

RESEARCH MONEY

THE 11TH ANNUAL RESEARCH MONEY CONFERENCE
"Budget 2012: Canada's new innovation strategy for an age of austerity?"



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The proceedings of the
11th Annual RE\$EARCH MONEY Conference:

“Budget 2012: Canada's new innovation strategy for an age of austerity?”

Prepared by Tim Lougheed

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The 11th Annual RESEARCH MONEY Conference “Budget 2012: Canada's new innovation strategy for an age of austerity?”

At a Glance

Two challenges for participants

Jeffrey Crelinsten, Publisher, RESEARCH MONEY, framed the proceedings with two “challenge” questions for both the audience and presenters:

- 1) Why are there so few policies for established firms that want to grow large and so many programs focusing on start-ups?
- 2) Why is there never any discussion about the role that our post-secondary learning environment might play in the lackluster innovation performance by Canada’s business sector?

Although neither of these questions was featured directly in the terms of reference for any of the keynote speakers or panelists, every presentation touched on each of them at some point.

Budget 2012 in brief

David Watters, President, Global Advantage Consulting, offered an overview of the recent federal budget, with an eye toward all the elements within it that pertain to R&D or innovation in general. He suggested that these aspects of the budget’s contents were logically preceded by the Expert Panel Report, Review of Federal Support to Research and Development, popularly known as the Jenkins Report.



Watters emphasized that various aspects of innovation must be considered in any discussion on the subject. He cited a definition offered by the OECD, which was formally adopted by the Jenkins panel for their report. The OECD defines four distinct types of innovation: product innovation (including goods and services), process innovation, organizational innovation, and marketing innovation. Watters pointed out that most accounts focus only on the first and perhaps the second of these types, which are closely linked with developments in science and technology. However, as other presenters made clear, significant progress can be achieved through innovative changes in how companies organize and govern themselves, how financial interests arrange support for those firms, and how a customer base expands.

Watters suggested the budget also contains the elements of a strategy for enhancing international trade, a strategy that has yet to be formally announced by the government. This approach likewise emerges from the Jenkins report, which argues that competition drives innovation that is aimed at improving economic productivity. This observation contrasts with a view that government can promote innovation by offering a safety net for smaller businesses, protecting them from the prospect of failure in a competitive marketplace. Private sector participants rejected the notion that government should supply a safety net for

firms. They suggested that a risk-averse culture in Canadian educational, business and government institutions is a large part of Canada's problem.

Beyond the Jenkins report

Nobina Robinson, CEO of Polytechnics Canada and a member of the expert panel that produced the Jenkins report, highlighted the absence of any formally-stated federal policy on innovation. Rather than weighing any such policy, she added, the report was actually a review of 60 federal programs intended to support business R&D. Regarded in this light, the report's relationship with Budget 2012 is as significant as Watters suggested, but she argued that there is still more to do with respect to innovation than either the report or the budget formally recommend. Robinson concluded that it will take more than one budget to effect the broad sweep of changes that will begin to change the way Canada approaches innovation.

Recurring themes

Attitudes toward risk and commerce

Adam Chowaniec, Chair, Belair Networks, characterized Canada as nurturing a risk-averse business culture, one that stifles innovation by stigmatizing failure. He contrasted this outlook with American attitudes, which embrace failure as an essential part of an ongoing learning process, whereby the experience makes for better-informed entrepreneurs. The ability to fail actually makes the entrepreneur a more attractive candidate for future support. Chowaniec's observation was echoed by many others throughout the course of the conference who pointed out that risk aversion extends beyond entrepreneurs to investors, financiers, postsecondary institutions and governments.



Nobina Robinson gets animated at the RESEARCH MONEY conference.

Others noted that Canada's culture of risk aversion is bolstered by a general lack of experience with commerce, suggesting that Canada has given rise to a commerce-averse culture, one that regards starting and building a business, in order to meet the needs of customers, as a less-than-desirable means of making a living. This aversion similarly compromises the innovative capabilities of Canadians, who often seek out new ideas or technologies as ends in themselves, with little consideration and understanding of how to create value with those ideas and technologies in a commercial setting. All too often, the outcome is a failure.

Senia Rapisarda, VP, Strategic Initiatives and Investment at BDC, offered a simple solution to this problem: fail fast. She pointed to the harsh reality that a diverse investment portfolio will inevitably include some unsuccessful ventures. However, that does not mean those ventures should compromise the success of the portfolio. By abandoning failing ventures quickly and completely, any losses are minimized and resources are preserved for more promising prospects. As part of this realistic perspective, she also endorsed the identification of winners as quickly and completely as possible, backing these ventures with a greater proportion of funding, rather than trying to treat all of one's investments equally.

Role of government

Panel discussions and keynote speakers returned repeatedly to a handful of high-profile government initiatives designed to promote innovation, which are going to be affected by Budget 2012. Most frequently these exchanges dealt with the Scientific Research and Experimental Development (SR&ED) tax credit program, an indirect, tax-based form of support that is expected to be partially supplanted by more direct mechanisms of assistance. This change sparked vigorous debate, as some participants defended the versatility of the program for businesses that do not need funding as much as they need to reduce their tax burden. Others suggested that the program does not always serve the needs of growing firms, particularly those making the difficult leap into international markets, by reducing the allowable tax credit as well as removing refundability just as firms reach critical mass.

In much the same way, the National Research Council's Industrial Research Assistance Program (IRAP) was praised as a mechanism for bringing start-ups into the marketplace, but also criticized. Many observers noted that the pace of proposal review and decision-making in IRAP and other programs is nowhere near fast enough to be useful for many businesses, which are inclined to simply ignore such help. And even in cases where a timely and suitable government program might exist, potential applicants had difficulty learning about such opportunities. The budget was credited with introducing the concept of a federal concierge service to help businesses navigate the array of services that are available.

Role of educational institutions

Further to Crelinsten's initial query about how colleges and universities contribute to a country's ability to innovate, Robert Luke, Assistant VP Research & Innovation at Toronto's George Brown College, described how his institution fills some of the gaps that linger between businesses, governments, and universities as they struggle to bring new goods and services into commercial existence. He emphasized that the college's activities were designed to complement rather than supplant the fundamental research undertakings by universities, which often have difficulty matching the immediate needs of businesses.

Students emerging from the more traditional educational process can be very well trained in theoretical, objective principles of their field, but utterly lacking in any experience of how that field interacts with business, industry, or society in general. Luke suggested that successful innovation represents a combination of abstract thinking and a subjective knowledge of "making things", i.e. the technical and administrative details of how new products emerge in a commercial context. He and others endorsed the value of supplementary education to provide students with just this kind of subjective experience, so that they can leap from the exploration of academic ideas to the introduction of innovative goods and services. Such leaps — and the people capable of making them — will be essential to Canada's economic success in the face of international competitors whose manufacturing base can easily outpace Canada's.



Suzanne Fortier, NSERC president, introduces Minister Gary Goodyear at the RESEARCH MONEY conference dinner.

Challenges around growth

Many presenters returned to the other “challenge” question, which dealt with the extraordinary attention given to small businesses, along with relative neglect of larger, growing firms. Participants highlighted two barriers that hamper firm growth in Canada. First, government support of business often penalizes firm growth. Growing companies that become large or profitable suddenly lose access to particular granting streams or tax advantages. Participants particularly criticized Budget 2012 for signaling that the SRED credit for profitable firms would be lowered. Second, a heavy dependence on external investors by start-up entrepreneurs creates a pressure to sell an enterprise when it is most advantageous for these investors to realize a return. Such pressure mitigates against any long-term ambitions held by the individuals who run these enterprises, so that they often face a working assumption that they will inevitably sell, rather than continuing to explore the scope and possibilities of the business. Such circumstances promote an aversion to risk.

Narrow Focus on Product Innovation

In his overview of the budget, David Watters characterized innovation in relation to products, processes, organizations, and marketing. Each type of innovation can have a profound economic impact, but discussions of innovation tend to revolve around only product innovation. As Watters noted, this kind of activity represents only a fraction of the country's economy. Programs designed to support innovation, no matter how successful, will therefore yield limited results so long as they concentrate only on products.

Senia Rapisarda observed that businesses suffer from this same problem when they spend too much time dealing with the needs of their products rather than the needs of their customers. The desire to hone an outstanding product is natural, she admitted, but customers can often identify aspects of innovation that



Ron Freedman, co-publisher of RESEARCH MONEY, talks with Rebecca Melville (RESEARCH MONEY) in front of the registration table.

transcend the specific features of the product, aspects that might be overlooked by company officials who are looking only at the product itself. We should resign ourselves to living in a “beta” world, she advised, where new products are launched as soon as practically possible and the resulting customer feedback becomes the guide to further progress.

Without this broader perspective, companies run the risk of drastically limiting their potential. Clarissa Desjardins, CEO, Centre of Excellence in Personalized Medicine, explained in the extreme this strategy can yield a single-product enterprise, one which then becomes ripe for sale to some larger, more broadly based operation. That outcome may satisfy the short-term interests of investors in such enterprises, but it can foster expectations that entrepreneurs should sell out rather than continue to build up their businesses, an attitude that some conference participants blamed

for the lack of thriving, mid-sized companies in Canada.

Economists vs entrepreneurs

Peter Nicholson, Founding President, Canadian Council of Academies, described a long-lived paradox in the way Canada's economy functions. In direct contradistinction to successful economies built on business innovation as a driver of competition and prosperity, almost any measure of innovation shows

Canada lagging consistently far behind others. Nevertheless, Canada's standard of living has risen steadily, so that it is easily near the very top of any international assessment. Nicholson insisted that what little innovation policy the country has embraced is rooted in outmoded economic models dating from the 1960s. Meanwhile, gains by entrepreneurs around the world have turned innovation into a key factor in economic success and the maintenance of living standards. Nicholson acknowledged the enduring reality of this paradox, but suggested that Canada may not be able to carry on this way for much longer.

Kevin Lynch, Vice Chair of BMO Financial Group, went even further. He suggested that we often label innovative accomplishments as the exception rather than the rule. By regarding outstanding entrepreneurial success as something extraordinary, instead of something that is essential to our quality of life, we then feel no pressure as a society or as individuals to support measures that would sustain this level of performance. He maintained that this outlook holds us back as a country, reinforcing an attitude of complacency that could compromise that quality of life.

Panel Summaries

Panel 1: Implications for key sectors – looking behind the numbers

Celine Bak, Partner, Analytica Advisors

Peter Frise, CEO, AUTO21

Lynda Leonard, Senior Vice President, ITAC

Moderator: Jean-Claude Gavrel, Associate VP, NSERC

Budget 2012 highlights the importance of innovation and makes some significant adjustments to budget allocations for different innovation support programs. It also signals changes to come in the coming years. This panel explored the implications of these spending priorities for different sectors of Canada's economy: the auto sector, which represents more than a quarter of Canada's exports; the ICT sector, which has traditionally been the backbone of Canada's R&D-intensive economy; cleantech, which is an emerging value-added sector on which many hopes for economic growth are pinned. Experts from these three sectors reviewed Budget 2012 from a sector perspective as well as for Canada's business innovation community as a whole.

Panel 2: Implications for innovative companies

Karna Gupta, President, ITAC

David Ross, CEO, Ross Video

Jason Tham, CEO, Nulogy

Moderator: Jim Roche, President & CEO, Stratford Managers Corporation

CEOs running innovative companies face daily challenges in a variety of areas, including sales, marketing, customer support, research and development, governance and finance, and human resources. They must stay ahead of global competition and continuously create value for their customers. This panel of CEOs shared their experiences in running globally active firms headquartered in Canada. Does Budget 2012 contain any good news for them? Can government innovation policy help or hinder the growth of such firms?

Panel 3: Implications for innovation intermediaries

Clarissa Desjardins, CEO, Centre of Excellence in Personalized Medicine
Robert Luke, Assistant VP Research & Innovation, George Brown College
Mario Thomas, Managing Director, Centre for Commercialization of Research
Allison Young, Senior Trade Commissioner, Canadian Consulate, New York
Moderator: Tom Brzustowski, RBC Professor, University of Ottawa

The innovation ecosystem is increasingly populated by specialist organizations (or groups within traditional institutions) whose role is to connect companies with one another and with other sources of support, including expertise and finance. These innovation intermediaries often play a vital role in supporting companies and helping them succeed and grow. This panel looked at how Budget 2012 might affect the effectiveness of innovation intermediaries in their task of helping and supporting entrepreneurs and innovative firms.

Panel 4: Priorities for action

Adam Chowanec, Chair, Belair Networks
Kevin Lynch, Vice Chair, BMO Financial
Moderator: Paul Dufour, President, Paulicy Works

This panel provided an opportunity for participants to engage in a discussion of priorities for future action by government and other players in Canada's innovation ecosystem. Keynote speakers Adam Chowanec and Kevin Lynch commented on ideas proposed and issues raised by the foregoing presenters, as well as comments from the audience. Chowanec, as a serial entrepreneur, CEO, angel investor and Director of Canadian technology companies, tackled the realities faced by entrepreneurs, innovative companies and investors. Lynch, as former Clerk of the Privy Council and Deputy Minister of both Industry and Finance, and currently Senior VP at one of Canada's major banks and formerly Executive Director of the IMF, considered the realities faced by government and Canada's financial establishment.

Day 1: 16 May 2012

WELCOME AND OPENING REMARKS

Jeffrey Crelinsten, Publisher, RESEARCH MONEY
Mark Henderson, Managing Editor, RESEARCH MONEY

Crelinsten introduced the conference theme of the 2012 federal budget and its implications for business innovation, such as through a \$110 million contribution to Industrial Research Assistance Program (IRAP) or \$95 million for the Canadian Innovation Commercialization Program, as well as the change in emphasis from indirect support for innovation to direct support.

He also offered two “challenge questions” for the audience to consider during the course of the conference. The first asked why established firms that want to grow into multinationals have essentially been abandoned by governments that have instead become infatuated with small to medium size enterprises (SMEs), as well as start-ups and large companies that bring foreign direct investment into the country. This infatuation comes at the expense of this middle tier, which often lack the support to grow to a significant size, so that they either fail or are purchased before they can become major players in the Canadian economy. This government neglect of SMEs that aspire to grow is bipartisan: advocates on the right of the political spectrum insist such support interferes with the operation of a free market, while advocates on the left regard these mid-size companies as corporate welfare bums if they receive government support.

“I don't envy politicians around budget time. Before budget time, everyone's lobbying them to do something or not to do something. And then when the budget comes out, everyone's lobbying them for what they did and for what they didn't do.”

— Jeffrey Crelinsten, Publisher, RESEARCH MONEY

A second question considers the well established problem of Canada's underdeveloped investment in R&D by the country's business sector. “Why is there never any discussion of the role that our post-secondary learning environment might play?” Crelinsten asked. He pointed out that entrepreneurs in tech sectors often receive their training from Canadian post-secondary institutions. If Canadian tech companies are failing, that should give the leaders of these educational institutions cause to reflect on how they failed to impart the necessary insights and skills that would equip their graduates for success in business. Such soul-searching did in fact take place when the 2008 financial crisis struck the United States, and such prestigious universities as Harvard took note of the fact that their own graduates were among those who made the disastrous decisions that led to this problem. “They publicly said, ‘we're going to look at what we did wrong’,” Crelinsten recalled. “They took some responsibility.”

Henderson reiterated the budget theme of this year's event, noting that this approach was inspired by last fall's release of the Expert Panel Report on Federal Support for R&D (better known as the Jenkins Report, for panel chair Tom Jenkins) and the government's longstanding intention to balance its books. In

“It's clear that for the first time since the mid-90s, the scope and scale of government S&T will be getting smaller and more focused.”

— Mark Henderson, Managing Editor, RESEARCH MONEY

each case, questions lingered about what changes might occur in federal policy toward R&D, and given that seven weeks had passed since the budget fell, Henderson indicated that at least partial answers to those questions were starting to appear. By way of introducing the many different analyses that would be offered during the conference, he indicated that the budget signaled a major shift in innovation policy toward

commercialization and business-driven research. He added that several key research organizations, including CFI and CANARIE, have seen their funding renewed; the transformation of the National Research Council has been endorsed; and a balancing of support for business R&D to emphasis direct support as opposed to tax breaks. Nevertheless, he added that there were cutbacks associated with the effort to reduce and eliminate the deficit: targeted increases to funding for the three main granting councils amounted to a clawing back of their budgets; science-based departments and agencies were also forced to make difficult choices, often cancelling some of their programs.

He concluded that it was difficult to know where this would leave the country's R&D landscape, and what the government's intentions are. Other than the 2007 science and technology strategy document, there has been little offered to the research, business, and investment communities with clear policy directions in this regard. Even signal items in the budget, such as \$400 million for early stage venture capital, included little or no detail. In this light, he suggested that the conference deliberations should touch on these questions:

- will the budget provide a better environment for private sector innovation to flourish?
- is Canada's research base being eroded?
- will the new emphasis on commercialization contribute to greater productivity and global competitiveness?
- are Canada's knowledge-based industries taking a back seat to natural resource extraction, or is there room in the front seat for both of them?

R&D AND THE CULTURE OF RISK IN CANADA

Keynote speaker: Adam Chowaniec, Chair, Belair Networks

Chowaniec began by arguing that Canada has a problem with its culture of risk, and in particular how that culture compares with that of our trading partners, which has implications for the health of our knowledge and technology sectors.

Among the most widespread observations about R&D in Canada is the lagging participation by the country's business community. He rejected at face value the claim that industry does not invest enough in R&D, and insisted on looking at the underpinning of that claim. He dealt with specific sectors, starting with finance, banking, and insurance, which do not need R&D in order to innovate. Similarly, he maintained that the manufacturing sector consists mainly of branch plants; if we are simply assembling car parts designed and produced elsewhere, there is no benefit to conducting R&D in Canada. The country's resource sector has been very successful, he noted, but it is because of exploration and discovery, not R&D. Some resource industries, such as the oil and gas sector, are engaging in R&D to take advantage of new technologies, but this activity is not among their highest priorities.



The country's resource sector has been very successful, he noted, but it is because of exploration and discovery, not R&D. Some resource industries, such as the oil and gas sector, are engaging in R&D to take advantage of new technologies, but this activity is not among their highest priorities.

In this light, the only industries that are highly engaged in R&D are in the relatively small technology sector. Chowaniec argued that these firms clearly punch above their weight, and should not be criticized for lagging, but praised as overachievers of innovation. He emphasized that this sector is small and fragile. Canada's industrial representation in areas such as information and communication technology,

"I think we need to change our risk appetite, our culture of risk, or face damaging our technology ecosystem."

— Adam Chowaniec, Chair, Belair Networks

aerospace, and clean technology is dwarfed by the United States, where some 25% of GDP now comes from companies created in the technology sector in the last 50 years. There are many small companies on our corporate landscape, but few that achieve a size that would have an impact on the economy. Without such companies, there will be no critical mass in the technology sector.

Chowaniec insisted that risk aversion — coupled with a lack of helpful policies — plays a key role in determining the nature of this landscape. He pointed to the relative lack of risk capital as evidence of this aversion. "We tend to build companies at lower levels of financing than the competition. They're therefore weaker, and often end up getting acquired by the competition before they can realize their full potential." He concluded that Canada will not harbour large, high growth firms until this problem is solved.

As companies grow, they reach a point where they must acquire growth capital by offering shares to the public. According to Chowaniec, risk aversion plays a part in this process, too, resulting in companies that obtain valuations at much lower levels than competitors in the United States. He cited an analysis by

the Toronto-based Byron Capital Markets that found this under-valuation to be systemic, not simply in companies listed in the Canadian marketplace, but even those that were dually listed in the United States as well. In the ICT sector, for example, Canadian software companies were discounted by about 23%, and hardware firms by 34%. “Our companies are ridiculously cheap. So guess what? They get acquired.” He referred to the Ottawa-based Branham Group, which has compiled figures indicating that 164 significant Canadian ICT firms have been lost to acquisition in the past decade. Many of these firms have been public, a trend that is accelerating. He recited the names to remind the audience of how much these firms had been feted. Just in the past year Rugged.com, Gennum, Mosaid, Zarlink, March Networks, and Bridgewater were all acquired. Even more celebrated names such as Newbridge, ATI technologies, Cognos, Tundra Semiconductor, CREO, and DALSA have long since passed from Canadian control. “We are losing these companies at a much, much faster rate than we can create them,” he said, adding that Canadian security regulators had created an environment where hostile acquisitions were much easier here than in the United States.

Our companies are ridiculously cheap. So guess what? They get acquired.

In a larger perspective, the proportion of ICT firms in the S&P 500 has increased from 15% to 19% over the past decade. In Canada, he warned, the trend is heading in the opposite direction: the ICT component of the TSX reached 8% about 8 years ago, but has subsequently sunk to 1.2%. Take out RIM and OpenText Corporation, he said, and the proportion is practically nil.

As disturbing as this observation might be, Chowaniec offered even more reasons for concern. Given the dearth of private equity capital in the country, there is also comparatively less coverage by competent analysts, fewer bankers with knowledge of the tech sector, and fewer institutions with such knowledge. This means valuations will be of a poorer quality, even as the capacity to take on risk and opportunities to take companies public are both in decline. “This is a virtual death spiral.”

“None of these issues are new. We’ve talked about this stuff for decades. But we’re running out of time. The decline in the number of public companies in the technology sector, and our inability to replace them, should be a wake-up call to us all.”

— Adam Chowaniec, Chair, Belair Networks

For Chowaniec, these factors also affect the availability of business talent. Such talent requires experience in order to be able to build a high growth firm; such experience must be obtained before moving into a high growth setting, but an industrial environment dominated by branch plants presents few

opportunities for this kind of learning experience. Nor will there be enough companies to establish the foundation for vibrant sectors that can nurture such talent, along with the infrastructure and services that contribute to high growth. Above all, he stated, innovation on the part of companies requires longevity, and without a tolerance for risk, such longevity will not occur.

Turning to an appropriate response to this situation, he maintained that we should stop talking about “industry” and start talking about specific sectors. Then we can focus on potentially important areas such as ICT, while recognizing how small they are and how fragile their existence is in the Canadian economy.

With respect to risk capital, he argued that government handouts — such as the \$400 million proposed in the 2012 federal budget — are not a useful strategy. Nor can we expect money to arrive from outside the country. The problem is systemic, tied to risk aversion, and it will take a long time to remedy. In the meantime, he estimated that it would take \$1 billion annually to get this process started, and because of the attendant risks of that investment, it must come from private sources. Instead of putting out a

comparatively paltry \$400 million over 10 years, he maintained, it would be better to turn this sum into a tax credit as an incentive for private investors to leverage amounts on the order a \$1 billion. British Columbia has introduced a tax credit system that functions in this way, which he regards as worthy of being emulated by other provinces and the federal government. And, he reminded the audience, that money will require talented people to work with it.

Chowaniec also recommended regulatory changes that would protect shareholders but put more power in the hands of corporate boards and managers, thereby giving Canadian firms the ability to fend off hostile takeover attempts. And finally, he admitted that the country's culture of risk must be changed, although it remains unclear how this might be accomplished. One possible indication is the fact that large sectors, including banks, airlines, telcos, and insurance companies, are protected from foreign competition. Ultimately, he argued, the change will come from the people who make up the economy, as their sense of self-reliance and ambition evolves. As more of us become self-employed, we develop a keen entrepreneurial outlook. Ensuring the success of such entrepreneurs is the mandate of Startup Canada (www.startupcan.ca), a volunteer initiative to address this challenge. Chowaniec chairs the governing board of this organization, which is seeking corporate sponsors to engage a broad spectrum of entrepreneurs.

Q&A Session

The first questioner to Chowaniec dubbed his view "bleak", asking him to reconcile that view with media assertions that Toronto is the fourth-best place in the world to start a business. Chowaniec replied that he had no idea what kind of criteria went into that assessment, then went further. "All I know is that as a continuing serial entrepreneur, Canada is about the worst place on earth to raise any capital. And if you want to build something significant, you need to raise not half a million or a million or two million, you need to raise 10, 20, 30 million dollars, and that's even more difficult. If we don't crack that problem, we're not going to see a change in the number of successful, significant companies." That being said, he added that Canada does spawn lots of small firms, but if they do not get enough support to grow, they disappear from failure or acquisition.

All I know is that as a continuing serial entrepreneur, Canada is about the worst place on earth to raise any capital.

The second question extended this observation, noting that starting a company was the easy part, while growing one to a significant size was much more difficult. Hence a huge proportion of the country's business landscape consists of SMEs. Another question asked about the role of flow-through shares in helping to grow businesses. Chowaniec acknowledged that he did not have a specific preference for this or any other approach to investment, although he noted that financiers do not like flow-through shares.

Jim Roche, President and CEO of CANARIE, asked for his opinion on the Scientific Research and Experimental Development (SR&ED) program. Chowaniec pointed out that other countries had introduced similar programs, but he emphasized the distinction between the support provided by these programs and the kind of capital investment that is required for a company to grow.

"Government doesn't have to pick winners. It's not necessary. We just have to have policies to support people who pick winners."

— Adam Chowaniec, Chair, Belair Networks

“SR&ED helps offset some of your R&D costs, but it does not replace the need for you to go and find capital.” That being said, he did not reject them for the purpose they fulfill; instead, the problem of supporting growth must be solved in other ways.

Karine Morin, Director of the National GE3LS Program at Genome Canada, said she has heard these same ideas discussed before and wondered if the discussion had become futile. Rather than attempting to change a risk averse culture that clearly will not do so in a reasonable time frame, she proposed extending safety nets to compensate for this shortcoming. When Chowanec asked for a more specific conception, she suggested perhaps more daring innovation could be encouraged in the public sector. Chowanec observed that while innovation in the public sector would be a good thing, risk taking there is not part of how these institutions are organized. “If you want to build technology-based enterprises, you have to take huge risks. That’s the only way to do it. I don’t think government can help other than by creating a climate where there is more risk capital, where there’s more understanding of what taking risks really means, and where there’s more acceptance that failing is okay, because it’s a learning exercise and next time you’re going to do something bigger and better.”

Jacek Warda, President of JPW Innovation Associates Inc., suggested that the SR&ED program may be the reason why we talk of “industry” in monolithic terms, and why we are eager to see Canada pick winners. Chowanec rejected the notion that it is up to the country to pick its winners, but also recommended applying a more critical eye to the SR&ED program, where sectoral advantages and disadvantages would emerge.

Doug Barber returned to the question of culture, suggesting that it is rooted in what individuals believe to be important and true. Although friends and family may determine much of at the earliest ages, our educational institutions shape beliefs at the key ages of 18-25, and our institutions in Canada are radically different from those in the United States. He insisted that it is here students learn that customers are not

“Move towards the American model. Where the provinces that are floundering deep in debt only pay the academics for the academic year, and expect them to go and earn their keep.”

— Doug Barber, Distinguished Professor-in-Residence,
McMaster University

all that important and that sales do not really matter. In this context, he noted that American academics are employed only for the duration of the academic year, so that they are expected by their institutions to create value for society and receive value in exchange during the rest of the year. MIT even had its prestigious “10% club”, made up of outstanding faculty members whose university remuneration

represented 10% or less of their total remuneration. In such contexts, commercial notions of sales and customers become familiar, and become part of how students begin to understand the world they will be entering. Moreover, he argued that the federal government, which provides a third or more of most universities’ funding through the granting councils, should acknowledge its contribution and tie it to more practical learning experiences for students.

Caroline Cook, Manager of Innovation at the Canadian Forest Service in Natural Resources Canada, suggested that one way of helping companies address risk is to address the innovation system as a whole and extend a safety net to help them cope with it that is based on more than simply providing money. Chowanec agreed with this strategy, but advised against using the term “safety net”, since it implies something other than embracing risk. “From what I’ve seen in the forest sector of the last few years, they’re actually starting to invest in R&D, but not because there’s a safety net — they know they can’t compete anymore on a global basis. They have no choice but to invest.”

Irène Makary-Abourizk, a senior business analyst with Industry Canada, pointed out that manufacturing drives 50% of R&D expenditures, even though R&D intensity in this sector is low compared with other

countries. If manufacturing firms can be regarded as the clients of the ICT sector, she asked how can we ensure that the needs of this sector are being met? Chowanec replied that it is still necessary to understand what R&D in manufacturing means. He reiterated his earlier point that much of the country's manufacturing base is branch-plant operations that do not get involved in high-end R&D work that would qualify as basic innovation.

ANALYSIS OF BUDGET 2012 FROM AN INNOVATION POLICY PERSPECTIVE

Keynote speaker: David Watters, President, Global Advantage Consulting

Watters suggested that the Jenkins report was a seminal document that serves as a logical predecessor of the budget, and represents a new path for Canadian innovation policy. He began by setting this budget in the context of other provincial budgets that were coming out at about the same time. While some of those budgets did include new money for R&D activities, the amounts were generally modest, and none represented a significant change of pace or direction. Among the most significant developments was the report submitted by economist Don Drummond to the Ontario government in February 2012. Drummond concluded that the province's programs were uncoordinated and lack coherent objectives. Perhaps even more interesting was the fact that the provincial government agreed with this assessment. Given that the federal government actually spends six to seven times more on innovation in Ontario than the Ontario government does, Watters suggested that a profound reorganization of this province's activities should be in order.

Watters also noted that most observers had been braced for a much harsher, more austere document than Budget 2012 turned out to be. He outlined its six chapters, highlighting a key portion under "Improving Conditions for Business Investment" that he regarded as a trade strategy that is already under way. The budget did include some dramatic measures, such as changes to the starting age for Old Age Security and streamlining the immigration system. But while a great deal of attention fell on the cuts to the public service, Watters points out that the result will not be as severe as the cuts in the mid-1990s turned out to be.

Most observers had been braced for a much harsher, more austere document than Budget 2012 turned out to be.

Looking at the ongoing problem of Canada's inability to commercialize its obvious accomplishments in science and technology, Watters asked the audience to consider whether the budget addressed this issue, whether it is proposing the right investment, and whether it is large enough to have a significant impact. Before those questions can be addressed, he argued, it is crucial to define innovation. For example, the Jenkins report defines four different kinds: product innovation (for both goods and services), process innovation, organizational innovation, and marketing innovation. This breakdown is important, because our support for innovation often focuses only on product innovation dealing with goods. This is obviously pertinent to the manufacturing component of the Canadian economy, but that only accounts for about 13% of all economic activity. It is important to consider the other types of innovation with respect to the rest of the economic activity taking place in Canada.

While the budget included cuts to many science departments, totaling \$1.3 billion, Watters noted that it also included new investments in science that totaled \$1.1 billion over five years. One surprise was the modest cutting of funding to the National Research Council, which is inconsistent with the expectations framed by the Jenkins report. Some of the budget's investments in the NRC are a continuation of a cluster strategy begun in 2010. The largest investment was \$110 million annually in support to IRAP, a sizeable amount that comes with the challenges of growing a successful program. He hoped that the Industrial

Technology Advisors who make up the front line troops of this program will be able to strike the appropriate balance between maintaining established firms and taking chances on some new firms.

The budget addressed activities in the natural resources sectors. Cuts to environmental review of projects have been contentious, but Watters pointed to \$165 million that will become available for safe transfer of resources across the country. The budget also referred to responsible resource development in relation to some 500 identified projects that will be ready to go as soon as they receive environmental approval. He suggested that many of these could represent significant opportunities that are worthy of being linked to any innovation agenda.



With respect to the high-profile changes to science and technology, Watters argued that the government is trying to reduce the size of the indirect R&D investments represented by the SR&ED program and replace it with direct expenditures, all without adding any new expenses. Among the changes that have caused concern is the removal of capital from the expenditure base, but he insists that the amount being discussed is quite small.

Another place where the government will be putting new money is the Canadian Innovation and Commercialization Program, which will bring in changes to the government's procurement strategy. Watters compared it with the American Small Business Innovation Research program, where government departments express what their anticipated needs will be so that businesses and academic institutions can join forces to find the best way of meeting those needs.

Watters described the cuts to three main research granting councils as fairly large, but each one received about half of its respective losses back, albeit tied to some sort of targeting, e.g. Partnerships and Innovation Strategy for NSERC, Industry-Academic Partnership Initiatives for SSHRC, and Patient-Oriented Research for CIHR. This targeting appears to be intended to take emphasis away from the research itself and build a stronger relationship with the business community or the main client base that is being served.

He also highlighted some benefits the budget provided to not-for-profit organizations, including Genome Canada, Canada Foundation for Innovation, CANARIE, and the Networks of Centres of Excellence. However, he added that the money in each case was not so substantial as to signal any change in direction.

For Watters, the character of Canada's private sector, which is overwhelmingly dominated by SMEs, is highly relevant. But he pointed out that the average size of these SMEs was no more than a handful of employees, so small that many of them are simply struggling to land contracts that generate some sort of cash flow.

Returning to the Jenkins report, Watters asked if the proposed Industrial Research and Innovation Council and the Innovation Advisory Committee would really be at arm's length from the government, and who would actually be participating in these groups. Rather than simply ensuring representation from the

private sector, for example, he suggested that such representation could specifically encompass SMEs and even the younger cohort of entrepreneurs running those businesses.

Watters found little substantial discussion in the budget regarding how to face the challenge of encouraging risk capital, and like Chowanec, he recommended the virtues of the British Columbia angel investor tax credit system. Similarly, he pointed to trends toward crowdfunding in the United States, which should be monitored for potential application in Canada.

He observed that the Jenkins report did not consider the role of international programs, something that the budget did do. "I make the argument that an innovation strategy is an export strategy, because you're going global, right from the get-go," he said, while noting that the smallest SMEs may have considerable difficulty figuring out how to proceed. Moreover, the vast majority of exporting firms are SMEs, which further justifies a specific consideration for the needs of this group.

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The budget highlighted a number of trade agreements, reflecting recent activities by the Prime Minister and others to expand the country's trading frontiers. Watters described this as a "robust and detailed agenda" to open up the Canadian economy in this way, highlighted by new free trade agreements, foreign investment promotion protection agreements, a global commerce strategy focusing on SMEs, extending Export Development Canada's domestic power, stewardship of the G20, and the opening up of the telecom sector.

Watters recalled that on the Monday after the Thursday budget day, the Governor of the Bank of Canada gave a speech bemoaning the country's poor export performance, a juxtaposition that could hardly have been coincidental. Rather than blaming this problem on the types of goods and services that are being traded, or the costs and productivity of labour, that speech suggested that the markets being pursued by Canada might not be the most appropriate. Most of our exports are winding up in developed economies with low rates of growth, rather than developing economies with high rates of growth.

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According to Watters, Tom Jenkins was apparently aware of some of these issues, given that just before the innovation report was released he also published an article on opening up trade as a stimulus for innovation (Tom Jenkins, "A simple solution to Canada's innovation problem", *Policy Options*, September 2011)

By way of summary, Watters saw much in the budget to support innovation in Canada. That being said, however, he painted the \$1.1 billion being proposed there as a minor addition to the entire landscape of Canada's R&D structure, which is worth about \$150 billion. The effect is even more muted with respect to the economy as a whole, worth \$9.7 trillion. So while he concluded that the budget did represent a concerted effort to enhance innovation in the country, he was forced to ask: "Are we really on the right path in terms of using innovation as a key instrument in transforming our economy?"

Q&A Session

Ron Freedman followed up with three points. First, he observed that changes to SR&ED came with some tax grabs, such as a lowering of the overhead rate, which reduces the amount of money going to applicants. Secondly, he wanted to qualify Watters' skepticism about IRAP's ability to manage an extra \$110 million by pointing out that the budget two years ago gave the program an extra \$200 million, which was absorbed without extra staff. Thirdly, he recalled the four types of innovation defined in the Jenkins report, none of which are supported by SR&ED, even though this is the country's largest single innovation support program. "What it will support is the research up to the point where you do any of those types of innovation." Freedman called this observation a major oversight in the Jenkins report, which should have called for SR&ED funding to be used not for research but specifically for product development.

"People don't buy research. They buy products and services."

— Ron Freedman, Co-Publisher, RESEARCH

Watters emphasized the third point, suggesting that he had never seen an analysis of SR&ED from a policy point perspective, i.e. in terms of the intended economic result. Although ostensibly aimed at helping goods and services reach a global marketplace, the execution of the program actually stops short of that goal. "The closer you get to a market, the less you're eligible for any kind of SR&ED expenditure. I quite frankly don't understand that."

BEYOND THE JENKINS REPORT: WHY IT'S NOT JUST ANOTHER STUDY ON CANADIAN INNOVATION

Keynote speaker: Nobina Robinson, CEO, Polytechnics Canada

Robinson began by noting that this was one of the first occasions she has spoken in public about the report, a prospect the expert panel members had discussed both before and after the budget was released. She therefore stated that she was going to talk about the things she liked in the report, and simply remain silent on those things that do not please her. Similarly, she insisted that her comments were entirely her own, and did not reflect any consensus view of the panel.



She immediately clarified the common link many readers make between the report and innovation in Canada. “This was not about innovation policy in that Canada has no innovation policy,” she said. “It was about 60 programs that support business R&D. The programs were about R&D, not S&T, and that was our major constraint. It was not clearly understood, and if we in this room don’t understand it, how can we expect Joe Q. Public or the small companies to understand it either.”

This was not about innovation policy in that Canada has no innovation policy. It was about 60 programs that support business R&D. The programs were about R&D, not S&T, and that was our major constraint. It was not clearly understood, and if we in this room don’t understand it, how can we expect Joe Q. Public or the small companies to understand it either.

She added that the mandate of the review only covered federal initiatives, not provincial or international ones. Nor did the review look at the activities of the granting councils or the National Research Council’s

“Everywhere you turn – CCA, STIC, individual programs, the NRC, even the Conference Board with its new Centre for Business Innovation – they’re all measuring outcomes. Our report found that there is no stated practice in terms of measurement of outcomes for government R&D and innovation programs. Yet outcome measures are critical, and they can at least provide a rationale for program change or program consolidation.”

— Nobina Robinson, CEO, Polytechnics

intermural research or federally funded science. The panel did receive a great deal of information about inputs to the 60 programs that were being reviewed, but she recalled that it quickly became clear there would not be time to cover everything. “The programs had simply not been designed to be cross compared,” she said. “For example, on what common indicators can you compare SR&ED and

IRAP, when they’re not intended to do the same thing?” Instead, the panel began looking at the intentions of each program. While they did not come up with a rationale for eliminating particular programs, they did find that some of these programs were “brittle, inert, and in some cases being gamed”.

She reminded the audience that this panel was not operating in a vacuum, but alongside other reviews that were being conducted. The Science, Technology and Innovation Council issued its State of the Nation

Report even as the expert panel was deliberating. The National Research Council, which had just appointed a new president, was actively repositioning itself on the research landscape. The Canadian Council of the Academies was in the middle of numerous studies, and there was the government's ongoing program review.

She presented the six key recommendations from the report, then stressed that the real impetus for action lay with the sub-recommendations. This is an important distinction, since the main recommendations were created by consensus, but any consensus on the more detailed recommendations was much harder to find.

As the work of the panel gained momentum, it also gained attention, causing Robinson to dub it “the report that keeps on giving.”

As the work of the panel gained momentum, it also gained attention, causing Robinson to dub it “the report that keeps on giving.” Some programs were removed from consideration, such as when the aerospace sector made it clear they wanted their own report. Hence the Strategic Aerospace and Defence Initiative was ignored. Procurement fell into the same category, and all their information on this subject was provided to the Minister of Public Works and Government Services. Likewise, the 2012 budget commits the government to further consultation on key items the panel had raised, such as repositioning the NRC to be industry-facing, the changes to SR&ED, and the \$400 million dedicated to raising risk capital. In other words, many of the matters raised by the Jenkins report are not closed items, but fall under a new bureaucratic category of “program consolidation”. This term refers to combining a number of programs into a smaller number of larger, more flexible programs with a common purpose, such as honing talent or commercializing technology.

“If the only way to measure outcomes of business R&D programs is to survey the users, the firms, we will soon see survey fatigue. Collaborators will only put forward successful projects to evaluate. Then they'll prime the firms ahead of the survey, they themselves will be glowing. No one could have done anything without institution X and the generous support of program Y. Great quote: photo holding something metallic and shiny, slap it up there with a glossy brochure and all is well. You can't kill the program.”

— Nobina Robinson, CEO, Polytechnics Canada

She linked the budget's focus on program cuts with a new emphasis on measuring outcomes, as a means of determining what to cut.

According to Robinson, the blurring of assessment lines was especially profound with respect to measuring outcomes of work supported by the granting councils, where it is not clear what is S&T, what is R&D, and what is innovation. Robinson warned that the proliferation of outcome studies could become an exercise in futility.

The result becomes a conundrum; things appear to be going well, but Canada is also revealed to be lagging in terms of innovation. By way of avoiding this difficulty, she proposed designing outcome measures in advance, rather than trying to analyse them retroactively. By making it part of all project reporting from the beginning, this bias can be minimized.

The result becomes a conundrum; things appear to be going well, but Canada is also revealed to be lagging in terms of innovation.

Robinson said she was fond of some of the report's less obvious recommendations. One was what she called the voucher program (Recommendation 1.2), whereby approved R&D service providers would be made available to firms, offering them a choice. She also challenged the necessity of government doing its own work. "Novel program delivery by non-government delivery agents can maximize program outcomes," she said, quoting the report. "Does everything have to be delivered by a federal department or agency?"

"This is the core vision of an innovation ecosystem, where all actors are playing to their strengths, and their unique roles – universities in basic research, colleges and tech transfer office in applied research, and companies of all sizes commercializing their products and services."

— Nobina Robinson, CEO, Polytechnics Canada

Robinson also highlighted some of the reports "hidden gems". The first was Figure 2.6 in the report, which illustrates an innovation ecosystem made up of universities, colleges, and private firms. For her, this graphic correctly reveals how it is well trained people who are responsible for innovation, an observation that adds the important qualifier of "skilled" to the all too common emphasis on "highly qualified people". This is not a trivial distinction, since making a priority out of graduating more individuals with advanced degrees has not generated the desired improvements to innovation.

"The human capital agenda needs to be better linked to the innovation agenda. We really need to break the silos, encourage collaboration among people, encourage applied education, encourage this model that I have a conviction around: learning by doing and learning by using. We are currently leaving our tradespeople, our highly trained foreign professionals, our technicians, college and polytechnic graduates out of the innovation game."

— Nobina Robinson, CEO, Polytechnics Canada

Another gem is taken from the guiding principles of the report, which resonate in government priorities such as measuring outcomes. These principles include the need for transformative programs, making positive net benefit a priority, favouring national scope and broad application, building sector strategies collaboratively, and requiring commercial success in regional innovation.

Robinson assigned even greater prominence to Recommendation 1.4, a talent strategy that would be led by the Industrial Research and Innovation Council. This recommendation stemmed from the panel's review of the shortcomings of the granting councils' talent programs. "They're sub-scale, they're input oriented, they focus on eligibility criteria and not on outcome, they're not as well used by industry as one thinks; money is being left behind." She proposed moving in a much more ambitious direction to identify highly qualified and skilled personnel.

It is time to stop blaming industry for failing to innovate, when federal programs regularly fail to move at the speed businesses require to pay their bills and meet customer needs.

Looking ahead, Robinson argued that it was time to stop blaming industry for failing to innovate, when federal programs regularly fail to move at the speed businesses require to pay their bills and meet customer needs. She recalled working on Chapter 8 of the report, which examined how other countries were establishing government departments specifically dedicated to business innovation, a field that is currently scattered in an uncoordinated way amongst various federal bodies within the Canadian government. Finally, she articulated the aspiration of building a national Research Technology Organization based on the model provided by Germany's Fraunhofer-Gesellschaft organization, which oversees 60 distinct institutes dedicated to customer-oriented, applied research.

Finally, she predicted that it would take more than one federal budget to re-design the organizations and their services to promote innovation in an effective way. It will also take the participation of others, actors outside the federal government, who must be willing to provide their own ideas and “sweat equity”.

Q&A Session

A questioner asked for more detail about the guiding principles she had mentioned in the presentation. Robinson quickly listed them as:

- scale up the programs
- focus on the outcome you intend
- once you know what you want, let anybody play
- industry also needs to put skin in the game
- use programs to foster collaboration

Crelinsten asked about program consolidation, noting that programs should be invisible to the clientele, who are actually only interested in the resources or services provided by programs. For Robinson, this notion is implied in the budget's discussion of the concierge concept, but that discussion was not comprehensive. After surveying 1,200 firms for the Jenkins report, the panel learned that most firms had little idea what programs existed beyond SR&ED and IRAP. “How do you navigate to these programs?” she asked. “At a time when we're so fiscally challenged, you can't afford to leave the dollars on the table.” She offered Germany's equivalent of IRAP, which helps companies conduct this kind of navigation, learning where within the spectrum of programs they would be best served.

How do you navigate to these programs? At a time when we're so fiscally challenged, you can't afford to leave the dollars on the table.

Rory Francis of the Prince Edward Island BioAlliance expressed some doubts about the ultimate value of the concierge approach, proposing instead a cluster model with third party delivery of services, which would simplify navigation through the innovation ecosystem available to companies. “What adds value is stress relief for companies,” he said.

“Budget 2012 was a first and dramatic step in the right direction, but much more remains to be done. Restructuring our supports for business innovation is equivalent to changing the oil on a car while driving down a freeway — it's not impossible, but it's not going to be easy, and we need the right tools.”

— Nobina Robinson, CEO, Polytechnics Canada

**PANEL 1:
IMPLICATIONS FOR KEY SECTORS – LOOKING BEHIND THE NUMBERS**

Celine Bak, Partner, Analytica Advisors
Peter Frise, CEO, AUTO21
Lynda Leonard, Senior Vice President, ITAC

Moderator: Jean-Claude Gavrel, former Associate VP, NSERC

***Precis:** Budget 2012 highlights the importance of innovation and makes some significant adjustments to budget allocations for different innovation support programs. It also signals changes to come in the coming years. This panel explored the implications of these spending priorities for different sectors of Canada's economy: the auto sector, which represents more than a quarter of Canada's exports; the ICT sector, which has traditionally been the backbone of Canada's R&D-intensive economy; cleantech, which is an emerging value-added sector on which many hopes for economic growth are pinned. Experts from these three sectors reviewed Budget 2012 from a sector perspective as well as for Canada's business innovation community as a whole.*

Gavrel began by pointing out that for all the criticism Canadians like to heap on themselves, the country has a lot going for it, including an enviable lifestyle, an ability to combine cultures from all over the world, and a new generation of young people who are well educated and highly motivated. Within the context of this conference, he assigned priority to the challenge of helping the people running programs look beyond their programs to the needs that those programs are supposed to address. "We spend more time now trying to justify whether a program is valuable than actually being able to deliver it," he said.

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Bak referred to Chowanec's comments on capital, Watters' comments on trade, and the overarching theme of risk aversion. She cited the lower levels of investment capital as a primary challenge for entrepreneurs, who find themselves simply having to do much more administrative work than their counterparts in the United States. From her broad perspective on the clean technology industry in Canada, she noted that there are some 10,000 SMEs in Canada, sharing an overall pot of investment funding that totals \$7 billion. Among those that invest in clean technology, each spends an average of \$1.5 million. Looking from an export perspective, the country has about \$400 billion in exports, about half of which is resource-based, and the rest consist of value-added or manufactured goods, about half of that being automotive.

She emphasized the fact that in the clean technology industry, 55% of Canadian companies are exporting outside of the US, and 23% of the industry's revenues are from non-US markets. With respect to risk aversion, she cited her own example of working with a Canadian firm that was eventually sold for \$1.2 billion, which had customers all over the world but none in Canada. That being said, there is a receptivity to the idea of clean technology that makes it an attractive business. The industry is about more than obvious technologies like solar panels and windmills, but also environmentally benign industrial processes such as biorefining, smart grids, and more efficient use of water. "Clean technology's R&D investment is almost a billion dollars," she said. "This is an industry that you don't know about. It's about

\$10 billion in revenue in 2010, with about 44,000 jobs. These are small companies, with an average of about 64 people per company. With a multiplier that brings it up to about the size of the mining industry in Canada.”

Frise introduced three key drivers for the automobile industry: consumer desire, what people want to buy; government demands, the regulations imposed on what is a very tightly controlled industry; and industry imperatives, which companies must observe in order to remain viable. This is also an industry that provides well paying jobs, even as they turn out desirable products at the lowest possible cost. This is complicated by the fact that the market for these products can shift quite rapidly, and manufacturers must retain the maximum flexibility for their operations. For example, the price of oil has undergone dramatic increases and decreases over the past decade, as the relative value of the Canadian dollar, all of which complicates life for auto owners as well as auto makers.

“When you design a new car, you are quite often betting on the company. The kinds of decisions these people have to make are quite gut-wrenching.”

— Peter Frise, CEO, AUTO21

As an aside, he pointed out that it costs in the order of \$1 billion to \$5 billion to design a new car. In this light, the kind of R&D money that is available in Canada barely registers. Most of the parts that go into a car are produced by the suppliers, so he disagreed with Chowaniec’s assertion that all we do in Canada is assemble kits. The companies that make these parts do their R&D work here, as do the automobile

makers. He observed that Canada is home to major centres for studying alternative fuels, as well as the world’s largest automotive lighting facility.

With some government programs taking a year or more to respond to a company’s request for support, Frise said such options are not even considered by this industry, which has to move much more quickly than that. Of much greater relevance are new regulations stipulating that by 2016, fleet vehicles will have to increase their fuel economy by 40%, an increase that is expected to rise another 54% by 2025. These are among the challenges facing the companies as they contemplate putting another \$1-5 billion into models capable of that kind of fuel economy.

With some government programs taking a year or more to respond to a company’s request for support, such options are not even considered by this industry, which has to move much more quickly than that.

Frise noted that the industry employs about 2,000-4,000 engineers in Canada, each hired at an average cost of around \$10 million, and each of whom will generate \$20 million to \$50 million in added value over the course of his or her career. Based on the number of vehicles produced on a daily basis, he estimated that a single car plant generates about \$48 million of goods every day, or about \$15 billion per year, “and that’s all coming out of one building that employs about 6,000 people.” He added that this employment is spread over the parts sector as well, which employs roughly 100,000 people.

Leonard began by noting that ICT represents the single largest sector that invests in R&D, amounting to about 38% of the total. There are some large companies that account for that activity, but also a significant number of small and medium size players. Her work involves having regular meetings with the CEOs and CTOs in order to turn ideas in this field into commercially viable technology. She also noted that this industry is not geographically confined, and establishes itself based on the available talent pool, rather than any physical resources that might be tied to a particular location.

The proliferation of options for performing R&D around the world means that Canadian managers must make an internal case for conducting such work in this country. She expressed her admiration for these people and others working in this high pressure environment where new products are emerging, standards are shifting, and competition can be fierce.

“Increasingly other jurisdictions with aggressive strategies to compete for science-based 21st century jobs have shifted the R&D landscape globally. They started off with approaches that capitalized on a relatively low wage rate, and a superabundant supply of smart people, and rapidly established themselves as forces to be reckoned with in the global ecosystem. And now they’re moving up just as aggressively in the value chain, demonstrating more qualitative capabilities in other areas of expertise.”

— Lynda Leonard, Senior Vice President, ITAC

In contrast to much of the criticism that surrounds SR&ED, Leonard praised the program enthusiastically. “SR&ED has helped to build our industry over the past two decades.” While there may be other strategies for growing R&D-intensive firms, she offered two specific reasons why tax-based measures are superior. First, they are predictable, making it possible to determine the bottom

line without having to worry about losing support, such as when a grant application fails. Secondly, the program is accessible to any firm performing R&D, regardless of size. This is especially important to those who are conducting high volume work, which might seldom qualify for direct support. She reminded the audience of the important role that larger companies play in guiding the work of the start-ups and smaller firms that often get more attention, and SR&ED gives such influential firms a reason to stay in Canada.

While there may be other strategies for growing R&D-intensive firms, Leonard offered two specific reasons why tax-based measures are superior. First, they are predictable, making it possible to determine the bottom line without having to worry about losing support, such as when a grant application fails. Secondly, the program is accessible to any firm performing R&D, regardless of size.

For this reason, she welcomed the discussion of innovation that was found in the federal budget, but suggested that changes to SR&ED could make life much more difficult for those in ICT, who will face an even greater challenge in keeping their work in Canada. “We believe this will produce outcomes that we don’t want in our quest to build a stronger, more innovative economy,” she said. Before ushering in such outcomes, therefore, she advised a careful review of the implications associated with any changes to SR&ED.

Moreover, echoing Robinson’s earlier remarks about the measurement of outcomes, she suggested those outcomes did not consist of marketing triumphs such as photo opportunities, but instead accomplishments regarding employment levels, wealth creation, and the establishment of enterprises.

Moderator Q&A Session

Gavrel posed a number of questions to panelists, starting with the notion raised by Leonard that companies based in Canada often look elsewhere to conduct R&D. Frise noted that this is a particular challenge in the auto sector, where design and production are spread across so many companies and jurisdictions; the cars we buy may have a considerable amount of content generated in Canada, but it is hard to describe any vehicle as a “Canadian” car. “What’s important is that government use procurement to foster advanced technology, and hopefully that advanced technology will have relevance to the Canadian segment of the auto sector,” he said. When Gavrel speculated on how readily an ambitious

student might be able to launch a company to create an innovative component for automobiles, Frise replied that the tremendous size and reach of the existing component supplies made that kind of start-up an unlikely proposition. Having said that, he cheered Robinson's insistence on defining measurable outcomes, and not restricting programs to small players. "All companies need to become more competitive, and all companies need to develop more innovative and desirable products."

On that same point, Leonard pointed to the emergence of RIM from a university-based idea about paging technology as proof that Canada can nurture the necessary conditions for global success in ITC. The real question is whether those conditions can still operate in today's changing global context.

Gavrel asked Bak if the budget contained elements that the clean technology industry had been seeking. She noted that the government had been asked for a concierge service to help companies navigate programs, an ongoing procurement program based on the articulation of a clean technology sector strategy, and sector-specific R&D investment. She expressed satisfaction that the first two points were delivered, and she was not surprised about not receiving the third, given the budget's emphasis on austerity. She added that she is optimistic that this same emphasis on austerity will be shifting to make room for the advantages of innovation in areas such as trade and the competitiveness of traditional industries. Moreover, since some 75 per cent of the companies founded in clean technology were commercializing private sector IP, while only 7 per cent were commercializing university-based IP; Bak indicated that this puts the onus on private sector innovation capacity.



Panel One (from left): Jeffrey Crelinsten, Jean-Claude Gavrel, Lynda Leonard, Celine Bak, and Peter Frise

Gavrel asked specifically about the link between peer review among researchers, and the need to speed up decision making in order to compete, and how these potentially opposing activities can be resolved. Frise returned again to Robinson's comments on outcomes, suggesting that when you apply academic measures of research success to work that business depends upon for commercial success, it should not be surprising that mistakes and delays crop up. "Decisions made in 18 months are irrelevant, if you're talking about anything to do with business," he said, indicating that strong academic ideas often make poor business proposals, while researchers can lambaste potentially strong business innovations. Leonard was even more blunt: "Peer review is not an industrial concept."

Decisions made in 18 months are irrelevant, if you're talking about anything to do with business.

Touching briefly on the issue of Canadian attitudes toward innovation, Bak brought up the fact that Canadian securities regulations do not require firms in this country to report their R&D. So while you can

find this information about potential competitors around the world, you cannot for Canadian firms. “From a private-sector benchmarking perspective, we actually run an opaque market here.”

Q&A Session from the Floor

The first question from the floor came from Mario Thomas, Managing Director of the Centre for Commercialization of Research, who suggested that there was a disconnect between criticizing Canada's lack of domestic procurement at a time when many aggressive competitor nations nurture enterprises that are “born global” and pay no attention to their own domestic markets. Leonard disputed that image, but stressed the need for a “reference client”; she took umbrage at the notion of “born global” as a macho exaggeration of the practical reality.

A second question asked about the turnaround time on decision-making, asking if we are agile enough to compete. If a process that takes months here takes weeks elsewhere, then this is a profound incentive to look offshore. Gavrel suggested that this is a problem that could be remedied as we enhance our culture of innovation, and Frise brought this back to the theme of domestic procurement by citing the example of AECL. “If they can't sell a CANDU reactor here in Canada, it's hard to see how another country would buy one.” That being said, the questioner offered his own example of how a Chinese firm took less than a day to fabricate the prototype of a tool he was considering; the pace of this purely mechanical step added momentum to decision-making, whereas spending weeks to do the same thing in Canada would bog down decision-making.

Jim Roche asked the panel members to compare Canada's federal programs with comparable programs found in other countries, and what lessons we could learn to improve our offerings here. Bak offered the example of the Korean government responding to the need for an economic stimulus with a procurement policy that strategically developed key sectors, including clean technology; this resulted in \$11.9 billion being invested in that country, versus the \$1 billion Canada spent on its own stimulus package. Leonard responded that even more was required, and that Canadians were seeking high quality employment and enterprise creation, but these goals must be articulated and measured. “Absent an industrial policy, it's absolutely essential that we understand what it is that we're running toward.”

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As for what works, Frise said that SR&ED has been extremely beneficial to all levels of the automobile industry, so that changes to this program have raised serious concerns. Moreover, the lack of any kind of industrial policy is no less concerning, given that other jurisdictions have gone to great lengths to sharpen their focus and set specific goals. Domestic regulations that diverge from international standards without necessarily adding value are also problematic. In contrast, Canada's support for education and training has been outstanding, and represents a strength that must not be compromised.

“Canadian programs often have this foggy view that we'll do good things and good things will happen, and I don't think that's close enough to the mark. Too much money gets spent over too long a period of time with outcomes that are just too hard to figure out. Design the program to achieve that goal and then make sure that it does.”

— Peter Frise, CEO, AUTO21

Day 2: 17 May 2012

NEW MODELS FOR ACCELERATING INNOVATION: A VENTURE CAPITALIST'S PERSPECTIVE

Keynote speaker: Senia Rapisarda, VP, Strategic Initiatives and Investment, BDC

Rapisarda is responsible for strategic investment at BDC venture capital, a new group that was established a year earlier, not just as a profitable undertaking, but also to support the economic system by going into areas where other people will not go. Although she is not from Canada, she has spent the last 25 years investing in early stage companies, in Europe, Israel, and the US. For that reason, she introduced herself



as a dispassionate observer of what is happening in the Canadian market. She recalled her experience in working on the board of a Canadian start-up company that had a very promising technology developed at Laval University. Everything was set up properly, she said, but “to put it mildly, they were pretty mediocre at selling it.” Moreover, their syndicate of investors was dysfunctional, so when the market shifted in a way that created challenges, the syndicate did not move to support the technology and enable it to withstand this situation. Ultimately, the company was forced to shut down and the technology was sold for very little money.

For her, that experience characterized one of the “elephants in the room” with respect to Canadian ventures. She was distressed by the absence of anchor investors in many Canadian ventures, something that is at odds with what she has seen in Europe and the United States, where investors are eager to move into start-ups as a way of initiating new forms of innovation. “I don’t see that in Canadian corporations at all. I see neither corporate venture arms, nor a portion of their budget devoted specifically to that.”

She was similarly critical of Canada’s “immature and undercapitalized” venture capital and private equity industry. She acknowledged that this line of investment is much younger here than it is in the United States, but she finds it unacceptable that the country is home to no more than a handful of players after 20 years. Related to this issue is the tendency to fund a variety of start-ups rather than helping some of those firms grow larger, which means there are few of these firms on the Canadian landscape (and more elsewhere, which tend to buy out the Canadian start-ups).

“We need a massive cultural shift that embraces and celebrates entrepreneurship. We need to start at schools, saying this is a great career choice. We need to own the podium of business.”

— Senia Rapisarda, VP, Strategic Initiatives and Investment, BDC

She noted that the difficulties surrounding venture capital are not limited to Canada. However, she argued that Canada could make good use of 10 principles that were developed by Jerome Engel, Founding Executive and Director Emeritus of the Lester Center for Entrepreneurship at University of California, Berkeley, which she has been applying in her own investment work throughout her career. These principles include:

1. Invest in successful teams. This may sound all too obvious, but she emphasized that scientists only rarely make the transition to become good entrepreneurs. “We need to pair them with good CEOs, and good VP sales,” she said. “The vice-president of sales is somebody that is absolutely not taken into consideration in the Canadian dream of perfect jobs. But in most of the American companies I’ve invested in, the VP of sales is paid more than the CEO, if he performs. If we don’t sell the product, we’re nowhere.”

The vice-president of sales is somebody that is absolutely not taken into consideration in the Canadian dream of perfect jobs. But in most of the American companies I’ve invested in, the VP of sales is paid more than the CEO, if he performs. If we don’t sell the product, we’re nowhere.

2. Invest in large growing markets. She insisted that market analysis is as important as working on the product to be marketed, but the amount of time spent looking at markets is comparatively small.

3. Eliminate pain. By “pain” she was referring to technical problems that are worthy of solving, but which we seldom regard as potential new businesses. Most of us do not have the necessary entrepreneurial vision to develop products we did not know we needed, she admitted, but this is exactly what leads to success. To make a particular company or technology worthy of investment, she argued, the pain it addresses must be clearly defined.

4. Focus on customer development, not product development. “There is a moment when the search for the excellent product is actually damaging to your company,” she said, cautioning against a continual technical refinement. Venture capital circles have coined the phrase “minimal viable product” as a means of defining the launch point, which will be followed by rapid iterations based on customer feedback. “We live in a world of perennial beta.”

5. Dedicate your resources in stages. “This doesn’t mean to undercapitalize a company,” she said. It means to stagger your financing based on milestones, and be strict about it.”

6. Fail fast. Her team knows that she does not mind a bad investment, Rapisarda said. “What I mind is throwing good money after bad.” She added that her models for investment begin with a 70% failure rate during the first year, a figure that is unsettling to some, but which can quickly sort out the best performers. The most difficult part of this approach, however, is acknowledging failure and not trying to sustain an investment that is not worthwhile.

7. Speed is everything. Growth does take time, she acknowledged, but it must be matched by fast, motivated, and aggressive execution of the steps that lead to growth.

8. Pour it on. “When you find winners, back them; back them hard.” There might be a tendency to let the winners carry on and devote resources to those who are not doing as well, but she insisted that the winners must be reinforced first.

9. Offer no lifeboats. In connection with failing fast and backing winners hard, offering no lifeboats means that no resources are sacrificed to lost causes.

10. Be always selling, but never for sale. She described how companies are asked to list their three dream customers, the three relationships whose failure could kill the investment, and three potential exits.

If they cannot identify the people or organizations that fill these categories, then they still have work to do. Moreover, even if they cannot gain access to those people or organizations, they should be working toward such access.

With respect to her new group at BDC, Strategic Initiatives and Investments, she described the important role of accelerators as an intense program of entrepreneurial development. These are not incubators, but short-term positions that are extremely aggressive in terms of mentoring and graduation criteria.

Among the criteria that make an accelerator effective, she cited strong private sector backing, as opposed to allowing a government program to continue carrying a start-up. “The private sector has to be there to validate it, and to make it sustainable in the long term. If they feel there is no need or it’s not profitable, then it was never a good idea in the first place.”

The private sector has to be there to validate it, and to make it sustainable in the long term. If they feel there is no need or it’s not profitable, then it was never a good idea in the first place.

She recommended bringing seasoned venture capitalists on-board, so as to provide mentoring as well as direct support. BDC is also very active in the process, with a seat on the board and other active participation, including mentoring. “It clearly has to be complementary to what BDC does in terms of investment on the direct side — we do cleantech, IT, and life sciences.”

She concluded that the success of an accelerator depends on the role of founders, mentors, program structure, a highly competitive intake process, and the context of a strong tech community.

“There is a shift, an honest desire to make a difference. When my kids ask me what I do for a living, I tell them I back the extraordinary people of Canada. I try to find them, and there are plenty.”

— Senia Rapisarda, VP, Strategic Initiatives and Investment, BDC

By way of example, she described GrowLab Ventures in Vancouver, which hosts five companies at a time in the digital media and IT sector. As part of the program, participants spend a month in the Palo Alto area, meeting everyone there who is of relevance to the industry. Part of the linkage is through C100, a select group of Canadians based primarily in that region, dedicated to helping other Canadian entrepreneurs make the appropriate connections. Similar approaches have been adopted by Extreme Startups in Toronto, Real Ventures Limited in Montreal, and Communitech Hyperdrive in Kitchener, in each case accelerating — not incubating, she stressed — the progress of client firms.

Rapisarda pointed out that not everyone graduates from the accelerator program. Those who do are provided with a BDC convertible note worth \$150,000. “This is really bridging a gap in the market where there is nobody providing this type of financing and it’s very risky.” There has been an overwhelming demand for these services, for which BDC has earmarked \$15 million for these convertible notes.

She encouraged everyone to prompt Canada’s private sector to follow the example set by BDC, which is to find these extraordinary people and back them hard.

Q&A Session

The first questioner argued that the success of the initiative described by Rapisarda relies on the quality of the accelerator participants, and his own experience in this field suggested that the quality was lacking. When the results prove to be less than compelling, he added, the backers of such initiatives lose their enthusiasm. “Sifting to find the good ones is really difficult. One has to be careful not to overfund the start-ups, because you’ll end up with a low threshold and a lot of bad companies coming through, and there will be no exits and no return on the investment.”

She agreed with this cautionary outlook, and reminded the audience that her program is set up to invest at limited levels, and with the ability to abandon failing firms. “This is a way to test without throwing a lot of good money after bad.”

Caroline Cook pointed out that her government department had an interest in the kinds of companies that BDC is accelerating, but it has no direct relationship with such firms, only with intermediaries such as investment community. Rapisarda marveled, in what she insisted was a non-sarcastic way, that Canadians can imagine dramatic projects in fields such as environmental science without first considering where they might find the hundreds of millions of dollars those projects would require.

PANEL 2: IMPLICATIONS FOR INNOVATIVE COMPANIES

Karna Gupta, President, ITAC
David Ross, CEO, Ross Video
Jason Tham, CEO, Nulogy

Moderator: Jim Roche, President & CEO, Stratford Managers Corporation

***Precis:** CEOs running innovative companies face daily challenges in a variety of areas, including sales, marketing, customer support, research and development, governance and finance, and human resources. They must stay ahead of global competition and continuously create value for their customers. This panel of CEOs shared their experiences in running globally active firms headquartered in Canada. Does Budget 2012 contain any good news for them? Can government innovation policy help or hinder the growth of such firms?*

Roche began by asking each of the panelists to offer a brief introduction to each of their enterprises. Tham described his company Nulogy, which is based in Toronto and has about 50 employees, which provides a cloud-based application for supply chains. In this way they have become part of the supply chain of some high profile firms, such as Procter & Gamble, Nestle, and Kraft. Nulogy, he explained, automates this supply chain and can accelerate new product development. The firm is also multinational, with 60% of its revenue coming from the US and they are also active on four continents.

Roche asked him to list the business issues that were top of mind for him, to which Tham responded that it was making the distinction between sales and delivery, both in terms of solving problems and ensuring growth. Tham also cited the need to attract talent, which has led the company to look in the US and Europe to meet this need. Returning to the question of delivery, he said every new sale was matched by a discussion of how to deliver on that sale, and so ensure customer satisfaction.

Roche asked Gupta about ITAC, where he has recently arrived after engaging in his own entrepreneurial activity. As part of introducing the mandate of this organization, Gupta pointed out that Canada's uptake of ICT has not been optimal, and ITAC is dedicated to identifying why this is so and what can be done to correct it. This work extends beyond simply providing mechanical access to resources such as broadband connections, but also the applications based on such resources, such as on-line business transactions. He added that ITAC is also responsible for showcasing Canadian technology on a global basis, so as to overcome well known problems such as access to capital, access to markets, and access to talent.



Panel Two (from left): Jeffrey Crelinsten, Jim Roche, David Ross, Karna Gupta, Jason Tham

Ross outlined the history and activities of his company, which produces sophisticated video control systems used for professional production and broadcast. The firm is privately held and 40 years old, making him a second generation high-tech family owner, an admittedly unusual status. He added that they make their own products at a facility in the small town of Iroquois, which they recently expanded with the help of an Eastern Ontario Development Fund grant from the Ontario Ministry of Agriculture, Food and Rural Affairs.

He observed that the company continually reiterates that it is not for sale, and Ross indicated that the firm has advanced in its thinking from being an enterprise that might be bought to becoming an enterprise that

"The angst is terrible, actually, between investing in new product development and existing product development, versus investing in the sales force and raising the company name internationally."

— David Ross, CEO, Ross Video

buys others. He recalled making the first such purchase three years earlier, and since then he has bought five more companies. Moreover, four of those five companies are not Canadian, so they have wound up having facilities in the Netherlands, Belgium, Australia, California, and Massachusetts.

Some of their products are entirely software driven, such as graphics programs used to represent complex election-night data or sports statistics, while others depend more on hardware, such as the systems that move images from one camera to another. The firm also makes robots, by which he meant the elaborate controllers that manipulate cameras and other large pieces of equipment within a studio. When asked what remains top of mind for him, Ross replied that it is the question of how best to manage growth. He identified a particularly pointed tension surrounding the question of building up sales and creating new products.

Moderator Q&A Session

Roche observed that no one mentioned profit and revenue in their answers to him, something he suggested seldom comes out in these kinds of discussions because it is simply a given. What was revealed, he added, was the highly international nature of the businesses. Roche said that this was familiar to him in his own work, which deals with companies looking abroad in order to facilitate growth and new markets. He then asked the panel about what is working in Canada's innovation ecosystem, and more importantly, what is not working.

It's actually cheaper for me to hire an engineer — sometimes much, much cheaper — than to hire one sales person.

Ross recounted that his company had benefited significantly from government programs such as IRAP, to the point of making some of his colleagues in other countries somewhat jealous of the edge these resources provided. They also use Export Development Canada to break into markets that would normally be off limits to them. However, he explained that most of this work was strictly technology development, and that there is no program to help them commercialize products or hire international sales people. "It's actually cheaper for me to hire an engineer — sometimes much, much cheaper — than to hire one sales person."

He cited the SR&ED as a problem in this regard, since just as companies begin to expand their horizons internationally, this advantage disappears. He underscored the point by referring back to the robot technology, which was not developed internally, but acquired from other countries thanks to the skilled international sales force they have been able to assemble.

Gupta concurred with Ross' observation, describing the inability to find markets as a fundamental problem faced by Canadian firms. Although the close cultural ties between Canada and the United States means that most entrepreneurs here will be comfortable seeking out new markets there, elsewhere in the world it can be a much more complicated scenario. Links to sales people in some countries may end up being struck on-line, or through a quick encounter at a conference, which can lead to undesirable results if the firm ends up being locked into a contract that gives preference to an unproductive sales force. This is a problem the federal government could help resolve, not simply by organizing trade missions, but by following through with local sales providers in a way that can benefit Canadian firms that need to break into new markets but lack the knowledge and staff to do so. With respect to SR&ED, Gupta expressed some satisfaction with the direction being signaled in the budget, but he said he will wait to find out exactly what is going to be done.

"There's no program for marketing or selling anything that we've created. It creates a dysfunction situation in Canadian high tech, in that if you want to commercialize something, you end up being a company that has all these great ideas, all this great technology, and you're just looking to be bought by somebody that has a sales force."

— David Ross, CEO, Ross Video

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Addressing the innovation ecosystem as his company sees it, Tham argued that it has benefited from SR&ED, IRAP, and the Ontario Centres of Excellence program (of which they are a member). Nulogy has received some very limited funding — on the order of \$6,000 — to carry out international trade missions, which is just enough to defray costs, and a pittance compared to the support offered for activities within Canada. Moreover, although venture capital firms that invested with them might look fondly on the prospect of the company being sold in a few years, he is aiming to stick with it for at least another 10 to 15 years, and acquire other companies along the way.

"I don't think there are enough companies that are built to last. That's part of how they're set up, and how the funding is."

— Jason Tham, CEO, Nulogy

Moreover, he credited Nulogy's growth to technological superiority, since they have only three sales people (including him), and there is little support for building up that part of the firm. Given how hard it has been for the firm to establish even the most rudimentary footholds in other markets, he wondered why there was absolutely no Canadian program that could help them build on such success. In major markets like Russia, for example, Nulogy is providing its product entirely on a remote basis, with no direct support on the ground. Likewise, they have set up an operation in Shenzhen, China, which he has yet to visit.

Roche asked each of the panel members if they had ever commercialized technology that was originally developed in a university. Ross indicated his company had not done so. Gupta recounted the example of a company where he belongs to the board of directors, which has taken three-dimensional scanning technology from University of Montreal and turned it into a product for airport security checkpoints. Tham noted that their firm's foundational technology emerged from work that he and his colleagues were doing at the University of Waterloo as undergraduates.

Roche also asked each of the panelists to describe how customers factor into their innovation activities. Ross portrayed customer relations as integral, with about 20% of his time being on the road meeting these individuals. "If I don't do that, we're not going to be an innovative company. It's not a linear process, but very entrepreneurial throughout the entire life cycle of products." Gupta expressed a similar experience, with almost all of his travel being to customer sites. Gupta noted that he puts the same work into tracking the concerns of ITAC members as he formerly did tracking the concerns of customers in his company.

"It is absolutely critical for a technology company to understand what the problems and struggles of your potential and current customers are. So you can always frame the problem statement very simply. If we don't frame the problem statement, what our customers are facing we can never really solve it."

— Karna Gupta, President, ITAC

Tham agreed, suggesting that the attitude toward customers reflected a vision of the market occupied by those customers, which is necessary to any innovation that moves the company into that market. For this reason he estimated that 90% of Nulogy's innovation is customer driven, while 10% originated from within the firm. He acknowledged that he would like the firm to be responsible for a greater proportion, which would provide for additional control and direction.

Caroline Cook commented on the nature of government programs, their strengths along with their failings, by referring to Gupta's comments about how quickly those programs could respond to the needs of business. Drawing on her own experience with the successful transfer of government support in the forest sector, she suggested that there were some avenues of support that transcended much of the criticism the panel was leveling. Gupta

"The intensity you see in cities like Moscow or Shanghai or Mumbai is very different than the intensity you see in a city like Ottawa or Toronto or Vancouver or Montreal. That intensity is really all about time, and I still feel that the process could be a lot more streamlined. Young companies, beyond customers, worry about one thing all the time: making the payroll."

— Karna Gupta, President, ITAC

acknowledged her point, but drew on his experience with ITAC members, who continue to complain about the onerous, time-consuming process of trying to obtain government support that will not come soon enough in any case. Nor does the Canadian sense of urgency reflect the growing reality around the world.

Ursula Gobel asked about the role of the search for talent, asking if the skills being sought have shifted in response to a changing emphasis on customers' needs, the desire to nurture new markets, or the priority of adopting new technology. Tham replied that the demands for talent were driven by the desire to remain at the forefront of an innovation ecosystem. Gupta added that where once there might have been premium placed on pure technical knowledge, most firms now want that knowledge to be supplemented with some business education, since these individuals will ultimately be dealing with customers. Nevertheless, he added that some firms will wind up more heavily invested in this kind of technical talent if they are particularly research intensive, and many outstanding graduates want to work in that environment. Above all, he said international competitors were willing to pay as much for top talent as anyone in Canada could do; much like the price of gold, these individuals fetch the same price everywhere. Ross said that while he has had little trouble attracting talent, the company has had trouble getting a profile in Ottawa. News reporting on company operations is spotty, he added, nor does it always capture the essence of everything that has been accomplished.

Where once there might have been premium placed on pure technical knowledge, most firms now want that knowledge to be supplemented with some business education, since these individuals will ultimately be dealing with customers.

Doug Barber asserted that Canadians are commerce averse, so he is not surprised by the challenges that are faced in developing sales and marketing capabilities. He recalled his own experience in trying to cultivate engineers who could achieve a good rapport with customers. There was a perception that this was beneath the dignity of engineers. Ross echoed this comment, wondering aloud why Canadians underestimate the significant growth that sales staff enable. Building on that observation, he proposed to government program administrators that the SR&ED program be amended to accommodate exporters of technology, so that they can expand that export potential, “so you get to act like a small start-up one more time”. He offered this as “just a minor tweak, but that would mean that as you grow you’ve got sales people out there that are actually selling things to the rest of the world. It’s rewarding success because it is showing that you’re a net exporter. But as you do that, it actually puts money back into the SR&ED program, which only happens if you’re doing R&D. It’s a way to get the flywheel going faster, and develop some of these mid-sized companies that you’re looking for, and not having to go through venture capital to grow your company.”

“Grants are great. Money from customers is even better.”

— David Ross, CEO, Ross Video

Barber, while noting that McMaster University administers upward of \$300 million in research funding every year while IRAP’s budget for all of Canada is \$80 million, argued that customers are not the same the world over and finding them is not easy. In his experience, embassies were helpful to him in identifying these prospective clients and he wondered if this resource is still available. Tham indicated that Nulogy has made limited use of Canada’s embassy in Australia for this purpose. Ross recounted how the Belgian ambassador once called up a customer on the firm’s behalf, which was his only story in this regard. Gupta noted that this kind of activity is not mandated for embassies, so whether this kind of assistance is provided will depend very much on who occupies the embassy posts.

Customers are not the same the world over and finding them is not easy.

Jack Smith, of the Telfer School of Management, asked about Canada’s technological agility. Countries such as Brazil, Russia, and Taiwan are extremely aggressive in developing national foresight, an ability to anticipate technological and economic trends, as well as working with their domestic enterprises. He wanted to know if this skill set existed in Canada, and how they would like to see a Canadian innovation ecosystem help them in dealing with international competition.

Ross insisted that his and other companies demonstrated a great deal of agility, but developing sales and marketing remains a universal priority.

Gupta suggested that Canadian companies were able to look after themselves, but they need additional support in order to be able to grow, and he maintained that such support would be better coming from the private sector. Tham reiterated Ross’ remark about the significant value of money from customers, in terms of enabling a company to realize its ambitions.

“If you bet on a horse that did well, why don’t you just keep betting on those horses that keep on winning?”

— Jason Tham, CEO, Nulogy

Roche asked Tham about his preferences, whether he would be happier with venture funding that might point toward a short-term sale of the company or with government support that would allow him to hire sales people. “Definitely the latter,” Tham said, noting the need for “the right type of funding for what you want to do.”

Roche asked each of the panelists for a final comment. Gupta remarked on the limited abilities of venture capitalists to assist companies, which he blamed on the fact that these individuals tend to be MBAs with limited operational experience and little direct understanding of the needs of their clientele. He recalled working at an Ottawa telecommunications firm in the 1990s that raised \$100 million in short order and ultimately grew to 600 employees, but failed quickly after receiving no help from VCs to manage the changing market conditions.

Tham concluded that Canadian start-up firms were selling Canada, but doing so in a bad way, because many are making a virtue out of setting up an enterprise with the ultimate goal of selling it rather than building it continuously. "Our funding is set up in such a way as to do that," he said, adding that it would be far better to sustain companies that will continue building Canada's innovation ecosystem.

Canadian start-up firms are selling Canada, but doing so in a bad way, because many are making a virtue out of setting up an enterprise with the ultimate goal of selling it rather than building it continuously.

Ross enthusiastically seconded Tham's remarks, noting that his own company has consciously shunned external investment because of the potential loss of long-term control and pressure to sell the enterprise.

Crelinsten added one further observation, the case of a Danish government initiative targeted at Danish firms that were successful in the Danish market. The government created a fund to help these successful domestic firms break into the American market. The program failed, because they found out that the domestic success of these firms was based on providing 24/7 service to clients. To provide the same customer service on the other side of the Atlantic necessitated administrative expansion that was beyond the reach of these firms. The government killed the program and is piloting a second one targeted at export-oriented firms. They created a fund that firms can use for market-oriented activities, including market research, traveling to trade shows and other market intelligence. The fund is specifically not for R&D but to fund the activities that will enable firms to move into foreign markets. "The first lesson that the Danish government learned was, 'we took a risk and we failed fast.' They're taking a chance."

"We have no venture capital, we have no private equity, we're very customer focused. And you know what? I do get to make five- and ten-year plans now. And I do get to invest in the infrastructure. And I get to decide what we need to do to build the great Canadian company, because there's nowhere near enough of them."

— David Ross, CEO, Ross Video

DISRUPTING CANADA'S LOW-INNOVATION EQUILIBRIUM

Keynote speaker: Peter Nicholson, Founding President, Canadian Council of Academies

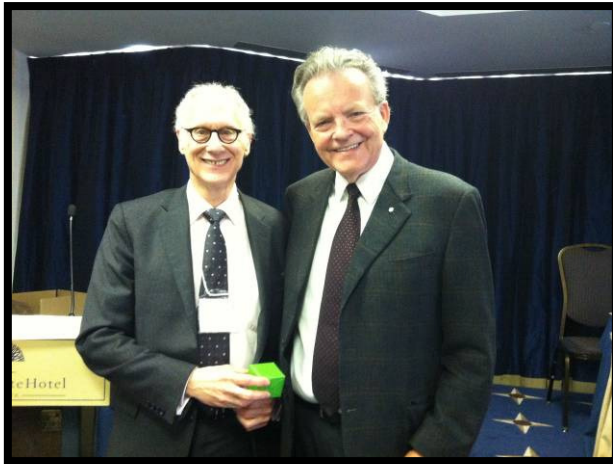
Nicholson noted that his remarks would take an extreme “macro” perspective, both in terms of the view above and the historical distance preceding the subject of innovation. Starting with the conference’s theme question — has Budget 2012 effectively disrupted Canada’s low-innovation equilibrium? — he offered a definitive “no”. His talk was therefore intended to explain how he arrived at that answer.

Nicholson then set up the paradox of innovation in Canada. Conventional wisdom asserts that business innovation is the principal driver of competitiveness and lasting economic prosperity. The harsh reality is that the country’s business sector is an innovation laggard, and yet our economy continues to yield one of the world’s most enviable standards of living, as well as business profitability that matches that of the US. Moreover, this paradox has persisted for decades, through all kinds of economic climates.

“Canada’s low-innovation business behaviour has delivered,” he said. Individual companies do encounter problems, but the economy as a whole thrives despite this low level of innovation.

Canada’s low-innovation business behaviour has delivered

As for the causes of this persistently low level of innovation, Nicholson credited it to Canada’s small and fragmented domestic market. He noted that the same might be said of Finland, Sweden, Taiwan, and Switzerland, but the telling difference with Canada is that none of these other countries ever saw fit to rely on their domestic market and were essentially “born global”. A case in point: Northern Electric (which became Nortel) and Ericsson were established at about the same time, but the former thrived on a supply arrangement with AT&T in the US, and Ericsson had no such partner so it had to seek out a global customer base from the beginning. That example likewise reveals the fact that Canadian geography has given the country a unique relationship with what has been the most powerful and successful economy in the world for the past century. “We have developed a very specific role in what is a completely integrated North American market.” Canada has produced and continues to produce some very sophisticated end-products, but our performance pales next to that of the US. “It’s not that we don’t have examples, we just have a relative dearth.” The study of this relationship is not new, and perhaps the most powerful academic analyses were carried out in the 1950s, 1960s, and 1970s. It is these very profitable linkages with the United States that has bequeathed to us the timid, myopic business culture that some speakers had already bemoaned.



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“The companies that play this role in an integrated economy are not by and large facing the end-user customers,” he explained, adding that this applied across the business spectrum, from retail and wholesale operations to the major players in the resource sector.

Nicholson disagreed with other speakers who maintained that Canada has no innovation policy. But he maintained that the country has no “serious” innovation policy. This could be perceived as a partisan comment, but he said it applies equally to governments of all stripes. “They’ve never sustained a commitment at sufficient scale needed to encourage Canadian business out of its low innovation equilibrium.”

To the extent that there is an innovation policy, he said, it pertains to R&D and features academic intermediaries. Nor should that be surprising, since a key motivation for supporting R&D is to capture some of the spillover, the social benefits that accrue from supporting companies in their efforts.

“The belief is that companies spend less on R&D than is socially optimal, so you subsidize it to get them to spend more, on the theory that new knowledge spills over into the rest of the economy and has an extra ROI that the company cannot capture. That ladies and gentlemen is the sole theoretical argument for R&D subsidies.”

— Peter Nicholson, Founding President, Canadian Council of Academies

Nicholson insisted that this outlook remains the philosophical foundation for R&D investments by Canadian governments, and it may have to change if a serious innovation policy is to emerge. Other reasons for the lack of a serious policy include the fact the file is always assigned to a junior minister, there is no science advisor to prompt discussion of the topic, nor do

people in the pertinent research agencies and advisory bodies stay in their posts long enough to have an impact. In fact, he added, the government’s own research establishment is largely ignored as an economic asset, and the primary innovation policy measure of SR&ED credits runs without significant direction or analysis. All of this reflects a common perception that the low-innovation model has been returning more than acceptable results, prompting no apparent need to change it.

The government’s own research establishment is largely ignored as an economic asset, and the primary innovation policy measure of SR&ED credits runs without significant direction or analysis.

Noting that the Canadian and American economies have performed in lock-step for more than a century, Nicholson considered whether this situation will continue. A graph comparing the two countries’ relative employment-to-population ratios and labour productivity over the past 35 years shows trends that are not in lock-step, but actually opposed. Canadian productivity has fallen steadily, even as American productivity has climbed steadily. Employment has gone up in Canada because the cost of labour was compensated by a lower dollar, which also compromised the availability of capital to make investments that would have improved labour productivity. He also presented figures showing how unit labour costs in either country had changed over the last two decades, revealing that Canadian costs have risen significantly since 2002, while US costs have slowly declined.

“Individual companies with sufficient ingenuity, management talent, a commitment to the customer, a global outlook — they can overcome all of those negative factors and still do well,” he observed. “But for the economy as a whole, this is a tremendous business challenge.”

There are other challenges as well, he indicated, which have the potential to permanently disrupt the equilibrium being enjoyed by Canada. He cited four:

- global economic rebalancing, the opening up of promising new emerging markets;
- resource demand and supply, whereby high commodity prices benefit Canada even as they prompt our customers to reduce their consumption or research substitutes;
- aging populations, which will create an imperative to boost productivity as the labour supply tightens; and
- transformational ICT, which is literally changing the ways human beings relate to one another and the entire world, and which calls for greater investment than Canada is making.

Regardless of what sort of public policy is put forward, Nicholson argued that Canadian business will simply have to become more innovative in order to cope with these structure-disrupting forces. Some policy measures, such as promoting a highly educated work force, are exactly the right things to do, but most of them are not directed toward the changes and are overwhelmingly insufficient to deal with it. Targeted policies can make a difference, he explained, providing some examples of what could be done. These suggestions include making major pushes into emerging markets, returning to a digital economy strategy, and building bridges between ideas and markets. In this light, he noted, an innovation policy that set genuine priorities would go beyond simply supporting R&D, would provide staff to engage with the business community in a more meaningful way, and would work with all levels of government in order to yield national results.

An innovation policy that set genuine priorities would go beyond simply supporting R&D, would provide staff to engage with the business community in a more meaningful way, and would work with all levels of government in order to yield national results.

The coming economic changes will also alter the nature of risk, however, so that anyone who will survive is going to have to begin dealing with new technologies and new ways of doing business.

“I’m not pessimistic,” he concluded. “There is a constellation of structure-disrupting forces that will have the power to change this equilibrium, and the role of policy has got to be to get behind that in a programmatic and operational sense, but to get in front of it in an intellectual sense.” In other words, members of the business community can best be helped by showing them how to address a future that is bound to overtake them.

“There’s lots of risk capital in Canada. It’s just the people with serious money know about how to dig holes in the ground, they know how to build pipelines, and they know how to develop shopping malls. That’s where the serious risk money in Canada goes, because those are risks that are understood.”

— Peter Nicholson, Founding President, Canadian Council of Academies

Q&A Session

Ron Freedman agreed with Nicholson’s assessment of the rudimentary innovation policy rooted in the “spillover” model of the 1960s, but he added that the rising dollar has not necessarily been all bad, since it has allowed businesses to make capital investments at a significant discount. He therefore suggested that in light of these investments, and with the coming demographic crunch that will reduce the available labour pool, then jobless growth could result. Nicholson agreed to a point, but recalled the fact that when

the dollar was low, the profitability of many companies became so high that their capital investments went up, since it was worth doing so.

We are way too comfortable in Canada, and maybe we need to get uncomfortable in order to get serious.

Mario Thomas also concurred with Nicholson, noting that his organization works with the International Commercialization Alliance, which brought together 22 countries to discuss these issues. Some of those countries are among those with “serious” innovation policies, but Thomas notes that these policies did not arrive until the countries were at the “point of pain”. “We are way too comfortable in Canada, and maybe we need to get uncomfortable in order to get serious,” he said. Nicholson agreed, but observed that no one was going to get elected on a platform designed to make the country uncomfortable. That being said, he echoed Thomas’ point, offering the example of how drastically Finland’s outlook changed after 1991, when the Soviet market disappeared. Closer to home, Northern Electric (which became Nortel) endured its own fruitful “catastrophe” in the late 1970s, when the US Justice Department broke up AT&T, which decimated the company’s key market.

Claude Goodman, representing Canada Economic Development for the Quebec region, followed up on Nicholson’s account of the history of Canada’s innovation capacity relative to the United States. Given that Canada has embarked in a number of bilateral trading arrangements with other regions, including South America and the EU, Goodman asked how this will affect innovation in Canada. If we occupied a colonial status under the US, will these new agreements alter that status. Nicholson suggested that it will improve export market access, even as it enhances competition for imported items, which he regarded as a good thing. “Anything that enables and even forces a more global outlook on Canadian business is a strong motivator and in fact just strengthens what is going to happen in any event.”

Don’t we need a permanent relationship between government and business on a sectoral basis, to look at these emerging issues as they come up and not wait for these *ad hoc* relationships and reviews to take place?

A final question referred to the Canadian Academies report, which referred to the loss of government’s ability to engage with business, then asked if such engagement would even go far enough to be effective. “Don’t we need a permanent relationship between government and business on a sectoral basis, to look at these emerging issues as they come up and not wait for these *ad hoc* relationships and reviews to take place?” Nicholson indicated that such relationships did exist in the past, making this a logical structure to revive. This will also be essential to repositioning the business sector from a reactive posture to one that is pro-active enough to confront structural changes.

PANEL 3: IMPLICATIONS FOR INNOVATION INTERMEDIARIES

Clarissa Desjardins, CEO, Centre of Excellence in Personalized Medicine
Robert Luke, Assistant VP Research & Innovation, George Brown College
Mario Thomas, Managing Director, Centre for Commercialization of Research
Allison Young, Senior Trade Commissioner, Canadian Consulate, New York

Moderator: Tom Brzustowski, RBC Professor, University of Ottawa

Precis: The innovation ecosystem is increasingly populated by specialist organizations (or groups within traditional institutions) whose role is to connect companies with one another and with other sources of support, including expertise and finance. These innovation intermediaries often play a vital role in supporting companies and helping them succeed and grow. This panel looked at how Budget 2012 might affect the effectiveness of innovation intermediaries in their task of helping and supporting entrepreneurs and innovative firms.

Brzustowski started with a working definition of an innovation intermediary as “anyone, individual, group, organization, who helps a company commercialize an innovation by filling a gap in its innovation capabilities.” He added that this role could take place anywhere in the chain of commercialization activities. He then asked each of the panelists to describe how the organizations they represent fulfill this defined role.

Young said the New York City-based Trade Commissioner’s office had launched two business accelerators in the past three months. One is a three-month program focusing on digital media, bringing companies to New York and immersing them in a 350-company incubator, where they will link with mentors for breaking into the New York market, as well as potential clients and the city’s venture capital community. They are planning to have 24 Canadian companies participate in 2012, six at a time. A second program is a virtual accelerator for clean technology, which is bringing mentors and potential investors on-line to 30- 35 Canadian firms in this sector. Through a Webinar format, these groups can discuss what these companies need and how entrepreneurship works in New York. She described how her office is also engaged with Fortune 500 companies, learning more about their supply chains and the needs of these large enterprises, with an eye toward opportunities that might be available for Canadian interests.



Panel Three (from left): Clarissa Desjardins, Robert Luke, Tom Brzustowski, Allison Young, Jeffrey Crelinsten, and Mario Thomas

Desjardins introduced personalized medicine as therapy that is based on an individual’s genetic background, tailored to minimize side effects or ineffective treatment. She pointed to an outstanding feature of her Centre of Excellence being its ability to attract significant foreign investment from major

pharmaceutical companies, which takes advantage of the outstanding infrastructure provided by the centre's host institution, the Montreal Heart Institute (MHI). That infrastructure consists of a 200-person, non-profit clinical research group created by an entrepreneurial researcher, Jean-Claude Tardif, a pharmacogenomic R&D centre also founded by Tardif, and the MHI Biobank, which is assembling genetic information from 30,000 participants. The Centre of Excellence has therefore been established to commercialize and consolidate these foreign investments from the drug industry. "We do large public-private partnerships, we do commercialization and implementation of personalized medicine tests, and we do a lot of knowledge translation — education with physicians and pharmacists, policy work, and advocacy," she said.

Thomas recounted his entry into the Centres of Excellence program and the establishment of the Centre for Commercialization of Research. He assembled an advisory board to model the organization, making entrepreneurship the centrepiece of this structure by offering three services: management capacity, aggregation of seed capital, and reduction of risk for follow-on investors.

"Entrepreneurs do not need programs.
Government needs programs."

— Mario Thomas, Managing Director,
Centre for Commercialization of Research

More specifically, he noted that the Centre offers no programs. Instead, the Centre's model helps entrepreneurs to grow existing businesses, based on the specific needs of that business, which are usually rooted in management capacity. It has provided this kind of management capacity to about 90 firms, in the form of an embedded executive, a full-time employee who would work in the company with a specific mission for 6-12 months. The Centre also aggregates seed capital, having assembled \$15 million to provide commercial support over five years. "We have turned every NCE dollar into \$12 in the companies," he said, pointing to Jason Tham's firm Nulogy as one a star example of how this has worked.

Thomas has observed that after three years, the companies that had early on been provided with an embedded executive were surpassing other companies on all measures of performance — job creation, incremental sales revenues, or follow-on capital. Moreover, fully a third of these companies are "born global", aiming initially at foreign markets.

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Luke described George Brown College as a "finishing school for those who are looking to get into the work force", since a large proportion of the students arrive on campus with previous academic qualifications. While Canada's colleges have often been regarded purely as training grounds, he stressed the robust relationship they have cultivated with government and industry, which defines the outcomes of their academic programs. The 2007 Federal Science and Technology Strategy allocated \$27 million to all colleges, which has since grown to \$30 million for applied research. This funding is used when industry approaches the college with a problem to solve, and wants access to equipment, capital, talent, and markets.

"We are doing applied research that is complementary to the basic research facilities that Canada is well known for. I said to University of Toronto President David Naylor that we have helped U of T scientists get patents, publications, and PhDs. They come to us because they need to be able to make something, and that's what we do."

— Robert Luke, Assistant VP Research & Innovation, George Brown College

Luke outlined the correlation between thinking, making, and an innovation economy, so that a more robust innovation ecosystem can respond to the needs of industry and help university scientists take their work into a commercial sphere. When he is approached by companies for help, then, he examines whether the College has the ability and an interest in doing so, with an eye toward learning by their students and an actual exchange in the marketplace for the company. “That’s what we’re in this for — so that industry makes money at what they’re doing.”

Moderator Q&A Session

Looking specifically at the impact of Budget 2012, Young noted that it means the closing of five of 22 regional offices in the United States, with attendant program reductions. This has imposed a significant discipline on her and her office, which now focuses only on innovation-related sectors and excludes R&D activities. More specifically, she indicated that her office will concentrate on ICT and clean technology, cutting its other activities in aerospace, defence, and life sciences, which will likely be covered by other offices. Even more critically, the funding for the accelerator program disappears after next year, forcing her to look at new partnerships or even running this program independently. Conversely, regional offices in Canada have also been closed, which reduces the intake of companies that would have found their way to her operation. That prompted her to suggest that better coordination of these activities should be initiated, starting with a comprehensive review of the “virtuous circle” to determine what it is that particular facilities bring to the table. “My value added is market intelligence, with specific intelligence about key clients and bringing companies to this market,” she said. “But there’s a clear partnership role that I need with the people in Canada to be able to pull off what we’re doing in New York.”

Desjardins responded that the Budget has not necessarily had a dramatic impact on her Centre of Excellence, which has drawn in outside investment into its unique facilities, as she explained earlier. The changes to SR&ED do not affect the European and American firms that make up their partners, although this program was vital to her earlier work in biotechnology. She was familiar with IRAP, but the extensive application procedure and long time lines led her to abandon that as a source of help. “Eventually I told my staff not to invest any more time trying to get government money, because you really should be spending your time trying to sell your product to the customer,” she said.

Thomas was bluntly critical of the budget. “I don’t think there’s anything in this budget,” he said. “It lacks courage. It lacks vision. It’s the same-old, same-old. In terms of real commercialization, it’s empty.” The promised \$400 million for innovation may go somewhere, he added, but it remains unclear how it will be used.

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He also added to Young’s comments that pulling back on trade offices in Canada and the United States is counterproductive to the overall goal of enhancing innovation. He indicated that he has already met with DFAIT to yield a better synchronization of these efforts, but he foreshadowed Lynch’s comments that Canadians are good at cooperation but not collaboration. “I have observed this intensely over my first three years in a not-for-profit,” he stated, recalling how hard it has been to reach across various silos of activities (often at the provincial level) dedicated to improving Canada’s innovation ecosystem. “There is no budget for this, but we are doing it because we feel that it is necessary; otherwise, things are not going to happen.”

Luke expressed more satisfaction with the direction being taken in the budget, starting with the funding offered to the granting councils. He highlighted the fact that this funding was tied to partnerships, which echoed the tone of the speakers on Panel Two, all of whom said science and technology were good to pursue, but sales were even better. “Getting the money to the Tri-Council, particularly for SSHRC, will help us foster this customer-focused, people-centred innovation that’s going to let us get over our aversion to commerce.” Similarly, he was cheered by money being put toward CFI, IRAP, and venture funding for the BDC. “The money is going to industry,” he said. “The market will decide what innovation intermediary is going to be most appropriate to serve the commercialization or applied research needs of a particular company at a particular time.”

Brzustowski asked Luke about the role that colleges have defined for themselves as institutions downstream from university research. Luke outlined how George Brown has built links with the University of Toronto’s Faculty of Engineering, tapping into projects that Master’s students must complete as part of an innovation course. “We linked the student project teams with our student project teams working with our industry partners to add some value,” he explained. “That’s a good example of complementarity, where you’ve got people from the Master’s program working with mechanical engineering students and design students and programming students to help companies solve problems. It’s not a theoretical problem, it’s an actual market problem with an actual company.”

That’s a good example of complementarity, where you’ve got people from the Master’s program working with mechanical engineering students and design students and programming students to help companies solve problems. It’s not a theoretical problem, it’s an actual market problem with an actual company.

Luke gave another example from Bloorview Research Institute, part of the Bloorview Kids Rehabilitation Hospital, where their mechanical engineering students and faculty member make items proposed by the institute’s vice-president of research Tom Chau. This collaboration was especially appealing to Luke because the students ended up making physical items on order, an experience that they would never obtain from the rest of their formal education. “The offshoot of all this is that U of T engineering students come up to our campus and take a summer course, for credit in the University of Toronto engineering program, on how to actually make stuff,” he said. “It reinforces the connection between thinking, making, and innovation in the economy.”

Brzustowski posed a challenge to the panel, asking them to consider the prospect that “the company becomes the product”, in other words, companies actually fulfill their innovative role when they are purchased by other firms in order to enhance the prospects of that firm, which will serve markets even better than the acquired firm could have done. He asked how we capture the value that is created by these sorts of firms that become their own products.

Thomas responded by portraying an innovation ecosystem inhabited by large anchor companies, small start-ups, SMEs, and companies that exit in order to generate wealth. He recalled the case of a Montreal-based company that had been sold, an occasion which at face value looks like a loss for Canada of an enterprise that could have grown to be quite large. However, a closer analysis reveals the large amount of talent that was honed by this enterprise, individuals who subsequently went on to contribute to the success of other companies or even to found their own firms. Upon following the trail of the money that was earned from the sale, too, he found that much of it had been reinvested in local firms. Even the building that had been occupied by this firm remained active, housing knowledge workers and researchers in other enterprises.

Luke added another dimension to Thomas' response, suggesting that if the acquired firm had interacted with an educational institution like his, there would be a knowledge transfer that would continue to produce dividends. However, those dividends have not been tracked in the way Thomas has done, and Luke recommended pursuing just such an analysis of downstream educational impact.

Desjardins added that in the case of personalized medicine, the costs of development turns many firms into single-product enterprises, for which the optimal outcome is in fact an appropriate sale, because Canada cannot provide the necessary capital for such firms to grow into competitors in the open marketplace.

"Perhaps somebody at some future time will apply this label to us – Canadians: hewers of wood, drawers of water, and generators of IP."

— Tom Brzustowski, RBC Professor, University of Ottawa

Young interpreted the question from a cultural perspective, referring to a program called The Next 36 (<http://www.thenext36.ca/>), which takes second and third year students from across the country and puts them into small teams that are matched up with highly placed mentors from large companies. In this way, the students gain an appreciation for the long-term vision of an enterprise, rather than simply creating a company that is destined to be sold. "We're finding they're an interesting bunch, because they have this connection to high-level people, and they have a very different approach to the New York market." She concluded that such an approach is necessary to transforming the previously stated difficulties in the Canadian business culture.

Q&A Session from the Floor

Caroline Cook asked if it would be feasible to consider partnerships between innovation intermediaries who perform different functions. Thomas replied it was definitely feasible, and he has already signed several such agreements in order to shore up innovation throughout a value chain, and the potential for similar agreements in future is considerable. Luke agreed, referring to a Tri-Council program called Idea to Innovation (I2I), which is specifically designed to bring colleges and universities together with industry to promote innovation in the marketplace.

Cook also asked about the role of innovation intermediaries in the process of brokering open innovation. Young indicated that part of her work with Fortune 500 firms has been the challenging task of teasing out their innovation plans and market ambitions, a gathering of intelligence that calls for a significant amount of trust. By getting them to share their ideas, she pushes them toward an open innovation strategy, one that can reveal synergies with Canadian firms that could usefully contribute.

We need to take risks and experiment with novel models in order to change the game.

Thomas described a program called "Six by Six", a group made up of intermediaries from six countries, including Canada, who meet regularly to discuss best practices and common problems in helping innovative firms succeed globally. The group met in Toronto, hosted by his centre, and invited six Canadian intermediary organizations to showcase their best client company for possible introductions in the six participating countries. A similar approach will be taken at subsequent meetings held in the other five countries, with presentations from six counterpart intermediary organizations in each respective country. In this way, these six countries want to identify global market opportunities for their best firms in

an open setting. “Results are yet to come,” Thomas admitted, “but I think we need to take risks and experiment with novel models in order to change the game.”

“You’re going to be hearing the expression ‘innovation intermediaries’ again and again. They cover a great range of activities, from strictly business activities to some that really convey a systems approach to assembling new technologies into practical form – building trust, building commercial relationships, helping people get experience. They’re going to be increasingly important.”

— Tom Brzustowski, RBC Professor, University of Ottawa

Desjardins discussed the significance of open innovation in personalized medicine, which aspires to make the health care system much more efficient. Genetic testing could make this possible by reducing the prescriptions being made for a proportion of the population who will not respond to particular drugs, which may be as high as 40-60%. Likewise, personalized medicine will make it possible to

avoid giving prescriptions to individuals who will suffer from side effects. This is already happening in the US, where insurers have a vested interest in preventing drugs from causing complications to their clientele. However, pharmaceutical firms have no such vested interest in such innovation, as the usage of their products is bound to drop, so they cannot be counted on to support this work; the true beneficiaries will be patients and taxpayers, who have the ultimate vested interest in the solution to what is actually a societal problem. “Organizations such as ourselves are the key integrators to bring the parties to the table to address these societal questions,” she said. “We’re bringing together IT companies, we’re bringing together pharmacists, we’re bringing together our core genetic expertise and our physicians to implement already validated personalized medicine tests and measure the socio-economic benefits in our system.”

Personalized medicine will make it possible to avoid giving prescriptions to individuals who will suffer from side effects. This is already happening in the US, where insurers have a vested interest in preventing drugs from causing complications to their clientele.

Luke endorsed this approach to solving societal problems where the companies directly responsible will not necessarily move forward. Colleges are similarly well placed to bring together the parties that have an interest in developing solutions.

ECONOMIC RENEWAL, INNOVATION AND BUDGETS: A LONGER-TERM PERSPECTIVE

Luncheon Keynote: The Honorable Kevin Lynch, Vice Chair, BMO Financial Group

Lynch began with an engaging anecdote about the use of the term “special factors” as a universal excuse used by people who run firms or any kind of institution, as to why a particular trend or rule does not appear to apply to them. “As Canadians we develop this very sophisticated defence mechanism about why we don’t have to change.” Shortly after he took over as deputy minister of finance, his predecessor had coached him to fall back on “special factors” as the ultimate excuse for why something was done or not done in a particular way. Upon being hauled into Prime Minister’s office to answer for the absence of a desired policy accomplishment in a high profile report, he was prepared to offer just that excuse when suddenly Mr. Chretien said to him “And don’t tell me special factors!”

With this bias in mind, Lynch asked how we could consider what is necessary to overcome the way we have traditionally thought of innovation. More specifically, he asked about how we can think of innovation in the context of annual budgets and fiscal planning. He argued that fiscal planning done well is a challenging, complex affair that balances current stability with future sustainability. He also pointed out that austerity is linked with economic renewal by “and”, not “or”. This debate is much more polarized in Europe, but in the Canadian context there is much more balance. And he underscored that context was the defining characteristic of fiscal planning. The current round of fiscal planning also has to accept that the changes sweeping the world’s economies at the moment are not part of some cycle, but a distinct trend that is moving permanently forward. There will be no return of the Canadian economic position to where it was at some point in the past; instead, we must plan for an entirely new position that is to come.

There will be no return of the Canadian economic position to where it was at some point in the past; instead, we must plan for an entirely new position that is to come.

Lynch outlined five drivers of this change. The first is **pervasive globalization**, a subject that has been discussed so extensively and for so long that we have become numb to its ongoing implications. “We’ve almost overused the word, and we don’t understand how incredible the reality is.” What it means in hard economic terms is that by the end of this decade, Asia will account for half of global GDP; as recently as the 1960s, that proportion was less than 10%. And the speed of this shift continues to overtake our thinking, so that our policy is mired in a now outdated reality. Yet the world’s economic fast-lane will be defined by the rise of these new markets, which we must begin to appreciate.

A second driver is **demographics**, which has become remarkable for the fact that we are aging collectively. Among the most outstanding examples is Japan, which in less than a decade will have fewer people than it has today. “Absent war or disease, we’ve never managed for that,” Lynch suggested. Depopulation in this calm way represents an unprecedented challenge to policy and planning. The challenge will be different in Canada, which will not have a smaller population, but a smaller proportion of the population that is working. Nor is this going to be a uniquely Canadian problem,

“Look out five or six years and the issue is not going to be surplus labour. It’s going to be surplus jobs. And the constraint on growth is going to be finding talent, not finding jobs for talent.”

— Kevin Lynch, Vice Chair, BMO Financial Group

but one that will heighten the hunt for talent globally, making the world's economic winners those places that can attract and retain talent.

Thirdly, the **information revolution** proceeded from a technical initiative to one with profound economic, social, and political implications, as highlighted by the role of electronic media in the Arab spring uprisings. Canada took an early leadership role with the technology in the 1990s, but the pace of change has continued to accelerate. This has profoundly altered the traditional definition of information exchange, and the roles of the people responsible for those exchanges.

Lynch dubbed the fourth driver as **“the ultimate hang-over”**, one that never seems to end no matter how many aspirin you take. A typical example is the endless hand-wringing over the Greek debt crisis, which has become emblematic of the macro-economic factors that are shaping the future of whole regions.

Finally, he cited a **new global competitiveness** as a fifth driver. This feature has two distinct characters, one based on low-cost, large-scale output, and the other based on high creativity and innovation that yields a significant premium. This driver also has less to do with geography than it does with the local capacity to remain competitive. According to Tom Friedman of the New York Times and Michael Porter of the Harvard Business School, this new competitiveness is decidedly global in its orientation, focusing on productivity and innovation, and relying heavily on talent, creativity, and entrepreneurship. Lynch argued that this perspective will be crucial to a key tenet of these observers, who insist that competitive American firms will be able to sell their products around the world while paying their employees rising wages. Increasing productivity thus becomes the only way of preserving middle-class expectations in high income economies, and the only way of increasing productivity is through innovation.

For Tom Friedman, the mantra of industrial success in a hyper-connected world runs as follows: imagined here, designed there, manufactured elsewhere, sold everywhere. This powerful encapsulation of the change is profoundly disturbing for any leadership still rooted in a geographically defined world, but that discomfort does not make the new reality any less true. Hence Lynch returned to the European debt fiasco as a telling example: “Your problem is now my problem.”

For Tom Friedman, the mantra of industrial success in a hyper-connected world runs as follows: imagined here, designed there, manufactured elsewhere, sold everywhere.

Where does this leave Canada? Lynch suggested that too much of our investment lies in the developed world that is limited to 2% annual growth, while too little of our investment is with the emerging global economy that is enjoying 6-8% growth. While it will be possible for a trade in natural resources to enable us to make inroads into this dynamic economy, he argued that the foundation of that economy is the emergence of hundreds of millions of new middle class consumers. In this context, he reminded the audience that Canadian firms have positioned themselves well to serve the needs of this country's middle class, honing an expertise that they could bring to the people in these emerging markets, who will be seeking better food, better housing, financial services, and education for their children. The challenge, therefore, will to make these goods and services attractive to these consumers, within the context of their respective cultures; meeting that challenge will call for innovation.

Lynch admitted that such attractive opportunities can be eclipsed by our economic shortcomings. Many of these difficulties are well known: business productivity is mired at about 72% of American levels, though now without the cushion of a weaker dollar; business R&D investment, at about 1.0% of GDP, is well

below the OECD average of 1.6%; Canadian firms spend only about 48% as much on ICT as their US counterparts, and only 75% on advanced machinery and equipment. For him, one of the most unsettling signs came in a recent GE Global Innovation survey, where 91% of Canadian business leaders expressed the opinion that Canada was doing well in terms of innovation, while outside of the country only 4% of business leaders thought Canada was doing well.

Lynch then outlined a framework for assessing everything from federal budgets and policies to corporate strategies and university vision statements. Leadership is necessary to convey a sense that innovation matters, and decisions must be taken with innovation in mind. If no such leadership emerges, people will revert to familiar, well worn ways of keeping their own bosses and customers happy, which may prove to be futile in the long term. We saw this kind of significant mind-set appear with respect to the issue of fiscal balance, so there is hope that innovation could become similarly accepted.

Leadership is necessary to convey a sense that innovation matters, and decisions must be taken with innovation in mind. If no such leadership emerges, people will revert to familiar, well worn ways of keeping their own bosses and customers happy, which may prove to be futile in the long term.

He recommended several other steps, including a shift from indirect to direct support for R&D, retooling the financial basis of innovation, strengthening the foundation of outstanding university research, expanding the boundaries of public-private partnerships, increasing market competition and regulatory flexibility, raising educational norms, and diversifying the markets for our international trade.

Applying this framework to Budget 2012, Lynch concluded that the government is beginning to take innovation more seriously. He highlighted the scaling back of SR&ED as evidence of this outlook, but also pointed to changes in venture capital availability, an emphasis on public-private partnerships, and measures to open up the Canadian market to foreign competition, which could inspire more innovative behaviour among established Canadian firms. Despite this evidence of moving in the right direction, Lynch warned that speed is of the essence under these circumstances, and the real question remains whether Canada can move fast enough to succeed.

Innovation does not happen in the abstract, he said; it does not happen by accident but is actually carried out by people during the course of their work. The real priority must therefore be identifying and nurturing these people, which he dubbed a “community innovation infrastructure”, made up of colleagues and relationship that enable new ideas to thrive.

“I worry about how in the world we maintain above-average lifestyles and living standards with below-average productivity and innovation. You can't, long term. Without productivity innovation, we're not going to have the standard of living in the long term even as high as today, let alone growing for our aspirations.”

— Kevin Lynch, Vice Chair, BMO Financial Group

He cast this infrastructure as part of a viable “innovation ecosystem”, which is complemented by an “organizational innovation infrastructure”, consisting of the necessary incentives for companies to remain innovative. This ecosystem also requires a “macro innovation environment” and a “micro innovation environment”, the former established by governments at the highest level, and the latter shaped in colleges and universities.

He criticized a tendency to regard governments simply as another source of revenue, since their key virtue is a unique ability to convene, to bring together all the participating branches of the economy. All of those

branches will have to contribute in order for Canada to become more economically robust and compete internationally, and that message must be repeated loudly and often, just as it was done on the fiscal front in the 1990s.

Most people don't change because they see the light; most people change because they feel the heat.

Lynch insisted that strong competitive pressure is essential to spur innovation, quoting a commentator on the subject: "Most people don't change because they see the light; most people change because they feel the heat." That being said, regulations and policies still matter, so that people are not simply being pressured to compete, but receive positive incentives to do so.

Returning to the important role of people in innovation, he emphasized the need to educate with excellence in mind, as well as attracting the best and brightest from around the world. He also passed along a comment from a foreign observer, who indicated that Canadians were very good at cooperating, but not as good at collaborating. "Collaboration is a different level of engagement than cooperating. In formal collaborations, you're sharing risk, you're sharing gains, you're sharing outcomes." Lynch concurred with that perspective.

Collaboration is a different level of engagement than cooperating. In formal collaborations, you're sharing risk, you're sharing gains, you're sharing outcomes.

He concluded that Canada is home to two solitudes, namely a desire to separate our best problem solvers from our best problem identifiers. Business people, who spend their lives trying to understand the problems of consumers and what they want, operate in an entirely different sphere from academics, who hold the expertise in solving different kinds of problems. Where the interaction between these groups has been promoted, in places like Chicago, Boston, or California, there are higher levels of overall problem solving with practical impact.

"Our average performance is substantially less than our best performance. And that's hurting us. In the United States what you'll see is less of a divergence between best performance and average performance, and that's just a shame on us. If we can do the best, there's no reason we shouldn't be able to raise the average. There's no reason Canada should be a laggard in the innovation and productivity space."

— Kevin Lynch, Vice Chair, BMO Financial Group

Our greatest flaw, he said, may be to label our accomplishments in innovation as exceptional, rather than simply what we should expect. Regarded as exceptional, then, it does not put any pressure on the rest of us to match that performance. In this way, the appeal of "special factors" holds us back.

Q&A Session

Ron Freedman asked Lynch about the public sector perception that the only paradigm to justify the support of innovation in Canada is a market failure paradigm, which represents a dated view that is at odds with the perception of innovation as offering a strategic advantage. Lynch responded that the answer does not lie with any particular government's outlook, but also with the way the private sector perceives the problem. He recalls how representatives of that sector have traditionally blamed government for

holding them back from this kind of innovation. The reality is that successive governments have created a fiscally positive environment for business over the last 15 years, and so that excuse no longer holds. He characterized the situation as being more complicated than a single paradigm would represent, since moving forward will require government, business, and academia to align their priorities to maximize innovation.

Celine Bak asked about the usefulness of value-added exports as a narrative to get us beyond dwelling on inputs and on to a discussion of results, i.e. improved current accounts and the ability to pay higher wages. By way of example, Lynch referred to energy, and the case of exporting oil to Asia. This move would call for far more than just shipping a raw material, but would prompt developments in supply services, support technology, and related industries.

PANEL 4: PRIORITIES FOR ACTION

Adam Chowaniec, Chair, Belair Networks
Kevin Lynch, Vice Chair, BMO Financial

Moderator: Paul Dufour, President, Paulicy Works

***Precis:** This panel provided an opportunity for participants to engage in a discussion of priorities for future action by government and other players in Canada's innovation ecosystem. Keynote speakers Adam Chowaniec and Kevin Lynch commented on ideas proposed and issues raised by the foregoing presenters, as well as comments from the audience. Chowaniec, as a serial entrepreneur, CEO, angel investor and Director of Canadian technology companies, tackled the realities faced by entrepreneurs, innovative companies and investors. Lynch, as former Clerk of the Privy Council and Deputy Minister of both Industry and Finance, and currently Senior VP at one of Canada's major banks and formerly Executive Director of the IMF, considered the realities faced by government and Canada's financial establishment.*

Dufour summarized much of the discussion that had taken place over the two days, and asked audience members to consider points that they would like to bring forward as specific steps to help define the Canadian innovation ecosystem and help it evolve to become more globally competitive.

Chowaniec set the stage with three points. The first was not to build policy on the basis of a single, mythical "industry", but instead consider the distinct needs of specific sectors. Secondly, while Canada has a strong entrepreneurial culture that generates more than enough new firms, very few of those firms achieve any significant size or impact because risk capital remains in short supply, a problem compounded by a Canadian tendency to avoid risk. Thirdly, although he had no concrete solution to dealing with the cultural dilemma of risk aversion, he insisted that it must be discussed more openly, otherwise it will never be solved.

While Canada has a strong entrepreneurial culture that generates more than enough new firms, very few of those firms achieve any significant size or impact because risk capital remains in short supply.

Lynch offered a similar list, pointing to Chowaniec as an example of an entrepreneur who has met with success and now wants to help improve the system that provided him with that success. In that light, Lynch noted how much he has been impressed by the role of communities in ushering in such improvement. Moreover, communities overcome many of the shortcomings listed by Chowaniec, being sector-specific and region-specific, overcoming the tendency to high-level solutions that are often too sweeping and abstract to be effective at the local level. Nevertheless, he returned to the virtue of competition, which inspires more positive activity and innovation than any dedicated program can do. "A Canadian company that sells goods and services in global markets changes its behaviour here in Canada," he said. Similarly, appropriate identification and promotion of talent can go a long way to resolving other difficulties. "If we get talent right, and incent it, it's hard to think that long-term we can lose," he said. "But if we don't get talent right — if we don't attract the best and retain the best and help them train — then I worry."

David Watters responded to these points, starting with how they are linked by the cultivation of a completely global perspective on business. He then weighed the role of government in this shift, and the need for help in entering international markets that many enterprises will require, and concluded there is much more that governments could do.

Nobina Robinson recalled a recent conference hosted by Polytechnics Canada, where an American observer cited the “four T’s” of innovation — taxes, trade, technology, and talent. With respect to talent, she worried about how often the term “best and brightest” is bandied about. “It almost always leads to that elitist understanding of human capital, which is that we need PhDs. But we actually need the best designer, we need the best marketing strategist, we need the best apprentice tradesperson.” She then asked the commentators to speak to that assertion.

Lynch responded with the observation that Canada is becoming demographically challenged at the same time that other parts of the world are demographically advantaged. Unfortunately, we have yet to build a distinct brand that appeals to the rest of the world. Surveys show that our most globally acknowledged quality is that we are nice, which is admirable but far from sufficient for this purpose. “I don’t think you decide to come to the University of Toronto because the people in Toronto are nice,” he said. “You want to come because it’s got incredible research capacity and professors.” He insisted that the potential to build a strong brand is there, but we are failing to do so. And he added that brands are built by a partnership between the private sector, the university sector, and government, as has been done in Australia.

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Chowaniec added that high growth businesses depend on multi-functional talent for their success. “You’ve got to have technology people who understand business, you’ve got to have finance people who understand technology, you’ve got to have marketing people who understand technology,” he said. “The skill sets need to be mixed up.” Colleges do a better job of producing such people, he noted, since universities continue to consist of silos where an individual can become highly specialized.

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Doug Barber returned the exchange to the topic he regards as crucial — customers. He observed that the discussion touched on the concept of a market quite often, but talk of customers represents something much more intimate, since customers are individuals, who must be treated as such. He quoted Peter Drucker, who indicated that he had never seen a market place a purchase order, let alone pay for a delivery. “You really have to deal with customer by customer,” said Barber, who concluded that Canadians tend to be customer averse. “We can’t get this government-private sector learning environment collaboration if we don’t respect each other and listen to each other. And the business of business is listening to the customer and understanding what their needs are.”

Harkening back to Robinson's observation, Barber also touched on the term "best and brightest", insisting that these qualities are usually defined in academic terms, which may be not at all suited to success in business. "Academic performance, didactic bookish learning, does not make you wise," he said. "And when you get into the world of commerce, you've got to develop wisdom."

Lynch responded by agreeing with Barber's assertion about listening to a customer's problems, which should lead to practical solutions to matters such as refining a supply chain, which we do not necessarily do well. Chowanec expanded on this notion by returning to the Canadian obsession with R&D and science, which are merely a part of innovation, and not sufficient to achieve innovative results. "That is not where our focus should be," he said. "You've got to understand markets, you've got to understand people, you've got to understand problems. It's got nothing to do with technology. You can buy technology if you need it. But you've got to understand the underlying problem."

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Rory Francis, Executive Director of the Prince Edward Island BioAlliance, brought in the various facets of the concept of timeliness — time to market, timely responses to customers, speed in productivity, pace of government programming, and the braking effect of regulation. He suggested that we should augment our global perception of niceness by adding "fast". Lynch extended this line of thought by suggesting that we confuse direction with speed. There is little comparative advantage in analysing circumstances and opportunities, which anyone in the world can do; the real advantage comes from implementation. In this sense, he reflected further on what innovation really means; it represents disruption. "You're going to fundamentally upset the way you did a product or a process or a market. Systems don't like disruption, and management systems are set up to avoid disruption." That being said, he cited American studies that reveal the most successful firms in that country include organized structures that are specifically set up to encourage innovation within the company. "It's one thing to do one-off innovation," said Lynch. "It's a harder thing to change that product every 18 months for the next 15 years; you've got to organize for that."

Innovation represents disruption. You're going to fundamentally upset the way you did a product or a process or a market. Systems don't like disruption, and management systems are set up to avoid disruption.

Chowanec agreed entirely, crediting the Internet with making information practically a universal commodity, which completely changes the paradigm of business competition.

Dan Duguay, Vice-president of the Communications Research Centre, asked how a country that is serious about innovation can not have the equivalent of a Chief Technology Officer, who may be in a position to overcome some of the siloing that takes place within various science departments. Secondly, further to Chowanec's call to consider industry in sectoral rather than monolithic terms, he asked how long Canada can survive without dedicated industrial policies. Thirdly, he asked if government could be persuaded to undertake risks in order to progress. And finally, he suggested that the Canadian passion for hockey

reveals that Canadians can muster enthusiasm and drive, which might somehow be channeled into business.

Lynch began by dealing with the idea of silos, which he suggested are far more widespread than might be obvious. "If you don't actually experience different things, your chances of connecting the unconnected dots is much lower." The results are manifold: we cannot see the potential for applications of government science in other areas; we are not combining people in the most effective ways. Occasional these problems have been overcome, as in the outstanding case of the Information Highway Advisory Council, which did manage cross many different boundaries within government. "There wasn't a policy on the Information Highway, there was a commitment and an excitement to it."

Referring to Duguay's sports analogy, Lynch recalled the Own the Podium drive, which led to a media backlash that suggested maybe it was putting too much pressure on these young people to perform. Lynch recalls hearing one of the country's Olympic medalists speak about being at the centre of this attention. She rejected the notion of too much pressure, stating "Do you think I've gone off to university and spent my entire life for five years to come third? I'm doing it to win, and winning is good." Lynch said the same concept applies to the new world of business; you can't play defence. "It's opening up enormous opportunities if we play to win," he said, "and it's opening up enormous challenges if we play defence."

Caroline Cook asked the speakers to choose from the different types of innovation to select which one an organization should focus on for best effect. Chowanec responded tentatively, but suggested that the first order of business should be to help our growth companies get bigger. Without these large enterprises, the ecosystem will not be sufficient to sustain and nurture the next generation of entrepreneurs. Lynch responded that none of the elements for an innovation system are missing in Canada, but we lack the leadership to pull them together. "Canada's biggest challenge now is complacency," he said. "We're extraordinarily rich. Our standard of living is passing the United States this year in terms of per capita income. Who would have ever thought? But the danger is that the status quo is not going to take us to the next level. And the hardest thing, whether you're in the public sector or the private sector or universities, is to disrupt the status quo absent a crisis. And what we're really saying is that we should be changing because of a real and present opportunity, not a real and present crisis. That's tough, but on the other hand, the payoff is extraordinary."

Canada's biggest challenge now is complacency. We're extraordinarily rich. Our standard of living is passing the United States this year in terms of per capita income. Who would have ever thought? But the danger is that the status quo is not going to take us to the next level. And the hardest thing, whether you're in the public sector or the private sector or universities, is to disrupt the status quo absent a crisis. And what we're really saying is that we should be changing because of a real and present opportunity, not a real and present crisis. That's tough, but on the other hand, the payoff is extraordinary.

Jerome Le Corvec, CEO of Aonix Advanced Materials Corporation, addressed the question of the gap in programming that would enhance sales, prompting him to ask the speakers how this shortcoming can be corrected. Chowanec replied that the support for any such initiative must come from the private sector, so any program that is established must help members of this sector begin to take on risk. For him, this is not something that happens quickly, but must be established on a decade-long time frame. Lynch concurred, adding that this is a private sector economy and it will not work if it does not appeal to members of that

sector. “The question is how do you make the private sector — either because of impediments, or gaps, or lack of information or lack of competition, actually enter the space?” he asked. “I would worry if we ever thought that government, in a market driven economy, is actually going to be the source of financing.”

When asked about how government could mitigate the risks associated with innovation, Lynch responded that there has been a notable lack of demand for such services from government, which reflects not only the risk aversion of our entrepreneurial culture, but also the complete lack of expertise that our institutions have developed to manage any kind of risk.

Robinson brought up the German concept of the *mittelstand*, that country’s family-owned companies which are passed from generation to generation, and which remain innovative enough to outperform competitors from around the world. This is done without government

programming, raising the question of how success occurs. Lynch suggested that Canada should seek partnerships with Japan and Germany, two countries that are extraordinarily good at innovation. They do not necessarily excel at basic research, but rather at the ability to turn that research into products. The prospect of getting closer to this skill set is for Lynch a key incentive to establish closer ties with the EU. He argues that a key to Germany’s performance is a higher proportion of engineers who occupy senior management roles, who have lived with disruptive change throughout their careers and are therefore prepared to handle it when they are in charge.

Lynch cited the Canadian economist Michael Spence, who at Davos touted the virtue of retaining a manufacturing base within in the economy in order to retain an intangible appreciation of how innovation happens on the shop floor. In the UK, by contrast, most manufacturing has been shed in favour of an almost exclusively service-oriented economy, yielding a poor innovative capacity. Germany, on the other hand, has retained its manufacturing and its ability to innovate.

Chowaniec proposed Magna and Bombardier as Canada’s two most German-like firms, which have survived because of dual-share class structures, so that only a closely held set of people control them.

Crelinsten commented on the disconnect within the academic system, whereby successful, knowledgeable entrepreneurs who would like to contribute to the education of the next generation of entrepreneurs by teaching in universities, are denied this opportunity because they do not have PhDs. Just as it would run counter to the people in university administration to allow these individuals to participate in teaching, he then asked whether it would be possible for members of the federal civil service to take similar risks by allowing for deserving exceptions in their own programs designed to promote innovation.

Lynch observed that the people working in the federal government were eminently rational individuals who respond in a reasonable way to the choices that are available to them through official program



Panel Four (from left): Paul Dufour, Adam Chowaniec, Jeffrey Crelinsten, and Kevin Lynch

guidelines. Given that we are risk averse, he said, it is no surprise that this tendency is reflected in the guidelines and the resulting choices. But Lynch remained optimistic that if the choices could be consciously altered by government policy, then these people would become more daring in their choices. “I think we want entrepreneurial public servants, who are willing to think about different ways of doing things,” he said. “But it’s going to need a broader ecosystem of the press, the public, governments, Parliamentarians, and public servants themselves thinking about that.”

Ron Freedman wrapped up the proceedings recalling the origins of the RESEARCH Money conference series some 11 years ago, which the organizers only agreed to do if they could put together an event that would go beyond the usual exchanges on these topics. He regarded this year’s conference as yet another demonstration of the fact that they have been able to do just that. He thanked not only those organizers, but also the participants and especially their partners and sponsors.

APPENDIX A: SPEAKERS, PANELISTS AND MODERATORS**Céline Bak**

Céline Bak is an internationally recognized author, speaker and consultant on clean technology and on innovation and commercialization. She published and authored a ground-breaking national report on clean technology and on commercialization – the 2010 SDTC Cleantech Growth & Go-to-Market Report. Also published by her firm, the 2011 Canadian Clean Technology Industry Report builds on the 2010 baseline data set for Canada's multibillion dollar clean technology industry that Analytica Advisors projects has the potential to attain \$60 billion in annual revenues by 2020. Her firm Analytica Advisors provides research and information services for profitable and sustainable growth to corporations and start-ups. Her firm also advises public sector clients on trade, innovation and economic development.

Ms. Bak has had an international career, first as a Principal of A.T. Kearney, a global management consulting firm where she served multinational clients such as Rolls Royce Aerospace, Liquid Carbonic (acquired by Air Liquid), Prudential Insurance and GM. She later held executive roles in two high growth Canadian technology companies. She led operations in Europe, the Middle East and Africa at the Solect Technology Group (acquired by Amdocs: DOX) and held Product Management and Office of the CEO roles at Bridgewater Systems (acquired by Amdocs: DOX).

Her current leadership roles include Global Practice Leader at the Department of Foreign Affairs and International Trade Clean Technology Practice. Ms. Bak is also the co-founder of the Canadian Clean Technology Coalition that was struck to create the conditions required to make Canada's clean technology industry a driver of Canada's economic and energy productivity as well as an enabler for Canada's green house gas reduction targets. She was the co-chair of the 2011 Canadian Cleantech Summit and sits on the nominations committee for the Canada Clean50. She is the co-chair of the Canada-Brazil Science Technology and Innovation Working Group for Cleantech/Green Energy and Green Mining.

She resides in Ottawa with her husband and three daughters.

Dr. Tom Brzustowski

Tom Brzustowski is RBC Professor in the Commercialization of Innovation at the Telfer School of Management at the University of Ottawa and Chair of the Board of the Institute for Quantum Computing at the University of Waterloo. He is also Chair of the Scientific Advisory Committee of the Council of Canadian Academies (CCA) and Chair of the Management Advisory Board of the Centre for Commercialization of Research (CCR) of the Ontario Centres of Excellence (OCE).

Dr. Brzustowski was President of the Natural Sciences and Engineering Research Council of Canada (NSERC) from 1995 to 2005. His work on innovation and productivity has been published several times, including in the internet journal "Optimum Online" and in the book "The Way Ahead – meeting Canada's productivity challenge" (U of Ottawa Press, 2008)

A professional engineer (P.Eng.) in Ontario, Dr. Brzustowski graduated with a B.A.Sc. in Engineering Physics from the University of Toronto in 1958, and a Ph.D. in Aeronautical Engineering from Princeton University in 1963. He taught Mechanical Engineering at Waterloo from 1962 to 1987, and also served as

Vice-President, Academic of the university (1975 – 1987). Later he served as Deputy Minister in the Government of Ontario (1987 – 1995).

Dr. Brzustowski has received honorary doctorates from numerous Canadian universities, as well as the Engineering Alumni Medal from the University of Toronto and the Gold Medal of the Professional Engineers of Ontario. He is an Officer of the Order of Canada, and Fellow of the Engineering Institute of Canada, of the Canadian Academy of Engineering, and of the Royal Society of Canada.

Dr. Adam Chowaniec



Dr. Adam Chowaniec is a serial entrepreneur and corporate director who has frequently been recognized for his leadership, business excellence and innovation. He is involved in a number of local business and community initiatives and his commitment and participation have positioned him as a key spokesperson for the high tech community. In 2010 he was recognised by the California Computer Museum as one of the founding fathers of the personal computer.

In addition to being the director of Solantro Semiconductor, Dr. Chowaniec is member of several boards of directors, including Startup Canada, the Public Sector Advisory Board of the Natural Sciences and Engineering Council of Canada, and the Export Development Corporation of Canada by the Privy Council of Canada, where he currently serves as the Chair of the Risk Committee. He is chair of the board of BelAir Networks Corporation, and vice-chair of the Ottawa Health Research Institute as well as of the Museum of Nature's national fund raising campaign.

Dr. Chowaniec has served on numerous other boards of directors in the United States and Canada, including the National Research Council's Industrial Research Assistance Program, Amiga and GEAC Computer Corporations, Futurecom, and OSI Technologies. He has served as chair of the boards of the Information Technology Association of Canada, Zarlink Corporation, Liquid Computing, Sibercore and Microbridge Corporations. He chaired the Ottawa Economic Development Corporation (and was a member of the Ottawa Partnership) from 1999 to 2001, and the Ontario Research and Innovation Council from 2006 to 2009.

Dr. Chowaniec began his career in 1975 as an assistant professor at Acadia University, and has since worked for Bell Northern Research, Nortel Networks, and Commodore International, where he was responsible for the development of the Amiga personal computer. He has served as president of the semiconductor firm Calmos Systems (renamed Newbridge Microsystems in 1989) and as a vice-president of Newbridge Networks. In December 1995, he was the founding CEO of Tundra Semiconductor Corporation.

In 1998, the Ottawa-Carleton Research Institute honoured Dr. Chowaniec with its prestigious Chairman's Award. In 1999 he received the Gold Business Person of the Year Award from the Greater Chamber of Commerce. He holds a Master's degree in Electrical Engineering from Queen's University (Canada), as well as both a Bachelor of Engineering and a Ph.D. from the University of Sheffield (England). His affiliations include the Institute of Electrical and Electronic Engineers and the Association of Professional Engineers of Ontario.

Clarissa Desjardins



Clarissa Desjardins, Ph.D., is the CEO of CEPMED, the Centre of Excellence in Personalized Medicine. CEPMED is a Centre of Excellence for Commercialization and Research (CECR) funded by the federal government and private companies to promote personalized medicine through education, policy and public-private research partnerships.

Prior to this, Dr. Desjardins was a serial entrepreneur, taking part in all aspects of company creation from conception, to financing, to the marketplace. She founded Advanced Bioconcept, a research reagent and diagnostics company sold to NEN Life Sciences (Perkin Elmer) in 1998. She went on to co-found Caprion Pharmaceuticals Inc. (now Thallion, a TSX-listed company), a biotechnology company focused on proteomic biomarker discovery and drug development, where she was Executive Vice-President of Corporate Development. She has been a Board Member on numerous private and public companies including most recently the Populomix Cancer Research Institute.

Dr. Desjardins received the BRIO award for outstanding contributions to the biotechnology industry from the Quebec Biotechnology Association. She was also nominated for the Ernst & Young's Entrepreneur of the Year award and was named one of Canada's top young Canadians likely to influence the future by the Globe and Mail. She earned a Ph.D. in Neurology and Neurosurgery from McGill's Faculty of Medicine, and was a Medical Research Council postdoctoral fellow at the Douglas Hospital Research Centre.

Paul Dufour



Paul Dufour is Fellow of the Institute for Science, Society and Policy at the University of Ottawa and Principal of PaulicityWorks, a science policy consulting firm in Quebec.

Mr Dufour has been senior adviser and programme officer in science policy with several Canadian agencies and organizations over the course of the past 30 years. Among these: senior program specialist with the International Development Research Centre, and interim Executive Director at the former Office of the National Science Advisor to the Canadian Government, counselling on international S&T matters and broad questions of R&D policy directions for the country.

Born in Montreal, Mr. Dufour was educated at McGill, the Université de Montreal and Concordia University in the history of science and science policy. His practical S&T policy experience spans over three decades, and he has worked with numerous bodies including the Science Council of Canada, Ministry of State for Science and Technology, Foreign Affairs, and special adviser to the Prime Minister's Advisory Council on S&T.

Paul lectures regularly on science policy, and has authored numerous articles on international S&T relations and Canadian innovation policy. He is series co-editor of the Cartermill Guides to World Science and is the author of the Canada chapter for the UNESCO 2010 Science Report released in November 2010.

Dr. Peter Frise

Dr. Peter Frise holds degrees in mechanical engineering from Queen's University in Kingston and Carleton University in Ottawa. He began his industrial career as an oil well wireline data logging engineer working for Schlumberger Wireline Services in Nigeria. He then moved to Husky Injection Molding Systems in Bolton, Ontario as an R&D engineer and later as a design group leader.

In 1985 he joined Carleton University where, starting in 1988, he taught mechanical design. From there he moved to Windsor where he held the Chrysler Canada/NSERC/University of Windsor Senior Industrial Research Chair in Mechanical Design and was instrumental in founding Canada's first university program in Automotive Engineering in 1998.

Dr. Frise works with a number of automotive companies in his present capacity as the Scientific Director and CEO of the AUTO21 Network of Centres of Excellence, Canada's national automotive R&D program. AUTO21 brings together nearly 200 researchers and 440 graduate students from 46 institutions in partnership with 110 industry and public sector companies and organizations to engage in applied automotive R&D. Through 2012, AUTO21 and its partners will have completed more than \$112M worth of automotive research.

Dr. Frise is a member of Defence Research and Development Canada and has been appointed to a second term on the National Research Council of Canada and the Defence Science Advisory Board of Canada. He serves on the boards of the Yves Landry Foundation, the Ontario BioAuto Council and SAE Foundation Canada. Dr. Frise is active on several sub-committees of the Canadian Automotive Partnership Council (CAPC).

Jean-Claude Gavrel

Jean-Claude recently retired as associate vice-president of the Natural Sciences and Engineering Research Council of Canada and Director of the Networks of Centres of Excellence (NCE) Secretariat. Under his leadership, the NCE expanded and launched several successful programs promoting Canadian R&D and innovation, including the Centres of Excellence for Commercialization and Research, the Business-Led Networks of Centres of Excellence and the Industrial Research and Development Internships.

Having held several senior executive positions in the private high-tech and public research sectors, Jean-Claude has a broad yet intimate knowledge of the issues surrounding R&D partnerships. As vice-president of Precarn Incorporated—an industrial research consortium in robotics and artificial intelligence—he helped launch and manage the Institute for Robotics and Intelligent Systems, a successful Network of Centres of Excellence. He also served as vice-president at the Computer Research Institute of Montreal, as an advisor to Innovatech Montreal—a technology venture capital fund, and as president of IVS Canada—an Ottawa-based high-tech firm specializing in virtual reality.

Jean-Claude holds a degree in computer science from the University of Ottawa.

The Networks of Centres of Excellence is jointly managed by Industry Canada and the three federal granting agencies.

Gary Goodyear



The Honourable Gary Goodyear was first elected to the House of Commons in 2004 and was re-elected in 2006 and 2008. On October 30, 2008, he was appointed Minister of State for Science and Technology, and on August 13, 2009, he was named Minister of State responsible for the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) by Prime Minister Stephen Harper. Prior to entering federal politics, he practised chiropractic medicine and worked as an advisor to investment firms in the biomedical industry.

A former Public Relations Director and Past President of the College of Chiropractic Sports Sciences in Toronto, Dr. Goodyear taught at the Canadian Memorial Chiropractic College and the University of Waterloo. He was co-designer of a three-year post-graduate sports fellowship program and co-author of "Practice Guidelines." He has worked with many athletes, both amateur and professional, and served as medical services chair of the Ontario Special Olympics.

Dr. Goodyear attended the University of Waterloo, specializing in kinesiology and psychology, before graduating from Canadian Memorial Chiropractic College. He worked his way through university as a meat packer and labourer.

A native of Cambridge, Ontario he is married to Valerie and they have two children. He enjoys scuba diving, writing and rebuilding motorcycles.

Karna Gupta



Karna Gupta is one of Canada's most respected and well-seasoned executives in information and communications technology. With more than 30 years of outstanding industry experience, his expertise and accomplishments span across North American and international business domains.

On August 10, 2011, Karna Gupta was named President and CEO of ITAC, the Information Technology Association of Canada. In addition to his experience and exceptional track record, he brings a passionate commitment to building strong ICT ventures to this new role. He currently serves on several corporate boards and actively mentors young companies and entrepreneurs. He also serves on the board of the Regional Incubation Centre – Venture Lab in York Region.

In 2008, Mr. Gupta was named CEO and a member of the Board of Directors of Certicom Corp (TSX: CIC). He led the organization through a successful turn-around, including defending against a hostile bid, and eventually a successful sale to RIM with over 96% shareholder approval. Prior to his appointment at Certicom, Mr. Gupta held the role of President for the Real-Time Billing Division of Converse Technologies from 2006 to 2008 (NASDAQ: CMVT). He significantly improved the overall performance of the division with a globally-distributed workforce (1500) in 50 countries and serving a world-wide customer base. His previous role in Converse was Chief Marketing Officer for Converse Americas.

Mr. Gupta past appointments include the President of Sitraka Mobility. Under his leadership, the company grew from a start-up venture to a strong industry contender in mobile application development. He led the organization through a successful merger with Everypath Inc of California. He also served as Chief Marketing Officer and Senior Vice President of Eftia OSS Solutions, a company focused in delivering OSS solutions to the carriers. Earlier in his career, Mr. Gupta held several executive positions with Bell Canada (TSX: BCE), including Vice President, Product Development and Management. He

holds a Master of Business Administration degree in Marketing and Finance from Concordia University in Montreal, Quebec. He has also attended executive development programs at Duke University, Harvard, MIT, University of Western Ontario and Technion Institute in Israel.

Lynda Leonard



Lynda Leonard has over twenty years of experience in organizational communications and public policy advocacy in the information technology sector.

She began her career in telecommunications working for the TransCanada Telephone System, Bell Canada and Stentor. At Stentor, she was accountable for marketing communications for the company's international operations and subsequently was responsible for executive public relations support.

In 1996, she and a partner established an independent public relations practice specializing in providing a full range of communications programs to companies in the IT sector. The company was subsequently acquired by GPC Communications.

In 1998, Lynda joined the team at ITAC as Vice-President of Communications and was named Senior Vice-President in 2004.

Lynda's accomplishments in communications have been recognized by the International Association of Business Communicators (Gold Quill). Throughout her career, Lynda has been an advocate for the broader engagement of women in the technology sector. She helped to establish the first Ottawa chapter of the Wired Woman Society, and she is a member of the Board of Directors of Canadian Women in Communications. In 2010, she was honoured with a World of Difference 100 Award from the International Alliance for Women.

Robert Luke



Robert Luke is Assistant Vice President of Research and Innovation for George Brown College where he works with industry and community partners to address business and social innovation. Dr. Luke is also responsible for institutional research including corporate planning and strategy, and educational quality measurement and improvement.

Dr. Luke maintains an active research program in participatory innovation design and the application of innovative technologies in healthcare and education. His current research investigates the role of students in applied research and graduates with innovation literacy fostering innovation and productivity in firms. He is chair of the Polytechnics Canada Research Group, a Board Director of the Colleges Ontario Network for Industry Innovation, a member of the Toronto Community Foundation Toronto Vital Signs Advisory Group, a member of the George Brown College Board of Governors, a member of the Programs and Quality Committee of the Social Sciences and Humanities Research Council of Canada, and member, Council of Canadian Academies' Expert Panel on the State of Science and Technology in Canada.

Dr. Kevin G. Lynch

The Honourable Kevin G. Lynch; P.C., LL.D, PH.D earned his BA from Mount Allison University, his Masters in Economics from the University of Manchester and a doctorate in Economics from McMaster University. Dr. Lynch also holds honorary degrees from seven distinguished Canadian universities.

Dr. Lynch began his career in 1976 as an economist with the Bank of Canada. Through a storied career, Dr. Lynch served as Deputy Minister of Industry from 1995 to 2000 and then Deputy Minister of Finance from 2000 to 2004. He then served as Executive Director of the International Monetary Fund until early 2006, when he was appointed the 20th Clerk of the Privy Council, Secretary to the Cabinet and Head of the Public Service of Canada. In July 2009, after a long and distinguished career, Dr. Lynch retired from the Government of Canada.

In early 2010, Dr. Lynch was appointed Vice Chair of the BMO Financial Group. He currently serves on several boards, including those of the Gairdner Foundation, the Perimeter Institute, the University of Waterloo, U.K. Ditchley, Chair of the Canadian Ditchley Foundation, the Learning Partnership, the Shannon School of Business, and the Accounting Standards Oversight Council.

The Honourable Kevin G. Lynch was made a Member of the Queen's Privy Council for Canada in 2009, was awarded the Distinguished Alumni Award from McMaster University and was recipient of the Queen's Golden Jubilee Medal.

Dr. Peter Nicholson

Dr. Nicholson was the inaugural Chief Executive Officer of the Council of Canadian Academies, serving from 2006 through 2009. The Council supports studies by independent panels of experts on science that is relevant to important public issues.

From 2003 to 2006, Dr. Nicholson was the Deputy Chief of Staff for Policy in the Office of the Prime Minister of Canada. In 2002-03 he was Special Advisor to the Secretary-general of the OECD. From 1995 to 2002, he was Chief Strategy Officer of BCE Inc. in Montreal. His career has also included senior executive positions in banking and the fisheries industry, as well as in the federal public service where, in 1994-95, Dr. Nicholson was Clifford Clark Visiting Economist in Finance Canada. He holds a BSc and MSc in physics from Dalhousie University and a PhD in operations research from Stanford University. He began his professional career in the faculty of computer science at the University of Minnesota. Dr. Nicholson is a Member of the Order of Canada.

Senia Rapisarda

Senia Rapisarda is Vice President, Strategic Investments at BDC. In this role, Ms. Rapisarda leads BDC's efforts to develop a healthy VC ecosystem in Canada through several key strategic investments and initiatives in the seed and early-stage space.

Ms. Rapisarda is an early advocate of venture capital in Europe with over 20 years experience in private equity, as well as corporate finance and academia in world-class institutions in the IT and clean-tech sectors. Before joining BDC in 2010 she was in many different senior roles, including senior advisor at NUR Energie, a London-based investment fund specialized in renewable energy, and Managing Director of the Technology Private Equity Team at Nomura International, managing over \$300 million of investments in 42 companies across Europe, Israel and the U.S.

A corporate lawyer by training she practiced in New York for several years. She is also the founder of the Collier Institute at the London Business School - the first in Europe to provide a forum for the exchange of views and analysis of trends and policy issues in venture capital and private equity.

Ms. Rapisarda has a law degree from LUISS University in Rome, a Master's in Law and Economics from Columbia University in New York, and is a Fulbright Scholar.

Nobina Robinson



Nobina Robinson was appointed Chief Executive Officer of Polytechnics Canada in May 2009. Before joining Polytechnics Canada, Mrs. Robinson was the Ottawa-based Senior Government Relations Advisor for Seneca College, responsible for federal advocacy for one of Canada's largest colleges.

Ms. Robinson began her public service career in 1990 when she joined the Treasury Board Secretariat as a management trainee. Two years later, she became a Foreign Service Officer and was posted as a political officer to the Canadian Embassy in Havana from 1994 to 1997. From 1998 to 2002, Mrs. Robinson led FOCAL, a policy institute on Canada's relations with the Americas.

Mrs. Robinson has a B.A. from Amherst College, an M.A. from Oxford University (Commonwealth Scholar 1985-1988) and has pursued post-graduate studies at Yale University. She served as a member of the Expert Panel on the Review of Federal Support to Research and Development, which completed its work in October 2011.

Jim Roche



Jim Roche is President and CEO of Stratford Managers Corporation, a respected management-consulting firm serving the high-tech sector, as well as President and CEO of CANARIE, Canada's Advanced Research and Innovation Network. He is a successful entrepreneur with over twenty-five years of leadership experience in technology organizations.

Prior to founding Stratford Managers in 2006, Jim served as the CEO of CMC Microsystems. He co-founded Tundra Semiconductor (now IDT) in 1995 and, as CEO, led the company through a successful IPO and growth to over \$1.5B in market value. Jim started his career in 1986 as a founding member of Newbridge Networks Corporation (now Alcatel-Lucent), helping the company grow to over \$1B in annual revenues.

Throughout his career Jim has served on advisory committees and boards for diverse private and public organizations including: WiLAN, DNA Genotek, Tundra Semiconductor, Fidus Systems, Symagery Microsystems, ThinkRF, Eseri, CMC Microsystems, Precarn, CANARIE, Ocean Networks Canada, the ICT Advisory Board for DFAIT, the Committee of Research Partnerships for NSERC, the Expert Panel on Business Innovation for CCA, OCRI, Queensway Carleton Hospital and Youth Services Bureau.

Jim is an educator and lecturer who is frequently called upon to speak about entrepreneurship, commercialization of innovation, and strategy development. He holds a Bachelor of Science in Electrical Engineering from Queen's University, where he graduated at the top of his class. He has added to his management skills through intensive programs at Stanford, Ivey, and Queen's among others.

David Ross



David Ross is the President & CEO of Ross Video, a global company with headquarters in Canada that designs, manufactures, markets and supports a wide range of innovative products used in live production by television stations, sports stadiums, corporate and government communications departments, houses of worship and live events.

David has been surrounded by engineering, business, and production switchers his entire life. David began programming in the very early days of personal computers in 1975 at the age of nine. While in high school, he won three major engineering competitions at the national level with projects involving real time programming and computer graphics, including some significant early work on 3D stereoscopic graphics. He continued to develop a variety of software and hardware during his university years, during which time he also received his first patent (shared with his father) for the innovative Downstream Multi-Keyer. He also had the opportunity to help develop a DVE at Electrohome and design a simple tape editing system at the CBC. David graduated university with a heavy business emphasis and a degree in Computer Engineering.

David Ross began working full time at Ross Video in 1991 managing all switcher product development and working closely with the sales and marketing team. He was later promoted to Director, Product Development where he became responsible for all product development in the company and then to Executive Vice President, followed by a promotion to President, and now to CEO in April of 2006.

In November 2005, David also assumed the position of Chairman of the Board and is the majority shareholder of Ross Video. He continues to also be the Product Manager for their production switcher lines.

David currently enjoys competing in triathlon sports, is happily married with two daughters, and has a cute older dog rescued from a puppy mill.

Jason Tham



Jason Tham is the CEO of Nulogy, a solutions company focused on the development of cloud-based solutions for complex supply-chain problems. Responsible for overall strategic direction and product vision, Jason has helped Nulogy grow into a global company serving customers across four continents.

Prior to co-founding Nulogy, Jason gained valuable experience working at companies renowned for their supply-chains, as well as at a number of rapidly growing software companies. At Magna International, he was part of their corporate continuous improvement and quality teams, responsible for facilitating TQM (Total Quality Management) workshops and implementing 5S, VA/VE (Value Added/Value Engineering) and lean principles with OEMs including Toyota and Ford. Jason also worked at Kellogg's most advanced manufacturing facility in the world with the packaging and continuous improvement group, responsible for quality and using SPC (Statistical Process Control) methods for quality measurement in manufacturing. At 724 Solutions he worked through a period of 800% growth and one of the largest IPOs in history. At one of Canada's fastest growing companies, Redknee, which is now public, he led a pivotal nation-wide product deployment in Italy.

Jason has several pending patents in his name related to manufacturing, quality control and contract packaging. He is involved on several boards of industry associations and has a passion for helping early-stage technology companies in Canada.

Jason enjoys sports, is a competitive triathlete, and lives with his wife in Toronto. Jason graduated with an Honors degree from Systems Design Engineering with an Option in Management Sciences from the University of Waterloo.

Dr. Mario Thomas



Dr. Mario Thomas is an accomplished senior executive with impressive international credentials in the management of innovation. He brings extensive experience filled with achievements driving successful development collaborations and financial ventures. With over 30 years in leadership roles directing corporate development and commercialization, he creates remarkable value for all stakeholders.

Dr. Thomas is the founding chairman of the recently created International Commercialization Alliance (ICA). He holds the dual role of Senior Vice-President, Ontario Centres of Excellence, and Managing Director, Centre of Excellence for Commercialization of Research.

His previous experiences include Partner in the venture firm T2C2 Capital; CEO and co-founders of two start-up companies; and senior level positions in business development, marketing and scientist. He holds a PhD in chemistry and a BSc from Université Laval in Quebec City, as well as a diploma in business administration from École des Hautes Études Commerciales of Université de Montréal. He is also a Chartered Director with the ASC designation in board governance.

David Watters



David Watters worked for 30 years in the federal government as a senior executive and Assistant Deputy Minister in a variety of Economic Ministries including Industry Canada, Treasury Board and Finance Canada. He was the Assistant Deputy Minister at Finance Canada for Economic Development and Corporate Finance, where he helped to shape the economic and innovation investments in several federal Budgets.

David then established the Global Advantage Consulting Group Inc. (Ottawa), a strategic management consulting firm, where he is currently president. Since 2002 the firm has completed over 350 assignments providing advice to corporate, association, university and government clients in Canada and abroad in a broad range of areas from organizational strategy, innovative business models, the design and management of commercial networks to enhanced governance and decision-making. His firm also designs and builds “system maps” in the areas of new technology, innovation/commercialization, trade, and energy/climate change to support client investments in projects, programs and policy.

David holds an Economics degree from Queen’s University as well as a Law degree in corporate, commercial and tax law from Queen’s Law School. He was an adjunct Professor at the University of Ottawa Management School for seven years where he taught International Negotiation to MBA students.

Dr. Allison Young

Dr. Allison Young currently holds the position of Senior Trade Commissioner at the Consulate General of Canada in New York where she heads up the International Business Development Program (IBD). Since her arrival in September 2011, the International Business Development Program has launched a Canadian Technology Accelerator (CTA@NYC) for 24 Canadian tech start-ups in digital media as well as a Virtual Cleantech Accelerator (named Virtual Venture North) with 35 cleantech companies.

Prior to this appointment, Dr. Young served as Director of three divisions at the Department of Foreign Affairs and International Trade handling the overall coordination of Canada's trade negotiating agenda with India, China, Japan, Korea, Turkey, and Israel; Canada's negotiating position at the World Trade Organization (WTO), and; implementation of the 2006 Canada-United States Softwood Lumber Agreement (SLA) and its accompanying domestic legislation and regulations.

Prior to this, Dr. Young worked on bilateral and multilateral trade negotiations concerning agri-food, wines and spirits, chemicals, professional services, financial services, environmental services, information communication services, telecommunications and investment.

Dr. Young's academic credentials include a Ph.D. from Dalhousie University (2001); M.A. Political Science, Acadia University; Bachelor of Education, McGill University; Joint Honours Bachelor of Arts, History and Political Science, McGill University.

**APPENDIX B: HON. GARY GOODYEAR'S DINNER KEYNOTE
"SPEAKING POINTS"**

From Industry Canada Website <http://news.gc.ca/web/article-eng.do?mthd=tp&crtr.page=1&nid=680019&crtr.tp1D=4>

Thank you for the kind introduction, Suzanne Fortier.

I'd also like to thank the team at Research Money for the invitation. This conference provides us all with a good opportunity to think about how we can harness the innovation potential across this country and translate that into long-term prosperity. All too often, conversations about technology and innovation revolve around the instantaneous. I'm encouraged to see so many of you here who are willing to ask one another how Canadian businesses can further drive innovation in Canada.

Since our government released Economic Action Plan 2012 in March, I've had the opportunity to speak with stakeholders about some of the innovation measures found in the budget.

I think we can all agree that competition for the brightest minds remains fierce. The pace of technological change is lightning-quick, and it is happening in both developed and emerging economies. This means that to ensure Canada's long-term economic competitiveness, we must create and nurture globally competitive businesses that innovate and create high-quality jobs.

Beyond our borders, the global economy remains tentative and any potential setbacks would have an impact on Canada.

Canadian businesses face ever-increasing competition from emerging countries as well as new realities associated with an aging population and demographic change.

Fortunately, Canada is facing these challenges from a well-established position upon which we can build.

With a comprehensive and forward-looking agenda that will deliver high-quality jobs, economic growth and sound public finances, our government's Economic Action Plan will allow Canada to overcome future adversity and emerge stronger than ever.

It builds on our positive record of achievement. The budget measures will help further unleash the potential of Canadian businesses and entrepreneurs to innovate and thrive in the modern economy to the benefit of all Canadians for generations to come.

Conferences like this one focus on long-term growth, and, in much the same way, our government is targeting its innovation measures on long-term priorities like high-quality jobs and prosperity.

By focusing on the drivers of growth and job creation—innovation, investment, education, skills and communities—the new measures in Economic Action Plan 2012 will solidify, strengthen and draw upon the entrepreneurial sector's role as the driving force behind Canada's economy.

Canada's businesses—entrepreneurs and —have proven time and again that they are up to the task if given the opportunity.

Well, ladies and gentlemen, with its Economic Action Plan, the Harper Government is ensuring that they will have all the opportunity they need to flourish.

For starters, this transformational agenda includes a new approach to supporting entrepreneurs, innovators and world-class research.

As a world leader in post-secondary research with a highly skilled workforce, Canada has strong fundamentals for innovation.

The federal government provides significant resources to support research, development and technology.

In fact, Canada tops the G7 for its higher-education expenditures on research and development (R&D) measured as a percentage of gross domestic product (GDP).

Our Scientific Research and Experimental Development (SR&ED) tax incentive program is currently one of the most generous systems in the industrialized world.

But these measures alone are not enough. Only results matter.

Our government realizes that the results of these policy measures need improvement.

Canada continues to lag peer nations in terms of overall innovation performance, including private sector investment in R&D. We also need to improve our ability to commercialize research into products and processes that create high-value jobs and economic growth.

Our government is taking steps to address these challenges.

First, we set up an expert panel, chaired by OpenText's executive chair Tom Jenkins. The panel was asked to determine how we could improve and optimize our incentives to turn around this lagging performance.

And now we are responding to the panel's recommendations in a way that will create high-value jobs through investments in:

- direct support for business innovation;
- financing opportunities for businesses with the potential to become globally competitive; and
- linkages between public research and market needs.

Among other things, our Action Plan will double the National Research Council of Canada's Industrial Research Assistance Program to better support R&D by small and medium-sized companies.

It will refocus the National Research Council on demand-driven business-oriented research that will help Canadian businesses develop innovative products and services.

It will support innovation through procurement by connecting Canadian companies with federal departments and agencies to build their capacity to compete in the global marketplace.

It will help high-growth firms access risk capital by committing \$400 million to leverage increased private sector investments in early-stage risk capital and to support large-scale, privately managed venture capital funds.

It will support private and public research collaboration through internships for graduate students and funding for business-led R&D networks.

And it will streamline the SR&ED tax incentive program and invest the savings in direct support programs that will reinforce business innovation in Canada.

Our government is also building on earlier investments by proposing significant new resources to support advanced research and leading-edge infrastructure.

Furthermore, our Action Plan will enhance granting council support for research partnerships between industry and academia and provide new funding to research human health and genomics technology through Genome Canada.

It will link Canadian researchers to the world through the Canadian Institute for Advanced Research.

And it will enhance support for leading-edge research infrastructure through investments in the Canada Foundation for Innovation and CANARIE, Canada's ultra-high-speed research network, among others.

But, to effectively compete and succeed globally, Canadian job creators need more than bright ideas.

They must be supported by a modern regulatory environment that promotes competition, business investment and economic growth.

This implies a competitive and efficient tax system, a well-functioning financial system and access to international markets. That is why this year's Economic Action Plan includes key commitments in all of these areas, which will improve conditions for business investment and drive the next wave of job creation.

The budget also recognizes that, in uncertain times, living within our means is just as important as creating jobs.

In keeping with this fiscal discipline, we are implementing moderate restraint in government spending.

The savings from this federal review of expenditures amounts to less than 2 percent of expected federal program spending in 2016–17.

Although this was a comprehensive review of departmental spending, it was by no means an across-the-board cuts exercise.

We will ensure continued and growing funding for the programs and services that are a priority for Canadians. Economic Action Plan 2012 makes a wide range of important investments in business innovation that bear witness to this commitment.

The reductions in departmental spending simply reflect changes to refocus government and programs, to modernize and reduce the back office, and to make it easier for Canadians and businesses to deal with their government.

These actions will yield real dividends for Canadians. They will support the return to balanced budgets at an appropriate pace as the economy continues to recover from the global economic crisis.

And three years after the stimulus phase of Canada's Economic Action Plan was launched in response to that crisis, it is clear that our economic recovery is advancing.

There is renewed strength in our exports, and our domestic economy is continuing to grow. Since July 2009, employment has increased by more than 750,000 jobs and is now 320,000 above its pre-recession peak—the strongest job growth among G7 countries over the recovery and the largest back-to-back gain in the number of jobs in 30 years.

We are projected to return to a balanced budget over the medium term, and the federal debt is projected to decline to 28.5 percent of GDP in 2016–17, in line with its pre-recession level.

Canada continues to hold a significant fiscal advantage over other G7 countries in this regard.

The International Monetary Fund projects that, by 2016, Canada's total government net debt-to-GDP ratio will remain at about one third of the G7 average and more than 20 percentage points of GDP below that of Germany, the G7 country with the next-lowest ratio.

Reducing this debt is no mere abstract accounting exercise. It will have very real tangible benefits, including:

- freeing up tax dollars otherwise absorbed by interest costs;
- keeping interest rates low and encouraging investment; and

- preserving Canada's low-tax plan, encouraging the long-term growth that generates high-wage jobs for all Canadians.

So clearly our prospects are shining brightly. And we know that securing long-term prosperity for Canadians in uncertain times means that we must act today.

With Economic Action Plan 2012, we have done so decisively, creating long-term opportunities for jobs and growth in Canada.

All of these measures are aimed at creating the conditions necessary for a sustainable, competitive innovation system. These conditions include supportive regulatory and marketplace frameworks, engaged citizens, a highly skilled workforce, as well as world-class research and leading-edge infrastructure.

I wish you all a productive conference. I look forward to hearing about the discussions and outcomes of this gathering. Thank you.