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www.itac.ca**ITAC Response to
Science and Technology
Consultation
February 7, 2014**

ITAC, the Information Technology Association of Canada, welcomes the initiative on the part of the Government to update its Science Technology and Innovation Strategy. Representing a science-based industry that is the largest contributor to business enterprise research and development in the Canadian economy, we are pleased to offer our perspective on the ways science, the capacity for innovation and the factors that contribute to the creation of sound commercial enterprise converge to create wealth and employment for Canadians.

Building on the advice provided by the Expert Panel on Federal Support for Research and Development, what more can be done to improve business investment in R&D and innovation?

The Expert Panel Report offered a number of suggestions for improving Canada's capacity for innovation which the Government has adopted since its release in 2011. ITAC has vociferously supported many of these measures. Most recently we welcomed the announcements of a new Fund of Funds, which is a major pillar in Canada's Venture Capital Action Plan (VCAP). The industry has persistently stressed the importance of access to capital to fund the formation and the long research and development cycles of science-based businesses. While we have encouraged a faster pace for the delivery of the elements of VCAP, we are generally satisfied with the caliber of the thinking behind VCAP and the talent drawn from the private and public sectors to deliver it.

We also welcomed the transformation of the National Research Council to play a stronger role in supporting the needs of Canadian business. We believe that Canada needs to play an active role in scientific discovery, contributing Canadian knowledge and expertise to the global pursuit of a better understanding of our world and the forces that shape it. In order to do this in a

sustainable fashion, we must create the virtuous cycle of economic activity that creates the wealth and talent to maintain this pursuit. The refocusing of the NRC's mandate expresses a strong grasp of this reality. So too does the Government's ongoing support for public private partnerships to drive innovation and commercialization through Business-led Networks of Centres of Excellence and the Centres of Excellence for Commercialization and Research.

ITAC also strongly supports the measures put in place since the release of the Jenkins Report to:

- Link innovation to the tremendous purchasing power of the Government through ongoing commitments to programs like the Canadian Innovation Commercialization Program
- Provide enhanced support to IRAP for ongoing service to emerging Canadian companies including new innovative services
- Improve CRA's pre-claim review of SR&ED claims and generally improve its engagement with stakeholders

Representing as we do some of Canada's largest R&D investors, we continue to have serious concerns about the potentially negative impact of reducing the tax rate to SR&ED qualified pool balances from 20% to 15% and removing capital expenditures for R&D from SR&ED eligibility. We believe that these measures have a serious impact on the largest R&D investors who anchor clusters and themselves drive R&D activity and R&D-based business creation. We have expressed our concerns that these changes will actually impair BERD performance and in our 2014 pre-budget submission recommended an adjustment to these measures. At minimum, we strongly recommend careful cognizant of the overall impacts of the shift from indirect to direct measures for encouraging R&D to ensure our overall policy objectives are being met. It is not clear to our members, some of the largest R&D performers in the country, that dramatic changes to the SR&ED program have been offset by new initiatives to directly fund R&D. This is particularly true of major new investments in programs such as the Advanced Manufacturing Fund. Data collection and analyses are particularly critical at this juncture to ensure our new measures are fulfilling their objectives. An oversight body, such as the Industrial Research and Innovation Council recommended by the Expert Panel, might provide useful governance for this type of analysis.

What actions could be taken by the Government or others to enhance the mobilization of knowledge and technology from government laboratories and universities, colleges and polytechniques to the private sector?

Innovation policy must better understand the way that science is transformed into innovations that produce commercially viable enterprises that create jobs and wealth. A desire to “enhance the mobilization of knowledge from (research organizations) to the private sector,” reflects a persistent and unhelpful belief about how science-based commerce happens. Science-based commerce usually begins with a customer. Successful entrepreneurs will start from a problem statement or challenge expressed by a customer or potential customer. They will then pursue the science in their own labs or in collaboration with public institutions to address the problem. If they are successful, a product or service will emerge from the R&D phase and, assuming an adequate supply of capital and talent, find its way to the customers’ hands. Only rarely does discovery science conducted in public institutions produce a commercially viable product.

Our focus therefore should not be upon how to mobilize or push discoveries out of public labs and into the marketplace, it should be upon how to pull the knowledge and expertise resident in public research institutions into the activities of commercial partners. Again, private public partnerships, such as through Centres of Excellence, is key here. And greater transparency between academe and industry is also vital to this process. The transformation of the NRC is one very strong measure in this direction. So too is the renewed focus on industrial collaboration from granting councils notably NSERC and the universities and colleges themselves. These measures must be celebrated and supported.

Above all, we must never lose sight of the fact that successful science-based commerce starts with the customer, not with the science industry and government (through programs like IRAP) must continually stress the importance of customer-centricity. This seems like an obvious business notion but in a study of an array of science-based companies that did not meet their business objectives, one of the most frequently cited problems was that the emerging companies did not being with or ever successfully find a customer.

Canada’s relatively small marketplace makes finding customers particularly challenging. Emerging ICT companies understand pretty much from incubation that to succeed they must

find global customers outside Canada. This places particular importance on the work done by DFATD through its vigorous pursuit of international trade agreements and the services it provides to encourage and enable Canadians to capitalize on global opportunities. DFATD, its Trade Commissioner Services and agencies like Export Development Canada, play a vital part in the creation of science of commerce and they must be funded appropriately to continue to do so effectively.

How can Canada continue to develop and retain the world's top talent at our businesses, research institutions, colleges and universities?

The investments the Government has made in scientific research and in new initiatives, like the Canada Research Chairs, are profound and they will contribute to the fulfillment of Canada's aspirations as a science-producing nation. These investments are necessary but alas not sufficient.

The principal contribution that universities and colleges make to the innovation ecosystem is in the education of a highly skilled workforce. Canada's universities and colleges graduate top talent but, unfortunately, not in sufficient numbers to meet the needs of industries, such as ICT, that are growing faster than the Canadian economy. While Canada enjoys impressive metrics in secondary and post-secondary education, ITAC believes our overall performance in science, technology, engineering and mathematics literacy presents a serious challenge to our aspirations as an innovative nation. Comparatively few of our university-educated men and women are pursuing studies in STEM disciplines. From 2004 to 2007, for example, 9% of Canadian graduates were in engineering or engineering related fields compared with 30% in China. At the doctoral level, Canada placed 25th out of 36 countries in science and engineering doctorates in 2006. The Conference Board of Canada, while scoring Canada high for overall education, gives Canada a 'D' in its production of PhD graduates and a 'C' in STEM graduates.

Canada must take up the challenge of improving our STEM capacity. The simple reality is that a higher capacity for STEM comprehension is a basic ingredient in the formation of a strong 21st century citizenry. Beyond this, it is key to our competitiveness in a global economy increasingly predicated on the exchange of knowledge. We simply cannot continue to be complacent about our overall STEM literacy.

As we work to improve our domestic supply of engineers and scientists, we must also recognize the importance of the global workforce to our science and technology aspirations. Just as a Canada Research Chair recruited from a foreign country may catalyze a major force in scientific discovery and impact the lives and careers of countless students and research associates, the same catalytic impact can occur in commercial research and development facilities. A highly qualified scientist from another country can anchor a research activity that can provide jobs for many Canadian researchers and technologists – jobs that would not likely exist without him or her.

Yet with recent changes to regulations governing access to global workers, many Canadian companies are encountering difficulties in accessing the international talent they need in a timely manner. Canada's policies must recognize that even if we succeed in fulfilling our science and innovation aspirations, no country has a monopoly on innovation. We will always need and benefit from the best talent the world has to offer. There are strong indications of comprehension of this reality in initiatives such as the Canada Experience Class and the new entrepreneur class visas. But overall Canada's approach to the immigration, permanent or temporary, of highly skilled workers needs to more thoroughly reflect Canada's need to draw talent from around the world.

How might Canada build upon its success as a world leader in discovery-driven research?

Returning to the notion of the virtuous circle forged between industry and “science” to create the wealth necessary to continue to fund science and discovery, our assessment of what “success” looks like should include among other indicators (like BERD, enrollment and graduation data, etc.) the number, health and performance of science-based companies. These companies are vital as research collaborators, employers and economic drivers. Growing a strong cadre of Canadian companies of leadership-size should be an explicit aim of our science and innovation policy.

Is the Government of Canada's suite of programs appropriately designed to best support research excellence?

There is a great deal to be proud of in terms of Canada's position as a science and innovation producing nation. Innovation continues to be a transcendent theme in Budgets and Speeches from the Throne and there is a strong track record of achievement in Canada's current innovation policies and programs. But challenges still remain in terms of our overall STEM literacy and performance, our access to global talent and our ability to encourage large scale business research and development. ITAC shares the Government's aspirations to build a stronger science and innovation ecosystem in Canada and we would welcome an opportunity to discuss our views on how to do so in more detail.

About ITAC:

The Information Technology Association of Canada (ITAC) is the voice of the Canadian information and communications technologies (ICT) industry. ITAC represents a diverse ICT community spanning telecommunications and internet services, ICT consulting services, hardware, microelectronics, software and electronic content. ITAC's community of companies accounts for more than 70 per cent of the 572,700 jobs, \$155.3 billion in revenue, \$6.2 billion in R&D investment, \$30.4 billion in exports and \$11 billion in capital expenditures that the ICT industry contributes annually to the Canadian economy. The ICT sector currently represents 4.9 per cent of Canada's gross domestic product (GDP) and accounted for 9.4 per cent of all real GDP growth since 2002. ITAC is a prominent advocate for the expansion of Canada's innovative capacity and for stronger productivity across all sectors through the strategic use of technology.