MONTREAL MEETING ON 'GREENHOUSE' GAS IMPACT OF HYDROELECTRIC DAMS

Controversy surrounds both the magnitude of 'greenhouse' gas emissions from hydroelectric dams and the way that these emissions should be expressed in order to make fair comparisons of the impact of this energy source with those of alternatives. Full Energy Chain (FENCH) analysis is an evolving methodology for achieving comparisons among alternatives, including all emissions from the building of facilities to their eventual replacement and/or decommissioning. Jan F. van de Vate of the International Atomic Energy Agency (IAEA) and Luc Gagnon of Hydro-Québec organized a meeting of the IAEA Advisory Group on FENCH, 12-14 March 1996. The event, held at Hydro-Québec headquarters in Montreal, convened 15 specialists from Canada, China, Brazil, India, Sweden, Switzerland, Germany and Finland to 'brainstorm' on the best way to make such comparisons for hydroelectric projects. This is the second in a continuing series of meetings, each dealing with a different form of energy generation; nuclear power was the subject of the first meeting, held in Vienna in 1995.

The Montreal meeting revealed both the limited extent of our knowledge about hydroelectric emissions and the limited extent of agreement as to how to interpret what we know. Rosa and Schaeffer presented their proposal for revised global warming potentials to allow for differences in the timing of emissions, with examples from dams in Brazilian Amazonia (see Environmental Conservation 24(1): 64-75), while I used Brazil's the Tucuruí Dam as an example to explore the implications of discounting on the atmospheric loads of gases from hydroelectric versus fossil fuel generation. The examples presented from the remaining countries summed, with varying degrees of completeness, emissions over a fixed time horizon (such as 100 years), without distinction based on the timing of emissions. Important data needed for FENCH analysis were presented, such as measurements of emissions from reservoirs in Canada and Finland, and calculated emissions from dam construction in Switzerland, Germany, Sweden, China and Canada.

Results from several of the countries represented at the meeting were summarized for purposes of comparison. The methodology used, however, did not enter into the thorny questions related to discounting and the timing of emissions. Both of these factors act to reduce (and in extreme cases even negate) the advantage of hydroelectric over thermal generation in terms of global warming impact because hydroelectric projects have large initial impacts followed by relatively 'clean' energy in the longer term future, whereas fossil fuels produce a nearly constant stream of emissions over time.

FENCH represents an important development for making more rational decisions in a key area: how to provide the benefits of electricity with a minimum of environmental impact. I suspect that over the next five years we will see rapid evolution and expanded application of FENCH. Further information on the meeting results can be from Mr. L.L. Bennett, Head of

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