CANADA

National Advisory Board
on Science and Technology

REPORT OF THE COMPETITIVENESS COMMITTEE

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SEPTEMBER 1992

National Advisory Board on Science and Technology

Conseil consultatif national des sciences et de la technologie

September 21, 1992

Mr. David McCamus
Co-Chair
Steering Group on Prosperity
235 Queen Street
Ottawa, Ontario
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Dear Mr. McCamus:

Earlier this year, you solicited the comments of NABST on the competitiveness issues being considered in the Prosperity Initiative. At that time, we provided to you copies of the NABST reports on Competitiveness, Innovation, Financing, and Human Resources. Now that the Prosperity Consultation reports have been completed, we are in a position to provide additional comments. Members of NABST would like you to know of our full and strong endorsement of two clear messages that have been received from reports to the Prosperity Initiative: first, that Canadians must become more committed to meeting the competitiveness challenge; and second, that swift and decisive action is vital in all sectors of the economy.

As you know, NABST formed a committee to review the reports and recommendations of the Prosperity Initiative, in order to identify the most critical science and technology priorities for action. The Competitiveness Committee reviewed the hundreds of excellent proposals that emerged from the community, sectoral and national consultations. Our specific interest was in those S&T proposals concerning: learning, training and skills in mathematics and technologies, technology acquisition and diffusion, technology management, R&D, and innovation. In order to assess the proposals by a consistent standard, the Competitiveness Committee established a set of specific evaluation criteria; these are attached to this letter.

In summary, however, the Committee looked for fiscally responsible proposals which:

- support the capacity of **companies** to acquire and apply technology;
- encourage adoption and adaption of market-driven product and process **technologies**; and
- assist in the development of highly qualified **personnel**, capable and technically skilled.

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Based on our evaluation, the following are the top priorities for federal action.

1) A central consensus of the Prosperity consultations is the importance of investing in people to ensure the future availability of Canada's highly qualified personnel. In NABST's view, the introduction of national education performance standards is a key investment in our ability to compete as a nation. The impetus for action to achieve standards should come not only from the provinces, which have jurisdiction over education, but from all parties in our national economic union, including the federal government, industry, the workforce, and educators. Student achievement in literacy and numeracy should be monitored by regular examinations based on nationally-agreed standards, and our stronger education system should contribute to a learning lifestyle.

2) Vocational schools, apprenticeship, internship and continuing on-the-job training are essential parts of an integrated system of education which is needed to establish and maintain a highly skilled workforce. Governments, workforce, industry and educators must act cooperatively to bring such a system into operation. A National Industrial Technology Internship Program, based on the successful operation of the federal IRAP program which arranges for industrial problem-solving by university and college students, would be an important start toward the larger goal.

3) The federal government should consolidate its science and technology programs in order to make them more accessible and more effective. In NABST's view, it is particularly important that federal Technology Diffusion programs be structured for "one-stop shopping" by concentrating resources through IRAP, which has a superlative record of serving small and medium sized firms in their communities. These programs in turn should be networked with provincial and private sector technology diffusion services. In addition, federal S&T programs should demonstrate a customer focus and should be driven by the demand of Canadian firms. Rigorous and regular evaluations of S&T programs should be conducted, including peer assessment where appropriate as recommended in the Lortie Report, on the basis of each program's contribution to international competitiveness.

4) To promote better technology development, federal funding for R&D organizations and technology support programs should be re-focused to promote both specialization in areas of strength and partnerships with industry in order to achieve high-quality, market-directed results. The Networks of Centres of Excellence is a good beginning. Leadership and financial support from the private sector are required to transform existing institutions to serve industry's competitive needs.

5) Modest amounts of government financial support for cooperative pre-competitive research undertaken through industry associations and consortia of

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private companies have had good results in Canada and elsewhere. Where possible federal funding should be used to continue to encourage a more active role by industry associations and consortia, and to catalyse those research projects which are likely to be self-sustaining. The definition of applied research for this purpose should be extended to include market intelligence. Efforts of industrial firms and their associations to act in mutually supportive ways can also contribute to quality training and continuing education.

6) The Scientific Research and Experimental Development (SR&ED) tax credit program should be amended to allow: shared use of equipment for production and R&D purposes; simpler administration and costing of overhead expenses; and a more inclusive and reliable basis for eligibility of expenses, including market intelligence. We commend the government's commitment to assign more resources to the SR&ED program.

In most instances, these proposals are not new. But they have not been implemented and our problems persist. Collectively, we have not appreciated the urgency of meeting global competition. Essential changes, particularly in learning and skills upgrading, are delayed in wrangles over jurisdiction and funding. This must change.

In our view, while the federal government can show leadership in a number of critical areas including the priorities indicated above, many of the changes needed are the clear responsibility of the private sector and educational institutions. For example, the transformation of the culture for technical training and the practice of Canadian firms measuring their products, processes and business practices against those of their toughest competitors (benchmarking) are best done by firms, industry groups or consortia. Similarly, educational institutions themselves can take the lead in building stronger courses in mathematics and science, as well as in introducing the essential component of management skills into technology training programs.

In the end, however, all players in the Canadian economy must cooperate to achieve the objectives identified through the Prosperity consultations. Failure to meet the challenges of competitiveness assures a continuing decline in living standards, job losses and a bleak future. Members of NABST believe that science and technology are a vital means for Canada and Canadian companies to succeed. One message from the Prosperity Initiative stands out: swift and decisive action is required.

Yours sincerely,

Bill Shaw

Bill Shaw
Chairman
Competitiveness Committee

Enclosure

CRITERIA FOR EVALUATING S&T PROPOSALS

The purpose of the Prosperity Initiative is to produce a plan of action based on national consensus of governments, business, labour, the academic and scientific communities, and individual Canadians on how to best adapt to the competitive demands all around us. It is meant to recognize that actions are necessary at many levels in our society -- at the level of the firm, the industry sector, the region and the country as a whole -- reflecting the advice, opinions and recommendations from all stakeholders in Canada's prosperity.

The task of the NABST Competitiveness committee is to consider the many proposals related to science and technology that are arising from the Prosperity Initiative consultations and from other sources, in order to suggest a small number of effective measures that NABST may wish to recommend to the Prime Minister.

Using the previous work of NABST on competitiveness issues and the views expressed by committee members, the following criteria have been selected to screen each proposal and to judge its value in specific terms. They focus on companies, technologies and personnel, and are meant to establish a clear standard of qualification in each point:

1. Does it support the capacity of companies to originate or acquire technology, and to apply it through such measures as:
   a) encouraging both strategic management in firms, and better management of their R&D and innovation?
   b) developing technology champions and a strong core of engineering and technology personnel?
   c) providing skills training to assist work force adaptability and capability to contribute to the company's best use of available technologies?

2. Does it encourage market-driven product and process technologies to be adopted and adapted in Canadian companies, through a public policy framework, including taxation, regulations, financing, and diffusion of technology information, favorable to innovation?

3. Does it assist the development of highly qualified, capable and technically skilled personnel to contribute to the Canadian economy, specifically in terms of:
   a) training the next generation, particularly more women, in technology fields?
   b) assisting technical personnel in industry in continuing education in technology and problem-solving abilities?
   c) improving skills to access R&D and technology from international sources?

Each proposal qualifying in terms of the criteria stated above, would then be required to satisfy this additional test of esssential elements:

(1) Is it no / low cost, or would it involve a re-allocation of resources which would qualify it as having a net low cost?
(2) Can it be implemented quickly and effectively?
(3) Would it attract broad public agreement and consensus as a feasible course of action?

Finally, would the package of initiatives developed from the criteria outlined above sufficiently involve all key agents of change -- industry, governments, academe and labour?

30 June 1992