



CANADA

REFERENCE PAPERS

INFORMATION DIVISION
DEPARTMENT OF EXTERNAL AFFAIRS
OTTAWA - CANADA

No. 78

(Revised June 1963)

ATOMIC RESEARCH IN CANADA*

The high-energy yield from the fission of uranium is the key to the prospect of economic nuclear electric power. The yield is so high that the cost of the raw uranium is a very minor component of the cost of electric power. It will be about 5 per cent of the total and may be contrasted with 50 per cent or more paid for coal in some large conventional generating stations. The largest component in the overall economy of nuclear power systems is reactor-plant construction, and a minor (10 per cent to 20 per cent) component is fuel fabrication.

For a few more years yet, the major atomic-energy activity in Canada is likely to be uranium mining and refining for export in support of military uses. A major transition, however, is taking place in which uranium production will give place to engineering and construction of nuclear electric generating stations. This phase will last until nuclear plants are established in such numbers and capacity throughout the world that the market for uranium revives and regains its former peak.

Future of Heavy-Water Reactor

There is some prospect that the economic advantages of the heavy-water reactors designed in Canada will lead to the adoption of this type in many other countries with the creation of a market for heavy water that could be produced competitively in Canada. The possible export of nuclear generating stations, heavy water and uranium fuel is appearing as a new, near-term prospect on a small but significant scale.

Expanding Capacity

In Canada plans are already taking account of a revolutionary increase in the size of electricity-generating stations. The full-scale, 200,000-kilowatt Douglas Point Nuclear Power Station now under construction has come to seem small. Steam turbines and conventional stations are now appearing in larger capacities and the prospects of long-distance, high-voltage transmission to interconnect centres of load, together with the lower unit-power costs that result from operating on a larger scale, cause utilities to plan generating stations of 2,000,000 kilowatts and more. The Canadian design of nuclear-power reactor appears capable of expansion to keep pace, and will yield even more benefit than the conventional plant in the resulting reduction of unit-power cost.

*Based on an article by Dr. W.B. Lewis, Vice-President, Research and Development, Atomic Energy of Canada Limited.