DEPARTMENT FOR BUSINESS
ENTERPRISE & REGULATORY REFORM

# UK CONTINENTAL SHELF OIL AND GAS PRODUCTION AND RESERVES

## Background to BERR's Production Projections

OCTOBER 2007

# UK CONTINENTAL SHELF OIL AND GAS PRODUCTION AND RESERVES: BACKGROUND TO BERR'S PRODUCTION PROJECTIONS

## Introduction

1. This note seeks to put BERR's published UK Continental Shelf (UKCS) oil and gas production projections[1] into context by describing the relative maturity of the UKCS. The charts below show, separately, the evolution since 1980 of oil and gas production (charts 1 and 3) and reserves as estimated annually by BERR based on data provided by the operators of each field or other significant discovery (charts 2 and 4). Chart 5 shows the evolution of the expenditure needed to support production and add to reserves while Chart 6 shows how average oil and gas prices received by UKCS producers have evolved over this period. As further background to BERR's production projections, charts 7 and 8 show the recent history of oil and gas production, focusing on the period since 1998.

## Oil Production and Reserves

2. After a dramatic build-up following the start of offshore oil production from the North Sea in 1975, and against a background of rapidly falling dollar oil prices, UK oil production peaked in the mid 1980s ahead of the Piper Alpha disaster in 1988 which resulted in a sudden and dramatic decline in production (Chart 1). With recovery of production from existing fields and increasing numbers of new fields coming on stream (following a period of significantly higher development expenditure in the early and mid 1990s - see Chart 5), oil production reached a second (and higher) peak in 1999. Until 1997, exploration activity had maintained the level of discovered oil reserves remaining (Chart 2). The subsequent lower level of exploration activity (Chart 5) has not added sufficient to "ultimate recovery" (ie the total of cumulative production to date and estimated remaining discovered reserves) to prevent an overall decrease in remaining reserves; even the discovery of the large Buzzard Field (in 2001) is not evident in Chart 2. Unless future exploration activity[2] results in a significant increase in ultimate recovery, the level of discovered reserves remaining (currently representing less than a third of ultimate recovery) will set a natural

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1. See http://www.og.berr.gov.uk/information/bb_updates/chapters/Section4_17.htm.
2. Higher oil prices and technological developments could also increase the extent to which existing discoveries are commercial; improved geological knowledge can also affect the estimates of the commerciality of existing discoveries. To date, recent increases in oil and gas prices (see Chart 6) have not resulted in a significant reclassification of the status of existing uncommercial discoveries to probably or possibly commercial; some reclassification has occurred but the extent has been masked by downgrading of reserves for technical reasons.

limit on the level of oil production which, over time, can be expected to continue to decline as remaining reserves are depleted.

3. In the absence of significant new fields starting production or major incremental projects in existing fields, UK oil production tends to decline at 10 per cent or more per annum (Chart 7). However, if (large) enough new fields start production (as happened in 2002, with Elgin/Franklin and Shearwater coming into full production), or there are enough significant incremental projects in existing fields, the decline can be arrested or even temporarily reversed.

## Gas Production and Reserves

4. Prior to the late 1990s the rate of natural gas production from the North Sea was, effectively, constrained by the level of domestic demand for gas (with gas from most fields being sold under long-term field depletion buyer's nomination contracts), though throughout the 1980s some demand was met by direct imports from the Norwegian Frigg Field (Chart 3). The "dash for gas" in the 1990s saw a large increase in demand for gas for power generation and, from 1998 with the opening of the Bacton–Zeebrugge Interconnector, significant exports were possible, allowing UK production to increase faster than UK demand. An increasing proportion was "associated gas" ie produced in association with oil (for example from the oil fields in the central and northern North Sea) rather than from the "dry" gas fields in the Southern Basin of the North Sea. Gas production peaked in 2000 and has been declining sharply since 2003 as new fields starting production have been too few and too small to compensate for the decline in production from existing fields. As with oil reserves, estimated ultimate recovery of gas increased through to 1997 as additions from exploration more or less kept pace with the increasing rate of production (Chart 4). Technical and commercial reassessments have, subsequently, reduced ultimate recovery at the proven plus probable plus possible level. Remaining gas reserves represent less than a third of the total discovered to date.

5. The rate of decline of UK gas production (see Chart 8) has until recently been less dramatic than the rate of decline of UK oil production. Compared with oil production, which exhibits some seasonality (as maintenance tends to be scheduled for the summer months), gas production fluctuates much more through the year, reflecting the strong seasonality of gas demand.

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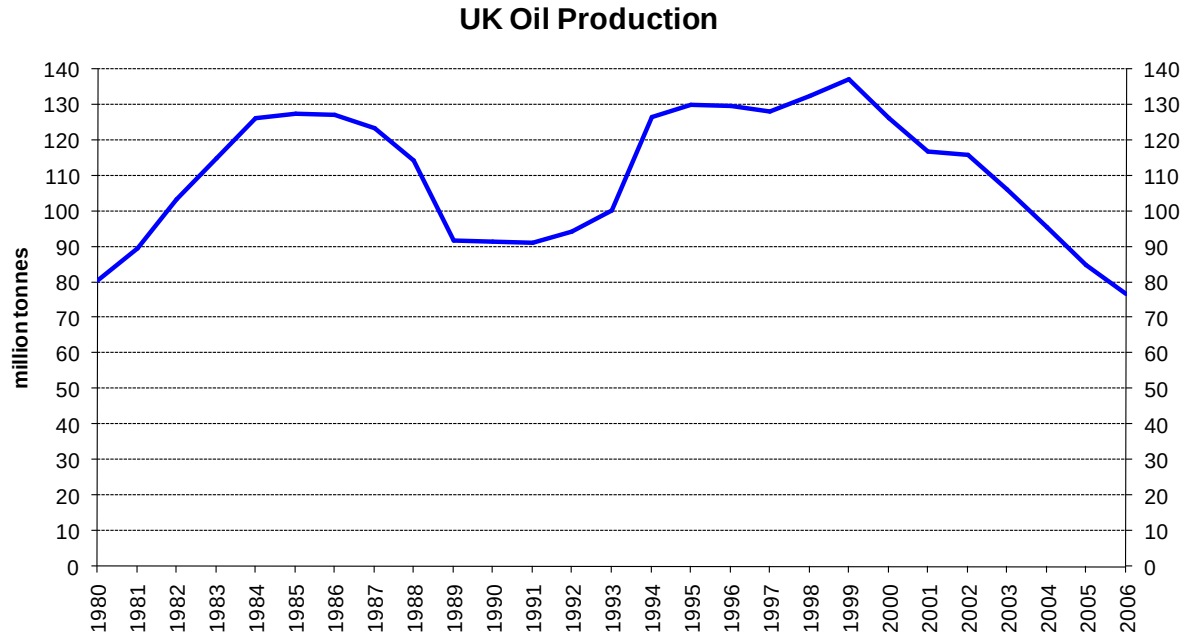
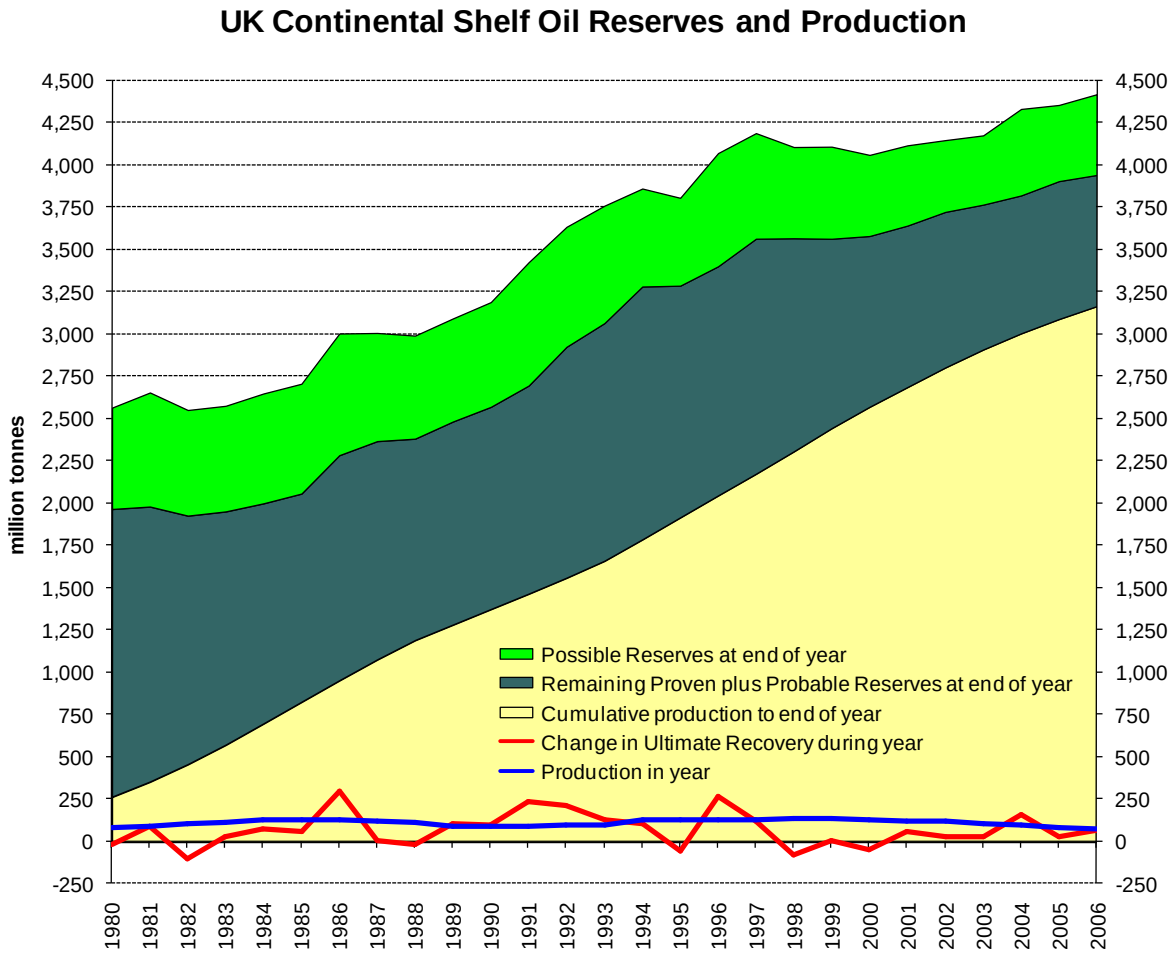
18 October 2007

(URN 07/1527)

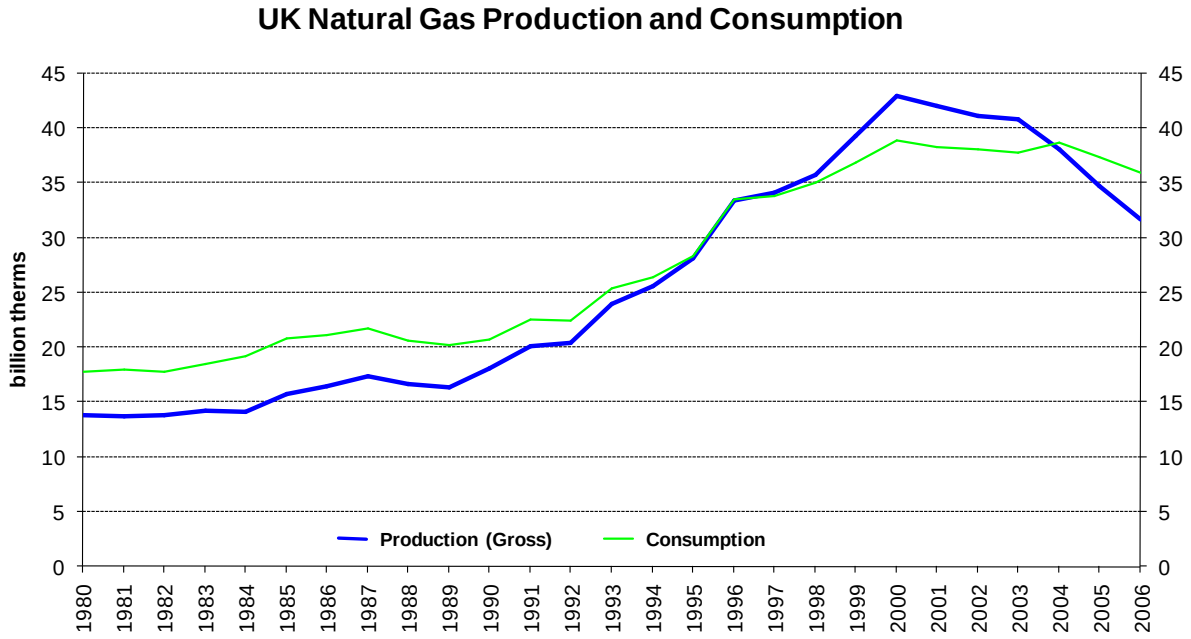
## Chart 1



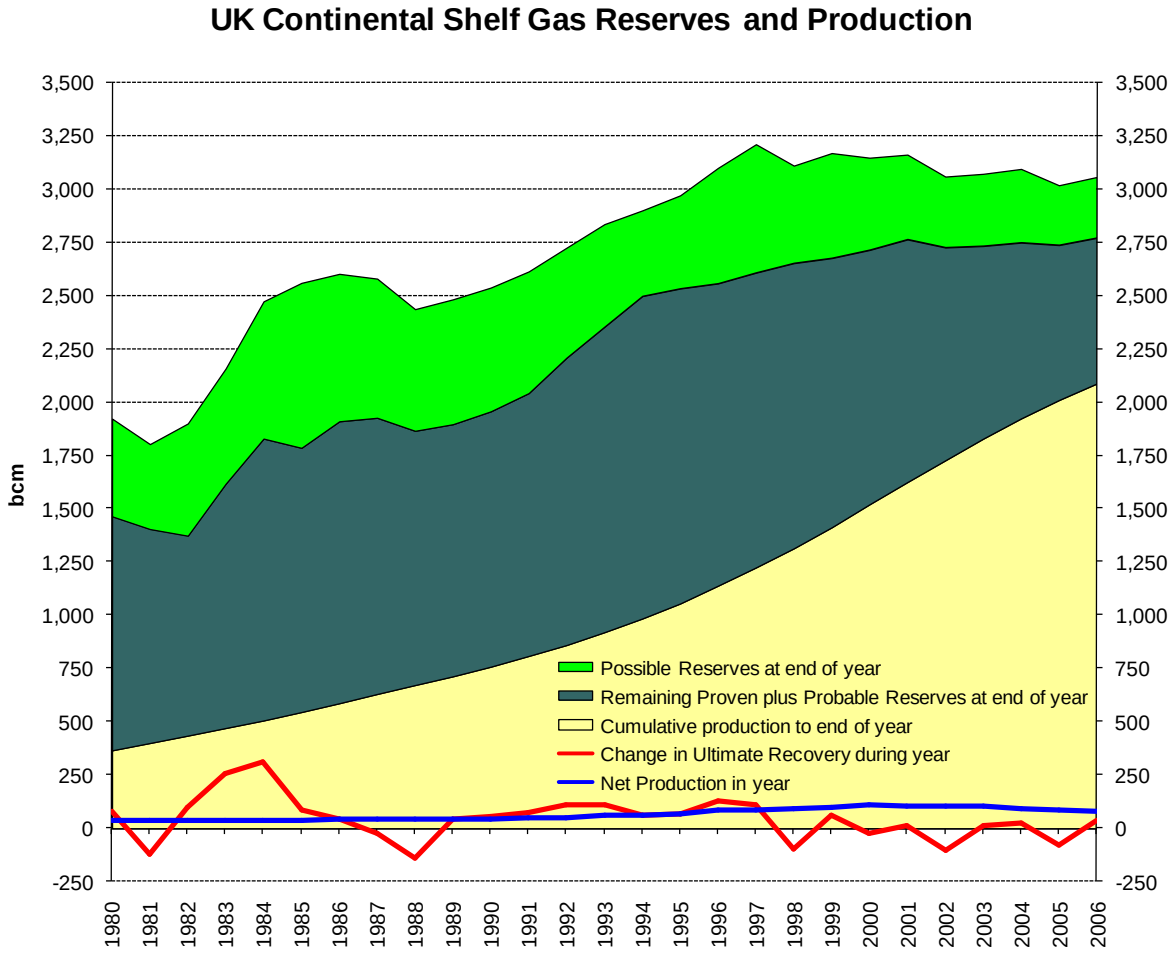

## Chart 2



## Chart 3




## Chart 4



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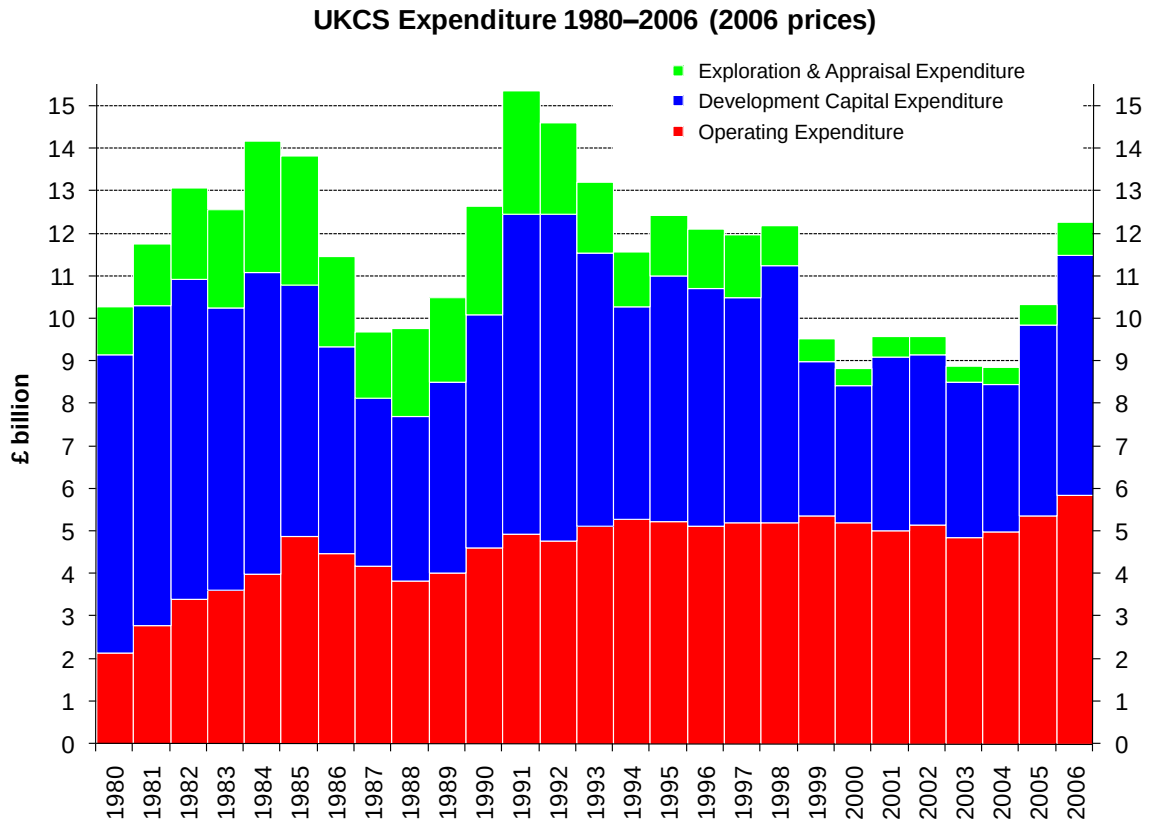


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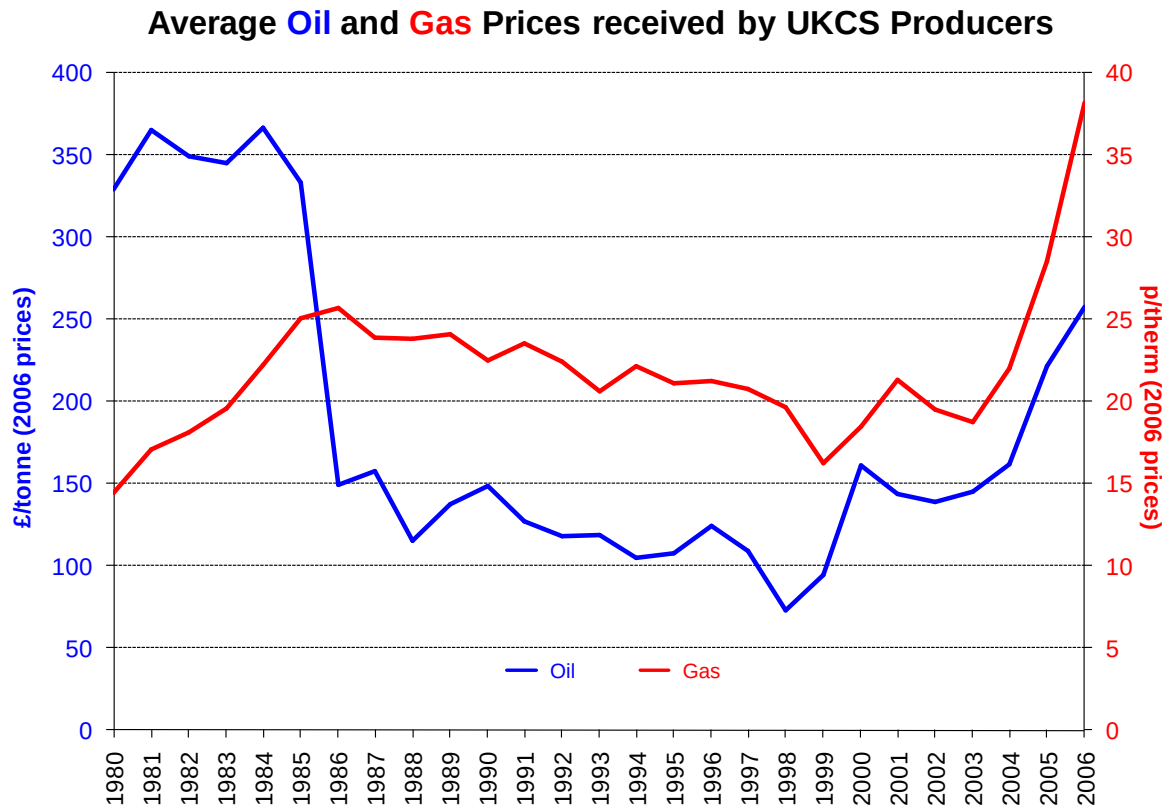
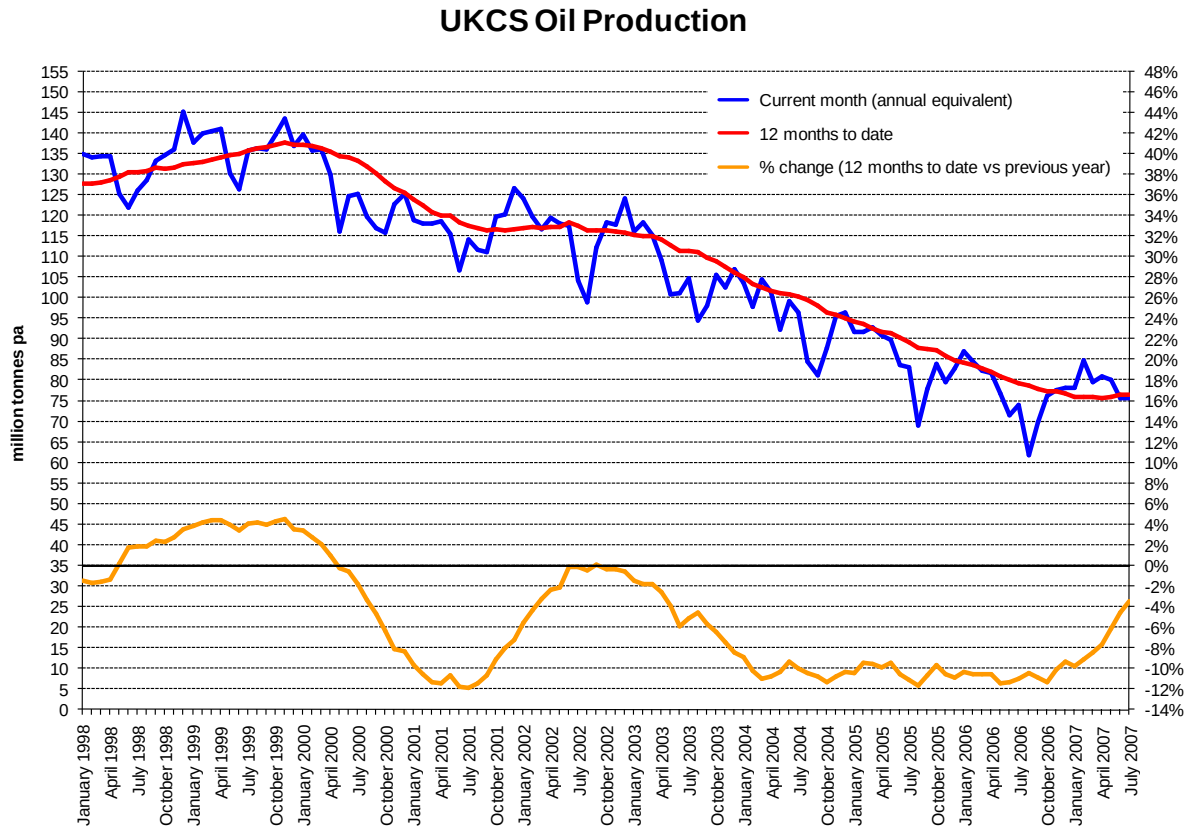


## Chart 7




## Chart 8