

## **NRC A Model for Bottom-Up Approach to Innovation**

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Innovation is the key to Canada's continuing economic viability. At the National Research Council of Canada (NRC), we have been collaborating for a number of years with universities, research organizations, financial institutions, industries and policymakers to foster and strengthen a national system of innovation based on regional development initiatives. The objective is to help build a strong, knowledge-based economy in which new ideas, through networks of committed stakeholders, can be quickly turned into commercial successes.

In today's global economy, where partnerships are essential for identifying and exploiting commercial opportunities, perceptions of the innovation process have changed radically. The traditional concept of innovation is that of a straight line, starting with research and development, moving through the prototype stage, and ending with product engineering and marketing. To use a sports analogy, innovation has been seen as a relay race.

In the new economic paradigm, innovation is a complex, cumulative process, rather like basketball. There are constant interactions among the key "players" (R&D, engineering, production, marketing) who, although they have different talents and skills to bring to the "game", work together through all stages of the innovation process to achieve a common goal.

One of the major challenges facing us at NRC is ensuring that we derive the maximum benefit for Canadian industry and the Canadian people from our technical and scientific achievements. In 1996 we announced a Vision for 2001 that called on NRC to be a leader in the development of an innovative, knowledge-based economy through science and technology. One of the ways we

propose to achieve this Vision is to strengthen our commitment to focused research, in collaboration with universities, research organizations and industry, that will help Canada develop and exploit key technologies. It is a client-driven strategy in which our partners and clients are involved early in the innovation process -- helping to define the R&D program and increasing their own technical receptivity. This is one element of a bottom-up approach.

As another element of this approach, NRC fosters partnerships within communities and regions, where the strongest engines of innovation, the small and medium-sized enterprises (SMEs), are at work. Individuals and firms operating at the local level, using the resources at hand, and tapping into networks that will help them take their ideas to market, are at the heart of the effort to establish and develop knowledge-based industrial clusters that can stimulate economic development, both locally and nationally.

The development of clusters is an international phenomenon that has now been documented. Success depends on a number of factors including entrepreneurial drive, availability of investment capital, effective information networks, support from educational institutions and regional strengths and assets.

NRC sees itself as one of those assets, and has many strengths it can bring to the innovation process, among them an outstanding research base, state-of-the-art facilities, and links with universities and research organizations in Canada and around the world. As a federal research organization with a strong regional presence through 16 research institutes in centres across the country, NRC fulfils an important role as a leader in developing a national system of innovation.

We believe this regional or "bottom-up" approach to innovation can serve as a model for formulating policy on economic growth based on science and technology. It is, in fact, an approach that supports the action plan of the Industry Portfolio, an alliance of science- and economic-based government departments and agencies working together in response to the federal science and technology strategy. The Portfolio's objective for innovation in Canada echoes the one we have formulated at NRC: to help Canadian businesses increase their competitive advantage and their capacity to expand, with a particular emphasis on strengthening the backbone of Canada's economy -- small and medium-sized enterprises.

Within this context, in July 1998 NRC will join the Social Sciences and Humanities Research Council (SSHRC) and the Natural Sciences and Engineering Research Council (NSERC) in launching the Innovation Systems Research Network. The Network will link NRC researchers and local champions of innovation in a program to explore the relationship between innovation and economic development at the local and regional levels. During its three-year mandate, the Network will support the work of about 30 university and government researchers across Canada in analysing the dynamics of regionally based innovation, and thereby help strengthen NRC's role in this area.

NRC's successes in cultivating partnerships at the regional level show that we are on the right track for fostering and encouraging a national system of innovation based on science and technology, which in turn will help guarantee

the continued growth and prosperity of Canada.