DECC Science Advisory Group

Advice to the Chief Scientific Advisor on Oil and Gas Supply and Use

The DECC Science Advisory Group (SAG) considered Oil and Gas Supply and Use at its third meeting on 9th March 2011. As a result of this discussion, the SAG advises that:

1) One hundred million barrels per day is a reasonable estimate for maximum total oil production (including unconventional oil), and we are probably close to it (in both magnitude and time).

2) However, this does not translate to a long-term limit on liquid fossil fuel availability. "Peak oil" concerns apply mainly to conventional oil; the geological constraints are reduced if unconventional oil, and the potential for conversion of coal and gas to liquids, are taken into account, given sufficient lead time.

3) Oil price increase due to geological scarcity is therefore unlikely to provide sufficient incentive to reduce CO_2 emissions in the face of climate change. The availability of unconventional supplies may actually extend the time taken for renewable energy to become cheaper than fossil fuel well into the future.

4) Short-term supply shocks and associated high oil prices are however a real risk. Short-term mismatches between supply and demand arising from political contingencies are more likely as cause of supply crunches than underlying geological or economic realities. This is because the time taken to develop responses via alternative sources (order 10 years) is too long to respond to short-term mismatches, and the more rapid response through increasing conventional supplies is likely to be less available in future.

5) Strategic reserves (in the UK and elsewhere) can help to reduce the risks of price spikes, although China (whose rising transport demand is increasingly important in world markets) is not a member of the IEA and not therefore subject to the requirement to maintain 90 days' supply.

6) Costs of developing unconventional supplies are higher than those needed for conventional supplies, which may affect the capital available for other investments (including renewables and nuclear).

7) Given sufficient supply, and investment and lead time for vehicle modification and supply chain infrastructure development, compressed and liquefied natural gas (CNG and LNG) as transportation fuels have high potential as a hedge against supply crunches, and as alternatives to oil for transport in the medium-term, especially for the HGV sector. Overall, as transport fuels, they offer little benefit for greenhouse gas

mitigation and air quality in the UK. Large-scale changes to these sources would also require increased national gas storage capacity.

8) The prospect of supply crunches may also encourage development & deployment of electric vehicles. The degree of associated greenhouse gas mitigation will still depend on the amount (and type) of fossil fuel use in the electricity supply.

9) Though significant gains can be achieved initially through fuel switching, the lower carbon content of gas sometimes leads to overestimation of the role of gas in greenhouse gas mitigation. Fugitive emissions of methane lead to greenhouse forcing, and long-term emissions targets (global reductions of 50% or more) mean that gas can act as a 'bridging' technology (as we move aware from coal and oil) but is not a sustainable long-term low-carbon solution. In the medium/long term CCS will also be required for large, fixed oil and gas-fired plant as well as coal.

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