



# Peak Oil

## Implications of the Gulf of Mexico oil spill

November 2010

### Briefing Note on Deepwater Oil Production

The Gulf of Mexico oil spill resulting from the blowout on April 20th brought the Macondo deepwater oil field, beneath 5,000ft (1,500m) of water, to the world's attention. The loss of the Macondo field, after it was successfully capped, is inconsequential in terms of its potential to deliver oil to the world markets. Indeed, deepwater reserves could easily be dismissed as "insignificant within the total supply picture", a view that could lead to the conclusion that deepwater oil is "not worth the risk involved in production".

Nonetheless, this oversimplifies the real picture. Forecasting forward five years, it is clear that if we are to meet global demand for oil then

deepwater offshore production will account for 29% of new oil supplies by 2015. In this context, deepwater production is vital to secure the new supply that is required to maintain a reasonable cushion between worldwide supply and worldwide demand. Therefore, any delays as a result of the Gulf of Mexico oil spill have potentially serious consequences leading to spare capacity falls and oil price rises.

We are running out of time to implement the necessary measures to both protect the UK economy from the threat of peak oil production, and make the necessary switch to more sustainable energy sources.

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#### 1 Introduction

This briefing note is issued by the UK Industry Taskforce on Peak Oil and Energy Security (ITPOES). The interpretation of the current position, and viewpoints expressed in this briefing, are those of the ITPOES members – a group of private British companies whose interests span a wide range of business sectors. This work, therefore, represents an independent, business-oriented, view of the national position.

Prompted by the much-publicised deepwater Macondo oil spill in the Gulf of Mexico, ITPOES commissioned analysis into the proportion of deepwater offshore production units within total new capacity due to come on stream. This note seeks to highlight issues arising from the Macondo spill as seen by the Taskforce, which are likely to confront the UK within the next five years.



## **2. Previous Taskforce reports**

Report 2 from the Taskforce was launched in February 2010. It drew upon the invited opinion piece by Chris Skrebowski, a recognised independent oil-industry expert. While oil supply is ultimately derived from below-ground resources, Skrebowski highlights above-ground aspects of production that might impact supply. He examined in detail the evidence which defines global oil reserves and extraction rates, and concluded that the global peak production rate for oil is likely to occur within the next decade. The conclusions drawn supported those reached in ITPOES' Report 1 from October 2008. It was clear that the fundamental issues identified in Report 1 remain unchanged, namely:

- The net flow-rate data shows that increases in extraction will be slowing down in 2011-13.
- The oil industry is not discovering more giant fields at a sufficient rate.
- There are concerns about the levels of reserves quoted by the Organisation of the Petroleum Exporting Countries (OPEC), which are critical to the confidence levels associated with future production capacity.
- There are indications that under-investment in the oil industry over the past decade has led to infrastructure problems and skill shortages that will make it difficult to increase production capacity rapidly in the short-term.

It is clear to Taskforce members that when the world reaches the maximum oil extraction rate, the era of cheap oil will be behind us. In the new era, oil prices are likely to be higher and more volatile, and oil price shocks will have the potential to destabilise economic, political and social activity.

The economic crash that occurred between the two Taskforce reports has done little to allay our concerns. The time until a peak in global production was little impacted as cancelled new capacity broadly offset recession-deferred demand. When combined with demand projections, we still projected a price crunch would take place following the peak.

Following the attention drawn to the issues of deepwater drilling by the Macondo well, the Taskforce has extended its analysis to examine the deep offshore component. This briefing note summarises this work and the conclusions drawn.

## **3. Incremental new capacity**

The basis of our analysis of above-ground conditions is summarised as follows.

The recent data on historical production, as provided by the Energy Information Administration (EIA), is 86.2Mb/d (million barrels per day) for May 2010 (see **Figure 2** lower line on left). The historical production capacity cap can be derived by adding spare capacity, currently about 3.3Mb/d, to the historical production data giving 89.5MB/d (see **Figure 2** upper line on left). It is important to note here that spare capacity is essentially

an OPEC phenomenon as all other producers aim to operate flat out, within operational constraints, to maximise their revenues. In contrast OPEC uses spare capacity to defend prices.

The Taskforce agrees with Skrebowski that incremental new supply capacity over the next few years is predictable owing to the slow-moving nature of oil supply and the long lead times for major oil projects. Increases in oil supply, up to six years hence, are largely dictated by the long lead times for major projects, so an analysis of these projects gives high confidence to a calculation of the maximum supply-side capacity. This 'megaprojects' analysis collates in future annual time bands all projects with a peak flow of 40,000b/d or greater. The primary risk in this analysis is from supply shortfalls caused by project delays over and above those already announced.

It is notable that there are very few oil projects in water depths of up to 1,000ft (300m). This means most offshore projects are now deepwater, in more than 1,000ft of water, well beyond the 500ft (170m) maximum depth for divers so rely much more on remote-operated vehicles. 500ft is the cut-off that has been used to define deepwater offshore projects for the data presented here. Deepwater projects make up an increasing proportion of future capacity for both OPEC (essentially Angola and Nigeria) and for non-OPEC (predominantly Brazil and the Gulf of Mexico). Planned new capacity for 2010 was 0.4Mb/d for OPEC and 1.0Mb/d for non-OPEC (see **Figure 1(a)**). Adding six years



of incremental data together gives planned new deepwater capacity by 2015 of 8.9Mb/d.

When the megaprojects as a whole were assessed in 2009 for Report 2, there were a number of projects which had been cancelled, delayed or were awaiting a decision. Reviewing these megaprojects now, it is evident that greater confidence in economic recovery during 2010 has led to their reinstatement and the decision to go ahead. This is reflected in higher overall annual increments compared to Report 2 (see **Figure 1(a)**). Adding six years of incremental data together gives gross additional capacity by 2015 of 30.9Mb/d. Of this, deep offshore contributing 8.9Mb/d corresponds to 29% of the total.

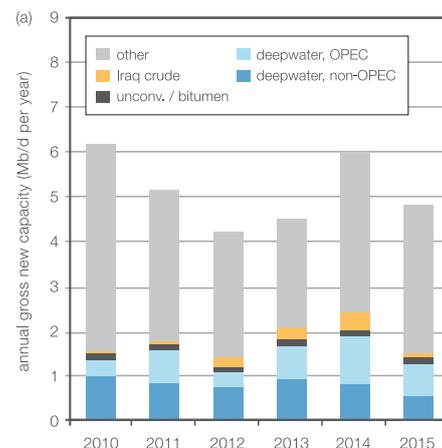
Whilst the megaprojects add new capacity, existing production capacity is declining. Most authorities estimate the reduction in achievable extraction rates, referred to as depletion, at around 4.5%/y. Looking at the six-year period to 2015, overall loss of capacity would amount to 25.4Mb/d on this basis. Therefore, the gross new capacity of 30.9Mb/d by 2015 is reduced by depletion to a net new capacity of 5.5Mb/d. Thus the future production capacity cap by 2015 can be estimated as 95Mb/d (see **Figure 2** upper line).

Analysing the demand side to 2015 is rather less predictable than for production capacity as the path of economic recovery since the recession of 2008 is uncertain. Also 80 to 90% of future demand is expected to come from non-OECD countries, such as China and India,

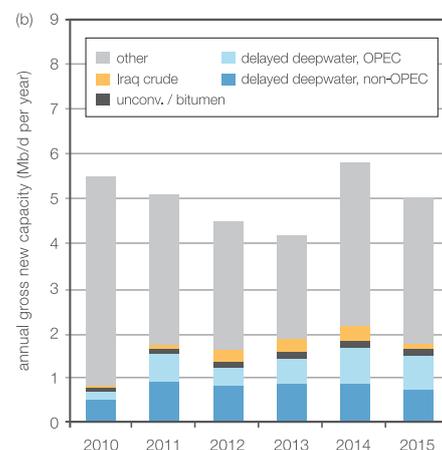
where consumption data is rather less reliable than for the OECD. The Taskforce has looked at the IEA's recent Medium Term Oil and Gas Report of June 2010. In this the IEA projects a band of global oil demand to 2015 between a high limit of 92.0Mb/d and a low limit of 89.5Mb/d (see **Figure 2** lower lines).

However, Report 2 of the Taskforce postulated strong growth in global demand from non-OECD countries. This suggested world demand in 2050 could be in the region of 180Mb/d. Working backwards from this, we might expect demand levels to exceed 120Mb/d in 2030. This trajectory is the top line in **Figure 2** which exceeds 95Mb/d by 2015.

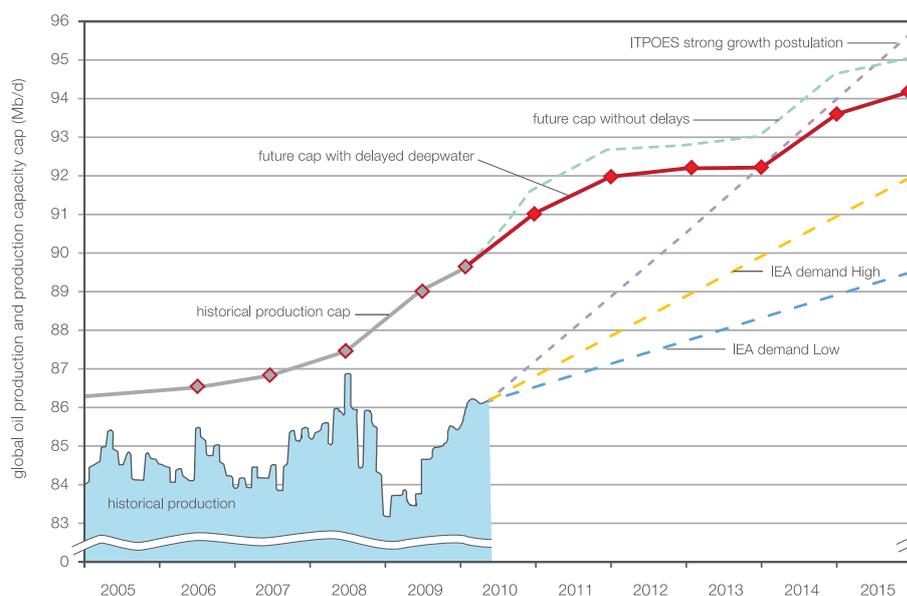
From this analysis of demand, spare capacity in 2015 against the IEA high demand would be about 3Mb/d, while for the ITPOES strong growth postulation this shrinks to zero (in **Figure 2**). We return to this aspect in our conclusion below.



**Figure 1(a)** Analysis of future annual gross new capacity from the megaprojects analysis



**Figure 1(b)** Analysis of future annual gross new capacity with an average six-month delay applied just to future deepwater projects.



**Figure 2** Analysis of global oil production and production capacity cap for the historical since 2005 and projected to 2015. The projection of the future cap on capacity is based on gross new capacity in Figure 1 less annual depletion of 4.5% with and without a six-month delay to deepwater production.



## For more information

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## 4. Implications of Macondo

Our analysis that deepwater oil projects will constitute 29% of new capacity by 2015 (see **Figure 1(a)**) shows their significance, not previously evident.

The Macondo well was planned to produce about 0.05Mb/d in 2012. This would have accounted for under 0.2% of the total overall new production to 2015. The loss of this output is of little significance, particularly given the uncertainties around the figures.

However, the effects of BP's problems at the Macondo well have introduced a wider issue. The real impact of Macondo may be from the impact of project delays as a result of new legislation, tighter controls or more inspections of deepwater installations. While it may be reasonable to conclude that Macondo will increase deepwater drilling and development costs and delay projects, as yet there is no way to quantify this. We can, however,

test the impact of an average six-month delay to future deepwater flows. We have repeated our analysis with a six-month delay applied to the deepwater component (see **Figure 1(b)**) resulting in 8.1Mb/d by 2015.

Now the total new gross capacity by 2015 is 30.1Mb/d. Depletion remains unchanged so the net new capacity by 2015 is 4.7Mb/d, a significant reduction from 5.5Mb/d without the delay. The expected production capacity cap in 2015 would be nearer 94Mb/d (see **Figure 2**) with spare capacity with respect to the IEA's high demand reduced to nearer 2Mb/d, nearly one third less.

## 5. Conclusion

Our analysis of the effects of an average six-month delay to deepwater projects suggests a reduction in future spare capacity from 3 to 2Mb/d by 2015 with respect to the IEA's project high demand (see **Figure 2**). This highlights to us the consequences of moving to difficult oil from deep

offshore. However, the Taskforce draws no comfort from this value of spare capacity:

- There are suggestions that up to 2Mb/d of OPEC spare capacity may be theoretical, inoperable or unsaleable.
- Our strong growth postulation suggests that all production would be needed by 2015.
- The depletion figure of 4.5% of existing production capacity could be on the low side.

The Taskforce sees very major consequences of rising oil prices in the next few years. Without a strong and coordinated response from Government to protect the UK economy and society from rising prices, we will see the cost of travel, food, heating and retail goods rise which will impact British businesses and citizens alike. We also need to see much quicker action from Government to support the introduction of renewable energy technology and energy efficiency measures.

The Taskforce would like to work with the Government to develop a contingency plan that both addresses the risks of Peak Oil and speeds up our transition to a low-carbon economy.

