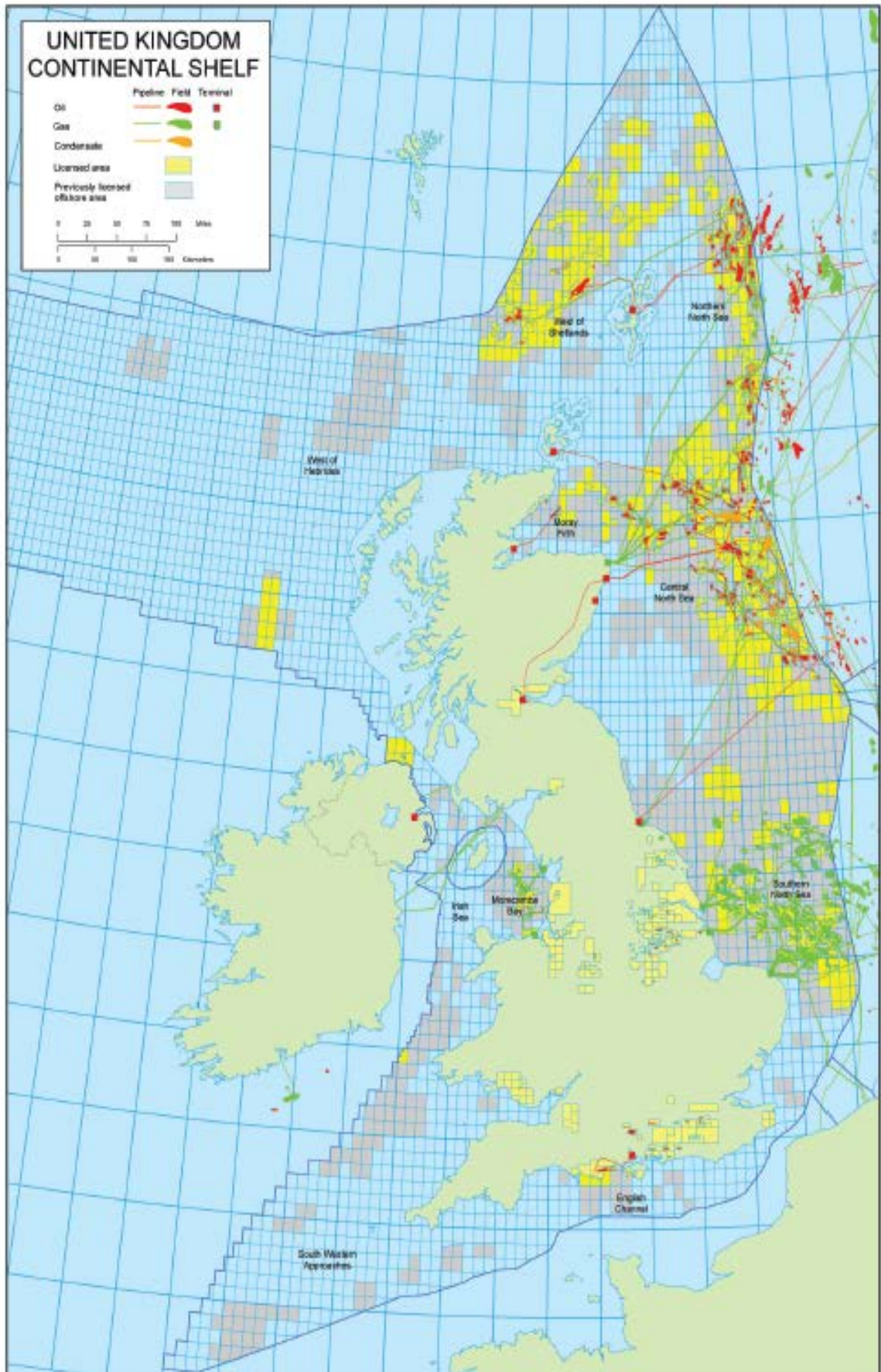
We have a unique challenge perhaps in the North Sea compared to some other basin's, where the infrastructure is so highly interconnected and so there can be unintended consequences: when one field goes down early, it could take out other fields.

Because they then all share infrastructure, and particularly the cost of maintaining that infrastructure, it can load up costs on other parts of the system and before long we can end up in a very grave situation. We are working very hard, for example in the northern North Sea, with a large number of operators to try to reverse some of those effects, but it is very difficult.⁶⁴

The map on the following page shows the current extensive number of producing oil and gas fields and pipelines in the UKCS.

⁶³ Sir Ian Wood [UKCS Maximising Recovery Review: Final Report](#). 24 February 2014

⁶⁴ ECC Committee [OGA oral evidence](#) 3 November 2015



5.2 Pressure on employment levels in the oil and gas industry

The collapse in oil prices from mid-2014 has led many UKCS operators to reassess their investment programmes and some have indicated that they are likely to reduce the number of employees as a consequence.⁶⁵

For example the *BBC* reported in January 2015:

BP has announced it is to cut 200 jobs and 100 contractor roles in the North Sea following a review of its operations.

It follows similar announcements by companies including ConocoPhillips, Chevron and Shell in recent months. The Chancellor has said he will look at new measures to support the industry in his next budget in March 2015.⁶⁶

Since then more companies have reported that they are to reduce employment in oil and gas production in the UK. For example in July 2015, the *Independent* reported

The damage being inflicted by the slump in the oil price was laid bare yesterday as Royal Dutch Shell and the British Gas-owner Centrica announced more than 12,000 job cuts between them.

Centrica is shedding 6,000 jobs, mainly in the UK, while Shell said it would axe 6,500 staff and contract positions worldwide this year, including 750 in the North Sea.⁶⁷

In September 2015, the Oil and Gas UK [Economic Report 2015](#) said:

Difficult decisions have had to be made across the industry. We estimate that employment supported by the sector has contracted by 15 per cent since the start of 2014 to 375,000 jobs. It is likely that capacity may have to be reduced still further in order for the business to weather the downturn.

5.3 Falling UK Government revenue

The Office of Budget Responsibility (OBR) provide updated public finance forecasts taking account of the latest views of energy prices and oil and gas production.⁶⁸

The OBR set out the difficulties of estimating future Government petroleum revenues as follows:

Receipts from oil and gas production are one of the most volatile streams of revenue coming into the Exchequer and therefore one of the most difficult areas of the public finances to forecast.

This reflects the number and nature of the factors that determine these revenues – the levels of oil and gas production, the global dollar oil price, the sterling/dollar exchange rate, the level of capital and operating expenditure in the industry, policy changes and the likelihood that individual firms will pay tax on newly generated profits given their past history of profits and losses.

⁶⁵ Westminster Hall Debate on 20 January 2015 on [North Sea oil and gas employment](#).

⁶⁶ BBC Online [BP announces North Sea job cuts](#) 15 January 2015

⁶⁷ Independent [Centrica and Shell cut 12,000 jobs as oil price collapse takes its toll](#) 31 July 2015

⁶⁸ For further discussion of the history of taxation of North sea oil and gas see Commons Library Briefing paper [Taxation of North Sea oil](#) (29 May 2015)

Most of these determinants are very difficult to predict in their own right, even over a very short time horizon.⁶⁹

The 2015 Budget set out significant reductions in government revenue from oil and gas production. The table below shows how these changes were made up.⁷⁰

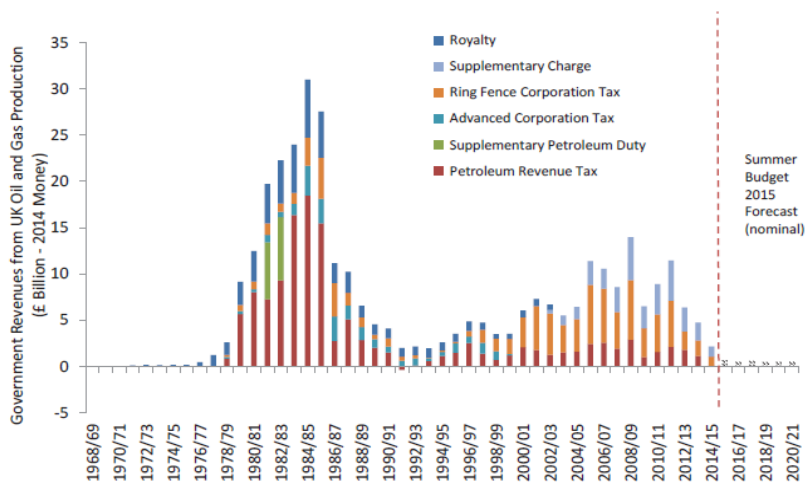
Table 4.2: Key changes to the medium-term oil and gas revenues forecast since March 2014

	£ billion				
	2014-15	2015-16	2016-17	2017-18	2018-19
March 2014	3.7	3.8	3.2	3.4	3.5
March 2015	2.6	0.7	0.6	0.7	0.8
Change	-1.1	-3.1	-2.6	-2.7	-2.7
of which:					
Sterling oil prices	-0.5	-1.8	-1.3	-1.0	-1.1
Gas prices	-0.6	-0.7	-0.6	-0.6	-0.6
Production	0.1	-0.2	-0.5	-1.1	-1.6
Expenditure	0.1	0.6	0.9	1.2	1.9
Modelling and outturn receipts	-0.2	-0.8	-0.6	-0.8	-1.0
Measures	0.0	-0.3	-0.5	-0.4	-0.4

Detailed information on the March 2015 Budget changes in taxation of offshore oil and gas fields can be found in the Library Note [Taxation of North Sea oil](#) (29 May 2015).

The changes in the UK Government revenue from oil and gas production since 1968/69 are shown below

Figure 19: Production Tax Revenues and HM Treasury Forecast



Source: HM Treasury, Office for Budget Responsibility

Indeed it looks as though the outturn for 2015-16 will be even lower than predicted by the OBR. The Guardian reported HMRC figures for the first six months (April to September 2015).

⁶⁹ Office of Budget Responsibility [Fiscal sustainability report](#) June 2015 Chapter 4

⁷⁰ *Ibid*

The latest forecasts suggest revenue in 2015-16 will be lower than forecast. The OBR's [Economic and fiscal outlook](#) published with the Autumn Statement on 25 November 2015 said

Our forecast for UK oil and gas revenues is just £130 million in 2015-16, down from £2.2 billion in 2014-15 and receipts of just under £11 billion four years earlier. Receipts of petroleum revenue tax (PRT) in the first seven months of 2015-16 were minus £222 million as PRT repayments more than offset PRT payments. High levels of PRT repayments relate to reclaim previously paid tax. We expect high PRT repayments to continue through 2015-16.

Compared to July, our forecast for oil and gas revenues is lower in all years. Lower oil and gas prices for the first two years and then held flat in nominal terms. This leaves them \$8 a barrel lower in 2015 and \$12 a barrel lower in the medium term than in our July forecast.

Gas prices are expected to be 2.5p a therm lower in 2015 and then between 7p and 8p a therm lower over the rest of the forecast. In light of lower prices, we have assumed that capital and operating expenditure drop by more than was assumed in July.

Our central forecast is that oil and gas revenues remain very low throughout the forecast. This remains subject to significant uncertainty, including about the extent to which the much lower oil and gas prices will affect production and expenditure and how much the new investment allowance and cut to the supplementary charge and PRT rates announced in March 2015 will provide an offset by boosting post-tax returns on oil and gas extraction.⁷¹

5.4 Pressure on security of supply

The Coalition Government set out the importance of gas and oil to the UK in its December 2014 [Statutory Security of Supply](#) report

Security of supply - Gas

2.65 Analysis shows that the UK gas market has enough capacity and deliverability to meet demand; this was particularly evident during the prolonged GB winter of 2012/13. The mild winter experienced in 2013/14 also reminds us that the gas market has to cope with a range of supply/demand scenarios and that the market itself is best placed to allocate risk and weigh up the 'correct' level of capacity redundancy which delivers the best value for consumers.

2.66. There is continued awareness and action around the uncertainty of future levels of gas supply and demand at both the GB and global levels. These are affected by factors such as the impact of government policy, changes in consumer behaviour, economic growth and the future profile of the UK energy mix. The Government sees the potential for a bigger role for unconventional gas in the UK energy mix, and is ensuring that the regulatory framework facilitates exploration activity while focussing on safety and the environment. It is still too early to predict the extent to which production will be commercially viable.

⁷¹ OBR [Economic and fiscal outlook](#) 25 November 2015

2.67. Cross border and international relationships continue, with gas coming into GB from around the globe via LNG shipments, interconnectors with mainland Europe, pipelines from Norway and the UKCS. These varied sources work to enhance gas security. Ofgem's revision to the cash-out scheme to sharpen the incentives on gas market participants to match demand and supply are intended to encourage investment in measures to enhance security of supply. The implementation of EU Network Codes additionally strengthens the GB position.

Security of supply outlook – Oil

3.29. The UK relies on oil products to meet a considerable portion of its energy needs. Oil demand is expected to stay relatively constant in the UK in the short to medium term, which is at least to 2030, according to the current projection. Over time, technology changes, including electric vehicles and the generation of more heat from renewables, together with Government energy efficiency policies such as seeking to encourage greater use of public transport, should reduce demand for oil. The timing and scale of these demand decreases is uncertain.

3.30. Globally, oil demand is anticipated to increase in the run up to 2035, driven by emerging economies. Global production is expected to become more challenging during this timeframe, and the UK will become ever more exposed to global oil markets, as its requirements for imports increase. In order to respond to this the UK works to promote efficiency and transparency in the world market while diversifying domestic energy supply.

3.31. The UK is still the largest oil producer in the EU, although the UK's production of crude oil and natural gas liquids is decreasing. Production in 2013 showed an 8.8% reduction on 2012 and is now just under 30 % of 1999 production. This long term trend will continue, but with a slower rate of decline in production over the next 20 years, as government has put in place a range of measure to maximise UK production following record investment in the UK continental shelf in 2012/13.

3.32. In 2013, less than 20% of UK crude oil production was used by UK refineries. Around 65% of the UK's crude imports have, until recently, come from Norway. This decreased to 40% in 2013, due to the declining reserves there, resulting in a significant increase in imports from the OPEC countries.

3.33. The UK remains a significant producer of refined products, producing more gasoline, fuel oil and gas oil than it needs but insufficient quantities of diesel road fuel and jet fuel. The UK is a net exporter of petroleum products.⁷²

5.5 Decommissioning

Industry body *Oil & Gas UK* has highlighted accelerated decommissioning of old infrastructure as one of the major challenges for the offshore oil and gas industry:

Decommissioning - much of the infrastructure in the North Sea is more than 25 years old and requires substantial ongoing investment if it is to remain technically and commercially viable. It is the industry's goal to prolong the life of existing infrastructure for as long as economically feasible so that it may be used to access reserves in nearby marginal fields and, possibly, subsequent

⁷² DECC and Ofgem, [Statutory Security of Supply Report 2014](#), October 2014

re-use for activities such as carbon or natural gas storage. However, there are three issues which have the potential to accelerate the rate of decommissioning of UKCS infrastructure. These are:

- Industry concerns about the fiscal risk regarding future access to tax relief on decommissioning costs.
- The impact on investment of providing decommissioning security on a gross cost basis rather than a net-of-tax basis.
- Phase III of the EU emissions trading scheme (EU ETS) which will significantly increase the costs of operating mature assets with declining production.

Decommissioning refers to the point in time when production of oil or gas ceases. Decommissioning is an integral part of the life cycle of oil and gas assets. Owners of offshore field infrastructure, including the platforms, processing plant and pipelines, are obliged by the [Petroleum Act 1998](#) (Part IV) to have in place an abandonment of infrastructure plan when it wishes to decommission its facilities and is subject to approval by the Secretary of State.

With its substantial scale and costs (see Box 1), decommissioning is of fundamental importance to operators.

Box 1: The scale of decommissioning on the UKCS

- 4,000 wells to plug & abandon
- 290 fixed platforms
- 33 floating installations
- 370 subsea wellhead & structures
- 20,000 km of pipelines

Source: Oil and Gas Authority

With the expected continuing overall decline in UKCS oil and gas production as fields reach the end of their economic life, the pace of decommissioning of these fields will likely accelerate. Indeed the average age of North Sea installations is around 25 years.⁷³

There are a small number of major decommissioning projects now under way. Upcoming projects listed on the Department of Energy & Climate Change's (DECC) Pathfinder [website](#) include the Brae area, Brent, Miller, Murchison and Thames.⁷⁴

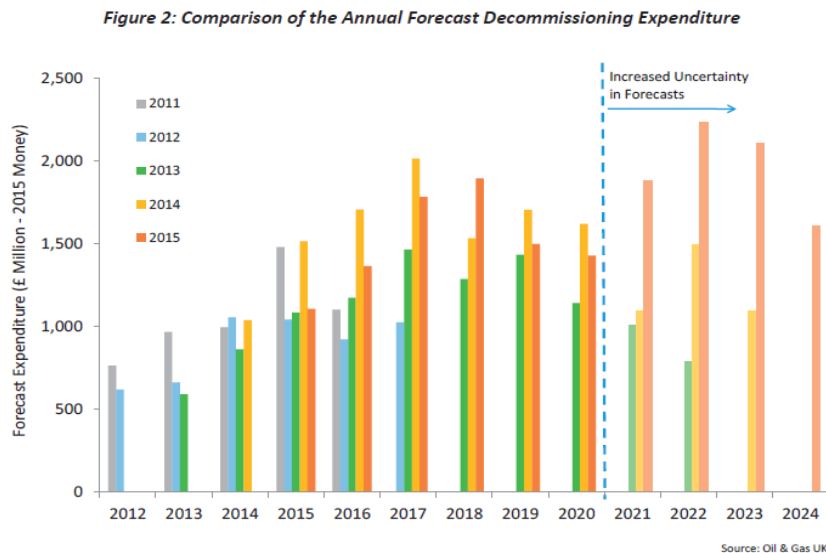
A report from Wood Mackenzie forecast 150 UK field closures by 2020 even if the oil price returns to \$85 per barrel.⁷⁵

⁷³ Arup [Decommissioning in the North Sea](#) October 2014

⁷⁴ Oil and Gas UK [Decommissioning Report 2015](#), November 2015

⁷⁵ BBC Online [North Sea could lose 150 platforms within 10 years](#) 7 February 2016

Oil and Gas UK has forecast decommissioning expenditure and the following is taken from its 2015 survey it compares forecasts over its surveys for 2011 to 2015 and indicates an overall acceleration in activity.⁷⁶



In its latest Activity Survey 2016, Oil & Gas UK say:

- in 2015, 21 fields ceased production in part due to the worsening market outlook.
- a further 80 fields are expected to cease production by the end of the decade.
- just over £1 billion was spent on decommissioning activity in 2015, similar to 2014.
- decommissioning expenditure is expected to be around £1.5 billion in 2016, rising to over £2 billion by 2017 and could match capital expenditure by the end of the decade.⁷⁷

Costs of decommissioning

The Wood review estimated that decommissioning will cost more than £35 billion (in 2012 money) over the 30 years from 2014 to 2044; though some estimates put the costs as high as £50 billion. The two elements with the highest costs are well plugging and abandonment and offshore facilities lifting and transportation to shore.⁷⁸

Whilst the industry will carry out the decommissioning, more than half the costs (estimated by Sir Ian Wood at around 60%) will ultimately be borne by the Government through tax relief. Therefore improvement to decommissioning performance could impact on public finances; for example a 25% reduction in costs could save the Treasury around £5 billion (2013 money).⁷⁹

⁷⁶ Oil and Gas UK [Decommissioning Report 2015](#), November 2015

⁷⁷ Oil & Gas UK [Activity Survey 2016](#) February 2016

⁷⁸ Sir Ian Wood [UKCS Maximising Recovery Review: Final Report](#), 24 February 2014

⁷⁹ Ibid

The Wood review said that the OGA will need to ensure that decommissioning is executed in a safe and environmentally sound and cost effective manner (consistent with the UK's international legal obligations) with sufficient early planning and co-ordination.

DECC's impact assessment said:

Under taxation rules, elements of the costs of decommissioning of oil and gas facilities and wells fall to the taxpayer. We are considering options for decommissioning to be planned and carried out at least cost (while still meeting environmental and health and safety requirements) to protect the taxpayer's interests, and for ensuring that decommissioning is carried out in a timely manner in accordance with MER UK principles.⁸⁰

HMRC reported in its [Annual report for 2014-15](#) as follows

Industry estimates of decommissioning costs are assumed to be the best available, though where provisions are shown in oil company accounts, the considerable level of uncertainty inherent in the cost estimating process is made clear.

From the Oil and Gas UK survey reports the total costs of decommissioning for the period 2015-16 to 2019-20 are estimated to be £9 billion and for the period 2020-21 to 2040-41 the estimate is £32 billion, in today's prices.

From this information the impact on PRT tax receipts for the two periods is estimated to be a cost to the Exchequer of £1.7 billion and £5.8 billion respectively. The total amount of £7.5 billion (£3.1 billion in 2013-14) is included in the provision for liabilities table.

The provision is subject to a considerable level of uncertainty, being calculated using oil and gas survey information, itself an aggregation of industry acknowledged uncertain data. In addition to uncertainties around the cost of decommissioning, the timing of when those costs will be incurred is also uncertain and will be dependent on factors such as oil prices, which will have a bearing on how long a field will be able to generate profit and, therefore, on when it will be decommissioned.

Avoidance of 'stranded' assets

The Wood review made it clear that it will be important for the OGA to ensure that key assets are not decommissioned prematurely to the detriment of production hubs and infrastructure and thereby achieve maximum economic extension of field life.⁸¹

This view was supported recently by one North Sea operator who said that

[] without support in the budget "people will decide to accelerate decommissioning of platforms" in the relatively high-cost North Sea.

The problem is once you decommission a platform all the satellite deposits around them can never be economic," he said. "Normally you have one central piece of equipment that gets built for a big field and then over time all the little ones feed into it and

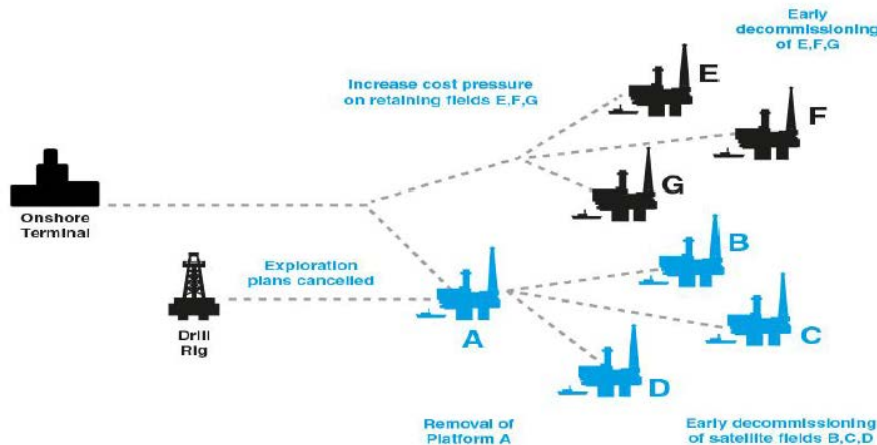
⁸⁰ DECC [Energy Bill – Oil and Gas Authority \(OGA\) Measures Impact Assessment](#), 17 June 2015

⁸¹ Sir Ian Wood [UKCS Maximising Recovery Review: Final Report](#), 24 February 2014

keep it going. If you take that infrastructure away, all the little ones cannot be developed. They just become sub-economic.⁸²

The issue of possible 'stranded' assets is illustrated in the following schematic diagram

Schematic diagram of offshore fields and infrastructure



If the operator and owner decides to decommission Platform A, it will mean early decommissioning of fields B, C and D and increase the cost pressures on fields E, F and G while leading to cancellation of plans for exploration at the satellite platform to the original platform A.

The Wood Review proposed further powers for the OGA and these are detailed in the commentary in the Library [Briefing note](#) on Part 3 of the *Energy Bill (2015-16)*

The DECC website has further guidance on offshore decommissioning.⁸³

Business opportunities

As decommissioning progresses, the UK has the potential to gain a significant competitive industrial capability that can be 'exported' to other oil and gas provinces over time.⁸⁴

In its announcement of support for the oil and gas industry on 28 January 2016, the Government said

As decommissioning is a fact of life in a mature basin, the Oil and Gas Authority will publish a UKCS Decommissioning plan by the early summer, that will enable the £15bn Aberdeen service sector to become the centre of a new global market for decommissioning and help UK firms to be ready to capitalise on the huge opportunities that are coming in the years ahead. This will be supported by the Natural Environment Research Council who are investing up to £1m in new projects to support the development of expertise in the UK on decommissioning and its environmental management.⁸⁵

⁸² The Times [North Sea oilfields 'face closure without tax cuts'](#) 1 February 2016 [subscription required]

⁸³ DECC [Oil and gas: decommissioning of offshore installations and pipelines](#) updated 6 August 2015

⁸⁴ Sir Ian Wood [UKCS Maximising Recovery Review: Final Report](#) 24 February 2014

⁸⁵ DECC [Prime Minister announces further boost for UK oil and gas industry](#) 28 January 2016

5.6 Long term future for offshore oil and gas

The previous sections looked at the medium term challenges facing the UK offshore oil and gas industry, this section discusses the long term future for the sector.

Any discussion of the longer term must recognise the considerable uncertainties; these are likely to include:

- the impact of the development of new economically viable UK onshore gas and oil resources such as shale gas and oil, biogas, biomass fuels, coal bed methane and even underground coal gasification;
- the impact of growing investment in renewables on demand for oil and gas and in changes to fuels used for transport (eg growing use of electric vehicles);
- the impact of the growing 'divestment movement' that seeks to persuade investors to change their investment portfolios from fossil fuel companies to those investing in alternative resources such as renewables together with the growing regulatory pressures to reduce greenhouse gas emissions and reduce dependence on fossil fuels. This has led some to suggest a 'carbon bubble' may emerge; the theory, warns that fossil fuel assets, such as oil and gas and coal, could be significantly devalued if a global deal to tackle climate change is reached.⁸⁶

The OBR's [Financial Sustainability Review](#) in June 2015 provided estimates of UK Government petroleum tax revenues from future oil and gas production.

The OBR said:

- Our central long term assumption is that production falls by 5 per cent a year from 2020 onwards.
- For our low production scenario we assume a 7.8 per cent a year fall – in line with the average pace of decline since 2000. If recent high levels of investment boost production, we may see current levels maintained over a longer period.
- Our high production scenario sees production remaining as we expect in 2019 for a further 5 years, with a fall of 5 per cent a year thereafter, in line with the assumption in the year thereafter, in line with the assumption in the central projection.

For oil and gas reserves, the OBR said:

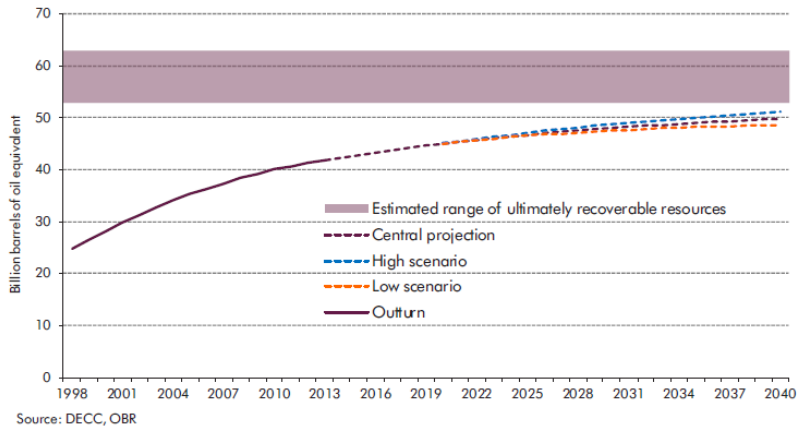
Over the long term, recoverable reserves are clearly on a declining path as the basin matures and resources are exhausted or become increasingly difficult or uneconomic to extract. DECC produces a range of estimates of remaining oil and gas reserves, based on technical and commercial viability under current conditions.

The following shows the cumulative production forecasts implied by OBR's scenarios against the estimated level of ultimately recoverable reserves produced by DECC as at the end of 2013. In all their scenarios,

⁸⁶ The risks from a possible 'carbon bubble' were discussed by the Environmental Audit Committee in its report [Green Finance](#) (paras 27-31) HC191, 6 March 2014

significant recoverable reserves remain by the end of the projection period. This implies scope for higher production if conditions were sufficiently favourable, or for production to continue for a number of years beyond our projection period.

Chart 4.9: UK oil and gas reserves and production



The OBR concluded:

Over the longer term, we can be more confident that oil and gas receipts [by the UK Government] are on a declining trend as production from the UK continental shelf moves towards its ultimately recoverable capacity. But the same factors that make receipts volatile on a year-to-year basis make it very hard to predict the pace of the decline with any confidence. The production and price variants in this chapter give some sense of the uncertainties. But even an assumption of higher production and oil prices reaching around \$210 a barrel leaves revenues as a share of GDP at a fraction of the levels seen in the past 10 years.⁸⁷

The OECD's International Energy Agency in its [World Energy Outlook 2014](#) broadly supported the outlook for oil and gas output set out by the OBR:

Oil production in OECD Europe is expected to drop to 2.2 million barrels per day [mb/d] by 2040 compared with 3.3 mb/d today.

This is despite efforts to increase recovery and develop new, smaller deposits in the North Sea, as well as more remote fields on both the United Kingdom and Norwegian sides. These bear fruit in the medium term, but are not sufficient to stem the underlying difficulties and rising costs of this mature producing area. We do not anticipate any significant unconventional oil production in Europe.⁸⁸

Among Europe's major gas producers, Norway sees only a slight decline in output between 2012 and 2040, while Netherlands gas production plunges steeply to around 20 billion cubic meters (bcm) by 2040, due to the decline of the giant Groningen field after 2020 (output is also capped by government mandated restrictions following recent seismic events).

⁸⁷ Office of Budget Responsibility [Fiscal sustainability report](#) June 2015 Chapter 4

⁸⁸ IEA [World Energy Outlook 2014](#), November 2014, Chapter 3, page 123

The decline in European gas supply would be even more pronounced if it were not for some unconventional output, mainly in Poland and the United Kingdom.

However, the contribution of unconventional supply to domestic European production remains modest: in the EU, unconventional gas contributes 17 bcm to the outlook by 2040, some 15% of total production and only 3% of total demand. The resource base would support significantly higher levels of output, but we expect the industry to face an uphill struggle to gain public and political acceptance in many countries.⁸⁹

Finally, the OGA said that they expected a general decline in production over the long term. In oral evidence to the ECC Committee on 3 November 2015, the OGA said

In terms of the long-term trend we are in a declining basin. Although, currently we are seeing a slight reversal: a 3% increase so far, year to date, which is encouraging but, overall, it is a decline. Clearly the levels of investment that the industry enjoyed—and some would argue perhaps they were too high—were up to £14 billion. Oil & Gas UK estimate that dropping to £3 billion over a short number of years. Without the new investment, without the continued exploration and discoveries it is not obvious how that decline would be reversed. Basins do come to an end.⁹⁰

⁸⁹ IEA *World Energy Outlook 2014*, November 2014, Chapter 4 page 147

⁹⁰ ECC Committee [OGA oral evidence](#) 3 November 2015

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