IN BRIEF

Food action urged

A publication from Earth Resources Research, the research arm of Friends of the Earth in Britain, urges government action using taxes and subsidies to encourage consumption and production of foods that strengthen consumers' health, minimise environmental pressures and make the best use of food resources.

Changing Food Habits in the UK, by Chris Wardle, argues that the two main government regulatory bodies, the Food Standards Committee and the Food Additives and Contaminants Committee, should be provided with their own scientific staff and research facilities. There should also be, he says, an intensive programme of consumer education on nutrition, the introduction of nutrition labelling, and an independent body to oversee all forms of food advertising.

German technology assessment?

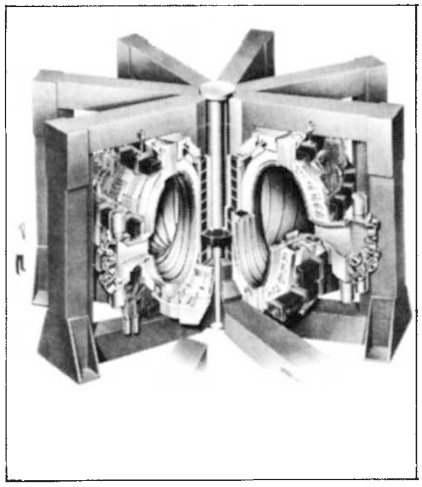
The opposition CDU/CSU parties in the West German Bundestag have proposed a motion to set up an office of technology assessment. They proposed this once before, in 1972. The new motion follows years of discussion and calls for the office to be set up within the existing Bundestag administration and for expert knowledge to be gained by placing orders both at home and abroad. It is regarded as important that Federal government offices should call on foreign experts for advice. The Bundestag will deal with the motion over the next few months.

Europe compact suggested

Professor Peter Odell, appointed earlier this month as a part-time consultant to the UK Department of Energy, said this week that the restraint on oil and gas development imposed by the lack of a West European agreement should be overcome by a compact between the exporting and importing countries concerned.

In a joint paper with Dr K. Rosing, his colleague at Erasmus University, at an Institute of Fuel conference, he said that Europe's strategy for oil and gas production is "constrained more by politics and institutions than it is by the likely size of the resource base".

Fusion's promise



BACKGROUNDER

THE EEC's Joint European Torus (JET), which was finally given to the UK's Culham Laboratory last week, is essentially a device to confine the ionised particles of a plasma long enough for fusion reactions to occur between them. The two light elements most suitable for use in fusion machines are deuterium and tritium. The former is plentiful—it can be extracted from seawater—but the latter does not occur naturally and is made by bombarding lithium, a naturally occurring element, with neutrons.

The most successful machine designed so far for confining plasma, the tokamak, was developed in the USSR and forms the basis of the JET design. The plasma is confined within an evacuated D-shaped torus by a magnetic field, created by field coils linking the torus, and by a current flowing through the plasma. For the energy obtained to be greater than that put in, plasma temperatures have to be about 100 million °C and the product of plasma density and confinement time has to be greater than 10^{14} cm $^{-3}$s.

It is the attainment of such stringent operating conditions that has made fusion so difficult to harness. JET aims to achieve higher temperatures and plasma densities and longer confinement times than any of its predecessors. According to the original plan it was to take five or six years to build. Experiments were then to proceed for two to three years, by which time they would have produced good enough results for a prototype reactor to be designed.

There is doubt, however, about the realism of this timescale. In spite of progress so far, it is unlikely that the road to what has been called a cheap, inexhaustible and clean source of energy will be smooth. As well as technical problems, those of fuel supply, waste disposal and potential radiation leaks will have to be tackled, even though these may not be so great as those for fission reactors.

The radiation hazard stems from the possible release of tritium, a radioactive gas which will have to be contained within the reactor. Tritium for the fusion process will be manufactured as hot neutrons interact with lithium in the container walls. Constant bombardment of the walls will make them radioactive and wear them out so that they will have to be replaced from time to time. Even though the products of the fusion process will not be radioactive and will pose no disposal problem, the old reactor walls will. The fuel supply problem will arise when world reserves of lithium run low. Present estimates put the reserve at about the same as uranium.

The enthusiasm for fusion as the answer to the world energy problem is based on the knowledge of what it could do, theoretically and not on what it actually might do on a large scale. If the fusion reaction were between deuterium and deuterium, for example, the problem of lithium supply would vanish. If it were between deuterium and helium-3 an added advantage would be that neutrons would not be produced and the problem of damaged radioactive walls would vanish. Similar advantages would be gained by using hydrogen and boron. But all these alternative fuels have their drawbacks when it comes to operating a large scale fusion machine, mainly because they would need even higher temperatures to ignite fusion reactions. Deuterium and tritium are at present the only promising fuels.

The outlook for JET itself, however, is fairly bright considering the two years delay. While politicians were negotiating, the team at Culham was building one-off pieces of equipment and refining the design. It has already placed phased contracts for some of the larger parts including the coils for the toroidal field. The next step is to appoint a head of project and management committee. Firm contracts for the rest of the parts will be placed throughout Europe and construction should begin within a few months.