

The Second Regional Atlantic

RESEARCH

MONEY

Conference

**National Priorities and Regional Advantages:
Opportunities for Atlantic Canada in Canada's
Science and Technology Strategy**

in collaboration with the Atlantic Canada Opportunities Agency

November 21, 2007

Halifax, NS

Conference Proceedings

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The Second Regional Atlantic Research Money Conference

Opening Remarks

Jeffrey Crelinsten, Publisher, Research Money

Mark Henderson, Managing Editor, Research Money

Jeffrey Crelinsten welcomed participants, and recalled the lessons of the first Regional Atlantic Research Money Conference, held two years ago in Moncton, NB. “We learned that the model of ideas to market is not the right one,” he remarked. “The key ingredient is people who have not only technical skills but also business know-how.”

Universities should not have to justify their funding by generating commercial ideas, because in fact graduates are universities’ most valuable output. Universities and industry must connect so that students and graduates gain valuable business experience. As Crelinsten noted, the path to success lies in creating an ‘ecosystem’ that supports entrepreneurs, provides business intelligence on customer needs and market opportunities, and connects firms to people on the leading edge of science and technology who can solve problems for customers.

The conference theme, ‘National Priorities and Regional Advantages,’ dovetails with the new federal Science and Technology Strategy, which underlined three advantages for regions to foster:

- a business environment that supports entrepreneurship
- generation of knowledge
- development and support of skilled people who can succeed in knowledge-based commerce

The challenge is to link science and technology prowess to business success in knowledge-based sectors. Crelinsten noted three critical success factors:

- the ability to transcend institutional, cultural and geographic barriers
- alignment of goals across jurisdictions
- focus on global commercial success in specific sectors of the economy: ‘pick an area and be the best.’

Atlantic Canada faces additional challenges, not unlike those of other places with large rural areas and diverse cultures and geography. By bringing together experts from across Canada, Europe and the United States, the conference provides a forum for Atlantic Canadians to learn from others who face similar challenges – and vice versa.

Mark Henderson, managing editor of *Research Money*, noted that this conference is the most international of all R\$ events so far. He reiterated that ‘partnerships’ and ‘focus’ are the essential ingredients for regional success in the global economy. He recalled the sense of urgency from the Moncton conference – that Atlantic Canada had only five to six years to change its trend lines. Fortunately, “the ability to work together in this region offers a distinct advantage.”

Henderson closed by commenting that, while the federal S&T strategy provides a framework, it is really up to the regions to develop their own strategies and policies to leverage that framework to their advantage. By sharing ideas, strategies and success stories from a wide range of speakers and panelists from around the world, participants will gain insights into how regional advantages can be developed, leveraged and deployed.

Industry Keynote:

Atlantic Canada's value proposition for global knowledge-based firms

Ron Keefe, President & CEO, Diagnostic Chemicals Limited

Ron Keefe began with an overview of Diagnostic Chemicals Ltd. (DCL). Based on Prince Edward Island, DCL employs 240 people in the development, production and worldwide distribution of diagnostic chemicals and therapeutic agents through its diagnostic division and BioVectra, its bio-pharma division. Company headquarters and 80 per cent of its employees are on PEI, where all corporate planning, R&D, manufacturing, packaging and quality control take place. The company also runs sales, distribution and customer service operations in Connecticut and Mexico.

Revenues have grown steadily, from \$25 million in 2003 to more than \$40 million in 2007 – despite the rising value of the loonie. In early November 2007, DCL announced it is selling its diagnostics division to US-based Genzyme, one of the world's leading biotechnology firms. This strategic partnership will provide Genzyme with expanded product lines and manufacturing capacity, and DCL with funds to grow BioVectra, which will become a separate company once the transaction with Genzyme is complete.

DCL's R&D strategy focuses on product development – internally and in partnership with diagnostic and drug discovery companies. DCL also collaborates with universities and the National Research Council's PEI-based Institute for Nutrisciences and Health – with a focus on extracting and purifying bioactive compounds from natural sources. The company plans to expand its biopharmaceutical business through BioVectra. Key product areas include the partially AIF-funded 'PEG' drug delivery technology, which improves drug stability and performance, and cancer-fighting taxanes the company first derived from Canadian yew trees and now synthesizes.

Keefe attributes DCL's outstanding success to:

- manufacturing excellence; Canadian Good Manufacturing Practice-certified, with strict adherence to the high quality-control standards so vital in this industry.
- unique products; some are 'first in class' in the world, used in 80 per cent of tests worldwide.
- customer service; "...our mainstay, we pride ourselves in ensuring our customers are well-serviced and their problems addressed as soon as possible."
- human capital; a very strong talent base on PEI.

He noted that DCL's focus areas dovetail perfectly with the three areas identified in the federal S&T strategy: entrepreneurship, knowledge generation and skills development.

After introducing the audience to DCL, Keefe went on to describe Atlantic Canada's value proposition to global knowledge-based firms:

- North American strategic location; close to major U.S. centres, Europe, etc.
- Favourable cost base for technical activities and manufacturing, with the quality advantage provided by a stronger regulatory environment.
- Quality of life for employees; inspires loyalty, resulting in a stable workforce.
- Low bureaucracy and a 'can-do' attitude.
- Excellent public-support climate for knowledge-based enterprises, including ACOA's AIF (Atlantic Innovation Fund), an important tool for reducing product development risk.
- Strong institutional support, i.e. from NRC, Atlantic Veterinary College and the many universities throughout the region.
- Strong university environment and a well-educated workforce.
- Strong work ethic and entrepreneurial spirit.

DCL clearly illustrates how these advantages can be maximized for commercial success.

PEI has engineered a number of additional advantages, which Keefe shared. For example, the province has developed a tightly knit biosciences community with a common vision, forming PEI Bioalliance to bring the players together. In addition, the provincial government has instituted a 10-year corporate income tax holiday to attract bioscience firms, and a three-year provincial income tax rebate for incoming workers bringing specialized skills to the province.

Keefe acknowledged challenges faced by the region – such as overcoming the perception of remoteness and the reality of distance from financial sources, staffing when experience among the available labour pool is limited, and retaining young mobile talent in a global economy. He suggested a number of solutions, including more competitive incentives for firms and individuals, and more investment in infrastructure. He said Atlantic Canadians need to send a clear message that we are stepping up as serious business contenders in the science arena. “This sector is an opportunity for Atlantic Canada to shine... we are committed to ensuring this happens in PEI and Atlantic Canada.”

Following Keefe's presentation, Jeffrey Crelinsten asked him if the Genzyme acquisition was a conscious decision driven by emerging forces in India and China. Keefe responded that, rather than being a deliberate move, the deal came about because Genzyme had been pursuing DCL for ten years. Genzyme wanted to develop its diagnostics, but lacked the manufacturing platform. When DCL examined the strategic fit between the two firms, they saw it as the right thing to do: “It gives us additional funds to invest in development of BioVectra.”

Policy Keynote: Canada's federal S&T Strategy: regional implications

Jorge Niosi, Professor, Department of Management and Technology, UQAM;
Canada Research Chair in the Management of Technology

An academic and consultant to many federal and provincial institutions, Jorge Niosi analyses government innovation incentive programs and identifies best practices in private and public R&D management. He presented a thorough analysis of Canada's R&D landscape and offered practical advice for Atlantic Canada to grow its R&D capabilities and output.

Niosi opened on an optimistic note, stating that Canada has one of the best R&D incentive systems in the world. He cited R&D tax credits and subsidies through the National Research Council's Industrial Research Assistance Program (IRAP) as examples of effective programs. However, he said, in spite of the national scope of these policies, innovation in Canada is concentrated in a few large Census Metropolitan Areas (CMAs).

Using data from Statistics Canada and the U.S. Patent and Trademark Office, Niosi illustrated that Ontario, Quebec and British Columbia are all moving ahead, while the rest of the provinces are falling behind, in relative positioning, in such areas as U.S. patents and establishments, business expenditures and employment in R&D. For example, most of Canada's business expenditure on R&D is taking place in Toronto, Montreal, Ottawa and Vancouver, and 60 per cent of U.S. patents are concentrated in the largest CMAs. Only 29 U.S. patents are held in Atlantic Canada. Furthermore, the largest centres are capable of supporting a wide variety of thriving sectors, while smaller centres support only a few successful sectors.

Its small population means Atlantic Canada faces difficult challenges in growing its knowledge sector. As Niosi pointed out, studies have shown that growing regions generate 'virtuous circles' of growth: high demand for skilled personnel leads to high salaries, attracting more talent and more R&D-intensive firms, which in turn creates more demand for skilled people, and so on. On the flip side, 'vicious cycles' of low demand for skilled people means lower salaries, fewer people coming to the area, and a stagnating or declining R&D sector.

Niosi outlined key factors a recent study shows attract R&D investment to an area:

- Market potential; limited in Canada and especially Atlantic Canada.
- Intellectual property protection; good nationwide.
- Quality of R&D personnel/human capital; he noted that a few good people are all that's needed to send strong signals and attract more top talent to a university.
- Anchor tenants; a cornerstone of any successful cluster, these large, highly productive firms attract talent and generate revenues, spin-off ideas and companies. IBM in Toronto and Bombardier in Montreal are prime examples.

University research, notes Niosi, is by far the most influential factor. Investment in university research attracts top faculty, which attracts top students. It can also produce commercial spin-offs, but its more important product is graduates, who companies can hire. The growing pool of top researchers and skilled graduates helps attract anchor tenants, which spin off new companies and/or attract other anchor tenants. These create further demand for skilled workers – as do public and private laboratories.

The good news, said Niosi, is that we have a policy opportunity here in Atlantic Canada, and a number of attributes to build on. The region is home to many universities. Nova Scotia's spending on higher education is fairly good, as is overall public spending on R&D. "The region is good on input, the problem is on the output side," he said, noting the small number of U.S. patents.

Because of the proven ability of larger centres to attract talent and investment, Niosi urged the region to "Choose larger centres to focus your efforts on... and beef up university R&D." The fact that the region has oil and gas means there are resources that could be invested in university research.

Ways to build supply of human capital include higher academic salaries, fellowships, student loans, tax incentives and selective immigration. Niosi urged the region to find ways to better integrate skilled immigrants into the labour force, so they have real opportunities to apply their skills. He noted that some provinces have not done a good job integrating immigrants and have lost this potential talent. Atlantic Canada can learn from their mistakes.

He closed by advising the region to focus on key sectors of strength, while remaining alert and aware of emerging sectors that may be developing spontaneously on their own.

Niosi's presentation sparked some controversy among participants. An audience member from the National Research Council commented on his observations that smaller centres such as Charlottetown, Regina and Waterloo have made tremendous strides. He noted that larger centres lack some natural advantages of smaller centres, such as the ability to integrate, coordinate and create a common brand to market and move their strong sectors forward.

In response, Niosi reiterated his enormous respect for Statistics Canada. However, he said, the fact that R&D is concentrated in a few large centres does not mean that smaller metropolitan areas cannot grow significant specialized clusters: "They just have to work harder."

A representative from Dalhousie University commented that statistics are harder to keep on smaller centres. He added that Dalhousie owns 20 U.S. patents, and that one of Canada's poorest areas of performance in commercialization of university research is Toronto – the biggest cluster of research in Canada: "Statistics belie what's going on on the ground. There may be lots of companies in Toronto utilizing research tax credits... but that doesn't mean that is pumping a lot of success out into the economy."

Niosi remarked that statistics are an indicator; they don't tell the whole story, but they do give a signal of what's going on.

An audience member from PEI Biolliance defended statistics, saying that we need to pay attention to what the statistics are telling us. He noted that Atlantic Canada is at an early stage in its transition from traditional industries – so companies that have formed the backbone of the economy haven't invested heavily in R&D. Business investment numbers are therefore still small. In spite of the successes we've achieved, we can't just pat ourselves on the back, because the region still has such a long way to go in becoming globally competitive in R&D sectors.

A representative from the University of Prince Edward Island commented on another trend revealed in the slides – the curse of the resource economies in Western Canada. The resource-rich Western provinces are investing in the old economy rather than the new. Higher GDPs mean overall R&D spending is up, but the percentages are going down. “That does not remove the problem we have here in Atlantic Canada,” he said, citing under-representation in research capabilities and population. “We've got to move away from our resource base to our knowledge base if we're going to uplift this economy.”

An Industry Canada participant asked Niosi to comment on Ron Keefe's earlier presentation and the DCL strategy to focus on niche products and partner with international firms. Niosi responded that forming such alliances with international companies is the only short-term solution for marketing products. And not just in Atlantic Canada. All Canadian centres face the same challenges – compared to CMAs in New York and New Jersey, with populations over 20 million each, “we are pygmies.”

Panel 1: Mobilizing regional strengths for national priorities

Panelist: Keith Silverang, Vice-President, Technopolis Group; Chairman, Technopolis Ventures Ltd., Finland

Panelist: Ronald Vuijk, Vice Mayor, City of Delft, Netherlands

Panelist: John Casey, Entrepreneur-in-Residence, School of Public Policy, George Mason University, Virginia, USA

Moderator: Ron Freedman, Co-Publisher, *Research Money*

Ron Freedman opened the panel by reflecting on key themes of the morning so far – such as how Atlantic Canada can grow its human capital and attract anchor tenants through nimble policymaking, regional collaboration, international partnerships, and turning local challenges into opportunities. He remarked that, as two of the panelists come from similarly small regions within their national and European contexts, they will doubtless have useful insights to share. With that, he called upon Keith Silverang of Finland.

Keith Silverang: Silverang began by noting that he has lived in several innovation hubs in his life, including Boston, New Jersey and the London-Oxford-Cambridge triangle. After 30 years in Helsinki, a much smaller centre, he identifies with Atlantic Canada's challenges.

On the surface, Finland appears phenomenally successful. With a population of only five million, the country has 20 universities, 24 science parks, the world's #1 primary education system, and third-place global ranking in per capita R&D spending. Silverang said the nation's 'behemoth' innovation system spends half a billion euros per annum on R&D initiatives – yet, the national economy is in jeopardy, because R&D output is paltry: “We have no IPOs, no venture capital, and few global success stories outside Nokia... if you measure based on VC-backing, we are not doing well.”

Silverang warned against scattering public money across large numbers of weak cases, using patents as a measure of output, and lulling ourselves into complacency because we have strong public support for innovation; it is the output, not the input, that counts. He advised Atlantic Canada to focus on the 'best of the best,' and, rather than funding start-ups directly, to provide the funds to venture capital firms “and let them do their job.”

To deal with its crisis, Finland is making a radical, disruptive shift. “Study us and don't make the same mistakes,” urged Silverang. He closed by endorsing the growth opportunity of niche technologies when paired with an international partner – adding that firms must search the globe for the right fit: “The narrower the niche, the farther away the partner may be.”

Ronald Vuijk: Vuijk began with a political perspective, noting that courageous political leadership – grounded in reality – is essential. He pointed out similarities between the Netherlands and Atlantic Canada. Delft, for example, is a city of 100,000, and part of a region with nine other cities. This region collaborates with four other regions, four provinces, and the national government... in short, a complex political scenario not unlike Atlantic Canada's.

Vuijk noted several issues his region has in common with Atlantic Canada: the need for cities to specialize; difficulty attracting foreign talent and investment; strong regional identities and sense of independence that can hinder cooperation; lots of political leaders but at times a lack of political leadership.

The Netherlands is working on specialization of cities: Delft specializes in soil and water; the Hague specializes in international law; Leiden in life and health sciences; Amsterdam in creative and financial, etc. This eliminates competition among the cities, while opening doors to inter-city cooperation. For example, when international conflicts are related to water, Delft can provide a technical solution, while the Hague handles legal and diplomatic issues.

The most important thing, however, is marketing – difficult in the Netherlands due to complex political structures, a plethora of political leaders, and so on. The other

challenge – also faced by Atlantic Canada – is how to determine where success lands when a region does manage to attract an anchor tenant. How are the benefits distributed and how are they measured?

John Casey: A ‘serial entrepreneur,’ Casey is new to the world of policy. He brought valuable business perspectives to the largely policy-oriented crowd. In his role as ‘Entrepreneur-in-Residence’ at George Mason University, he helps faculty-founded spin-off companies achieve commercial success. He noted that the diversity of the university community opened his eyes to the importance of human capital – and of top performers as lures for additional talent. He also pointed out that existing human capital can be re-allocated to more effective ventures: “We need to create opportunities to keep them.”

Like Silverang, Casey decried patents as a measure of effectiveness: “Start-ups need a defensible business model, not a defensible patent strategy.” He prefers to focus on metrics like the ability to apply what’s been learned in one success to a new venture, to reassemble teams and leverage past experience into another success, and then another. Start-up companies evolve into anchor tenants, which spin off more companies. And, keeping the opportunities flowing encourages the formation of investor networks, which can then foster further start-up successes. Casey described an angel network of anchor tenants in his area that offers seed funding and advice to start-ups, and agreed with Silverang that venture capitalists have expertise in equity investing that university researchers (and policy makers) do not. “We need to continue to irritate our institutions with the reality of how new ventures are created and succeed,” he concluded.

Discussion: Ron Freedman picked up the conversation by asking Keith Silverang why, with all its success, Finland is so concerned. Silverang replied that the country has gone too far down the road of centrally creating and trying to implement a vision – rather than empowering markets and businesses. He described a triple crisis caused by over-zealous public innovation policy, shotgun spending on too many weak projects (creating a lack of ‘smart money’), and lack of talent. “The single largest problem we face is lack of talent at the CEO level,” he said, explaining that venture capitalists won’t invest without strong entrepreneurial leadership – and that you can’t attract good CEOs without venture capital.

Finland is going abroad to transform its domestic entrepreneurial culture. It’s working with George Mason University, for example, seeking local champions to help its most promising start-ups develop their business models and obtain financing. On the topic of business models, Silverang emphasized that world class CEO’s, COO’s and sales directors are needed to launch and grow a company. If they want to succeed commercially, the ‘geeks’ who own the intellectual property must settle for the role of chief technical officer. Most scientific and technical innovators don’t have the skills to run a company; their talents are better applied coming up with new ideas for solving problems.

He has every confidence that the Finns will rise to the challenge... of generating “500 global growth companies in niches that will diversify the economy.” He closed by

wishing aloud that every policymaker would spend a year working with entrepreneurs in a start-up.

Ron Freedman noted the parallels between Finland and Atlantic Canada, in terms of the tension between policy-driven and entrepreneurial approaches to economic development. “Can governments and public servants drive growth by developing clusters, or is it all individual entrepreneurship and chance?” he asked Silverang.

Silverang responded that he absolutely believes in private-public partnerships – but he emphasizes ‘private-public,’ *not* ‘public-private.’ He cited the Israel model – where government provides money to funds that flow to venture capital firms to invest in technology firms – as the best in the world: “They have hundreds of companies listed on NASDAQ!”

Technopolis has recently agreed to support an innovative micro-clustering program. As Silverang noted, too often inventors are focused on their gizmo, rather than its potential demand. The new program sidesteps this fundamental flaw by aggressively linking Finland’s world-class start-ups with anchor companies anywhere in the world. “The start-ups will have reference clients because the anchor companies are driving the process; the startups will supply the business ideas the company wants... To become a global blockbuster, a company must be connected to international blockbuster needs.”

He went on to reiterate that governments should not finance all incubators; let the weak ones die. Focus on quality, not quantity – and put private interests in the driver’s seat – to avoid obstructing success.

Freedman called on the audience, prompting a participant from the Information Technology Association of Nova Scotia to ask the panelists for their thoughts on direct investment versus tax incentives for R&D.

Ron Vuijk noted that Delft does not offer subsidies to attract foreign direct investment, and that the city is facing a crisis of lack of space and traffic congestion that limits growth potential.

Silverang does not categorically oppose direct investment – what matters is how it’s done. He cited publicly supported consortiums of research institutions, small companies and anchor tenants as an effective way Finland encourages product development while creating an ‘ecosystem’ that provides opportunities for all players to thrive. Tax credits are also effective.

John Casey reiterated Silverang’s earlier comments about focusing public monies on the best of the best. He added that faculty entrepreneur ‘wannabes’ who feed too long at the public ‘soft money’ trough end up looking like weak candidates to venture capitalists. Entrepreneurial leadership is the key for start-ups: “You have to look like a company that’s venture-backable.”

Frank Zwetsloot of Science Alliance interjected to ask the panel how Atlantic Canada can ‘stir it up’ to leverage more entrepreneurial success from its universities. Silverang said the first thing that’s needed is the will. He also said the focus needs to be on building human capital – and linking world-class clusters with entrepreneurs, venture capitalists and anchor companies around the world – not on bricks and mortar.

Another member of the audience asked how policymakers should balance investment in early-, mid- and later-stage growth. John Casey replied that the best public investment is ‘pre-early-stage,’ in creating the municipal infrastructure that’s needed to support growth. He also noted the importance of streamlining processes.

Jorge Niosi added the final comments to the discussion by defending the patent metric. He said venture capitalists routinely use patents as a measure of innovation: “Patents are a signal of competency.” On how to manage the interface between government, universities and industry, he said: “With difficulty.”

Panel 2: Local and regional strategies – best practices

Panelist: Christa Bleyleben, Executive Director, Massachusetts Office of International Trade and Investment

Panelist: Rory Francis, Executive Director, PEI Bioalliance

Panelist: Brenda Halloran, Mayor, City of Waterloo

Moderator: Catherine Vardy, Research Innovation and Development Officer, NSERC-Atlantic

Catherine Vardy opened by asking each panelist to give an overview of their initiative, to provide context for the ensuing discussion.

Christa Bleyleben: Bleyleben described the Massachusetts Office of International Trade and Investment as a publicly funded, not-for-profit with an independent board of directors. Headquartered in Boston, it has satellites in Berlin, Shanghai., Sao Paulo and Mexico City. Its primary mandate is to help Massachusetts’ companies expand globally, through exports and international partnerships. At the same time, it offers a single point of entry for outside companies looking to establish markets or partnerships in the state. The office also negotiates international agreements and maintains the state’s international protocols and consular relations. Although it has a tight budget and must work through partners to expand its resource base, the office enjoys strong support from its many clusters’ active industry councils.

Rory Francis: The PEI Bioalliance is a ‘fourth pillar’ organization that brings players from industry, academia and government agencies together to set mutual priorities and create a single, coordinated strategy for growing the island’s bioscience sector. It emerged from the recognition that PEI’s primary industries are not the growth engines of the future, and that there were numerous institutions and companies which could form the

nucleus of a bioscience cluster. In a very short time, PEI Bioalliance has forged a common vision, with a focus on strengthening its science platform and growing its business in bioactive compounds for human, animal and fish (aquaculture) health. Its key metrics are growth in private sector revenues and job creation in the biosciences.

Francis cited the opening of the National Research Council's Institute for Nutrisciences and Health as a major milestone, adding that PEI's biosciences cluster is now home to 25 companies and eight research organizations, including the University of Prince Edward Island (UPEI) and the Atlantic Veterinary College. PEI Bioalliance has helped these many players and a host of government agencies align strategies to increase quantity and quality of science, attract human capital and create a risk-reduced business environment. He said PEI's size is an advantage: "Because it's a small community, people see themselves as part of a larger effort."

Brenda Halloran: Halloran described Waterloo and its impressive growth in a variety of science and technology sectors. The city's two-world class universities are the cornerstones of its success; proximity to major central Canadian and U.S. markets and strong local leadership are also key. In addition to its city status, Waterloo is part of a region including three other cities and adjacent rural areas. The region is Canada's 10th largest urban area, yet it has a \$12-billion export market and a GDP of \$19.4 billion – larger than five Canadian provinces, Halloran noted. Home to Research in Motion RIM), a 120-acre research and technology park and a booming S&T sector with 2,000 job vacancies, Waterloo recently received the international 'Intelligent Community of the Year Award.' In addition to its enormous student body, leading institutions, thriving S&T sector and vibrant arts and culture scene, Waterloo holds an even more important asset: "We have the will to carry on and become global... and we're open for business."

Discussion: Catherine Vardy followed up on Halloran's discussion about universities and students, asking the panelists for their insights on how to retain graduates and attract qualified people from outside their regions.

Bleyleben emphatically stated that universities are the key, and that they must be of the highest calibre to attract top students and faculty. To retain students after they graduate, universities must collaborate with industry to create internships to help students find their way into local employment in their field. Such partnerships are win-win, as interns are the lifeblood of many organizations. She also remarked on Massachusetts' high quality of life, rich in culture, recreational facilities and sports teams. This, and the opportunity to work in challenging and creative environments, makes the state attractive.

Francis commented that PEI must compete for the same human resources as places with more developed industrial bases. "We have to provide evidence of opportunity," he said. One effective strategy for keeping young people in the province has been to work closely with UPEI and Holland College to design programs that meet emerging skills gaps in the local economy. To attract outsiders, or entice Islanders to return home, the province is offering provincial income tax breaks, while promoting the Island's balanced, low-stress lifestyle – and the opportunity to get involved in a growing sector and "be part of

something bigger than their own job.” The Canada Research Chair program and the island’s growing scientific infrastructure have also helped PEI recruit top-level talent.

Halloran said Waterloo promotes similar lifestyle advantages, such as clean air and recreational facilities, and pays attention to the needs of young people and families, to attract immigrants and retain locals. Strong partnerships between the universities and chamber of commerce promote opportunities for young people and entrepreneurs, as do a variety of services, funding, mentorships, an ‘acceleration centre,’ and a web portal to connect employers with skilled workers. She has taken steps to keep students in Waterloo, forming an advisory council of students she consults on civic and economic issues. This gets young people involved in the community and fosters their sense that this is home, their place to start a family, said Halloran. She also takes every opportunity to personally let students know how much she’d like them to stay, and to ask them what Waterloo needs to do help them stay.

Halloran emphasized that it takes time to get the virtuous circle of growth started, but it is possible. “10 to 12 years ago, Waterloo was not there,” she noted. “We have had to reinvent ourselves.” Now the cycle is self-regenerating.

Bleyleben added that, in the increasingly flat world, communities can’t be complacent. They must constantly re-invent themselves and establish new opportunities, because young people are mobile.

Vardy next asked the panelists to comment on how to ensure the business community will be there, providing the jobs.

Francis noted that surveys have shown a strong science platform is more important than tax credits to S&T companies. Other key ingredients are access to capital, human resources, infrastructure and effective policy tools. He therefore recommends building the S&T platform, encouraging spinouts from local intellectual property and growing existing companies, along with tax incentives and inward investment. For PEI, he says, “We challenge ourselves with the question ‘Why PEI?’ We have to answer... what’s our competitive advantage, how would PEI be a competitive advantage to them?”

Vardy asked Bleyleben what had prompted Massachusetts to re-invent itself. Bleyleben responded that the state lost a lot of its key IT companies to California in the 80s. Now they face the same danger with the bioscience sector and don’t want to repeat their mistakes. They have created the Massachusetts Technology Transfer Centre – involving universities, academic hospitals, research institutes and firms – to help take research outputs to market. A strong venture capital community and entrepreneurial spirit are also key, with angel investors providing ‘proof of principle’ funding. In addition to funds, members of the many angel networks also offer expertise and advice.

Halloran added that business attracts business, and that in Waterloo, the collegial nature of the community helps business thrive. Strong institutions, innovative think tanks, and

University of Waterloo satellites around the world attract global attention to the area. “You can never be complacent... to me, we’re just beginning.”

Vardy opened the discussion to the floor, prompting a Dalhousie representative to ask Christa Bleyleben how they recruited a Novartis research institution, and how they addressed venture capital problems.

Regarding Novartis, Bleyleben responded that the company’s decision to locate a facility in Massachusetts was driven by the desire for access to a highly qualified labour pool. Despite concerns among Novartis employees in Basel that this move would cost jobs in Europe, employment in Basel actually increased. The company is now adding a facility in Singapore. “It’s a global game,” she commented. “Our state government is signaling its willingness to work with companies... but we’re not writing cheques.”

In the realm of venture capital, Bleyleben said there is no government involvement. However, when the increasing involvement of insurance companies and investment funds reduced overall risk tolerance in the VC community, angel networks stepped into the gap with new early-stage funds.

Another participant asked how to take local priorities and strategies to the regional and national stage. Halloran replied that, even with all Waterloo’s success, they are not receiving much federal and provincial support to help them go global. So, they are taking it upon themselves to leverage the ‘Intelligent Community of the Year’ award into a brand: ‘Intelligent Waterloo.’ This should strengthen their case when they go to other levels of government with ‘the ask.’ She suggested that cities should form coalitions and pursue opportunities as a group.

Bleyleben noted that federal funding through NIH is not increasing, but fortunately the university system attracts large private donations such as those provided to the Harvard-MIT stem cell network. Another novel idea: some of the larger companies have joined forces to create an incubator, hosting and supporting select companies to move their technologies to market. She emphasized: “You need the private involvement.”

Jeffrey Crelinsten closed the panel by remarking on the leadership evident in all three panelists’ stories – and that success does take time.

International Keynote: Global trends in regional innovation for national priorities

Frank Zwetsloot, Managing Director, Science Alliance, The Netherlands

As an intermediary between science and society, Science Alliance facilitates interaction between universities, research institutes, companies, and other science and technology players – not just within regions, but among regions around the world. This coordination role is an essential ingredient of internationalization, especially for small and medium-

sized enterprises (SMEs). As Zwetsloot remarked, small companies can make big jumps through internationalization and become what he called ‘gazelles.’

International R&D used to be dominated by large companies but now small companies, especially in biosciences and R&D, can internationalize very quickly. It is, however, extremely difficult. These firms need support, said Zwetsloot: “A small boost will help a lot.”

Gazelles are extremely important to economic development. In the U.S. in 2006, the 100 largest gazelles created 90,000 jobs. This kind of growth would not have been possible without internationalization. There are many reasons for this: home markets may be too small; the firm may lack a particular scientific expertise needed to develop its product; they may lack production capacity; domestic production costs may be too high, among others.

Zwetsloot described two aspects of internationalization. One is helping companies expand outward from their home region to become international. The other is attracting international companies to the region. It’s a two-sided process that requires regional and national support, coordination, and many sub-processes.

He shared some success stories, such as Gene Networks International, a science-based micro-multinational with headquarters and business development in Tokyo, R&D in Cambridge, Britain, IP functions in the U.S., and clinical trials in China. Another pharmaceutical company, U.S.-based Centocor, expanded to Leiden to take advantage of the Dutch city’s research capacity, creating 500 jobs in a few years.

The Netherlands has launched a number of initiatives to help SMEs become gazelles. These include subsidies (which must be matched by the company), counselors who help research-driven companies go international, initiatives to attract foreign investment and support exports and establishments abroad, and co-innovation initiatives. The key to co-innovation, noted Zwetsloot, is maximizing the complementarity of two (or more) regions, such as he did in a co-innovation project between Holland and China.

Zwetsloot went on to describe a fledgling regional co-innovation initiative, the TransAtlantic Research and Business Accelerator (TRBA). It involves the Netherlands, Massachusetts, Finland, Silicon Valley, Greater Washington and Atlantic Canada. At a meeting the previous day, in Halifax, representatives from the partner regions sketched out an operating model and short-term targets. “We are creating an intermediary system to connect players and investigate complementarities and opportunities,” he explained. “TRBA will organize matchmaking between companies, disclosure of technologies, and find investors for each other.”

He went on to describe the model in more detail, noting such players as universities, incubators, science parks, regional governments, chambers of commerce, and so on, that would work together to identify the needs and capabilities of their region, then work through TRBA’s networks to forge mutually beneficial links. Partners can interact across

the business development continuum, from research, to business development, production, and marketing.

TRBA set modest, achievable, targets for 2008-09:

- Foreign direct investment; five prospects and two deals per region
- Exchange of researchers; three prospects and two deals per region
- Trade, such as selling of technologies or devices; 20 prospects and two deals per region
- Subsidies; \$500,000 per region

Zwetsloot noted that the partners are such science-based regions with such great universities, he anticipated it would be easy to organize more academic exchanges than the target.

He then challenged the audience to consider how Halifax would maximize the opportunity presented by the next Technopolicy conference, set to take place in Halifax in September 2008. “What are your ambitions and what will you want to share?” he asked, encouraging participants to contact Doug Robertson at ACOA if they wish to be involved. (Earlier in his presentation he mentioned that there may be an award for Canada’s most entrepreneurial scientist, adding another element of great interest to the upcoming Technopolicy conference.)

The Technopolicy conference will host 150 to 200 delegates from around the world, on the theme of ‘expanding your science-based region.’ “Many regions will recognize themselves in this theme,” said Zwetsloot in closing. “I hope you see yourselves in this theme.”

Jeffrey Crelinsten asked Zwetsloot to explain what a university ‘deal’ looks like. Zwetsloot replied that there are two types of deals: a research contract, and successfully attracting a doctoral student or postdoctoral fellow. He noted that Dalhousie University is doing very well in research contracts, close to the University of Waterloo.

Panel 3: Playing to regional strengths

Panelist: Robert James, Director General, Strategy and Development Branch, NRC

Panelist: Lynda Leonard, Senior Vice President, Information Technology Association of Canada

*Panelist: Samuel Leiken, Senior Director of Policy Studies, U.S. Council on Competitiveness

Moderator: Carl Breckenridge, Vice President Research, Dalhousie University

*Unfortunately, Samuel Leiken was unable to attend.

Carl Breckenridge began by commenting how this panel builds on the previous two, along a continuum – from mobilizing regional strengths, to building regional strengths, to playing to those strengths to maximize competitiveness. He shared his perspectives on the Dalhousie experience, noting that, in spite of its success in funding competitions, its progressive IP policies, active tech transfer office, and fair number of spin-offs, they have received little venture capital and only one or two spin-offs have survived. On the positive side, the university has a great opportunity to do more to nurture potential commercial ventures...but “how do we finance them?”

Breckenridge then asked the panel for its insights into what challenges must be overcome to build critical mass... and furthermore, who is responsible for fostering critical mass, and how is critical mass defined?

Rob James: James identified and described three broad challenges:

- Cooperation; nurturing broad-based community partnerships enhances competitiveness. Such partnerships, including clusters, can be proxies for critical mass in smaller regions. He defined critical mass as the ability to absorb risk and expense while building capacity for R&D. Integration is an important sub-theme of cooperation: “No single company or organization can go it alone anymore; the issues are too broad, they are too deep, and they are too complex,” he said. “Any nation that moves that step ahead in integrating their innovation systems will step ahead in the competitiveness game in the long run.” He said the second important sub-theme is around science and technology convergence – and the as-yet-unforeseen opportunities that lie around the corner. How does a nation grapple with S&T convergence? How does the private sector grab onto the riches? How does the public sector foster and enable that? From the NRC standpoint, technology cluster initiatives are the first step in moving toward cooperation. That said, it is a fine balance between fostering cooperation and maintaining healthy competition.
- Leadership; private sector leadership is needed. The track record shows greater success rates among cluster initiatives with private sector champions. Public leadership is also essential. Governments need courage to invest ‘patient capital’ in the 15-to-40-year process of cluster development, and must demonstrate to private partners that they will provide stable support for the long haul. Provincial governments must also become actively engaged; the track record shows greater progress in those communities where the province is most involved.
- Understanding; government agencies/officials must spend the necessary time and effort to truly understand local and regional needs, capabilities and aspirations. “It’s no use for me to show up once a year in Regina with those fateful words, ‘I’m from Ottawa and I’m here to help.’ Unless I’m there eight times a year meeting the people and understanding the issues and pressures, how can I think I can make a contribution?” In spite of the stigma, there is a lot Ottawa can contribute if there’s a shared understanding. “It takes a bit of a leap of faith, but there are many quarters that genuinely want to help,” he said.

Lynda Leonard: Leonard echoed James' sentiments about courageous government leadership, particularly in the age of minority governments, and noted that we have to overcome the challenge of the short horizon of the political landscape.

As a government-relations professional, she's been involved in numerous government consultations on building innovation-driven economic capacity. Many have been 'pro forma' exercises of bringing stakeholders together that have rendered minimal results. In the past two years, however, she has seen more encouraging trends for Ontario's ICT industry – beginning with Premier McGuinty's creation of the Ministry of Innovation and Research, with himself as minister. According to Leonard, he assembled a very effective board representing a broad spectrum of industries, to consult on building innovation-related economic policy.

Ontario's minister of economic development, Sandra Pupatello, followed a similar path in response to economic troubles sparked by the rising Canadian dollar. She first formed a roundtable with the automotive sector, to conduct an inventory and chart a course. Then, she approached the ICT sector in a similar exercise. Leonard noted that Ontario has an impressive inventory of large and successful R&D-driven ICT companies, including IBM, Xerox and Motorola. Minister Pupatello pulled the players together to address vital issues of protecting and expanding on their investment in Ontario. "It seems simple," said Leonard, "but it was one of the most profound discourses I've participated in, in a decade of doing government relations."

These discussions led to the formation of strategies around four key areas:

- Talent; ICT is a talent-driven industry; provincial government controls the levers of the talent pool through its investment in education. They have put 16 recommendations together around talent.
- R&D incentive measures; the group is looking into both tax incentives and direct investments. ICT is investment-heavy and it is becoming more cost-sensitive, she noted. With dollar parity, Canada is no longer inexpensive compared to key centres in the U.S. and elsewhere. How can we continue to compete?
- Adoption of ICT tools across the economy to make the whole economy more productive
- The role of government in procurement.

Leonard feels the Ontario experience could be a model of success for Atlantic Canada. "We need to assess our critical mass, pull our key players together," she said, noting that we do have anchor tenants, such as Irving.

Discussion: Carl Breckenridge carried along the discussion by asking Robert James what criteria NRC considered when looking for places to develop its clusters. James didn't hesitate in his response that "the commitment and interest of the community" is the most important criteria.

James said NRC assessed community interest through a series of roundtables, then embarked on a process he called 'classical technology roadmapping.' This process

allowed the community's entire supply chain to identify the technology platforms critical to their industry's market success five-to-ten years out. More importantly, it enabled the formation of social networks and linkages across the nation. He cited the example of the ocean technology cluster out of St. John's, NF, which forged strong connections and unforeseen deals with Rimouski and the west coast. Highly regarded by government, this ocean technology road map formed the basis of a new federal oceans action plan that saw hundreds of millions of dollars invested in oceans-related industries. The third key benefit of the roadmapping process was the formation of Oceans Advance, a community-led board that addresses issues of strategic direction, marketing of the cluster, and so on. James is now looking at next-generation roadmaps with clusters across the nation and tools to take them to the next step.

Leonard added to James' remarks by pointing out the difference between models that work and those that don't. 'Dog and pony shows' conducted during the previous Liberal government, where academics outnumbered the private sector 10:1, rendered nothing. The S&T strategy seemed to happen almost more by stealth. On the other hand, finding the places where economic policy and capacity building intersect and applying effective public policy levers, can have a major impact. The key is for policymakers to connect and learn directly from innovators and serial entrepreneurs.

Breckenridge observed that regions don't necessarily do a good job bringing the academic community and private sector together. He also noted that there needs to be a balance between investing in the knowledge economy and lower-skill parts of the economy. He asked "How do we bring these communities together with government?"

James pointed to the Alberta example, where they have established the 'Ingenuity Fund' to help the transition from traditional resource industries to knowledge-driven ones.

Leonard noted that Alberta has political stability, whereas other provinces are faced with minority governments and the challenges they pose. However, she said, if governments have something the private sectors wants, "they'll find you." She also remarked that, in ICT at least, the connections between companies and governments will often be bilateral – rather than broader sectoral forums – because ICT is so competitive.

Breckenridge went on to pose a more general question about what kinds of coordination and communication need to be developed.

James responded that the key to cluster development is an assertive community-led board, which takes the time to map out where the community is heading. "It takes a leap of faith to move to cooperation, but I'm convinced by the results that those community-led boards are priority #1 for any community that wants to nurture a cluster."

Leonard backed up this point, commenting that the Kitchener-Waterloo cluster emerged from act of community will in the 1950s, when manufacturers and farmers joined forces to build an advanced technology educational institution. This grassroots move has generated enormous economic impact.

Breckenridge called on the audience for its questions and comments about national approaches to R&D-based economic development.

Jorge Niosi hearkened to an earlier comment from Lynda Leonard regarding India and China. “Today, Canada is a good place to conduct R&D,” he said. “Tomorrow, maybe not.” He said it’s imperative that Canada bolster its university systems and find ways to keep its international biotech companies in Canada.

Leonard added that Canada’s qualitative advantage cannot hold the line, with dollar parity and emerging economies in Asia making Canada one of the world’s most expensive jurisdictions to do R&D. On the positive side, Atlantic Canada is still relatively less expensive than the rest of Canada and should exploit this cost advantage to attract both talent and technology firms to the region.

James emphasized the importance of staying ahead of the knowledge curve to compete with China. But there’s more to it than bolstering universities and generating knowledge. “We have to take advantage of entrepreneurial opportunities and global supply chains... we have to be nimble, quick and decisive.” We must also find ways to ‘de-thicken’ the Canada-U.S. border. He also referenced a commercialization panel which found a low demand for highly qualified personnel in Canada, because SMEs are reluctant to hire people who may not generate an immediate return on investment. We need to find opportunities to keep these people.

An audience member from UNB asked James if large, R&D-intensive firms are such an important part of the ecosystem, what is the strategy to attract or develop them? James noted that, although he can’t speak for Industry Canada, ensuring a safe and fair investment environment is key. NRC, through its clusters, continually tries to help attract ongoing resources – but it’s a challenge.

Leonard interjected that the region is home to numerous world-class companies (Sobeys, Irving, etc.) that must be doing something right. If it’s knowledge generation, could that be mined for capacity? She said the formation of the energy cluster in NB is a potential area where this could happen.

A representative from Deloitte & Touche opened a new topic by asking if there is any coordination among federal agencies – NSERC, ACOA and the SR&ED (Scientific Research & Experimental Development) tax credit program – to leverage regional opportunities. If so, is there a venue that shows this coordination, and are firms’ downstream financial consequences being calculated? James responded that more effective long-term coordination is being negotiated through the federal S&T strategy. This includes ensuring the Business Development Bank of Canada doesn’t ‘throw good money after bad’ or leave companies hanging after helping them launch. NRC’s IRAP is another important funder involved in this process, as is ACOA.

An NRC IRAP participant cited a recent article in *The Economist*, about the emerging economies in Asia, which pointed out that “a new way of mixing technologies is also innovation.” Asian economies have exploited other nation’s discoveries to their advantage; Canada and Atlantic Canada should do the same.

Leonard added another perspective about India. Its success has been private-sector driven, through ‘a tremendous act of will.’ The government got on board long after the train was already steaming ahead.

Rory Frances of PEI Bioalliance reinforced the importance of private-public partnerships: “It’s really up to communities, clusters, and provinces to determine if we want to be in game. National policies are important but the local private sector has to step up or the benefits of national policies will go elsewhere.” He also observed that, although the region has great institutions and tech transfer offices, he’s not sure universities are ‘walking the talk’ of becoming part of the economic engine: “Is the culture of universities changing?”

Breckenridge lauded UNB’s progress, while noting that Dalhousie only began working with industry a few years ago. He says efforts to connect the university to industry must be stepped up, but it’s a challenge. Intermediaries between the parties are needed to help them overcome mutual frustration. At the same time, all R&D can’t be taking place in universities; Canada needs more industry-based research.

Leonard brought up a point that reflects the tension that can exist between industry and universities. Ontario’s strategic road map links investment in academic research to commercial outcomes – a controversial policy that reflects input from the private sector while provoking resistance from universities. Yet, she said, the more we can grow economic activity from universities, the wider the virtuous circles of growth.

UNB’s vice president of research, Greg Kealey, offered some closing remarks that shed a different light on the role – and plight – of universities. “This is all about balance,” he said, acknowledging that while the federal government has done a good job funding university research, “the same government has drastically cut transfer payments that fund the other part of university enterprise.” Provinces have not filled the void and hence Atlantic Canada has the highest tuition fees in Canada and faces a crisis of outmigration of young people. Meanwhile, two provinces are weakening their universities’ abilities to be national players: Newfoundland by establishing a second university, and New Brunswick by eschewing rationalization in favour of supporting seven universities in a province of less than a million people. “If we hope to achieve our aims, we need a vibrant Canadian university system,” he said. “Research cannot flourish if the whole university community is not healthy.”

Panel 4: Bringing it back home

Panelist: Michael Arbow, Capital Markets Specialist, NB Securities Commission

Panelist: David Healey, Executive Director, IRAP-Atlantic and Nunavut Region, NRC

Panelist: Arthur May, President Emeritus, Memorial University of Newfoundland,
Chairman, Atlantic Innovation Fund

Moderator: Doug Robertson, Director, Innovation Policy and Research Projects, ACOA

Doug Robertson opened by thanking his colleagues at ACOA for organizing and promoting the conference, and at the Technopolicy Network for their hard work over the previous two days planning for Canada's first Technopolicy Conference. He also thanked Jeff Crelinsten and the team at Research Money/The Impact Group, for staging these conferences and for their important role in Canada's innovation system.

In reflecting on the day, Roberston commented on the many references to collaboration, and that seeing his colleagues from NRC IRAP, NSERC and other agencies at the conference reflects this broader partnership. Listening and learning, at conferences like this, is fundamental to these agencies' roles. He picked up on Jorge Niosi's remark that, as a small region, "we need to work harder to be innovative and punch above our weight," and noted the sense of urgency. In posing his challenge to the panel, he reversed the conference theme – "Opportunities for Atlantic Canada in Canada's Science and Technology Strategy" – to ask "What are the opportunities for Canada in Atlantic Canada's science and technology strategies?"

Michael Arbow: As a capital market specialist involved in developing equity markets, Arbow had a unique and incisive perspective on the challenges Atlantic Canada must overcome. Most involved habits of thinking he insists must change.

First, people in the region must embrace the reality that "the trend is your friend; you can't buck the trend... the U.S. dollar is getting weaker, we have to live with that..." This same notion of rolling with the trends applies equally to our ideas about intellectual property. "IP is dead," declared Arbow, citing examples such as the Boeing 'Dreamliner,' Firefox, and Wikipedia as thriving concerns with no IP, adding that many companies with no IP have obtained venture capital. Facebook is a prime example. "This fits with the idea that you can't use patents as a metric."

We must abandon 20th-century approaches to solving 21st-century problems. The old adage, 'Knowledge is power,' has been usurped, in Arbow's view, by the new reality, 'Sharing knowledge is power.'

This kind of collaborative thinking is trickling uphill, said Arbow, noting by way of example that the New Brunswick Securities Commission, the First Angel Network and some NS and NB government officials favour an Atlantic Canada-wide small business tax credit system that would allow more interprovincial investing.

Arbow challenged the concept of the ‘purpose-built cluster,’ saying clusters need to be organic, and the idea that immigrants are somehow going to solve our problems. Between them, Nova Scotia and New Brunswick are calling for 35,000 immigrants per year for the next five years: “We’d need the equivalent of two D-Day invasions every year... it’s not going to happen.”

Nor should it. After raping the developing world of its natural resources in the 20th century, should Western nations now rob these nations of their intelligentsia by selectively recruiting their most highly skilled people?

At the same time we want to draw the rest of the world’s up-and-coming young people here, we don’t want our own to leave. Arbow criticized this ‘Hotel California’ mentality as short-sighted: “We have 30,000 Canadians in Silicon Valley... that’s great!” Atlantic Canada should in fact encourage its people to move around the world, to create a global network of intelligence and connections that the region can tap into. The Scots and Israelis are particularly good at maximizing the benefits of their expatriate networks, he noted.

The final myth he aimed to shatter: that size matters: “Brenda Halloran from Waterloo has proven that it doesn’t,” he said. Waterloo is no larger than Saint John or Moncton. The region’s small size, he feels, is more often an excuse. Marketing is the real key.

Arbow sees some encouraging trends. For example, the ‘NetGen’ of young people just hitting the workforce has marketing and collaborative instincts you see in action through globally networked gaming systems and such tools as Facebook. He sees the emergence of tax harmonization and new initiatives to share IP as promising.

David Healey: Healey focused on two key themes: collaboration and the need for long-term government commitment. He cited RIM’s Blackberry, Ocean Nutrition and Diagnostic Chemicals (DCL) as prime examples of ‘patient investing’ by NRC. He personally signed many of the agreements that supported DCL over its 30 years of growth – and 20 years ago, one of his colleagues was ‘called on the carpet’ for supporting RIM founder Mike Lazaridis’ ‘crazy idea.’

It’s essential for people to drill down and really understand what’s happening, Healey said. Research is not well understood by governments or appreciated by the private sector. “There’s a danger of oversimplification,” he said, noting he sees proposals for grand schemes that have been grossly underestimated. People also need to understand what patience means – 20 years or more sometimes – and that investing in companies means investing in constant change.

He picked up on other speakers’ observations that our problems are not unique. Other regions and countries have similar complaints. The key is to collaborate in meaningful ways to overcome common challenges – such as fundamental disconnects between universities and industry. ‘Private sector alliances with universities don’t happen with one visit,’ he remarked. “It takes visiting, again and again.”

Companies must also realize that they can't survive in a market if all they offer is product. They must set up operations and provide employment in those markets if they want to last. Israel is a prime example of a country that excels at forming alliances across the supply chain – they don't produce or sell goods in Israel; they take their ideas and find an international partner who can exploit them.

There is no need for Atlantic Canada to be defensive, he said, but a great need to be assertive. He summed up the day with a statement: “Cooperation starts with an open, inquisitive mind that knows adaptability and trade-offs will move you to the goal – which is constantly changing.”

Doug Robertson commented how refreshing it is to hear senior public officials talk about the importance of patience. At the same time, the political leaders' desire for immediate results poses an ongoing challenge for public servants, particularly in assuring the private sector that they are there to support them for the long-term. The other challenge: knowing how to pick the winners.

Arthur May: May began with an anecdote, recalling the time 20 years earlier when he learned that John Polanyi had won the Nobel Prize for his work in 'Light Amplification by Stimulating Emission of Radiation.' It seemed very esoteric to him at the time – yet those initials spell 'LASER,' now a ubiquitous and transformational technology. The point of his story: “You have to take some things on faith; you can't insist on seeing what comes out at the end of the pipe...”

He then congratulated the organizers on putting together what for him had been a productive day, and summed up his conclusions: “It's been said that Canada has too much geography and not enough history, but in Atlantic Canada, we have too much geography AND too much history.” We have four provinces, two languages, and three (or four) cultures. We do have political and geographic constraints, and lack the critical mass of larger cities, but we have to find a way to succeed regardless.

In terms of creating a climate where innovation and entrepreneurship can flourish, May said the region is in good shape in several ways. We have universities in spades, we have a self-reliant work force, and we have a means of compensating for our lack of critical mass – namely, ACOA and the AIF. “I believe strongly in what ACOA is doing,” he said. “It's a fine piece of public policy. It will take a few years, but we'll see what has happened that wouldn't have, if that program wasn't in place.”

The region needs to realize that innovation is not democratic, and find ways to pick and stick with winners. And, said May, we need to actively promote our lifestyle to new graduates with young families. It's a real advantage we need to maximize. In terms of disadvantages, he cited weak private sector spending on R&D across Canada.

May summed up Atlantic Canada's assets and needs in an acronym: DULSE.

D – Directive, rather than democratic, support for innovation

- U – Universities
- L – Lifestyle
- S – Self-reliance
- E – Easier money; access to investment

Discussion: Robertson called on the audience for comments. A Dalhousie representative commented that it sometimes seems like the region is trying to adapt as if it has the critical mass of a larger centre. “Should we be doing something different?” she asked, and “Can the AIF do it all?”

Art May pointed to ‘Springboard’ as an effective mechanism of compensating for lack of critical mass. By pooling the expertise of many universities, the larger ones help the smaller universities achieve what they could never hope to on their own. We have to set up more networks like this, he said. Robertson agreed that the region must create ‘proxies’ for critical mass: “It’s up to us to capitalize on our strengths and fill the gaps.”

Healey commented that ‘too much has been said about critical mass,’ noting Israel as a small nation that has achieved extraordinary success through multi-national joint ventures. Anchor tenants and R&D capacity are important, but investors are buying an entrepreneur’s credibility, initiative, etc., not their community’s critical mass.

Arbow agreed, quoting again that ‘the trend is your friend.’ “We don’t have the tax base of a Toronto, but that doesn’t mean we can’t have smaller critical masses in specialties. We just have to find our niche and we have to sell it.”

A representative of Petroleum Research Atlantic Canada made note of the absence of the region’s industrial players at the conference. “How do we increase the market pull in the innovation system?” he asked.

Healey responded IRAP works with Irving, for example, and that there are companies out there willing to get involved, “but you have to talk business.” May commented that private companies tend to interact directly with agencies, and that their industry associations are more likely to represent them at a conference like this.

Arbow closed by reiterating the vital importance of marketing. Healey hearkened to John Casey’s earlier remark that ‘no one has cracked the code’: there is so much to learn; people have to get out and talk to each other, to understand and help each other. May’s final comment: “Innovation is 90 per cent good management and 10 per cent black magic; and no one will ever figure that out!”

Robertson closed the panel by noting that people and relationships are at the heart of innovation, and it takes vision, willpower, courage and determination to make a plan and see it through: “Collectively and individually, we can all do a lot better.”

Closing Remarks

Jeffrey Crelinsten, Publisher, Research Money

Ron Freedman, Co-Publisher, Research Money

Crelinsten noted with satisfaction that he felt a significant change had occurred since the last Atlantic Research Money Conference. There was no whining; instead, the tone was positive, reflecting a ‘can-do’ attitude.

“There is leadership in this room, and in your communities,” he said. “And there is no silver bullet... so that means you’re not doing something wrong, you’re doing something right!” Talking to each other is the key, he said, adding that he sees a strong will to collaborate.

After thanking the panel for its wise and thoughtful conclusions, Crelinsten thanked all the partners and supporters, speakers and panelists, and Doug Robertson at ACOA for his help developing the program. He thanked Janet Sandor and Catherine Spence at Research Money for their hard work, and everyone who attended, and who took the microphone to question, comment and challenge.

In closing the conference, Ron Freedman commented that Atlantic Canada will have to become the ‘lemonade capital of Canada’ by taking its negatives and turning them into positives to sell to the world: “I have a feeling you can do it.”

Freedman thanked all of the conference sponsors: ACOA, Nova Scotia Economic Development, Business New Brunswick, Newfoundland and Labrador ‘Innovation, Trade and Rural Development,’ PEI Business Development, NSERC, Pratt & Whitney Canada, and association partners, Information Technology Association of Canada, Atlantic Cancer Research Institute, and BioNova.

He closed by thanking Jeff Crelinsten for his steadfast efforts to make these conference happen year after year, and Mark Henderson, editor of Research Money, for his longstanding and influential reporting and analysis of science and technology developments in Canada.