uranium scarcity? If there are compelling technical reasons for scaling up, why not concentrate R&D effort upon the specific, critical metallurgical and engineering problems, as opposed to building a 1,300 MW power station costing at least £1,500 million? In any case, the performance of very large conventional and nuclear generating units hardly inspires confidence that the proposed scaling-up is economically justified.

Second, since France and Germany are intent upon building demonstration plants which are broadly similar to CDFR, why not wait and license from them when their designs are proven? After all, other countries have acquired the ability to build thermal nuclear reactors on the basis of foreign licences, whilst Britain has spent untold sums in developing indigenous reactor designs. Alternatively, why not collaborate with France and Germany, learning through participation, so as to be able to incorporate any necessary modifications in an eventual British version? The argument that Britain must go it alone because we have little to offer in such collaboration hardly squares with the oft-repeated claim that Britain leads the field in fast reactor technology.

Third, given the decisions to build two further advanced gas cooled reactors (involving considerable design modifications) and to undertake the design work necessary for a pressurised water reactor, how will it be possible to proceed with CDFR without severely overstretching the design engineering resources of the ailing nuclear industry?

So far, attention has focused on the question of whether CDFR should be built, rather than what happens if it is not built. Fast reactor work accounts for two-thirds of the scientists and engineers employed by the UKAEA on reactor development. A decision not to build CDFR will immediately call into question the future of the UKAEA. Even if CDFR is approved, this question cannot be ignored indefinitely. Sooner or later, it must confront any single-mission R&D agency. It has already been faced in the USA, where the Atomic Energy Commission was amalgamated into ERDA and now into the US Department of Energy. In Ontario, the Royal Commission on Electric Power Planning, under Dr Porter, has recommended that the Canadian nuclear R&D establishment should become an energy R&D agency.

It is true that the UKAEA has partially diversified into ancillary work; but I would like to think that its skills and resources, which are unique in Britain, can be applied on a much larger scale to other technologies with the same brilliance and dynamism that were applied to nuclear technology in the 1950s. This is not to suggest that the UKAEA must become an energy R&D agency. Its new role must be defined in the context of overall industrial and R&D strategy and the need to make the best use of all our public laboratories.

The assurance of a future rôle which is nationally and personally worthwhile will remove much of the uncertainty for the scientists and will make it less likely that a breeder is built for the wrong reason. □

'Saving it' is easier said than done

With the oil crisis in full cry and nuclear energy still an uncertain option, the UK government this week called on industrialists to make energy saving a priority. Paul McDonald assesses the potential of this new policy.

Energy conservation, according to Mr David Howell, the Secretary of State for Energy, is "now at the centre of energy policy". Faced with the task of trying to cut oil consumption by five per cent, the Government is relying heavily on industry to make significant improvements in the efficiency with which it uses its energy. However, apart from the widely publicised efforts of certain individual companies, there has been little progress in this sphere.

There are no major technical reasons why much of industry could not improve the efficiency of its use of energy substantially. Such is the inefficiency of the average industry, that its energy can usually be reduced by 10% with little or even no capital investment, simply by goodhousekeeping measures, such as insulation, or turning off machinery not in use. Savings of a further 10% are usually possible from improvements in processes; and a further 10% on top of that from major reorganizations of processing and wholesale re-equipping. The actual proportion that can be saved varies from industry to industry. The Department of Energy's estimates of potential savings vary from a total of 10% in the pottery industry to 61% in aluminium smelting.

The Department of Energy has, unfortunately, no way of assessing accurately how industry is progressing in this. The most optimistic estimates put the average level of improvement in the efficiency of industrial energy consumption since 1974 at 10%; but this is no more than could be achieved by general goodhousekeeping measures in most industries — and certainly below the level of our overseas competitors such as West Germany and Japan. In spite of an upsurge of interest in energy conservation amongst industrialists since January, there are still many factors inhibiting any major improvement in the use of energy, which are going to make the Department's target of 5% very difficult to achieve.

On the surface, there appears to be a good deal of activity: over 4,000 energy managers have been appointed; but their functions and responsibilities vary enormously, and, even in some large companies, a number of them are little more than token appointments.

A major constraint on improving energy efficiency is the lack of capital for measures designed to improve energy use, such as waste heat recovery and improving processes. This is particularly the case for the large number of industries where energy accounts for less than about 2% of manufacturing costs. There is, in any case, a preference in most industries to invest in production rather than conservation. Whilst the latter brings savings, these do not necessarily show up in reduced expenditure on energy in subsequent years, since they may easily be cancelled out by the general rise in energy prices. Given the preference for increasing output, conservation measures are often penalised by the imposition of shorter payback times than those for other items of capital expenditure.

Continuing economic recession and low levels of productivity greatly inhibit the efficient use of energy by forcing industries to work well below their full capacity. Furthermore, in a number of industries, such as food, drink and tobacco, there is a trend towards increased processing, which will increase the consumption of energy for the same level of output.

Improvements in energy use are further hindered by the slow rate of re-equipping in British industry. Many companies wait until equipment is due for rebuilding or replacement before trying to improve its energy consumption. In the case of a furnace, this is only once every 5-10 years.

Proper records of fuel consumption are vital to the sucess of any serious attempt to improve energy efficiency. In a great many companies these simply do not exist, making it impossible to set targets or monitor progress. Futhermore, the high costs of installing and maintaining adequate metering for this task will make the accurate control of energy use a continuing problem for a large number of firms.

The aim of company energy policies is not always to save energy. For certain firms operating continuous processes, security of supply may be the paramount consideration. For others, energy policy may be part of a general cost cutting exercise, and can just as easily involve renegotiating tariffs or switching to other fuels, as actually trying to reduce consumption by requiring the installation of energy using anti-pollution equipment as part of its health and safety policies. Energy conservation is clearly not going to be the easy part of the Government's energy policy.

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