

Estimates of Undiscovered Resources 2015

The methodology for estimating undiscovered resources examines potential resources in mapped leads. In areas where detailed mapping has been carried out, mapped leads are analysed by standard statistical techniques to obtain estimates of resources in each basin. Geological risk is assigned by play and also to each individual lead. For each geological basin, the risk factors are calibrated to drilling results. In the West of Scotland area there is insufficient mapping of leads and prospects so an estimate is made based on knowledge of the geology of the area.

In earlier years, only leads mapped by OGA (DECC) were used to generate estimates of undiscovered resources. Since end 2003, leads and prospects mapped by oil companies have been added. These are mainly extracted from Licence Round application documents and Fallow Block submissions. The mapping done by OGA does not cover the entire UKCS systematically and company data have provided valuable additional information, particularly in the mature licensed areas where OGA mapped leads and prospects are relatively sparse.

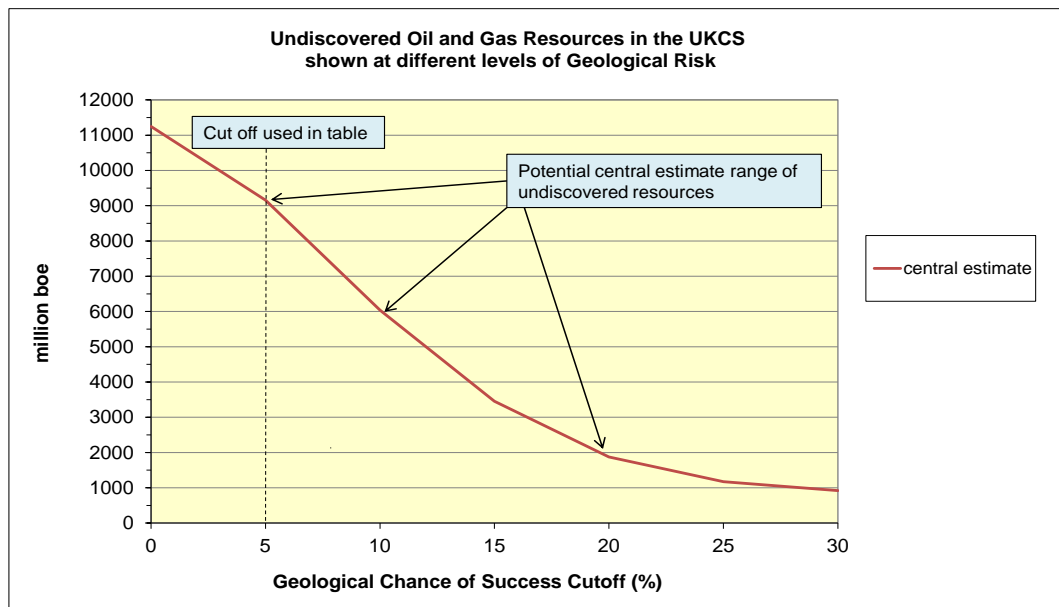
The database has been updated to take account of the new drilling and mapping that took place in 2014 and existing leads have been revised or deleted where necessary to fit with new industry-generated information. OGA and industry leads continue to be re-risked according to drilling results and the highest risked leads (less than 1 in 20 geological chance of success) are excluded from the tabulated estimates below as these are considered very unlikely to be de-risked to the level that will enable them to be drilled.

Estimates of Undiscovered Recoverable Resources on the UKCS⁽¹⁾ as at end 2014 by Geological Area [figures in brackets for end 2013]

Area	Range of estimated resources ⁽²⁾⁽³⁾⁽⁴⁾⁽⁵⁾					
	Oil (million tonnes)			Gas (billion cubic metres)		
	Lower	Central	Upper	Lower	Central	Upper
Northern North Sea, (59°N-62°N) ⁽⁶⁾	70 [72]	112 [112]	169 [165]	19 [18]	33 [33]	62 [65]
Central North Sea, (56°N-59°N) ⁽⁶⁾	305 [301]	407 [399]	540 [526]	169 [155]	245 [227]	359 [337]
Southern North Sea, Irish Sea and Celtic Basin	0 [0]	0 [1]	31 [15]	91 [88]	118 [118]	155 [168]
West of Shetland	62 [74]	143 [163]	270 [302]	70 [81]	132 [150]	218 [237]
West of Scotland ⁽⁷⁾	0 [0]	67 [67]	267 [267]	14 [14]	42 [42]	170 [170]
Land	7 [6]	21 [17]	43 [37]	2 [0.5]	7 [3]	24 [12]
Other areas of the UKCS	0 [0]	2 [0]	24 [19]	0 [0]	1 [0.4]	12 [8]
Total	444 [453]	752 [759]	1344 [1331]	365 [357]	578 [573]	1000 [997]
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Total oil (million barrels), gas (tcf)	3330 [3398]	5640 [5691]	10080 [9983]	12.9 [12.6]	20 [20]	35.3 [35.2]

- Notes
- (1) Includes onshore and offshore assessments.
 - (2) All entries are rounded to the nearest one million tonnes of oil or to one billion cubic metres of gas.
 - (3) Every offshore lead or prospect included in the detailed analysis on which this table is based was estimated to contain resources of at least 1.33 million tonnes (10 million barrels) or 0.57 billion cubic metres (20 billion cubic feet) of gas. For prospects in West of Shetland the minimum size is at least 4 million tonnes of oil (30 million barrels) or 5.7 billion cubic metres of gas (200 billion cubic feet). For prospects in East Midlands Basin onshore the minimum size is 0.67 million tonnes (5 million barrels)
 - (4) The figures in the table have the highest risk prospects removed.
 - (5) The conversion factors used are 7.5 barrels/tonne for oil and 35.31 bcf/bcm for gas.
 - (6) In these areas, gas is associated with oil and condensate.
 - (7) Area where detailed studies are limited or not carried out.

The undiscovered oil resources have decreased during 2014. Re-assessment of existing prospects and leads has reduced the overall volumes. New drilling also removed volumes from the undiscovered total. Undiscovered gas resources increased in 2014 but overall, there is a reduction of 27 million barrels of oil equivalent in oil & gas undiscovered resources.



The prospects and leads used to generate the estimates of undiscovered resources include many with high geological risk. The chart above shows how estimates of resource vary according to the level of geological risk chosen as a cut off: on the left all leads are included and at the right only those leads with a better than 30% geological chance of success. The figures quoted in the table have the highest risk leads removed and lie at or better than the 5% geological chance of success cut off. While it is unlikely that many leads with such high levels of risk will be drilled in the immediate future, a key part of the exploration process is to work continually to de-risk leads. Commercially recoverable reserves will strongly

depend on whether leads are sufficiently de-risked to drillable levels. To be consistent with previous years' analyses, very small leads and prospects have been excluded from the table (see footnote 3).

Looking at the long term potential of the UKCS, based on the chart above, the central estimate at 20% (1 in 5) of 1.9 billion barrels of oil equivalent is what could be expected based on recent drilling activity. The central estimate at 10% (1 in 10) geological chance of success of 6.0 billion barrels of oil equivalent is considered a reasonable estimate based on current knowledge. With better understanding of the basins or better technology, the central estimate at 5% (1 in 20) chance of success of 9.2 billion barrels of oil equivalent is considered possible.

Estimates of undiscovered resources must be treated with caution. They provide only a broad indication of the ultimate remaining potential. The limits of these ranges should not be regarded as minima or maxima. The mid range figures do not imply that these volumes are the most likely to be discovered.

Preliminary estimates of unconventional gas and oil resources are made in the following reports:

Unconventional hydrocarbon resources of Britain's onshore basins (coalbed methane) page 3:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66171/promote-uk-cbm.pdf

A BGS/DECC report on the resource potential of Jurassic shale of the Weald Basin was published on 23 May 2014. The potential is recognised for oil resources and not gas.

<http://www.bgs.ac.uk/shalegas/#ad-image-0>

A report (June 2013) from the British Geological Survey (BGS) in association with DECC has completed an estimate for the gas-in-place of shale gas in part of central Britain in an area between Wrexham and Blackpool in the west, and Nottingham and Scarborough in the east:

<http://www.bgs.ac.uk/research/energy/shaleGas/bowlandShaleGas.html>

All these reports are available on:

<https://www.gov.uk/oil-and-gas-onshore-exploration-and-production>

This shale gas estimate is a gas-in-place figure and so represents the gas that we think is present, but not the gas that might be possible to extract. The proportion of gas that it may be possible to extract is unknown as it depends on the economic, geological and social factors that will prevail at each operation. It will not be possible to make meaningful estimates of shale gas reserves until there is much more data available on actual

production experience from a number of UK wells. This is also the case for the Weald oil shale resource estimates.