

## Oil and natural gas UK – did they get it right?

### Activity:

This activity considers the changing perceptions of the UK's oil and gas reserves over a 40 year period. Students are asked to compare graphs of UK oil and gas production compiled in 1990 with those from 2011, and then respond to a series of questions.

The answers to the questions on the student sheet are as follows:

On each graph (Figures 1 and 2), draw vertical lines to show when peak production had happened or was predicted.

*(Oil 1985; gas 1991).*

In 1990, did the graphs in Figures 1 and 2 suggest that the UK's own supplies of oil and gas would eventually run out?

*(yes, probably in the first half of the 21<sup>st</sup> Century).*

On each graph (Figures 3 and 4), draw vertical lines to show when peak production actually happened

*(oil 2000; gas 2000).*

Do the graphs of 2011 show that the U.K. was able to produce more or less oil and gas than predicted in 1990?

*(a lot more – maximum oil output reached a second peak, at about 12% higher than predicted and was sustained for a further 15 years or so. Gas production in 2000 was nearly four times as much as predicted in 1990).*

Try to explain why the 1990 forecast might have been wrong.

*(Further exploration around existing oil and gas fields revealed more reserves than had been suspected. New areas were found to contain large reserves, e.g. gas in Morecambe Bay in the mid 1970s. The technology used to explore for oil and gas has improved. Techniques for extracting more of the oil and gas held in a deposit have improved. The price of oil and gas has risen, making it more economical than earlier to explore areas with less potential).*

In 2007, long pipelines were being constructed across the UK, to allow imported natural gas to be distributed from a huge tanker terminal at Milford Haven in west Wales. Use the graphs to say why you think this will soon be necessary.

*(The UK's own reserves continue to decline, and it is unlikely that there will be another upturn in the graph)*

### Student learning outcomes:

Students will be able to:

- describe how two similar graphs differ.
- provide possible explanations for the differences noted.
- list factors that might affect future oil and gas reserves.
- explain how these factors might affect predictions of future oil and gas production.

### Student practical or teacher demonstration:

Student worksheet

### Time needed to complete the activity:

20 minutes

### Preparation and set-up time:

Nil

### Resources:

- Worksheet per student
- Rulers

### Ideas for leading into the activity:

Discussions about sources of energy are frequently in the news. This activity could be used to follow up such news items, with especial reference to the ways in which graphs can be used to explain data, or sometimes deliberately to obscure them.

### Ideas for following up the activity:

Use the activity, "Energy crisis – what energy crisis?" to present an overview of the total energy resources of a country and to illustrate some of the dilemmas that might be faced in developing them.

Link the activity to concerns about the human impact on global climate change.

Look for data about the uses of energy in the media, or on websites, and develop students' skills in the interpretation of graphs etc.

Liaise with the Economics or Geography Departments at your institution to develop further activities.

### Source of activity:

Adapted by Peter Kennett from part of the *Crisis in Kiama: which energy source now* activity, in the Science of the Earth 11 – 14 booklet, *Power source: oil and energy* by the Earth Science Teachers' Association in 1992. Pub. Geo Supplies, Sheffield.

### Oil and natural gas UK – did they get it right?

The production of oil and natural gas in the UK is shown in the graphs below. The figures represent the total production, from oil and gas beneath the land of the UK, and more importantly, from the rocks beneath the sea bed around the country.

The UK ‘boom’ in oil and natural gas production began when commercial quantities of gas were discovered in the rocks beneath the North Sea in 1963, and oil a few years later.

The graphs below were drawn in about 1990. They showed the actual production of oil and natural gas up to that time. The graphs also tried to predict future production, from 1990 until 2020.

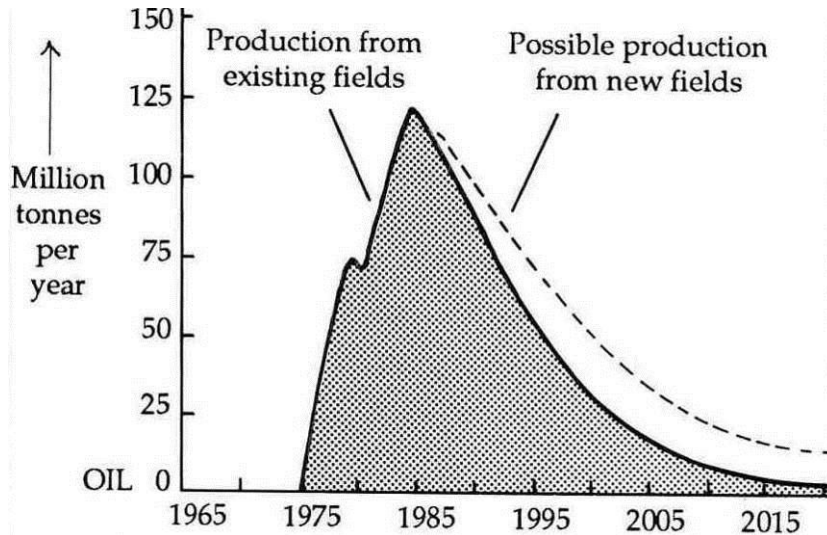


Figure 1: Oil production in the U.K. from 1965 to 2020 (Drawn in 1990)

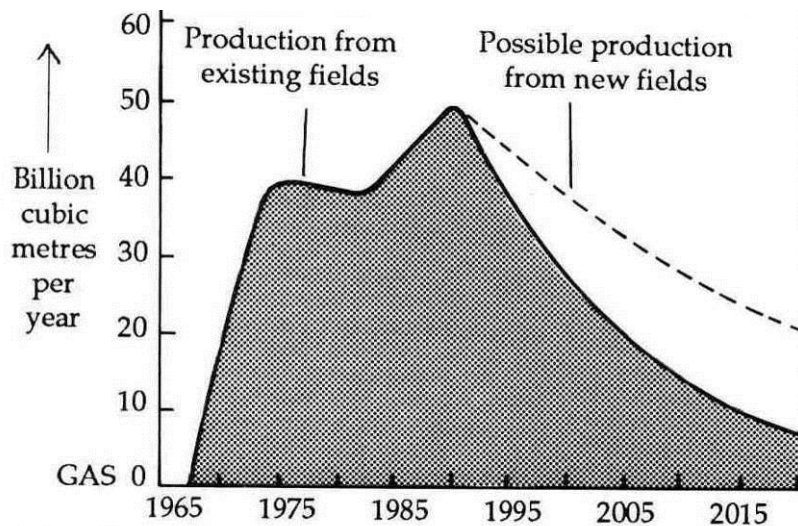


Figure 2: Natural gas production in the U.K. from 1965 to 2020 (Drawn in 1990)

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1. On each graph (Figures 1 and 2), draw vertical lines to show when peak production had happened or was predicted.
2. In 1990, did the graphs in Figures 1 and 2 suggest that the UK’s own supplies of oil and gas would eventually run out?

The two graphs in the second set below were drawn in 2011, using actual figures up to 2010.

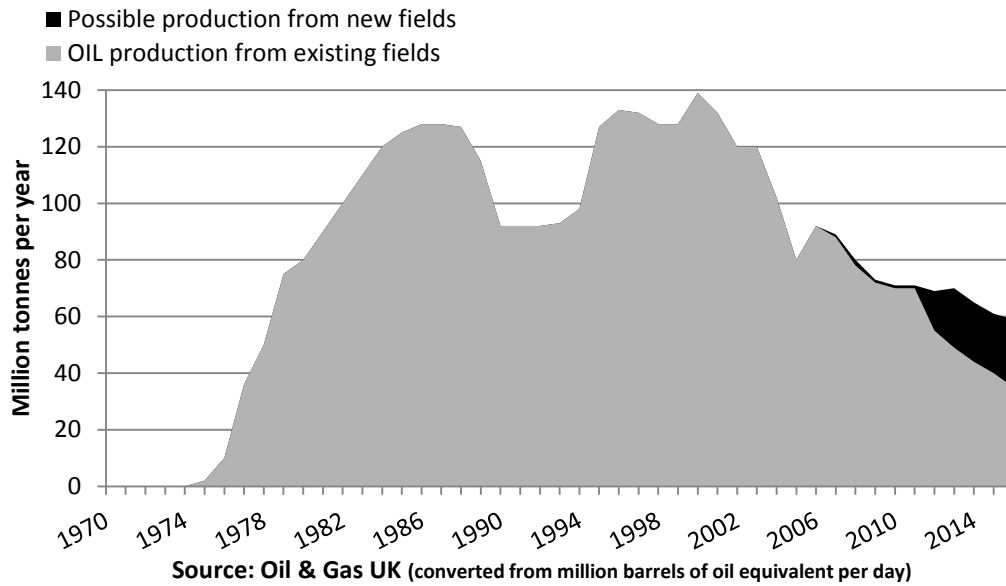


Figure 3: Oil production in the U.K from 1970 to 2016 (Drawn in 2011)

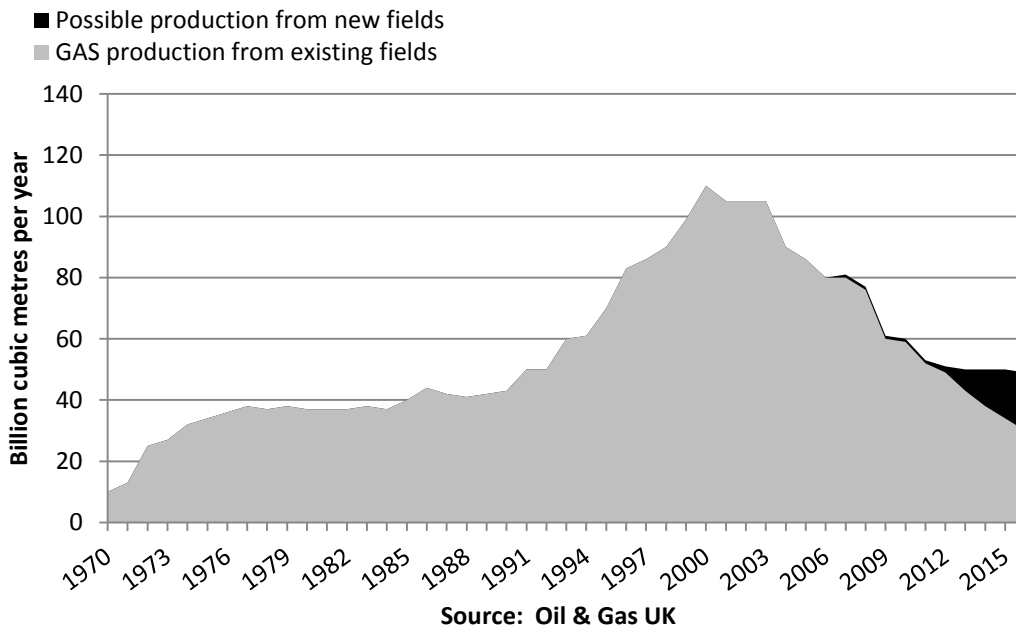


Figure 4: Natural gas production in the U.K from 1970 to 2016 (Drawn in 2011)

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3. On each graph (Figures 3 and 4) draw vertical lines to show when peak production actually happened.
4. Do the graphs of 2011 show that the U.K. was able to produce **more** or **less** oil and gas than predicted in 1990?
5. Try to explain why the 1990 forecast might have been wrong.
6. In 2007, long pipelines were being constructed across the UK, to allow imported natural gas to be distributed from a huge tanker terminal at Milford Haven in west Wales. Use the graphs to say why you think this was necessary.