



Malcolm Webb
Director General

UNITED KINGDOM
Petroleum Industry Association Limited
9 Kingsway
London WC2B 6XF
Telephone: 020 7632 9884 (Direct Line)
020 7240 0289 (UKPIA)
Fax: 020 7379 3102
e-mail: malcolm.webb@ukpia.com

10 September 2001

The Energy Review Team
Performance and Innovation Unit
Cabinet Office
Admiralty Arch
The Mall
London, SW1A 2WH

Dear Sirs,

**UKPIA'S RESPONSE TO PERFORMANCE AND INNOVATION UNIT'S
CONSULTATION ON THE UK ENERGY POLICY REVIEW**

The UK Petroleum Industry Association (UKPIA) represents the oil refining and marketing activities of the large oil companies in the UK. Petroleum products produced by our member companies supply 30% of the energy used in the UK. As such we have a major interest in the future direction of UK Energy Policy.

The main points we would like to bring to the attention of the Energy Policy Review team at this time are:-

· **A strong UK refining industry improves security of supply**

The future shutdown of nuclear generation capacity combined with the decline in the demand for coal and falling North Sea oil and gas production will inevitably lead to changes in the way energy is supplied and used in the UK. The challenge is to ensure that energy supplies continue to be secure and are sourced from a number of countries.

The UK downstream oil industry has a long track record of meeting the UK's varying demand for petroleum products in the form of gasoline, jet, fuel, diesel, gas oil, fuel oil, etc. It can continue to meet changing demand reliably for the foreseeable future provided that both UK and international market conditions remain conducive.

The environmental performance of both our operations and our products has been improved significantly over the years. For example UK refineries used 7% less energy to process a barrel of crude in 2000 than in 1990 despite tighter product specifications and changes in demand.

The downstream industry has also been a strong contributor to the UK Balance of Payments, £1.4 billion in 2000.

Retaining the UK's ability to process crude oil from all sources into a wide variety of products will improve the security of supply for petroleum products. This requires a strong, viable downstream oil industry in the UK which can be promoted by:-

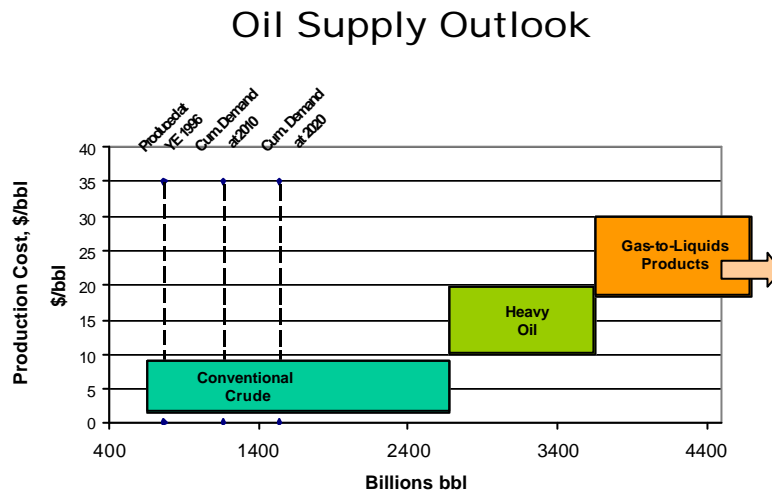
- letting the free market develop the technologies required to achieve the agreed objectives (environmental protection, energy efficiency, etc)
- ensuring that any legislation recognises the significant investment costs and lead times for our industry
- ensuring that UK legislation does not place the UK downstream industry in an uncompetitive situation versus their European and global competitors.

The alternative would be to import the petroleum products the UK requires from overseas. This would have a significant negative impact on the Balance of Payments.

The flexibility to find alternative suppliers during periods of temporary disruption is more limited with tightly specified products such as "sulphur free" petrol and diesel. Supplies of these tightly specified products will only be available from outside the EU if other countries have made the investment necessary.

- **North Sea production will decline but crude oil is not running out**

The oil industry's current estimates suggest that there is sufficient oil to last well into this century. The following figure illustrates that, despite the predicted decline in the production of crude oil from the North Sea, there will not be a physical shortage of oil for a large number of years ie **oil is not running out in the near future**. There is therefore no rush to substitute conventional petroleum products.



- Source of "oil" supply will evolve with time
- Current projections are that liquid hydrocarbons will be available and cost effective for extended period beyond 2020

When conventional crude oil declines there are vast reserves of heavy oil and natural gas which can be used to provide transport fuels. Improvements in the technology used to exploit these resources will reduce the cost over time. For the UK's point of view the key is to be able to refine oil in the UK with a range of qualities from a number of sources.

- **There will be a continuing demand for oil products**

DTI's Energy Paper 68 forecasts demand for oil products continuing over the next 20 years (the limit of the forecasts). A strong, viable downstream industry will ensure that this demand is met in the most competitive manner possible. In the longer term, say 2050, substitution of some products may take place but for others, eg jet fuel, this seems extremely unlikely.

Natural gas is predicted to meet the UK's predicted demand for extra energy

UKPIA's forecast of energy growth in the UK up to 2020 suggests that there may be an even greater dependence on natural gas in 2020 than predicted in DTI Energy Paper 68. As shown below the main differences between the DTI and UKPIA forecasts are that the UKPIA suggests a:-

- slightly lower growth in energy demand (but a higher demand for electricity)
- even greater demand for natural gas
- slight decline in the demand for petroleum products

Comparison of UKPIA Forecast with Energy Paper 68 (Scenarios CL+CH)

Mtoe	1990	2000	2010	2010	2020	2020
	Actual	EP 68	EP 68	UKPIA	EP 68	UKPIA
Coal	66.9	35.0	22.6	17.9	16.5	20.4
Oil	78.3	73.7	84.9	74.9	95.7	70.7
Natural Gas	51.2	95.7	109.2	121.1	124.6	133.7
Nuclear	16.3	20.5	16.9	13.1	8.8	6.8
Other	2.2	4.0	11.5	10.8	11.4	14.1
Total	214.9	228.9	245.1	237.8	255.0	245.7

The UKPIA forecast suggesting that a lower demand for crude oil is likely results from a number of different assumptions including:-

- incorporating the impact of the ACEA voluntary agreement on reducing CO₂ emissions from new cars and other measures announced by HMG.
- further switching to natural gas leading to lower demand for gas oil and fuel oil
- lower refinery energy as demand for petroleum products falls over time.

NB All forecasts are subject to errors and must be taken as illustrative only.

Reducing greenhouse gas emissions will require action in all sectors

Carbon dioxide emissions will increase post 2010 as total energy use grows:-

Domestic sector – Modest improvements in energy consumption per household are likely as higher efficiency is taken in the form of greater comfort, more/larger appliances and lifestyle changes. Moreover the overall number of households is predicted to increase, so total domestic energy consumption will probably rise.

Service sector – There is likely to be a modest improvement in the energy consumption per unit of GDP but total energy demand (especially gas and electricity) in the sector will probably rise. The key drivers include air conditioning becoming increasingly the norm, a greater use of IT and more flexibility in working hours.

Industrial Sector – Industry is expected to continue improving the efficiency of its use of energy. The key drivers are industrial restructuring and the impact of climate change

level/emissions trading As in the domestic and service sectors the growth will probably be in gas and electricity with coal and oil use declining. However total energy used is predicted to rise.

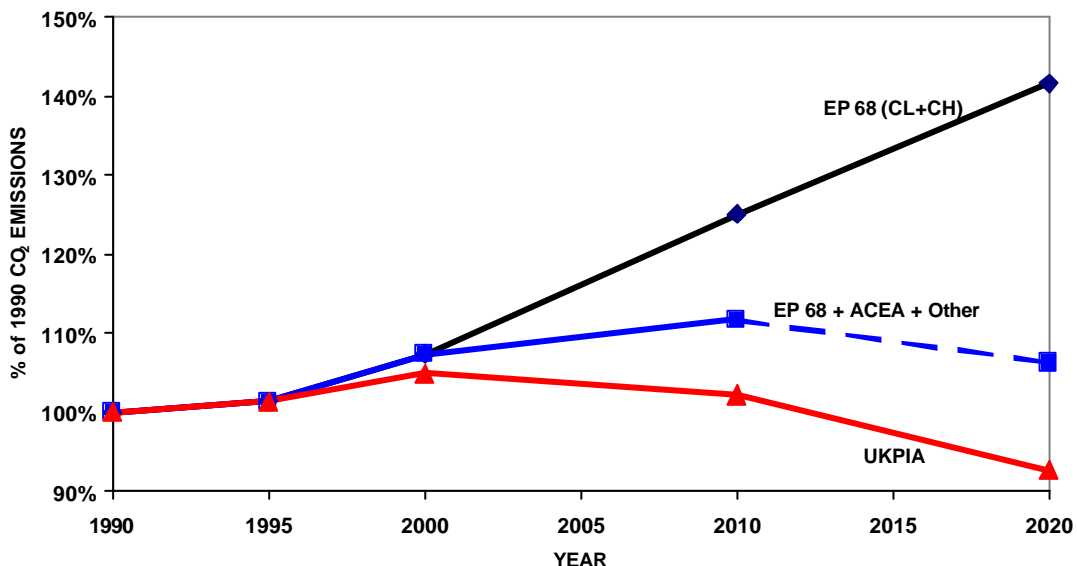
Transport Sector—UKPIA expects a small reduction in the consumption of road fuels over the forecast period due to measures already planned, technology improvements and a switch from petrol to more fuel-efficient diesel – see below. The predicted large increase in demand for jet fuel masks the on-going improvements in fuel economy being made by the aviation industry. In the longer-term technologies under development (fuel cells and hybrid electric/petrol or electric/diesel) have the potential to more than halve emissions of carbon dioxide from vehicles compared to 1990 levels – see below.

If HMG wishes to reduce emissions of greenhouse gases significantly, all sectors need to be targeted using a range of measures. Measures that improve the efficiency of energy use or conserve energy or reduce emissions of greenhouse gases on a “complete lifecycle” basis are particularly important. However, if the UK is to retain its international competitiveness, it is vital that HMG’s targets are met at the least cost to society. This requires the UK to implement the most cost effective control options.

- **Policy needs to reflect that carbon dioxide emissions from road transport will fall**

UKPIA predicts that carbon dioxide emissions from road transport will fall over the next two decades as the ACEA voluntary agreement on CO₂ emissions from new cars and other measures, which hit vehicle use not ownership, take effect. A similar profile but higher final emissions is obtained if DTI Energy Paper 68 is corrected for these measures using the published figure for 2010 and an estimated figure for 2020.

DTI and UKPIA Predicted Emissions of Carbon Dioxide from Road Transport



Impact of ACEA agreement & other measures assumed to be a 25% reduction in road fuel used in 2020

The overall impact should be a decrease in carbon dioxide emissions from road transport as lower sales of petrol should more than offset the increase in diesel sold. It is vital that the impact of current and planned measures are included in forecasts so that trends can be fully understood before policy decisions are taken.

· **Aviation and road transport fuels should be considered separately**

Sales of jet fuel are predicted to increase significantly over the forecast period due to strong consumer demand and Heathrow's position as a hub airport. However sales of road transport fuels are expected to be fairly static over the same period. It is therefore important that aviation and road fuels are treated separately in defining future policy.

· **The market will change gradually by evolution not revolution**

The introduction of new fuel efficient technology, eg fuel cells, will be a gradual process as the cost of the new technology is gradually reduced and the market gradually expanded. In the meantime the existing equipment (eg petrol powered cars) will remain in use due the slow turnover of the existing fleet. Hence there is time to develop any new infrastructure required by new technology.

· **Energy policy should define the ends not the means**

Markets will continue to deliver "lowest cost" improvements in fuel efficiency over the longer term, provided that they are not constrained unnecessarily. Hence policy should set targets without defining or restricting the technology required to meet them. Similarly fiscal and regulatory regimes should be framed to ensure that choice is not unnecessarily restricted. This will enable problems to be solved in the most creative way possible.

· **UK energy policy has to be set in a international framework**

Imported supplies of energy, particularly of natural gas, will largely meet the future UK demand for energy. It is therefore important that the energy policy review encourages developments in the supply of energy and promotes measures that encourage competition in the supply of energy to the UK. The latter point is important as it leads to greater efficiency and lower prices for consumers, both domestic and commercial.

· **The market is not distorted by premature attempts to pick winners**

The impact of technology cannot be predicted exactly as today's front runner may not succeed commercially eg fuel cells may prove to be too difficult to fit in cars but may go into homes or local power generation or may remain too expensive for everyday use. It is important that there are no premature attempts to pick winners by "rigging the market". Any policy intervention must be transparent and cost-effective.

For example there are several promising technology approaches to reduction of CO₂ from road transport but the eventual way forward is still unclear. Significant reductions in carbon dioxide emissions from road transport can be made by:-

- Improved conventional technology
- Hybrid petrol/electric or diesel/electric vehicles
- Fuel Cell powered vehicles

Conventional engine technology – ACEA has committed to reducing the carbon dioxide emissions from new vehicles by 25% to 140 g CO₂/km by 2008 and is discussing meeting the Commission's aspirational target of 120 g CO₂/km. VW already market a petrol driven Lupo which meets the 2008 target whilst its diesel counterpart meets the tighter EC target. Sulphur free petrol will help manufacturers optimise direct injection gasoline

engines. However manufacturers are not planning to market this type of technology until 2003-4 at the earliest. There is no economic or environmental case for an earlier introduction of sulphur-free diesel.

Hybrid petrol/electric or diesel electric vehicles - Hybrid vehicles have two engines - one petrol or diesel fuelled and the other electric. This enables the petrol or diesel engine to be run efficiently at a fairly constant load with the electric motor or its batteries providing or absorbing any extra power. There are concerns over the complexity and cost of having two engines. Initial models of hybrid petrol/electric technology that can run on current fuel quality are available now. The American Petroleum Institute estimate that, when fully developed, hybrids can achieve even better fuel economy than advanced conventional engines with emissions of around 90 g CO₂/km. This is similar to the current predicted performance of vehicles with fuel cells.

Fuel Cells are considered to be potentially the best way forward in the long term. However the joint motor industry/oil industry/HMG seminar on 18 June 2000 highlighted that fuel cells had a long way to go before they could become technically and commercially viable. Many issues remain to be resolved. Most UKPIA members are actively researching this area in conjunction with major car manufacturers. Timelines for this technology are uncertain but a crystal ball view is:-

2005+ limited pilot production - numbers in tens to hundreds worldwide
2010 some production with hydrogen, methanol, natural gas and petrol all feasible fuels
2020 measurable penetration of fleet - all above fuels still feasible.

Hydrogen – The decision about which fuels should be used for fuel cells is a major issue in their development. In the absence of a hydrogen infrastructure, the on-board production of hydrogen from natural gas, methanol or petrol (with close to zero sulphur) are possible options for the short to medium term. It is far too early to be able to decide the best fuel for fuel cells.

The best way forward is uncertain and industry is covering all the above options. Fuel cells are seen as the best long-term option but significant development and cost reduction are still required and there is no guarantee that it will be successful. Until a clear favourite emerges it is vital to ensure that the UK market is not distorted by prematurely “picking a winner”.

The best use of energy crops needs to be established

In general alternative fuels (bio-diesel, bio-ethanol, etc) are more expensive than conventional fuels. The extra cost of using renewable fuels has prevented their widespread use in the past and will require a substantial on-going subsidy to ensure their use in the future, unless there is a step change in the technology.

Different energy crops can be used to produce heat, electricity or road fuels. It is not clear which of these offers the best use of land in terms of meeting the UK target to reduce CO₂ emissions. The best use of energy crops needs to be established as part of the review.

The current European/British standards for petrol already allow bio-fuels such as methanol and ethanol (both with stabilising additives) or bio-fuel derived products such as ETBE (ethyl tertiary butyl ether) to be blended into petrol in small volumes. Similarly the European Standard for diesel is currently being modified to allow bio-diesel (fatty acid

methyl esters (FAME) derived from rape seed, etc) that meets certain quality standards to be blended into diesel in small volumes. In the case of diesel UKPIA strongly supports HMG's decision to only allow FAME that meets the new European Standard to benefit from the proposed duty reduction. Where supplies of bio-fuels are available, with the required quality and at an economic (subsidised) price, companies will consider their use.

However **UKPIA is opposed to the mandated introduction of bio-fuels** as proposed in the Bio-fuels Directive being developed by the European Commissions. The Directive appears to be primarily a way of supporting the agricultural sector in the enlarged EU and should be assessed on these grounds.

The analysis of the former DETR, along with that of many other organizations, shows that bio-fuels continue to be, at best, a marginal and very costly way of reducing CO₂. At most bio-diesel can contribute about 2-4% of the diesel demand, maybe saving a small fraction of a percent of road transport CO₂ emissions. Other measures are likely to be more effective and certainly much more cost effective.

Finally with current technology, crop yields and land area available in the UK the argument on bio-fuels contribution to the UK's security of supply should not be overstated.

I hope that the above assists your deliberations. Of course if you have any questions on the points raised or believe that UKPIA can be of help you in any other way please do not hesitate to let me know.

Yours sincerely

Malcolm Webb

MFG/FC