

Tens of thousands of Canadians derive their employment from the investment in nuclear science and engineering R&D, and its main product—environmentally friendly and cost-effective electricity—has helped drive Canada's economy for more than 25 years. Overseas sales of CANDU reactors also contribute substantially to both Canada's economy and to global environmental protection.

The contribution of nuclear R&D through the development and use of radioisotopes is important in many aspects of our lives. Canada is the world's leading producer and supplier of cobalt-60 used in cancer therapy irradiators, a device developed in Canada almost 50 years ago. Canada is also the leading producer and supplier of short-lived radioisotopes for nuclear medicine, which are used to perform 20 million diagnostic tests and treatments a year worldwide. In biology, radioisotopes have made possible the revolution in our understanding of life at the molecular level, which has led to highly effective new treatments for diseases.

Cobalt-60 irradiators, produced in Canada, are also used in such diverse applications as the sterilization of medical devices and products, insect control in agriculture, and the destruction of potentially lethal microbial contaminants in food. Radioisotopes have many other applications, including well-logging in the oil industry, analysis of ore samples in the mining industry, radiography, process control and quality assurance in manufacturing, detection and measurement of industrial pollutants, and smoke detectors in the home.

In 1994, Bertram Brockhouse was awarded a Nobel Prize for work that commenced in the 1950s using the NRX (now shut down) and NRU reactors at AECL's Chalk River Laboratories (CRL). This work led to the neutron scattering techniques that are widely used in many industries, including aerospace, automotive, oil and gas, and manufacturing, to assess the behaviour and properties of materials. This technology is now an essential requirement for the development of advanced materials for a knowledge-based economy, and is an example of the long-term payback that comes from investment in basic research.