



Oil & Gas
Authority

Projections of UK Oil and Gas Production and Expenditure

March 2018

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Introductory summary

The 2016 oil and gas production rate of 1.63 million barrels of oil equivalent (boe) a day was sustained into 2017. Cumulative UK production from 2016 – 2050 is now projected to be 2.8 billion boe higher than the pre-Wood Review baseline.

Figures for 2017



Oil and Gas Production
1.63 million boe/day

No Significant Change*

UKCS production was maintained at a level not seen since 2011. This was despite the closure of the Forties Pipeline System in December, without which production would have increased slightly. Production is projected to increase in 2018 as new fields come online.



OPEX / UOC
£6.9 billion / £11.7 per boe

+3% Annual Change*

Total operating cost (OPEX) rose marginally in 2017, however it is still 27% below the 2014 high. After 2018, OPEX is expected to fall with production, stabilising what is now considered a more sustainable level of unit operating cost (UOC).



CAPEX
£5.6 billion

Medium Term Outlook up 11%
on Sept 2017 Projection**

Capital expenditure (CAPEX) fell significantly for the third consecutive year and is expected to continue to fall for the foreseeable future. Despite this decrease, forecasts for later years are slightly higher than previously published.



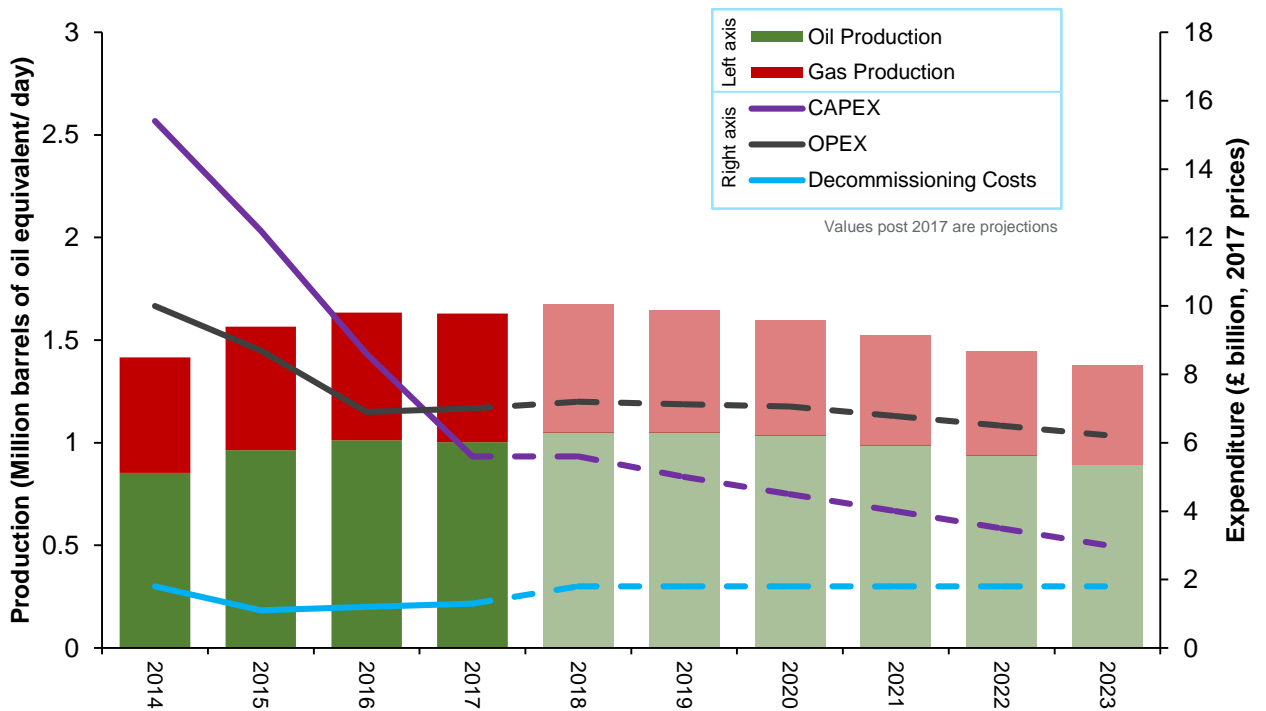
Decommissioning Costs
£1.3 billion

Medium Term Outlook down
12% on Sept 2017 Projection**

Decommissioning costs rose 4% in 2017 from 2016 and are expected to stay at around current levels in the medium term. The latest decommissioning cost projection to 2022 is slightly lower than the previous estimate.

Actual/ Projected UK Production and Expenditure

Source: OGA

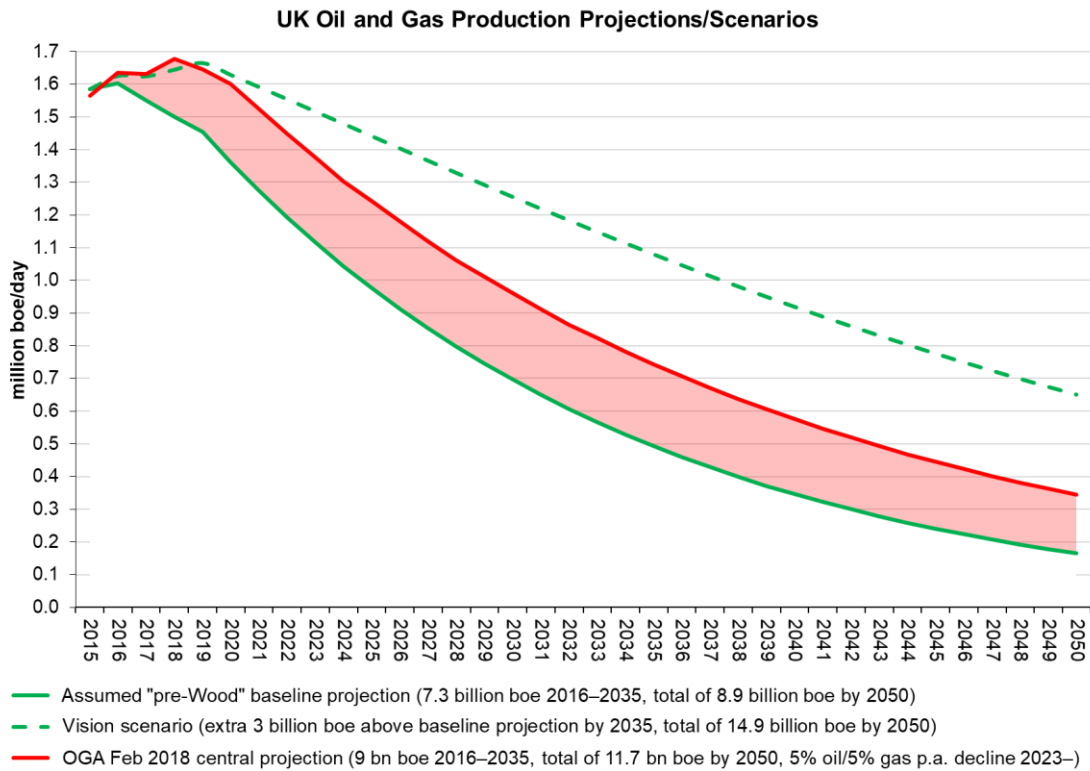


* Refers to the difference between 2016 and 2017 actual values

** Refers to the difference between this latest projection and the previous one for the period of 2018 – 2022

Long Term Production Projection

Based on central production projections, cumulative production from 2016 to 2050 is now forecast to be 2.8 billion barrels of oil equivalent (boe) more than it would have been in the absence of implementation of the recommendations in [UKCS Maximising Recovery: Final Report](#) (2014) by Sir Ian Wood. This is represented by the red area in the chart below. The “pre-Wood baseline” and “Vision scenario” production profiles charted below are consistent with the respective MER UK gross production revenue lines in the “big opportunity” chart on page 5 of [Vision 2035](#).



The difference between the “pre-Wood baseline” and the current projection has been supported by a number of OGA and Industry led initiatives contributing to the additional 2.8 billion barrels to 2050, including:

- A sustained focus on production efficiency (PE) which has resulted in a UKCS PE value of 73% in 2016.
- A drive to make the UKCS more cost efficient, reducing UOC by over a third from the 2014 peak.
- Improved asset stewardship standards and behaviours driving up levels of collaboration.
- The start up of 33 new fields since 2014.

The future potential of the basin could be boosted further through investment, exploration successes and resource progression. The OGA is supporting this through emphasis on the revitalisation of exploration, the implementation of area plans and promoting the development and adoption of new technologies.

Notes

1. The production projections are informed by detailed field-by-field data provided to the OGA by the current operators of each field in early 2018.
2. This report includes updated estimates for earlier years.

Updated Medium Term Projections of UK Oil and Gas Production and Expenditure

The following table gives the OGA's latest projections of UK production of crude oil, natural gas liquids (NGLs) and natural gas for the period 2018 to 2023; the projections for gas relate to net production available for sale. Projections are also included for expenditure over the same period together with updated estimates for earlier years. The projections and the estimates of expenditure, which have been provided to the [Office for Budget Responsibility](#) ahead of the [Chancellor's Spring Statement](#) on 13 March 2018, are based mainly on information from the OGA's [UKCS Stewardship Survey](#).

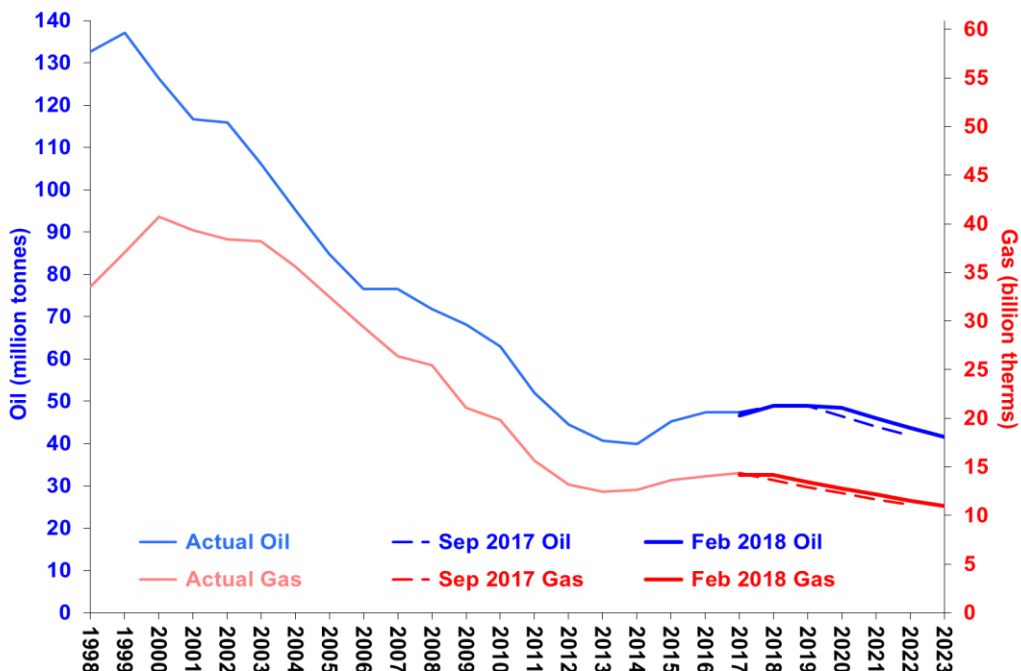
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Change 2016 to 2017
Production											
Crude Oil (million tonnes)	37.47	42.83	44.31	43.14	45.64	45.64	45.19	42.93	40.78	38.74	-2.6%
NGLs (million tonnes)	2.45	2.46	3.14	3.47	3.30	3.30	3.26	3.10	2.94	2.80	10.6%
Oil (million tonnes)	39.93	45.29	47.44	46.61	48.94	48.94	48.45	46.03	43.73	41.54	-1.8%
Oil (mtoe)	43.71	49.54	51.95	51.06	53.62	53.62	53.08	50.43	47.90	45.51	-1.7%
Gross Gas (mtoe)	35.73	38.82	39.75	39.98							0.6%
Net Gas (mtoe)	31.83	34.43	35.45	35.74	35.74	33.95	32.25	30.64	29.11	27.65	0.8%
Net Gas (billion therms)	12.63	13.66	14.07	14.18	14.18	13.47	12.80	12.16	11.55	10.97	0.8%
Oil & Net Gas (mtoe)	75.54	83.97	87.40	86.80	89.35	87.56	85.33	81.06	77.01	73.16	-0.7%
Production Rate											
Crude Oil (million bbl/day)	0.78	0.89	0.91	0.89	0.94	0.94	0.93	0.89	0.84	0.80	-2.4%
NGLs (million bbl/day)	0.08	0.08	0.10	0.11	0.10	0.10	0.10	0.10	0.09	0.09	10.9%
Oil (million bbl/day)	0.85	0.96	1.01	1.00	1.05	1.05	1.03	0.99	0.94	0.89	-1.1%
Gas (million boe/day)	0.56	0.60	0.62	0.63	0.63	0.60	0.57	0.54	0.51	0.49	1.1%
Total (million boe/day)	1.42	1.57	1.63	1.63	1.68	1.64	1.60	1.52	1.45	1.38	-0.3%
	2017 prices										
Expenditure (£ billion)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Exploration & Appraisal (E&A)	1.46	0.98	0.46	0.64	0.60	0.70	0.65	0.65	0.65	0.65	
Capital Expenditure	15.45	12.17	8.63	5.61	5.60	5.00	4.50	4.00	3.50	3.00	
Operating Costs	10.02	8.65	6.93	6.98	7.20	7.13	7.06	6.78	6.50	6.22	
Decommissioning	1.77	1.12	1.23	1.26	1.80	1.80	1.80	1.80	1.80	1.80	
Total Expenditure	28.70	22.92	17.25	14.50	15.20	14.63	14.01	13.23	12.45	11.67	
Average Unit	(£/boe)	19.4	15.1	11.6	11.7	11.8	11.9	12.1	12.2	12.3	12.4
Operating Cost	(\$/boe)	31.9	23.1	15.7	15.1						
Average Brent	(£/boe)	60.0	34.3	32.5	42.2						
Oil Price	(\$/boe)	98.9	52.4	44.0	54.4						

NGLs = natural gas liquids; mtoe = million tonnes of oil equivalent; 1 mtoe = 11.63 TWh;
 1 TWh = 1/29.3071 billion therms; bbl = barrels; boe = barrels of oil equivalent;
 net gas production = gross gas production less producers' own use;
 average Brent oil price = annual average BFOE (Brent-Forties-Oseberg-Ekofisk) spot price

The production projections are based on detailed field-by-field data provided to the OGA by the current operators of each field in early 2018. As usual, we have applied conservative contingencies. The extent of these contingencies reflects past experience of forecasting deviations; historically, industry forecasts have tended to over-predict production significantly in the short and medium term, reflecting asymmetric upside and downside risks relating to field-level production. The contingencies also include a small notional allowance for production from recently discovered fields awaiting appraisal and as-yet-undiscovered fields that might be found and brought into production in this timeframe. The projections of expenditure were informed by operators' responses to the UKCS Stewardship Survey with appropriate weighting of as-yet unsanctioned expenditure.

The following chart shows actual production from 1998 to 2017 and our current and previous (September 2017) projections out to 2022/23; the colour-coded scales are different for oil (left-hand Y-axis) and gas (right-hand Y-axis) while the actual levels of oil and gas production are shown in lighter shades than the projected levels. The projections for both oil and gas have been revised upwards reflecting the continuing robustness of industry forecasts. After 2023, oil and gas production are both assumed to decline at 5% a year as illustrated in the table on page 8 below. The production projections out to 2035 are available in spreadsheet form in a variety of units.

Actual/Projected UKCS Oil and Gas Production



While central projections of oil and gas production are shown in the chart, a wide range of outcomes is possible. The future rate of production is dependent on a number of different factors including the level of investment and the success of further exploration. A significant share of future oil and gas production is expected to come from new fields and major projects in existing fields compounding the difficulty of making accurate forecasts given the risks of project slippage and uncertain start-up profiles. **The central projections are therefore our best estimates rather than a definitive prediction of future UK production of oil and gas.**

Against a background of higher oil prices and new fields coming onstream, nominal total operating costs are estimated to have risen slightly in 2017. With essentially flat production, nominal unit operating costs rose slightly in sterling terms but, because of exchange rate movements, fell slightly in dollar terms. The projections of production and operating costs imply slowly rising average real unit operating costs through to 2023:

	2017 prices						
	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Average unit operating cost (£/boe)	11.7	11.8	11.9	12.1	12.2	12.3	12.4

UK Oil and Net Gas Production and Demand (all level figures in million tonnes of oil equivalent)

	Oil		Net Oil		Oil		Net Gas		Net Gas		Gas		Oil & Gas		Oil & Gas	
	Production	Demand	Exports/ (Imports)	as per cent of demand	import	dependency	Production	Demand	Exports/ (Imports)	as per cent of demand	import	dependency	Production	Demand	Exports/ (Imports)	as per cent of demand
1998	145	91	54	60%			85	82	2	3%			230	173	57	33%
1999	150	90	61	68%			94	88	6	6%			244	178	66	37%
2000	138	89	49	55%			103	91	12	13%			241	180	61	34%
2001	128	88	40	46%			99	90	10	11%			227	177	50	28%
2002	127	87	40	47%			97	88	9	10%			224	175	49	28%
2003	116	87	29	34%			96	89	8	9%			213	176	37	21%
2004	105	89	15	17%			90	91	(1)		1%		194	180	14	8%
2005	93	92	1	1%			82	89	(7)		8%		175	180	(5)	3%
2006	84	91	(7)		7%		74	84	(10)		12%		158	175	(17)	10%
2007	84	88	(4)		5%		67	86	(19)		22%		151	173	(22)	13%
2008	79	86	(8)		9%		64	86	(24)		27%		143	175	(32)	18%
2009	75	83	(8)		10%		53	82	(29)		35%		128	165	(37)	22%
2010	69	81	(12)		15%		50	89	(39)		44%		119	170	(51)	30%
2011	57	79	(22)		28%		39	74	(34)		46%		96	153	(57)	37%
2012	49	77	(28)		37%		33	69	(36)		52%		82	146	(64)	44%
2013	44	76	(31)		41%		31	69	(38)		55%		76	145	(69)	48%
2014	44	76	(32)		42%		32	63	(31)		49%		76	139	(63)	46%
2015	50	77	(28)		36%		34	64	(30)		46%		84	141	(57)	41%
2016	52	79	(27)		34%		35	73	(37)		51%		87	151	(64)	42%
2017	51	76	(25)		33%		36	72	(36)		50%		87	148	(61)	41%
2018	54	75	(22)		29%		36	68	(32)		47%		89	143	(54)	38%
2019	54	75	(21)		28%		34	66	(32)		49%		88	141	(53)	38%
2020	53	74	(21)		28%		32	63	(30)		49%		85	137	(51)	38%
2021	50	74	(23)		32%		31	60	(29)		49%		81	134	(53)	39%
2022	48	74	(26)		35%		29	57	(28)		49%		77	131	(54)	41%
2023	46	74	(28)		38%		28	56	(29)		51%		73	130	(57)	44%
2024	43	73	(30)		41%		26	56	(30)		53%		70	130	(60)	46%
2025	41	73	(32)		44%		25	54	(29)		54%		66	127	(61)	48%
2026	39	73	(34)		46%		24	55	(31)		57%		63	128	(65)	51%
2027	37	73	(36)		49%		23	56	(34)		60%		60	129	(69)	54%
2028	35	73	(37)		52%		21	56	(34)		61%		57	128	(72)	56%
2029	33	73	(39)		54%		20	56	(36)		64%		54	129	(75)	58%
2030	32	73	(41)		56%		19	57	(37)		66%		51	129	(78)	60%
2031	30	72	(42)		58%		18	55	(37)		67%		49	127	(79)	62%
2032	29	73	(44)		60%		17	55	(37)		68%		46	127	(81)	64%
2033	27	73	(45)		62%		17	54	(38)		70%		44	127	(83)	66%
2034	26	73	(47)		64%		16	55	(39)		71%		42	128	(86)	67%
2035	25	73	(48)		66%		15	56	(41)		73%		40	128	(89)	69%

Notes:

Oil Demand includes Bunkers (estimated at 2.8 mtoe from 2017 onwards); Net Gas Production and Demand exclude oil and gas producers' own use.

Both actual and projected Net Exports (Imports), and thus Import Dependency, are as implied by the difference between UK production and UK demand.

The production projections for 2017-2023 are consistent with those published by the OGA at <https://www.ogaauthority.co.uk/data-centre/data-downloads-and-publications/production-projections/>. After 2023, oil production is assumed to decline at 5% pa and gas production to decline at 5% pa.

The demand projections for 2017-2035 are consistent with the Reference Scenario in "Updated Energy and Emissions Projections 2017" published by BEIS (at <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2017>) in January 2018.

