Panel #1
Implications for key industrial sectors

Moderator: Peter Frise
Scientific Director & CEO, Auto21

Anthony Patterson
President and CEO, Virtual Marine Technology Inc.

Jim Stanish
CFO, Macadamian

William Harney
Executive Director of Research & Development, Magna Exteriors & Interiors

"Nobody does research just for the sake of doing research," Peter Frise began. "Research is always done to solve a problem, and it is important to connect our research capabilities with solving problems."

He added that those problems, such as maintaining Canada's standard of living in the face of international economic competition, have come up repeatedly during the conference. He then asked each of the panelists to offer their own perspective on the "Canadian problem" with respect to innovation.

Patterson emphasized that research is not the same thing as innovation, although research does make up part of innovation. "Until your research is converted into something that someone can buy and use, that you can support, they have not achieved any innovation," he argued. His own company's experience has been that it is an expensive proposition, and one that moves more slowly than you ever expect.

With respect to software production, Stanish suggested that the Canadian problem was a lack of coordination between business, government, and academia. Although his company has benefited from the SR&ED program, there is still a need to improve how firms make their way across the valley of death, so that priority is given to making one's way to market, rather than perfecting one's product beforehand. Moreover, he would like to see partnerships between private and public sector organizations that would overcome the tendency for firms to horde capital during times of uncertainty, a move that inhibits growth and the ability to respond to changes in the market.

Harney offered the very specific point that public support for consumer research was absent, even though the majority of innovative measures originate from customers or employees responding to customer feedback. "If we can't develop meaningful data in terms of what the market actually wants, whether it be in China, India, or the USA, we're really at a disadvantage," he said.

Frise reminded the audience that much of the world regards Canada as a caricature of tourist images rather than a technological player, which raises the point about whether Canadians know how to do business in a way that will overcome such stereotypes.

Stanish insisted that the skills do exist, but there is an ongoing need to engage the right people. Patterson built on this assertion, citing the stiff competition in his field of marine technology; his firm has coped with such competition by embedding itself in manufacturing clusters where it can thrive within an appropriate niche. Harney said that at Magna's scale of output, success is characterized in terms of state-of-the-art manufacturing facilities, ongoing innovation, and identifying changes in markets as efficiently as possible. He credited that last requirement with creating a dependence on a highly skilled workforce, one that is able to operate culturally and linguistically in all parts of the world where Magna operates.

Patterson offered a specific example of innovation, which was initiated by the oil industry's interest in learning how to launch a lifeboat from a sinking offshore platform. The situation was too complex to employ real equipment, so the industry was willing to invest in computer modelling services from Virtual Marine. The company worked closely with Memorial University, which used this private sector support to obtain more funding from the Atlantic Canada Opportunities Agency. As the work proceeded beyond a prototype to a prospective training tool, the system was transferred to the university's Marine Institute so that students could further hone it.. . In 2010, after five years of work, Virtual Marine welcomed national and international regulatory approval that allowed the company to tout the world's first commercial lifeboat simulator.

"Since 2007, we have provided over $1 million in grants to Memorial University," said Patterson. "We have invested over $1 million in ourselves, and the university has been able to assemble an addition $8 million of research funding. This levering off of oil and gas injections, then levering into public sources and venture

sources has been the way we've moved ahead."

Stanish acknowledged the virtue of these public support mechanisms, but insisted that they move too slowly to be of any practical assistance. Nor is it even assured that their efforts to obtain SR&ED credits will qualify for support. He credited design as a key aspect of differentiating software in ways that will enable it to compete internationally, yet public support programs like SR&ED do not necessarily recognize this kind of activity. "One of the things we'd like to see is expanding the definition of what's considered to be a qualifying expenditure," he said.

Harney observed that Magna's size excludes it from many mechanisms of support that are targeted primarily at small and medium-size enterprises. "For us to spend money on R&D, especially when it comes to adding heads who can be involved in the research to create products, is a challenge for us," he said. Programs that can make it possible bring in this outside talent, then, can have a significant impact.

By way of summarizing what the panel members were seeking from organizations dedicated to innovation, Frise listed *speed* of response to capture opportunities when they occur, *flexibility* to tailor activities to the need of your enterprise, *predictability* or *reliability* of support for R&D, and above all, *access to people* on a fast, flexible and reliable basis.

He then asked the panel how their firms select particular products for development. Harney reiterated the importance of customers to such choices, but he also pointed to the substantial links Magna has built with research-intensive organizations, which helps to identify the future promise in areas such as materials science. "We get huge benefit when we do interact deeply with organizations like the NRC," he said, referring to examples such as the Magna-NRC Composites Centre of Excellence, which was established in 2009 at one of the company's R&D facilities north of Toronto.

Stanish said Macadamian is proud of having a 90% repeat customer rate, which solidifies a perception that these customers are more like partners in the company's ongoing activities. Returning to the virtues of outstanding software design, he cautioned that this quality will only offer a temporary advantage, until major players around the world hone their own design skills, at which point a new approach will be demanded.

Similarly, Patterson said his firm operates closely with the oil and gas industry, not simply to find out what it might be able to sell to its customers, but to learn more about any changes in the regulatory and technical environment facing those customers. By bringing an in-depth understanding of that environment to oil and gas producers, Virtual Marine can develop projects that will build on industry needs as well as finding support from government or academia.

Frise re-stated these observations somewhat more bluntly, recalling the euphemism "lack of receptor capacity" for a dearth of customer interest. "If somebody doesn't want to buy your stuff, you don't have a business," he concluded. "You have a way of turning money into knowledge, which is just not the same thing."

He then asked the panel to consider the praise lauded on the quality of Canada science and technology research capacity, and what this means to their businesses in an international context. Patterson said his fiercest competitors come from Norway and the Netherlands, both of which have developed their own extraordinary research capacity to support such competition. In contrast, Brazilian firms have approached Virtual Marine for help, which he takes as an indication of that country's still-developing R&D capabilities.

Stanish did not deny Canada's reputation in science and technology, but he said it has done Macadamian little good because they have seldom found an appropriate mechanism or opportunity for interacting with the

country's various research institutions. "What needs to happen is more of a strategic perspective," he said. "There has to be a commitment on the part of the institution, as well as the company, that they're going to be a partner with respect to a certain technology. Then, when the opportunity presents itself, you can access that."

Harney also acknowledged the high calibre of the country's assets for basic research, but suggested that the field in which Magna operates is one of basic *commercialization*. The competition features companies who have plenty of skilled talent and the full-scale industrial infrastructure they need to succeed, challenges that will not be addressed by better science.

Speaking as someone embedded in an academic setting, Frise elaborated on Harney's point, noting that universities are not industrial entities and are in no way set up to become so. "We create knowledge and we educate people," said Frise. "We're really good at that, and if it can help a company advance their business, then it's a really good thing."

Referring to the conference theme, Frise asked the panelists how they responded to the federal government's latest budget. Harney was generally pleased with some of the budget initiatives, but noted that measures like the Automobile Innovation Fund — designed to provide low-interest loans to support R&D — would not have a major impact while the cost of borrowing commercially remains low.

Stanish was pleased to see SR&ED continue, but added that he remains wary of the tightening definition for this form of support. "It will have an impact in terms of us determining where we will have the ability to do the work," he said. "In fact, what we'd like to see is perhaps a revision of the definition in order to include elements of design in order to create that element of connection with the customer."

Patterson regarded the attention to small and medium-sized businesses as a positive move, although changes to SR&ED credits were of limited interest to them because of the way in which they licence technology in the academic sector. He was more concerned with a prospective phasing-out of early-stage venture financing, which is of direct interest to his company.

Frise noted that even our most ambitious efforts might pale on the international stage, so that a reality-check is necessary before we celebrate our accomplishments. He then asked the panelists if they think Canadians and their government have a sufficient sense of urgency when it comes to facing global competition, and what they would suggest to convey that sense of urgency.

Patterson replied that he saw no sense of urgency, and given how reliant the country has become on resource commodity prices, such a sense is well warranted. He would tell people in government that the country's real priority should be innovation, not simply academic R&D. "Let's keep the momentum forward to couple the universities with the companies," he said. "You forge that relationship, make it solid; you flow the money from the companies into the universities, that will strengthen the relationships." Likewise, he added, many government departments could significantly streamline the processes that make it possible to open up foreign markets.

Stanish agreed at the lack of any sense of urgency, as evidenced by drops in the lines of support for innovation. "There has to be a groundswell from all the stakeholders — the universities and business — to lobby our politicians," he said, adding that government should be made aware of the need for greater public-private partnership in matters of research and innovation. "We need to be able to engage academic institutions to support businesses, to support technologies that are already there, in order to build on that." Moreover, he advocated educational measures that would improve science literacy, in order to address the significant need for skilled people.

Harney noted that the people he works with do in fact have a profound sense of urgency, but he agreed with the other panelists that such a sense is generally lacking in Canada. He also recommended a shift away from commodities toward models such as those adopted by South Korea. “They’ve focused on picking winners and empowering companies through enormous support to be experts at product based on design,” he said.

Further to Harney’s point, the first question from the audience addressed the question of measures that would enable government to focus on growing companies, specifically the medium sized companies that can move into export markets. Patterson suggested that long terms loans would be advantageous, but conceded that the best remedy is private capital. “Governments don’t have enough money to grow all those little companies into big companies,” he said. Stanish reiterated his point about emphasizing education as a way of ensuring that the right people would be available to build these firms. Harney added that it would be worth distinguishing small and medium size companies in any policy deliberation, rather than lumping them together as SMEs.

When asked about how to nurture innovation within a firm, Harney referred to a Dragon’s Den approach that Magna uses to challenge new ideas and see how they hold up to critical scrutiny. A follow-up question asked about key innovation processes, which Stanish described as a response to expressed customer needs. And a related query asked the panelists how much time they spend on innovation issues, which Patterson indicated in his case comes to about half of his working day.

Another audience question asked for a perspective on how public policy can address matters that the market does not. Stanish insisted that government’s priority should rest with facilitating partnerships, in his case with academic institutions. More specifically, if the funding model could be tied to the market potential of the work being done, that would be even more advantageous. And such a tie to market prospects would also avoid the pitfall stated earlier by Jayson Myers, which is that governments should not be investing in areas the private sector consciously avoids.

Harney offered some encouraging words for people working in government, suggesting that they should actually celebrate their most outstanding achievements. “There’s some bureaucrats that are excellent to work with, and some that aren’t so much so,” he said. He also recommended a better coordination between government and business budget cycles, to avoid the ongoing “jet lag” that dogs interactions between these two spheres.

Further to Harney’s point, Patterson summed up the priority as one of time, with governments unsuccessfully attempting to operate at the same rate at businesses.. “Businesses are focused on very short time steps. We have to be very agile, we have to respond. Universities are less so, and a government program can be five to 10 years long. If everyone can stay within their time steps, and the government focuses on enabling certain strategies to be implemented and making sure the funding mechanisms and policy vehicles are in place, that would help the most.”

An audience question asked for specific advice to government employees on how to make their coordination more effective. According to Stanish, the approach should be no different than his firm does in visiting customers to find out how they are doing and what they need.

When asked about the role of intermediary organizations, such as granting councils or accelerators, Stanish noted that his firm does not work with them but would welcome the opportunity to do so. Patterson referred to the difficulty of finding appropriate partners within universities, where the right individuals would have neither the incentive nor the reward for engaging in this kind of work. He suggested that part of the granting council budget be set aside for these kinds of industry collaborations, in order to provide this kind of enticement to academics. Frise qualified this suggestion, noting that the responsibility for such a change did not really lie with

the granting council, but within individual university administrations more concerned with academic stature than economic contributions.

A final question from Yvon Brousseau CEO of C3E, asked the panelists how the innovation strategies of their firms might change throughout the 21st century. Stanish pointed out that being geographically close to customers has emerged as a priority, even if many parts of the operation are conducted more remotely. Harney echoed that point, indicating that much of Magna's operations would necessarily have to migrate to wherever cars are being built, which increasingly is in the developing world. Patterson took it even further, arguing that an international blending of corporate capabilities will become much more typical. This change will have implications for local employment, but it will be the only way to ensure the health of these enterprises. "That's not a failure of the Canadian innovation system, that a Canadian entrepreneur brought a company up that merged with some foreign company," said Patterson. "That's not a mistake, that's not a bad thing. In fact, we have to do that if we're going to attract the capital flow to keep growing the company."

"I would encourage people in government to talk to companies in the various sectors that they have to support, understand what their issues are, and then you'll be amazed once you hear the pains of the various companies how you're able to respond. As we have customers, I'm hoping the philosophy of government is that we the business community are also customers. So the best way to get to know us is to come out and see us." — Jim Stanish, CFO, Macadamian

By way of conclusion, Frise offered an observation that complements Jayson Myers' comments: "Attracting and retaining product development mandates is critical. Canada is going to have a big struggle ahead if all we try to do is be a manufacturing nation. We have to be a product development nation, because that's where the intellectual work is done that can absorb the graduates of our very fine education system."

Crelinsten added that Brousseau's earlier question about evolving innovation strategies raised issues such as business model innovation. He offered the example of a company building a key piece of equipment used by optometrists, which they initially thought of retailing direct for $50,000. "What optometrist could lay down $50,000?" he said. "They changed the business model and gave it to the optometrist for free, who would charge the customer a nominal fee that the company shared. It worked, and they made a lot of money. So that's business model innovation."