

14.2 Extramural activities

This category includes S&T activities funded by the federal government but carried out in the business sector, universities, other levels of government or other countries.

Since 1978 the federal government has strengthened R&D capacity, primarily in the extramural sector and particularly in industry. There has also been substantial strengthening of the university research system through budget increases of three granting councils: the Natural Sciences and Engineering Research Council, the Medical Research Council and Social Sciences and Humanities Research Council.

Other measures included expansion of the NRC program of industry/laboratory projects (PILP), in which government laboratory projects are contracted out to industry for further stages of development, and establishment of a similar program, co-operative projects with industry (COPI) shared by the departments of agriculture, communications, environment, fisheries and oceans, and energy, mines and resources. There was increased interfacing among government, industry and universities.

Universities are at the core of the Canadian science effort. The need for new knowledge cannot be fully met without investment in university research. This is also the principal means of training research manpower in Canada. Objectives for government support of university research are: to assist fundamental research arising solely from an investigator's personal interest in order to advance knowledge, and to institute concerted research programs that contribute to the attainment of identified scientific goals. Concerted research is more likely to be interdisciplinary than is fundamental research.

14.2.1 Industry

The industry, trade and commerce department (ITC) is the largest funder of S&T activities in industry. Under the enterprise development program, Canadian companies may receive cost-shared support to develop new or improved products and processes or conduct market research. Recent increases in this program and increased funding for the electronics industry more than offset reductions for S&T spending for a defence industry program to assist several sectors including aeronautics, electronics and shipbuilding. An industrial energy R&D program encourages Canadian industry to undertake R&D that will reduce energy consumption.

Other ITC programs have assisted in the establishment of non-profit organizations to provide R&D and other technical services. Nine industrial research institutes have been set up at universities; these arrange for university faculty to provide contract research and technical services to industry. Twelve centres for advanced technology have been established to help universities and provincial research organizations develop and maintain competence in specific fields of technology. Four industrial research associations were set up to help groups of firms undertake co-operative research on common technical problems. ITC supports such organizations for a maximum of seven years. They are then expected to become self-supporting.

NRC is the second largest funder of industrial S&T activities. More than 98% of the council's industrial funding is for R&D, divided almost equally between contracts (\$19.5 million in 1980-81) and grants and contributions (\$21.7 million). The PILP projects mentioned in Section 14.2 above are under the contracts program; examples are extraction of oil from tar sands, vertical axis wind turbines for electric power generation, a snow-and-ice-free railroad switch and reduction of hydrogen level in steels. Related COPI projects have included a modified skim milk drying process and an integrated radiotelephone system.

The principal source of funds for industrial research is the NRC industrial research assistance program with estimated expenditures of \$19.7 million in 1980-81. This program assists Canadian industry to pay salaries and wages of R&D staff working in Canadian companies on approved projects with significant technical content.

14.2.2 Universities

The federal government provides direct support to universities for S&T, first in grants and contributions and second through contracts in support of departmental missions.