UNITED NATIONS

Preparing for 1979

A Special Correspondent reports on preparations for the United Nations Conference on Science and Technology

THE appointment in January of Mr Joao Frank da Costa of Brazil as Secretary-General of the United Nations Conference on Science and Technology, which is scheduled for 1979, has enabled preparations to get under way. Sitting as the Preparatory Committee for the Conference, the 54-nation Committee on Science and Technology for Development gave a mixed reception to Mr da Costa's views on the organisation and timing of the conference preparations. He secured agreement, however, on several vital points, the most important of which is perhaps that he should have as free a hand as possible in the selection of the conference secretariat.

Kurt Waldheim, the UN Secretary-General, had stated that the post of Deputy Secretary-General of the Conference should be held by Dr Klaus-Heinrich Standke, the Director of the Office of Science and Technology in New York, and that his staff should form the core of the conference secretariat. From the first, Mr da Costa made it clear that he could not accept this arrangement, especially as Dr Standke was expected to double up two responsible jobs from now until the conference. No deputy as such has been appointed; the Executive Secretary of the Conference, Mr Hans Einhaus, who has lately represented the Office of Science and Technology in Geneva, is holding this position in an acting capacity.

Da Costa was less successful in persuading the committee of the practicability of some of his other ideas, such as the suggestion that each member state should produce three preparatory documents for the conference. If previous performance is anything to go by, many governments will have difficulty in producing a single really useful paper, as now requested, although the option to produce more remains open for those who can. Regional papers will also be prepared by the several UN Economic Commissions. With those from the other members of the UN system and from major organisations outside the UN, these will make up a considerable amount of documentation. To offset this, the number of meetings, seminars and so on suggested for the preparatory period will be reduced; the suggestion that the conference secretariat should be regionalised was also dropped.

No precise agenda is expected until this time next year, but the general objectives of the conference are already well defined. They include: the adoption of concrete decisions on ways of applying science and technology, as a strategy aimed at economic and social development "within a time frame"; strengthening the technological capacity of the developing countries; the adoption of means for the utilisation of science and technology in solving the problems of development; and the provision of "instruments of cooperation" to developing countries, for solving socio-economic problems that cannot be solved by individual action.

In general, it does seem as though the agenda will be action-oriented; one thing da Costa stressed was the need to avoid the "ritual complications" inherent in the preparations for all such conferences—the ritual of producing documents and of setting-up institutions do not of themselves solve problems, but are only tools to that end. In general, the objective of the conference will be to assess and redefine the role that science and technology has to play in development. Moreover, as seen by da Costa the preparations themselves can help towards the definition of a unified policy for science and technology within the United Nations system.

One other point on which da Costa did not get his way was in the location of the conference secretariat. He had asked that it be set up in Geneva, but this was overruled, the majority of delegations preferring New York, where they can oversee, if not interfere in, the conference preparations. Many regard this as unfortunate. One of the reasons for the success of the Environment Conference in 1972 was the insistence of Maurice Strong, as Secretary-General, that his headquarters should be in Geneva, away from the UN bureaucracy.

The New York siting could also prejudice really close collaboration on the part of the other members of the system, although their involvement has been one of the avowed intentions of those who suggested the conference in the first place. Geneva is central to these organisations—UNESCO in Paris, UNIDO and IAEA in Vienna, FAO in Rome and, in Geneva itself, WHO, WMO, UNCTAD and ILO. It is in these organisations that the bulk of international knowledge and experience in applying science and technology lies, and the possible economies of having the secretariat in New York may well be offset by a loss of their close collaboration and good will. □

CANADA

Support for alternatives

David Spurgeon reports from Ottawa on Canada's interest in alternative energy sources

CANADA, a country once thought to possess fabulous natural gas and petroleum supplies, is now carefully assessing its renewable energy resources. The government has recently increased the funds available for research on tidal power, wind power, biomass and solar energy. And the whole subject was highlighted at a recent meeting of the Parliamentary and Scientific Committee sponsored by SCITEC, the Association of the Scientific, Engineering and Technological Community of Canada. It was the second meeting of the committee, which was formed to bring parliamentarians and scientists together, and in spite of scepticism that this could be done, both meetings were well attended.

One of the most interesting energy potentials discussed was the Bay of Fundy's tidal power. Separating the two Maritime provinces of Nova Scotia and New Brunswick, the Bay of Fundy possesses one of the world's largest tide ranges. A. N. Karas, assistant director of planning for the Electrical Engineering Branch of the National Energy Board, said that although the last detailed study in 1968 concluded that Fundy power projects were uneconomic (albeit feasible), significant increases in power generation costs had helped the two provincial governments and the federal government to agree in 1975 to re-evaluate such schemes.

The conclusion was that the combined market for a 7,000 MW tidal

power plant—in the Maritimes, in the contiguous areas of Canada (mainly Quebec), and in the Northeastern United States—would by 1990 be more than ten times the capacity of the plant, or about 77,000 MW, and that such a plant could be brought into operation by that time. A survey indicated that the anticipated peak load in the Maritimes would grow from 3,216 MW in 1980 to almost 23,000 MW by the year 2010. For Quebec, the peak demand would be 18,682 MW in 1980 and 133,000 MW in 2010. And in the Northeastern United States, the figures would be 18,000 MW in 1980 and 87,500 MW in 2010. Thus the full output of the plant could be used.

The energy displaced by a tidal power plant in the Maritimes, furthermore, would be predominantly high cost oil-fired and some coal-fired energy, the latter mainly in Nova Scotia. "In 1990 tidal energy would displace about 4,000 GWh of oil-fired generation and 500 GWh of coal-fired generation," Mr Karas said. "This is equivalent to about an annual savings of 6 million barrels of oil and 300,000 tons of coal. By the year 2010 the corresponding annual fuel savings have been calculated to be about 9 million barrels of oil and 600,000 tons of coal." To serve the tidal plant's export markets, extra high voltage transmission lines (735 or 750 KV) would be required.

The scheme has considerable appeal to residents of Nova Scotia, who have been hard hit by the recent increases in oil prices. Residents of that province pay some of the highest prices in the country for home heating. The president of the Nova Scotia Power Corporation, L. F. Kirkpatrick, was quoted in the *Globe and Mail* as saying that, based on recent construction cost estimates of between $1,300 million and $1,700 million, power could be produced at one or other of the Bay of Fundy sites for between 18 and 29 mills per kilowatt. Currently, oil-produced electricity costs almost 20 mills.

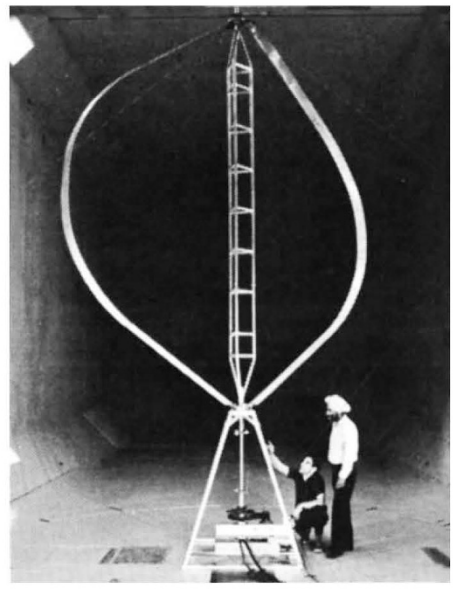
Dr E. P. Cockshutt, co-ordinator of the National Research Council of Canada's Energy Project, gave a cautious but positive forecast for the utilisation of solar energy in Canada. There is sufficient solar energy available in all the reasonably populated regions of Canada to make it a useful resource, he said, giving the lie to those who have played it down in the past. But there were unique features of climate and geography that necessitated a distinctly Canadian programme.

An attack on the technical problems of durability and cost was the most important priority for the next two or three years, Dr Cockshutt said, noting that "popular enthusiasm for solar heating presently outruns the technical and commercial realities." Large-scale commercialisation of solar heating is at least five to ten years away, but it is expected eventually to become a billion-dollar-a-year industry, he said.

Total radiation outside the earth's atmosphere available to a properly-oriented receiver amounts to about 1,400 watts m^{-2}, and that actually received on a horizontal surface at ground level in most of Canada is about one-tenth that (150 watts m^{-2}) on a year-round average basis, Dr Cockshutt said. Even the sunniest parts of the world receive less than twice as much, or about 250 watts m^{-2}. And with properly inclined collectors, the difference would be reduced. But it is because of the extremes of seasonal variation that a Canadian solar energy programme must differ greatly from those in countries close to the equator. In addition, the reflective properties of snow-covered ground differ distinctly from those of vegetation.

Professor H. M. Lapp, of the University of Manitoba's Department of Agricultural Engineering, called biomass a major energy source for Canada in view of the magnitude of its production annually. "The energy available in animal waste, crop residues and forestry waste represents approximately 6.72, 2.74 and 9.46% of Canada's national energy consumption, or a combined biomass energy potential of 18.92% of Canada's national energy requirement," he said. "Such a significant component of Canada's national energy requirements available from renewable sources should be examined carefully for the feasibility of economically viable development." Considering wood alone, he said it had been estimated that ethanol/methanol fuel production potential from wood was about $2\frac{1}{2}$ times Canada's current annual consumption of motor gasoline and approximately 110% of its total gasoline plus fuel oil consumption.

The head of the NRC's low speed aerodynamics laboratory, R. J. Templin, estimated that, with average one- to two-mile spacing between megawatt-sized wind turbine power plants with a total height of about 100 m, the average wind power available over the whole of the country was about 130,000 MW (overall conversion efficiency 15%). If it was assumed that suitable sites were limited to areas within 150 km of an existing network, the available average power was reduced to about 60,000 MW—about twice Canada's national electricity consumption in winter months. Even without energy storage, "it appears that wind energy constitutes a very large *theoretical* resource in Canada," he said. The main obstacles to large-scale wind energy development were the need to demonstrate long-life reliability and to reduce capital costs.



Wind up: turbine in tunnel

A number of small-scale wind power projects are currently in progress in Canada, including several at the Brace Research Institute, Montreal, and a rotor designed by Brace installed by Hydro Quebec's Research Institute for experiments on compressed air storage. The only large-scale project is the 200 kW vertical axis turbine now being erected by Hydro Quebec on the Magdalen Islands, one of the windiest sites in Canada. Several new versions of the turbine are under development at two Canadian companies with government funding assistance.

Only days before the SCITEC meeting, the federal government showed its interest in renewable energy resources by announcing that research in the area had been awarded the largest share of a $10 million increase in federal funding for 1977–78 for energy research. A Renewable Energy Resource Branch has been established within the Department of Energy, Mines and Resources, and a National Advisory Committee on Conservation and Renewable Energy is being created.

There was a $4.4 million increase for renewable energy research (including solar, wind, biomass and the use of heat pumps); energy conservation was allotted $3.7 million more; coal, heavy oils and oil sands research was increased $1.5 million; and transportation and energy transmission received an increase of $460,000. The increases will bring total federal energy R&D funding to approximately $138 million in the next fiscal year. □