Malcolm Watson
Technical Director

UNITED KINGDOM
Petroleum Industry Association Limited
9 Kingsway
London WC2B 6XF
Telephone: 020 7632 9882 (Direct Line)
020 7240 0289 (UKPIA)
Fax: 020 7379 3102
e-mail: malcolm.watson@ukpia.com

12 January 2006

Stern Review
2nd Floor, Room 35/36
HM Treasury
1 Horse Guards Road
London SW1A 2HQ

Dear Sirs,

UKPIA'S Input to the Stern Review on the Economics of Climate Change

The UK Petroleum Industry Association (UKPIA) represents the oil refining and marketing activities of the large oil companies in the UK. Our member companies supply most of the oil products used in the UK. As such we have a major interest in the economic challenges posed by polices designed to tackle climate change.

General

- Oil and gas are expected to remain major sources of energy for the foreseeable future

- The current oil market reflects high demand for oil products due to global economic growth, the impact of extreme weather and the erosion of spare production capacity.

- Oil is a global market which should be allowed to function freely.

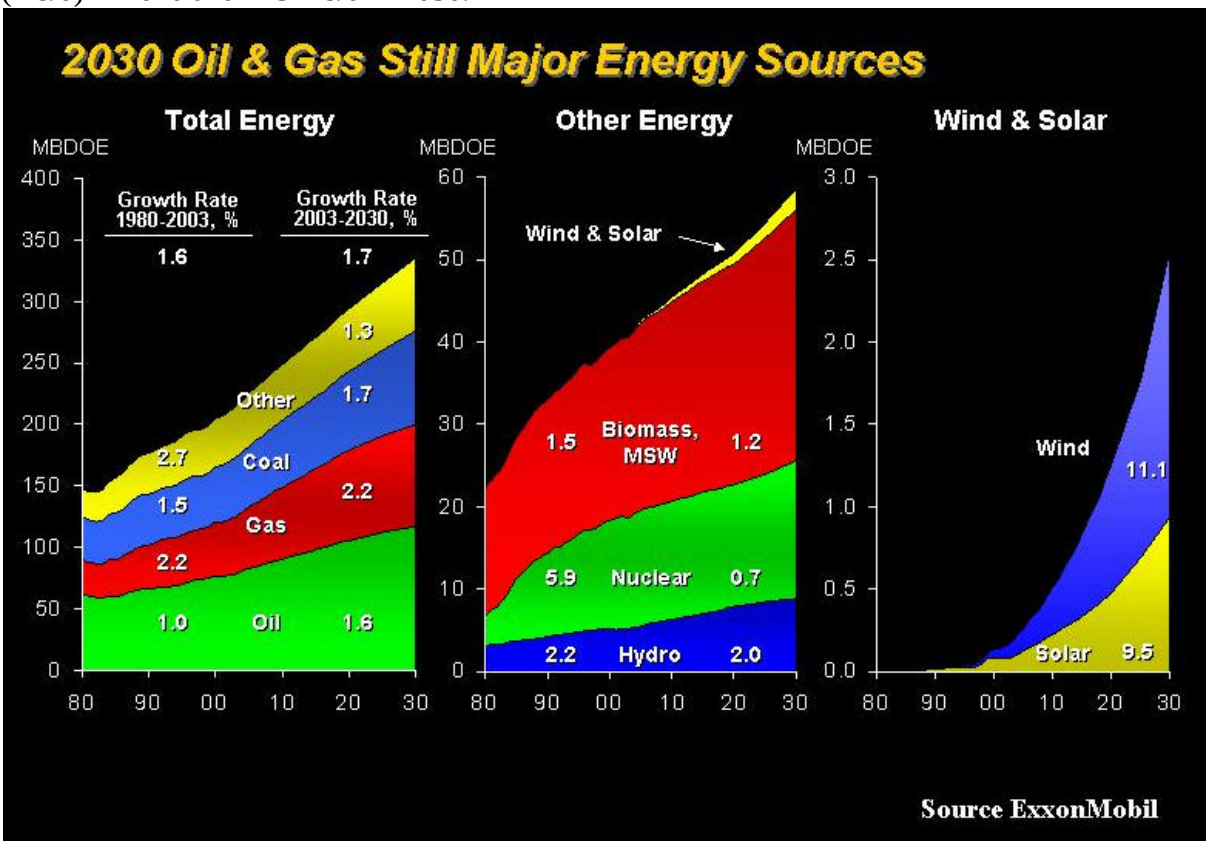
- Energy policy cannot be made in isolation. It is linked to Environment, Transport, Taxation, Research and External policy objectives

Detailed comments

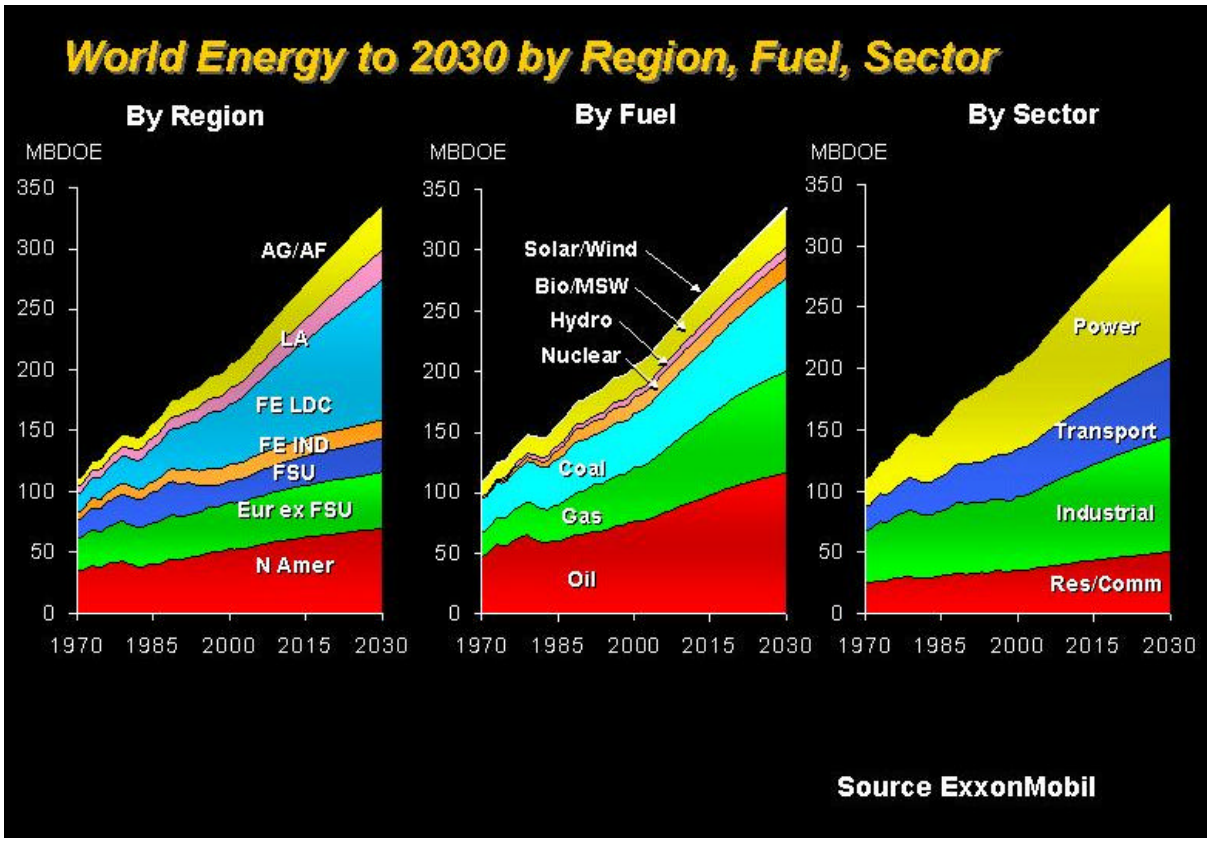
Q1 The implications for energy demand and emissions of the prospects for economic growth over the coming decades, including the composition and energy intensity of growth in developed and developing countries

The oil industry agrees with the International Energy Agency (IEA) that oil will remain the largest single source of energy in the world up to and beyond 2030. As shown below world demand for oil is expected to grow by around 1.6% per annum up to 2030 ie increase by around 50% from

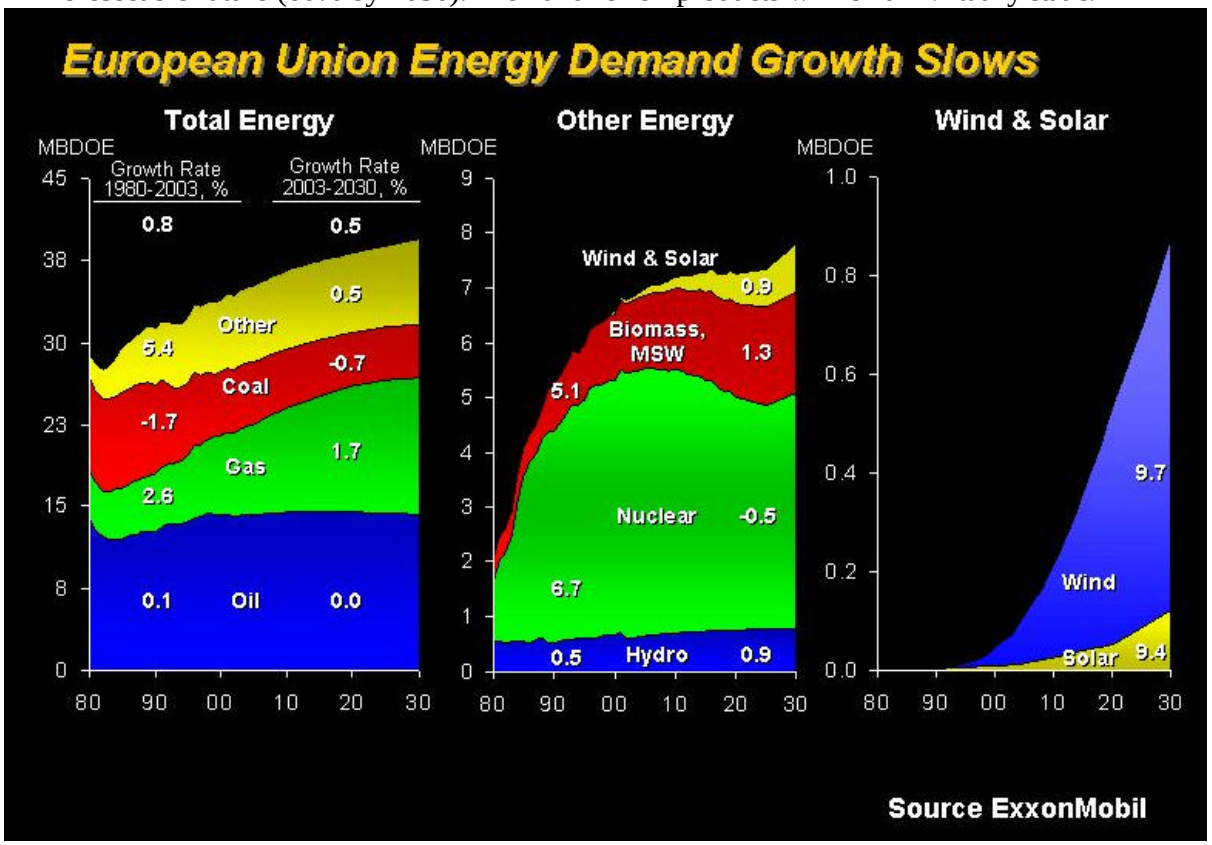
today's levels. The latest IEA forecast shows demand for oil reaching 92 million barrels per day (mb/d) in 2010 and 115 mb/d in 2030.



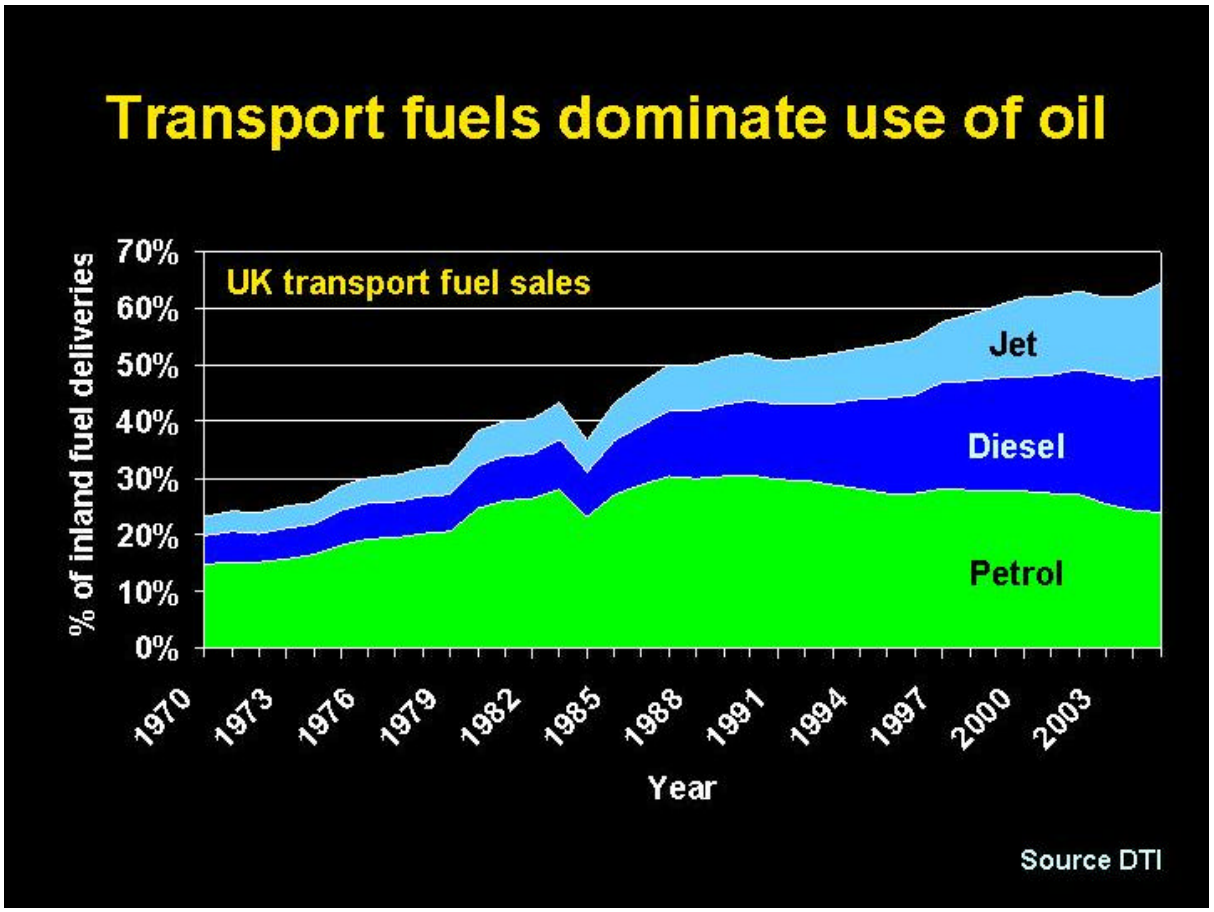
- As shown below the growth in demand for energy will vary between regions and sectors. The largest growth rate will be in the less developed counties of the Far East and the power generation sector.



- In the EU oil and gas will continue to form an important part of the energy mix for the foreseeable future (60% by 2030). Demand for oil products will remain virtually static.



- Oil derived fuels will remain the fuel of choice for transport for many years to come with around 70% of crude oil being used for transport fuels in OECD countries.



- Currently transport fuels (jet petrol and diesel) sold in the UK are equivalent to around 65% of the crude oil products sold in the UK – see above. This percentage is expected to increase in the future due to increased sales of jet fuel.

- The future demand is different for every transport fuel. For petrol, sales are expected to continue to decline as diesel car sales continue to climb. For diesel, jet fuel and marine bunkers sales are expected to increase with the largest increase expected in jet fuel. The UK overall demand for road fuels is expected to decline slightly in the future as the increase in the number of vehicles is offset by improved average fuel economy from technology improvements, greater dieselisation and a move to hybrid vehicles combined with the introduction of biofuels into road transport.

- In addition crude oil will continue to provide a wide range of products which are integral to modern society. In 2004 14% of inland oil product demand was for non-energy products – petrochemical feedstock, bitumen for roads, lubricating oil, greases, solvents, etc.

- While future demand for oil in the UK and the EU is virtually stable, the changes in the composition of the product mix (lighter, more jet and diesel) and the ever more stringent product quality specifications will make it increasingly challenging to satisfy market demand. This will require investment in refineries or imports to correct the product imbalances in jet and diesel which are growing.

Q3 The costs and benefits of actions to reduce the net global balance of greenhouse gas emissions from energy use and other sources, including the role of land-use changes

and forestry, taking into account the potential impact of technological advances on future costs

Reducing demand

- The oil industry believes that the Government should aim to meet its targets in the most cost-effective way for the UK whilst respecting consumers' freedom of choice and quality of life. In this respect energy efficiency initiatives intended to promote efficient and cost effective energy use by society, are critical and fully supported by the oil industry. So far however limited progress has been made especially in the domestic sector.

- The oil industry has made major efforts to reduce and optimise energy consumption in their facilities, resulting in significant improvements in energy efficiency. Without these improvements the demand for more intensive refinery processing to meet the tighter product specifications and the significant shift in product demand towards lighter products since the 1970s would have increased refinery energy demand significantly.

- The oil industry believes that more could be done to reduce demand for energy by:-
    - Education campaigns to make the public aware of the significant contribution they can make to reduce demand (and at the same time reducing GHG generation).
    - Further improvements in UK building standards
    - Stimulate the use of energy efficient equipment (including vehicles). In terms of vehicles the sulphur free petrol and diesel to be introduced into the UK this year will enable the next generation of fuel-efficient vehicles.

- High prices *may* help contribute to raising public awareness of the need to reduce energy consumption and of the options available to them. However, even at current high product price levels conventional energy is still cheaper than alternative energy options and remains the more economical choice.

Alternative fuels

- The oil industry (Concawe) has evaluated the **wells to wheels** (WTW) greenhouse gas emissions and costs of a large number of alternative road fuel options in a joint "well to wheels" study with the car industry (Eucar) and the European Commission (JRC). The latest version of the study is available at http://ies.jrc.cec.eu.int/WTW.

Crude Oil	**$25/bbl**	**$50/bbl**
Option	**Range of costs** euro/tonne CO_2 abated	**Range of costs** euro/tonne CO_2 abated
Current Processes		
Bioethanol ex wheat, sugar beet	178 – 358	97 – 239
Biodiesel	157 – 243	92 – 127
Future processes		
Bioethanol ex straw, waste	67 – 233	-13 – 160
Synthetic diesel ex biomass	90 – 237	32 – 188
Hydrogen ex wood	394 – 460	347 – 408
Hydrogen from electrolysis	540 – 566	488 – 526

Source Concawe/Eucar/JRC

NB £70/teC abated ~ 28 euro/teCO_2 abated

- The cost of greenhouse gas reduction for a wide range of routes is given at the end of appendix 2 of the WTW Report available from the above website. Some of the data are highlighted above. (To convert from euro/teCO_2 abated to £/teC abated multiply by 2.5 as a rough approximation)

- With current technology, alternative energy options are expensive and compare unfavourably with improving the energy efficiency of conventional fuel alternatives. Also in general, static applications contribute more to energy efficiency and climate objectives than use in mobile applications. For example using biomass to generate power saves more greenhouse gas emissions at a lower cost than using the same land for growing biofuels for road transport.

- The study suggests that land area constraints will limit the role of biofuels in replacing road fuels in the foreseeable future.

- The oil industry recognises that alternative energy will be part of the future energy supply and is involved at various levels in the development of alternative energy options. Approaches and emphasis vary by company reflecting their company's strategies but as an industry include **biofuels** (current processes and advanced, cheaper, more carbon efficient processes), **hydrogen** (fuel cell development, as well as hydrogen manufacture, distribution and storage), **wind-farms, solar** and **geothermal**.

- The development of advanced **technology** and **carbon capture and storage** (CCS) are also supported. Although not necessarily alternative energy options, they could contribute significantly to reducing emissions from the use of conventional energy sources in the longer term.

ADDITIONAL POINTS

Crude Oil Supply

- There are sufficient reserves of oil for a further 40-100 years of global oil supply. In addition large unconventional oil volumes remain essentially untapped.

- Industry has significantly increased investment levels to increase yield and prolong production life of existing oil fields and to explore/develop new acreage. New reserves are generally more costly since they are more difficult to find and produce.

Product Supply

- The choice of crude oils processed by refineries is dependent on refinery structure, logistics, consumer demand, economics, product specifications and environmental constraints on operations. Local product specifications can also limit the ability to import (thus affecting security of supply and consumer prices).

- Security of supply is enhanced by being able to refine a wide range of crude oils.

- EU and UK refineries produce surplus gasoline but a deficit for diesel. The UK also has a large deficit in jet fuel. Increasing EU diesel and UK jet fuel shortfalls are projected. Greater Europe (including Russia) currently has sufficient diesel production capability.

- Correcting local supply/demand imbalances requires substantial investments (usually at least several hundred million pounds) and significant lead times. Alternatively companies can, as now, import/export products to meet UK consumer demand

- Low EU/UK refining margins have persisted for many years. Current margins, even if maintained, barely justify major new investments. Refining investment decisions are based on long-term economics so influenced by Government policies.

- More than 50% of current investments in EU refinery and distribution infrastructure was made to meet new regulations or mandated quality changes rather than to increase profitability and long-term sustainability for the industry.

The oil industry would be happy to discuss any of the points raised. In addition if you believe that UKPIA can be of help to you in any other way please do not hesitate to contact us.

Yours sincerely

Malcolm Watson