THE GOVERNMENT'S ENERGY POLICY REVIEW

Basis for review:

The major factors that will impact on the UK energy scene within the next few decades are seen as (i) security of supply, particularly in the context of the depletion of UR gas and oil reserves and the fact that many of the overseas sources are in politically unstable regions, (ii) environmental impact-especially the need to reduce greenhouse gas emissions, and (iii) costs. In face of these factors, in virtually all cases, reducing demand by conservation and energy efficiency is the first priority. An examination of each energy use sector and form of energy is required before assessing supply strategies.

Energy Use

Transport. This is the most rapidly growing sector, and is currently fuelled mainly by oil, Casts of oil are likely to rise as supplies that can be easily exploited fall short of global demand. There is a large potential for increased efficiency, particularly in cars. The European manufacturers *voluntary* agreement to improve average fuel economy by 25% by 2005 should be seen as only a first step. Manufacturers have shown, using known technologies, vehicles with hugely improved fuel efficiency (1). Given the likely increases in fuel costs, such vehicles are likely to be attractive economically, but further pressures from governments should also be applied. The PIU background to the review implies there is only a small change in demand in response to fuel price changes. We accept this may be so in the short term, but believe expectation of a long term trend to higher prices would lead to reduced consumption

Reduction of vehicle use (or at least constraining any increase) is vital. Planning and public transport provision to reduce the need for car use, encouragement of tele-working and safe, pleasant routes for cycling and walking should be priorities.

Buildings: Buildings, domestic and commercial, are major consumers of energy, estimated to be approximately *50%* of UK energy use. There is a. huge potential for energy reduction in heating by methods that are currently cost effective, and which would be even more cost effective if energy costs rise. The new building regulations will force an improvement in new buildings and in refurbishment - the latter a welcome improvement. Thus, every time a boiler is replaced, the replacement will have to be up to modern efficiency standards, and every time significant changes to the building fabric are made) these will have to conform to latest insulation and ventilation control requirements. We believe that when houses are sold, it should be mandatory for cost effective energy efficiency improvements to be carried out, and for mortgage lenders to provide finance for this if needed, at normal rates and over the predicted lifetime of the installation (typically 15 years or more). This seems to be an effective way of resolving the difficult issue of the large existing stock of rather inefficient buildings. There is a potential conflict between increasing energy charges to internalise environmental costs and fuel poverty reduction policies. However, we think that increasing support for people on low incomes, particularly in grants for energy efficiency improvements, is the right way forward, rather than preventing energy prices reflecting true costs. Under the New HEES, support is concentrated very much on the elderly. We think additional funds should be made available to a wider range of people on low income. Regulation of the energy supply industries should provide incentives for the installation of energy efficiency measures in customers homes and businesses.

In relation to lighting, it is reported that light emitting diode (led) systems could give large improvements In efficiency over fluorescent lighting, giving a. major reduction in electricity

demand. Development of this technology should be promoted energetically.

Industry: Current trends to greater efficiency, for example in process heating and heat recovery, electric drives are likely to continue under the impact of the Climate Change levy, Product design to increase life and material efficiency needs encouragement.

Energy Supply

For Transport: For liquid fuels, there is some scope for bio-fuels (See also "International Aspects" below), Part of the revenue from the fuel tax escalator should be used to support the introduction of alternative fuels. If fuel cells were to come into general use, hydrogen generated from renewables could provide part of the energy supply. However it is necessary to assess the complete energy balance in any fuel cell strategy.

Heating: Given the likely upward trend in electricity costs as generation from cheap gas supplies is curtailed, electric heating is likely to be less attractive. Where appropriate, heat from CHP should be encouraged, using biomass fuel to the maximum practical extent. On new housing estates, provision for pipework routes should be required to facilitate immediate or future installation of heating systems from CHP.

Electricity: Currently, **wind power** on some sites and with advanced wind turbines is competitive in costs with other electricity supplies. We believe that the potential for intermittent renewable energy sources to provide a significant proportion of the electricity supply could be improved by the "Regenisys" **electricity storage** system being developed by Innogy, with the first large scale plant being installed at Little Barford. **Bio-fuels** from energy crops may provide a valuable use for set-.aside agricultural land, but the need for bio-diversity should be respected. **Photo-voltaics** (pv) have a good potential in the medium term. Large scale production would bring down the costs by a significant factor (-3). An international effort to promote a production plant of several hundred MW of capacity per year is needed. Some of the output could be used to promote pv in developing countries in areas not connected to a grid supply, under the UNFCCC Clean Development Mechanism. There are other renewable sources **(wave power, tidal**, especially from marine current turbines) where the IlK has good potential and could develop leading technologies.

Generation from **nuclear** power will decline as existing power stations reach the end of their lives. Currently no disposal site fur intermediate and low level radio-active waste has been shown to be acceptable, and the means of dealing with high level waste does not seem to have been established. Plutonium from the reprocessing of spent fuel as currently carried out presents a potential security problem. Even if spent fuel were to be stored in monitorable retrievable facilities, which we see as preferable to reprocessing, plutonium in this would become more accessible in the longer term as the fission products decay. No significant work on developing fuel cycles which might help resolve these problems appears to be in progress in Europe at the moment (for example fuel cycles that transmute the very long lived actinides including plutonium into shorter lived nuclides, and avoid production of separated plutonium). We believe it will be difficult to make the case for new nuclear stations until these issues are resolved - a conclusion in line with the Royal Commission on Environmental Pollution report "Energy - the changing climate".

When the costs of nuclear power are assessed, all costs, including decomissioning and long term radioactive material treatment and disposal must be taken into account. We believe that previous assessments that have discounted costs that would occur in the distant future (even at an apparently low discount rate) do not represent the true cost.

Recent studies have shown that nuclear power is likely to be more expensive than wind power (see above re continuity of supply from renewables). Nuclear power is often said to produce no *C02,* but C02 is produced in construction, fuel enrichment and other areas. All energy sources use energy and/or release greenhouse gases in their production and should be assessed for their energy balance and emissions.

The UK has large reserves of **coal**, but burning coal conventionally in power stations produces more C02 than other methods of generation. Proposals are being made for capture and disposal of C02 from fossil fuel power stations. While this concept may be technically feasible, we would need to see much greater research into the long term stability of any geological storage of C02 before this would be acceptable, and there appear to be significant risks with deep ocean disposal.

The use of **CHP** both at a large scale and small scale should be encouraged, and domestic scale CHP may be an appropriate use for gas as supplies become progressively scarcer.

International aspects. The aim within the EU should be an integrated market for renewable energy. In some of the new entrants to the EU there is likely to be scope for production of liquid fuels from biomass on a significant scale (2), and in Southern European countries for increased solar energy, which could contribute to achieving low greenhouse gas emissions for the EU as a whole. Extending the concept of an integrated energy network, in the longer term, large scale solar power generated in the large sunny areas of North Africa could be transmitted at very high voltages to Europe. The technologies for generation, including solar thermal generation (3) and for long distance transmission are well developed and the combination could become economically attractive if fossil fuel prices rise or the premium for low carbon energy supplies becomes significant. Such a scheme could ease the transition for some oil producing countries to a future less dependent on oil as well as providing a low carbon energy source for Europe..

The PIU background information mentions an EU-Russian partnership. There is a large potential for energy efficiency improvements in Russia and other former Soviet Union countries, for example in improving building energy efficiency and the control and efficiency of district heating systems. Joint Implementation projects to make improvements would be valuable.

Energy balance in the medium and longer term

We believe that the UK commitments on reductions in C02 emissions made at Kyoto can be achieved by strong action on energy conservation and efficiency together with fulfilling the government targets for CH.P and renewables. The price rises that will result from depletion of readily exploitable oil and gas reserves will move the balance in favour of more intensive energy efficiency measures, In the longer term, deep cuts in C02 emissions will be required. At any given time, the risks of different energy sources need to be assessed on the basis best information available at the time, without placing unreasonable burdens on future generations.

Note I General Motors 'Precept"- fill size American car, marketable in - l0 years, achieving - 8Smpg
Note 2 Bio-fuels for transport Renewable energy world May/June 2000
Note 3 Solar thermal electricity Renewable Energy World July/August 2000

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