

technical panels on the prospects for different energy sources, it is expected to be in a spirit of optimism that few thought possible six months ago.

One reason is the recent appointment of a new secretary general for the conference, Mr Enrique Iglesias, a Uruguayan who is also executive secretary of the Economic Commission for Latin America. Mr Iglesias, thought to be a candidate for Mr Kurt Waldheim's job as Secretary General of the United Nations, succeeds Mr Mohamed H. Gherab, who has recently been charged with accepting loans from subordinate officials.

A second reason for guarded optimism about the energy conference is that at present the UN secretariat seems to be successfully treading the delicate line between the technical and the political.

It has now been generally accepted that, given a lack of time and resources, the conference can only achieve a limited "state of the art" review of new and renewable energy sources (including solar, geothermal, wind, tidal, biomass, oil shale and hydropower energy). The main focus is therefore likely to be on the institutional mechanisms that can accelerate research and development on these various energy sources — and the obstacles that stand in the way of their implementation.

It is unlikely, however, that any new institution will emerge from the Nairobi conference. Proposals are more likely to be along the lines of a scheme being worked on by the World Bank to form an international network of energy research centres, with a clearly defined set of global priorities distributed in a way that minimizes duplication of research efforts.

Parallel initiatives are also under way inside the United Nations Development Programme (UNDP), which last summer set up a new energy account. UNDP has already received \$3.5 million from the World Bank to carry out a survey of the energy needs of 60 developing countries, as part of the ambitious scheme announced by bank president Robert McNamara last year for a programme of energy loans and investment to total about \$25,000 million by 1985.

The main concern of the UN conference organizers is to devise a set of policy proposals that will be sufficiently specific to meet the recommendations of the technical panels, but sufficiently broad to generate the necessary political support.

One idea under discussion, for example, is a coordinated effort to replant trees that have been cut down for fuel. The World Bank has already proposed raising \$1,000 million towards such a scheme, on the basis that a comparable sum would be found by the individual countries concerned.

Inevitably, there will be points of conflict, some of which have already come to the surface. Little attention, for example, will be given to the environmental efforts of different energy sources, a problem at present of greater concern to

the developed than the developing world. Similarly, the United Nations General Assembly has explicitly stated that the conference will not consider conservation technologies, even though many in the developed countries feel that a reduction in demand is one of the likeliest ways of tackling the energy problem.

There is also dispute about the role of the oil-producing nations. These hold many of the important cards, both in terms of their ability to affect energy prices and in having the cash surpluses available to which access would be needed for any major investment schemes. Their attitude towards the conference remains ambiguous, although Mr McNamara has made it clear that the success of his proposals depends largely on their support.

Given the actual and potential disagreements on each of these topics, therefore, the success of the Nairobi conference still hangs in the balance. But some see light at the end of the tunnel, and argue that although time is getting short, elements such as the World Bank and UNDP initiatives, existing trends in foreign aid budgets and the completion of the technical reports are sufficient to allow a successful outcome.

David Dickson

## Ariane space launcher Still in trouble

The problems of Ariane, Europe's hope for a space launcher, are not over yet. The third test flight, delayed after a failure in a first stage engine on the second test flight last summer, is now unlikely to get off the ground until well after June, the date to which the European Space Agency is still clinging. The difficulty is that no precise explanation of what went wrong with the second flight has yet emerged, and correcting the fault still seems to be a matter of trial and error.

A new schedule for the Ariane programme will not be released until one of two modified fuel injection systems identified as the cause of the fault has been chosen after tests expected to last 4–8 weeks.

The second test flight failed after high amplitude oscillations at 2,300 and 2,700 Hz developed in one of the first stage engines. Tests last October with modified fuel injectors of improved tolerance seemed to solve the problem at 2,300 Hz, but the 2,700 Hz oscillation remained.

Oscillations at these frequencies had not shown up in early tests of the Ariane engines and injectors. But tests up to the middle of last month indicate that the injectors used in early Ariane development differ from new ones, suggesting that they have been modified during assembly, preparation or testing. Nobody has been able to discover precisely how the injectors were modified, but the space agency says it is now trying to increase the margin of error acceptable in the injector design.

The latest line of attack is to test two modified injectors in the hope that one of them will be free from oscillation problems. Officials are hopeful that one system can be chosen within the next couple of months and work can begin on preparing the third test flight. Even if there are no more setbacks, however, a launch in June seems optimistic.

Meanwhile, the French space agency, whose idea it was that Europe should build its own space launcher, is now planning to propose another multi-million dollar venture to the European Space Agency. France wants to be in on the "industrialization" of space in the 1990s and hopes to suggest a remote controlled space laboratory, along the lines of the Russian Salyut space station.

The plan is to build a laboratory for materials processing under micro-gravity that would be placed in geosynchronous orbit by Ariane. The laboratory would be serviced by an expendable vehicle that would deliver supplies and bring processed materials back to earth. A third spacecraft, also in orbit, would be capable of building large structures and experiments for use by the laboratory. The proposal is still only a feasibility study, and will not be put to the space agency before the end of the year. Before then, the French plan to sound out other European nations; preliminary discussions with Germany have already taken place.

Judy Redfearn

## UK research councils

### Getting off lightly

Next year's allocation of the "science vote" of the UK Department of Education and Science is being accepted thankfully by the UK research councils. The thinking may be that if Prime Minister Margaret Thatcher's government can make £200 million cuts in the Conservatives' defence budget, the councils are lucky not to suffer even more.

The Science Research Council, for example, gets £174 million for 1981–82 (at October 1979 prices). Converted to average prices for the current year (say October 1980) this works out at £198 million, compared with current spending for 1980–81 of £204 million — a 3 per cent decrease in real terms. In its annual report for 1979–80, published last November, the council expected "a modest increase" in the next two years; yet a spokesman said this week that the council was "pleased" that the government was treating science and engineering so well.

The Science Research Council's nominal spending on science within the United Kingdom is at present £150.5 million (for 1980–81), and on international subscriptions a nominal £44.5 million. But the latter was calculated at 1979 exchange rates, since when the pound has strengthened sufficiently to reduce the subscriptions bill by some £9 million to

around £36 million. The council has been allowed to use some of this saving to offset its overexpenditure on domestic grants this year (see *Nature* 13 November). Next year, the Science Research Council projects a nominal expenditure of £158.5 million on UK-based science, with £39.5 million on subscriptions (at the same October 1980 domestic prices and exchange rates). Since the pound is unlikely to strengthen further, at least to the degree it strengthened in 1979–80, and the grants to which the council committed itself in 1980 will be continuing, 1981–82 seems set to be a difficult year for SRC.

Among other councils, the Agricultural Research Council has registered a 3 per cent rise from £29.5 million to £30.5 million, and the Natural Environment Research Council remains virtually static at £39.4 million. The Medical Research Council gets £73.2 million, including £13.9 million contract research money recently transferred from the control of the Departments of Health and Social Security. The Social Science Research Council will receive £16.1 million, the British Museum (Natural History) £6.5 million, and the Royal Society £3.3 million. These figures will be adjusted in October this year to account for the inflation rate.

**Robert Walgate**

## Canadian research

### Aiming high

*Washington*

Canada's Liberal Government brought its election promises a step nearer reality last month when it committed itself to increasing the proportion of the country's gross national product spent on research and development from 0.9 per cent to 1.5 per cent by 1985. The commitment is ambitious. Even though the federal government expects a large part of the burden to be carried by the private sector encouraged by tax incentives and other inducements, its own contribution will have to rise from \$1,000 million to \$2,600 million in the next five years — in real terms a growth of 8 per cent a year, allowing for inflation.

Much will also depend on the attitude of the provinces, which through their support of universities contribute about 20 per cent of the nation's effort in research and development. Relationships between the federal and provincial capitals have been cool recently, but officials in Ottawa hope that the need to spur the competitiveness of Canadian industry is one area in which it may be possible to reach agreement.

It will be some time before the broad commitments, announced in Toronto by the Minister of State for Science and Technology, Mr John Roberts, are translated into specific budgets for the various research agencies. And the scientific community is therefore reserving judgement until it sees the colour of the government's money. But for now, the minister's

announcement can be taken as a sign of good faith, since if nothing else it provides a broad framework within which sectoral policies can be worked out.

Spending on research and development has become something of a political football in Canada in recent years, to the surprise of foreign observers who frequently point out that — as the United Kingdom discovered the early 1970s — research spending can be a misleading indicator of industrial strength. Nevertheless, the Canadian public has been convinced that one of the reasons for the country's dependence on foreign investment capital, particularly from the United States, has been its relative lack of an indigenous technological capability. And both the Liberal and Conservative parties have competed with bids to raise research spending to correct the situation.

During last year's election campaign, the Liberals had promised yet again to reach the 1.5 per cent figure, but with no specific target date. Now they have fixed on 1985, and determined that by this time 50 per cent of the nation's research and development spending (equivalent to 0.75 per cent of its gross national product) will come from industry, with a third from the federal government and the rest from the provinces and universities.

Reaching these targets will require a considerable shift in responsibility from the public to the private sector. Industry is being asked to increase its share of the budget from 40 to 50 per cent, while the federal government's contribution would fall in relative terms from 40 to 33 per cent, even though the actual amount of money would increase.

To meet these targets, industry would have to increase its spending by 27 per cent a year — a goal which has already been viewed with a certain amount of scepticism, since the government will have to devise an appropriate set of indirect mechanisms to encourage such growth. Officials in Ottawa are now carrying out a quantitative analysis of the effects of previous policy measures, such as tax breaks on research investment and industrial training grants. One official admitted last week that the studies have so far not been too productive; but there is optimism that some fine tuning can be achieved.

Canada's efforts in this direction bear a close resemblance to the recent domestic policy review of industrial innovation carried out two years ago in the United States under President Carter.

One significant difference, however, is that the Canadian government supports a strongly sectoral approach, identifying areas of high technology — such as nuclear energy, telecommunications or space technology — where it feels that Canadian industry has a particular role to play on international markets.

Although there were structural elements in the policy recommendations put

forward by President Carter eighteen months ago, these were overshadowed by broader proposals aimed at encouraging the general climate for innovation. And with the election of President Reagan, even schemes such as the joint government/industry sponsored Cooperative Automotive Research Project, a pet project of the former president's science adviser, Dr Frank Press, are under threat from free marketeers.

In Canada, the sectoral approach has been strongly supported by groups such as the Science Council, whose chairman, Dr Claude Fortier, wrote in the council's recent annual report that government action is urgently needed along sectoral lines to stimulate innovation and productivity.

This concern is reflected in the government's new proposals. Of the new money which it is proposing to make available for the support of research and development, one half will go to support work in the private sector in clearly defined categories, one third to the government's own mission-oriented laboratories and the rest to universities and other research institutes.

But how much Mr Roberts' announcement indicates a genuine commitment by the Canadian government, already facing a growing budget deficit to increased funding, and how much is merely a political exercise, has become a subject of intense debate.

**David Dickson**

## Environmental cadmium

### Europe to ban?

*Brussels*

Moves to restrict the use of cadmium are gathering momentum in Europe. In Brussels, the European Commission's directive laying down limits for the discharge of cadmium into the aquatic environment is close to being adopted, before it goes to the Council of Ministers, while in Germany, the Home Office Minister has caused a furore in industrial circles by announcing that a new report on cadmium may lead to tough restrictions on its use.

This closely follows news of a Swedish ban due to come into force in July 1983, which has caused much unease among European producers of plastics, stabilizers and pigments, many of which contain cadmium compounds. As a result of research carried out by the Danish National Agency of Environmental Protection, the EEC Council of Environment Ministers has concluded that present environmental levels of cadmium are potentially harmful, the cadmium accumulating in the lungs, bone tissue, and particularly in the kidneys. Cadmium accumulates slowly in man, reaching dangerous levels at around the age of 50. Heavy smokers are thought to be most at risk.

German research has revealed dangerously high cadmium levels in beef, veal,