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Chair

Mr. David Sweet

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● (1135)

[*English*]

The Chair (Mr. David Sweet (Ancaster—Dundas—Flamborough—Westdale, CPC)): Good morning, ladies and gentlemen. Welcome to the 51st meeting of the Standing Committee on Industry, Science and Technology. We're continuing our study on the state of disruptive technologies in Canada.

Before us we have a very distinguished panel. I'd like to make sure we get their testimony on record before the bells go again for the next vote.

From the Blue Green alliance, we have Jamie Kirkpatrick, program manager. From the Canadian Association of Physicists, we have Robert Fedosejevs, president, and Kristin Poduska, director of science policy. From COM DEV International, we have John Stuart, vice-president, business development. From the Mowat Centre, we have Noah Zon, practice lead, intergovernmental economic and social policy; and from Quantum Valley Investments, we have Mike Lazaridis, co-founder and managing partner, and Cosimo Fiorenza, vice-president and general counsel.

I'll go ahead in the order that I just introduced you.

Mr. Kirkpatrick, you'll begin. Please keep it to the six minutes that the clerk mentioned. That way I can get everybody on record before the bells ring.

Mr. Jamie Kirkpatrick (Program Manager, Blue Green Alliance Canada): Good morning, everyone. Thanks very much for having me.

My name is Jamie Kirkpatrick. I'm the program manager with the Blue Green Alliance Canada. Blue Green is an alliance of some of the country's largest labour unions and most influential environmental and civil society organizations. Our purpose is to advocate for working people and the environment by promoting solutions to environmental issues that have a positive employment and economic impact.

Our alliance formed based on the realization that a sustainable economy must provide good jobs and protect the environment, not one or the other. We've produced reports and research showing how good jobs can be created across the country by making renewable energy, by using energy more efficiently, and by building more public transit to fight traffic.

I'm pleased to be here today to share the disruptive potential of a transition to a green economy through clean technologies. One prominent part of the clean technology sector is renewable power generation. It's experienced solid growth in the past decade globally, despite the global economic crisis and subsequent challenges to many of the world's economies. Worldwide there are now more than 7.7 million people employed in the clean technology industry. This is an 18% increase in the last year.

This growth has occurred despite falling prices of solar PV and wind technology because there has been an accelerated growth of solar PV installation, operation, and maintenance. These are good green jobs that are being added to the global economy through renewable technology and clean technology. These industries are excellent job creators.

In Canada we're seeing some progress on this front as well. According to the “Canadian Clean Technology Industry Report” that was issued just last month, Canada's clean technology industry directly employs more than 50,000 people in more than 800 firms. While these figures are impressive, unfortunately Canada's global market share of environmental goods has steadily declined, shrinking 41% from 2005 to 2013.

We can and must do better for a number of reasons. Renewable power offers a diverse array of green technologies from solar to wind, to geothermal, to run-of-the-river hydro. These zero or near zero carbon-emitting power generation forms all employ skilled workers and greatly reduce the negative impacts on our environment. For Canadians to truly benefit from the disruptive potential of clean technologies, Canadian economic and environmental policies must also be disrupted.

The International Energy Agency says that the global cost of fossil fuel subsidies in 2013 was $550 billion or more than four times that of the incentives provided to renewable energy. In Canada we're in a situation of putting all of our eggs in the oil sands basket and that has a couple negative impacts.

First, it dramatically accelerates Canada's contribution to global climate change. If oil sands production is allowed to expand as forecast by industry and government, in 2020 Alberta's pollution levels, with 11% of the population, will be approaching pollution levels of the three biggest provinces, Ontario, Quebec, and British Columbia, which together have 75% of the population.

Second, the current approach of working to make Canada a fossil fuel energy superpower hinders the real opportunities for renewable power and green technology growth. Canada has at its disposal some of the world's best solar and wind resource potential and we risk missing an opportunity to be a green energy superpower that exports green power and technologies. Solar energy itself is the largest energy resource on earth and it's inexhaustible. Advances in energy storage technologies mean that the potential for solar power is nearly limitless now.

The volatility of oil prices means our national economy is vulnerable if too heavily dependent on the oil and gas sector. One recent study predicted 185,000 jobs could be lost this year due to the fluctuating price of a barrel of oil and a glut of oil on the world's market. It seems like every day unfortunately there are announcements of more job losses in Alberta's oil patch.

We don't see these same issues with renewable power. Despite far less government investment in renewable power it continues to grow. At a time when growth in well-paying jobs is erratic, clean technology continues to outperform other industries.

Blue Green Canada released a report called “More Bang for Our Buck” that found that for every $1 million the government invested in support of the oil and gas sector it would net two direct jobs, while that same $1 million invested in clean technologies and renewable power would net 15 jobs.

Green jobs use many of the skilled labourers currently employed in more traditional fields. This means that with a little effort it's possible to transition workers and their skills into green jobs as we phase out more non-renewable resource-based employment. Investments in green technology not only net more jobs per dollar invested, they also have the added benefit of helping to reduce greenhouse gas emissions.

Clean technology exports are at the same levels as mining, wood, livestock, and processed foods, and these are really important sectors for the economy. Each has a single minister and ministry responsible for their economic stewardship. There is no formal provincial or federal policy for clean and green technologies. To fully capture the benefits of transitioning to a green economy, this should change.

Other important components of the clean technology sector include things like public transit, the growth of hybrid electric and fully electric vehicles, green building designs, smart grids. I could go on, but to respect everyone's time I won't read a laundry list.

I'll just say, in closing, all of these 21st century clean technologies deserve our attention. We do present and future generations of Canadians a disservice if we continue to treat them as boutique industries rather than recognizing them as crucial parts of our economy. Thank you.

The Chair: Thank you very much, Mr. Kirkpatrick.

Now to the Canadian Association of Physicists for six minutes, please.

● (1140)

Mr. Robert Fedosejevs (President, Canadian Association of Physicists): Good morning. I am Bob Fedosejevs and my colleague is Kristin Poduska. We're from the Canadian Association of Physicists. We represent physicists across Canada, both academic and industrial. We're both university professors, just so you know where we're coming from.

What's the nature of disruptive technologies? They're unpredictable far in advance, and then they become somewhat predictable as the research results start to come in. Generally it's the front-line people in the research laboratories who first identify the new technologies that are coming. Some of these, of course, will be totally disruptive and wipe out previous technologies, and some are more additive and add new opportunities to a given field, displacing current ways of doing things.

Time scales are a few decades for them to have a major impact, and then several decades for their lifetime. But I think every technology has a lifetime so we have to be aware that we can't be complacent and just assume that things going on today will continue for eternity. They represent a threat to existing technologies, but they're also an opportunity. I think most of the opportunities for new businesses and new successful enterprises are from initially disruptive technologies.

There are three aspects of strategy to deal with disruptive technology that we would like to highlight. First is that you have to be a leader in developing the technology to begin with, the research development phase, and being aware of what's coming up the pipeline. Second is then to identify these disruptive technologies and have a mechanism to say, “Okay, these are important, these are what we should focus on, and this is how we're going to do it.” Third is the capability to profit from these technologies, implementing strategies that will allow you to take advantage of them and/or mitigate their effect in disrupting current business and technology.

In terms of the first step, we need to maintain a strong program of fundamental research. I think that's critical. One of the major ingredients of that is the discovery grants program of NSERC, which has essentially fallen behind inflation over the last few years and has not kept up with the GDP or the growth of the population of Canada. That's something we need to nurture.

Also, it's broader than that. We should have strong, open research in the National Research Council of Canada, the Canadian Space Agency, government agencies, Canadian Nuclear Laboratories, and also the provincial research agencies that have also been shrinking from their fundamental research aspects. As well, within the government itself—departmental researchers—there should be some open and free research in all of the different departments to be aware of what's coming down the pipeline.

One of the missing aspects, and very important I think, is the industrial research laboratories. I think we've seen a shrinkage in them over the last several decades and that means two things. First, they are less aware themselves of what's coming. But second, they do not have the receptor capacity to even integrate new technology that's coming in because they don't have the people who understand how to do it and what impact it would have on them in the five- to 10-year time scale. To me that's a major part; the industrial acceptor capacity is not something we immediately have an answer for.

Another aspect, of course, in the awareness is training the brightest minds possible. The bright people, the highly qualified personnel we train, are the ones who will identify the new things as they're coming, and also come up with the new things. I think it's always been the case that you want to have a very strong, well-educated, leading-edge scientific community, so that means HQP training.

Next then, you need to be able to identify some of these. I think we need a national office of science, an advisory body to maintain awareness and assess the status of science and technology and new disruptive technologies. It would be good to have a think tank that would meet annually, perhaps, to assess the things that are happening, the new developments, and how we could prioritize a response to them. Essentially, then, they would recommend strategies to try to profit from these new technologies.

One of the strategies in the transition of the new ideas from the research to the industry is coordinated programs like the Networks of Centres of Excellence that we had and still have. I was the scientific director of the photonics network, and it was very effective in linking researchers to SMEs and companies, and transferring technology. Once identified you could set up a centre. You would want to coordinate the activity across the country, so that's why we need the Networks of Centres of Excellence and not just small institutional centres.

● (1145)

Perhaps I can highlight just a few of the disruptive technologies that are coming down the pipeline. I think some of them are familiar. Additive manufacturing—a new buzzword—I think is actually very important. It's using new techniques to manufacture things on demand. Climate change mitigation strategies might mean new ways of feeding animals, with new sources of feed and so on. Fusion energy, nanotechnology, coherent control of chemical reactions, and even things that are very forefront, such as the research going on into dark matter and dark energy, may lead to some new techniques and to results that will impact.

In the end, we recommend that we maintain a strong fundamental base through the NSERC discovery grant program; that we maintain strong HQP training and really strengthen it, as it's slipped by 40% over the last five years; and that we have a scientific advisory body for an awareness of what's coming so that we can prepare for it.

With that, I'll conclude. Thank you.

The Chair: Thank you very much, Mr. Fedosejevs.

We'll now go to you, Mr. Stuart. You have six minutes, please.

Mr. John Stuart (Vice-President, Business Development, COM DEV International Ltd.): Thank you, Mr. Chair. Good morning.

My name is John Stuart, and I'm vice-president of business development for COM DEV International, which is Canada's largest space product manufacturing company. We employ about 1,200 people in seven locations around the world. Our headquarters and main manufacturing facility are in Cambridge, Ontario, but we have a significant capacity here in Ottawa.

We actually dominate certain niche areas in the space technology area. You will find COM DEV equipment flying on most telecommunications satellites. In fact, you've probably heard the term “Intel Inside”. Well, it's “COM DEV on board”. It's a great position to be in for a Canadian company.

We were founded in 1974. We began life in Dorval and moved to Cambridge, not far from colleagues over there, to take advantage of the technology triangle. As is the case for many companies in the high-tech area, our assets walk on two feet and they leave the building every evening, so we need to, if anything, recognize that our strength is in the talent of our Canadian employees. We are constantly able to harness the skills and the energy of graduates from our universities and technical colleges. I just absolutely agree with what was said earlier.

I'm a space cadet, and I am here to press the case for space, if you like. Canada has a proud heritage and history in space, and we're reminded every time we pull out a five-dollar note. There you see the Canadarm, and indeed we were all delighted when Chris Hadfield burst into song on the international space station. These are truly nation-building moments.

But in line with this committee's focus on disruptive technology within the industry portfolio, I want to focus on new space developments and the massive potential for economic benefit to Canada's space industry, which can create wealth, new jobs, and new opportunities from investment in space innovation and space-based technology applications.

I've been part of the Canadian space community for more than 25 years. I'm passionate about my industry and about its future. When I look back—and I ask you to look back—it's absolutely amazing to reflect on how space has become so much a part of our everyday lives. It's so pervasive in fact that we run the danger of taking it for granted. I estimate that some aspect of space touches each and every one of our lives about 30 times a day. For example, from the time we get up in the morning, switch on the news, delivered by satellite probably, and we hear the weather forecast. Where was that generated? We get in our car, switch on the GPS, or not, to see where the traffic is. We go to a bank and we withdraw cash from an ATM using technology delivered by satellite, and so on throughout the day until we go home, turn on the hockey game, and where is that delivered from? My point is that the reliance on space and the demand for space-based activity is everywhere and it's increasing every day.

Today the pace of change is truly remarkable. A few years ago, in some government circles it was argued that satellite communications was a mature market and therefore did not require any intervention or investment from government. There are always going to be conflicting priorities for the use of scarce investment resources and difficult choices have to be made, but sometimes we don't get those choices right.

At a time when Canada reduced its investment in this kind of technology, our competitors in Europe and other G-7 countries were actually increasing it. Even though it was a period of austerity, they were putting money in, recognizing the pace of change that this makes, and recognizing that the market is very dynamic and there is a constant demand for broadband interconnectivity for high-definition TV. I could go on and list a few more things, but I am very pleased to report that the Canadian Space Agency has now recognized the importance of this dynamic sector and is taking steps to confirm the case for space.

● (1150)

I also acknowledge with gratitude that the government and Minister Moore made specific provisions in the recent budget announcement for investments in satellite telecommunications and also technology development in partnership with our European friends and partners. This was a very timely action indeed, as a tremendous opportunity exists.

I could run through the list of applications and the benefits of technology that is in my written testimony, but in the interest of time, I will make the plea that we are faced with a fantastically fast, expanding market. The yield from investment in space is very high. It outperforms the normal industrial yield or even high technology yield in terms of bang for the buck—twenty times return and so on. The industrial space sector in Canada has generated a cumulative revenue of over $2.6 billion. I can only say that this is going to move at a faster and faster pace and we need to keep pace. There is a danger that if we don't continue our investment, we will not only not be able to sustain our capability, we will not be able to grow.

In conclusion, Canada's space industry is poised to play a very significant role in the exciting transformational and innovative future, which I maintain represents a very sound investment for any government. I commend it to this committee.

The Chair: Thank you very much, Mr. Stuart.

By the way, with any constraint you felt you had because of our time limit, please submit your written text and we'll include it in the testimony.

Mr. Zon, you have six minutes, please.

Mr. Noah Zon (Practice Lead, Intergovernmental Economic and Social Policy, Mowat Centre): Thank you very much, Mr. Chair and members of the committee.

My name is Noah Zon. I'm a public policy researcher at the Mowat Centre, which is an independent public policy think tank based at the University of Toronto's School of Public Policy and Governance. One of the issues we work on at the Mowat Centre is looking at how technology creates new public policy challenges as it transforms our economy and our society.

You've heard over the course of this study from some very knowledgeable experts about the development of technology in Canada and about some of the programs we have that support research and development and the growth of technology businesses. My remarks today will focus instead on the role of the broader public policy environment and how we can craft a policy framework that responds to disruptive innovation in a way that makes Canada competitive, allows Canadians to benefit from these innovations, and protects our core public policy priorities.

In doing so, I'd like to focus briefly on three main areas today: how to craft more flexible public policy frameworks; modernizing the social safety net to adapt to technology-driven disruption; and the particular role that the federal government and Industry Canada can play.

Beginning with the need for more flexible and responsive approaches to policy and regulation in response to disruptive innovation, I would just note from a public policy perspective that when we're talking about disruption, it's not the technology per se we're thinking about that brings about a significant change. We're thinking about the way that technology is adopted and applied.

The nature of these disruptive innovations often makes traditional command-and-control approaches to regulation either obsolete or, in some cases, entirely unworkable. We're seeing that this is evident in the way that Uber and other transportation network companies are reshaping the ride-for-hire business. In this case, consumers are voting with their feet and their wallets to choose a system of consumer protection that relies both on technology and on their peers.

Other disruptive innovations also push traditionally regulated activity to a much wider scale that makes command-and-control approaches difficult. Additive manufacturing, or 3-D printing, could make any home a factory of sorts, and changes the way that we look at product safety inspections or even what a workplace looks like. The use of drones for widespread commercial use for delivery or other purposes, both in agriculture and in urban areas, will mean that we will need a different approach to our airspace.

If these new technologies are a bad fit with existing command-and-control approaches to regulation, then how do we think about moving forward? To begin with, our legislatures and our policy-makers can establish a clear set of principles for what we want to achieve, principles that might mention a level playing field for competition, promoting innovation, and managing risks to public safety, for example.

Based on these principles, governments can also look to institute risk-based enforcement and regulations based on performance rather than “one size fits all”. Governments also can design policies to be more flexible, recognizing that it is very difficult to anticipate how technology might change our worlds. One way to do this is to look at instituting either sunset reviews or regular updates for our policy frameworks to make sure that we're not locked into the status quo and falling too far behind the pace of technological change.

Looking at the broader social safety net, if we want to look at the policy implications of disruptive technology, we need to look at the economy more generally, especially the changing nature of work. Most of the core components of our social safety net were designed in the 1960s and in many cases have not evolved to keep pace with our changing worlds. We have fewer people with full-time jobs accompanied by comprehensive benefits, and our policies and programs have left important gaps.

Some of the disruptive innovations that the committee has heard about over the course of this study have the potential to accelerate those trends and bring about other radical changes in our labour market. Though it's too early to measure those effects, the on-demand nature of the sharing economy, for example, counts on people moving from full-time employment to what you might call “flexible entrepreneurship” or “precarious work”. If this is the case, we might need to find other responses to our retirement income security, health and dental insurance, and employment insurance types of needs. Other innovations, such as robotics, autonomous vehicles, or energy innovations, might bring similar or wider-scale changes to our economy.

For us to really prosper as these disruptive innovations take hold, we just need to make sure that we have both a short-term view of the transition assistance that might be needed in industries that have significant dislocation, and a broader look at our social architecture to make sure it's serving people's needs in today's economy.

● (1155)

With this in mind, what are some of the more constructive roles that could be played by Industry Canada and by the federal government more broadly?

One important role is as a convenor and a disseminator of information. While many policy responses to disruptive innovation will need to take place at the provincial and the local level as well, even in those areas the federal government can lead by putting forward principles and helping to convene a pan-Canadian strategy. You would do well to look at the work done by the U.K. government on responses to the sharing economy in this regard.

Industry Canada could put forward a strategic operating framework that sets out what we're hoping to achieve with our policies and that provides a strong understanding for policy-makers across the country of the risks and opportunities. The Competition Bureau in particular can set a proactive tone that welcomes innovation so long as it benefits consumers and is consistent with our broader public policy objectives.

If I could leave the committee with one parting idea, it would be that if we want Canada to be a more competitive and innovative place, then we do need to think as well about our broader public policy environment as an essential component of Canada's competitiveness. In particular, bringing in flexible, transparent regulatory approaches and building a strong and modern social architecture are two important components of the operating environment for innovators in Canada that we can't afford to overlook.

Thank you very much.

The Chair: Thank you very much, Mr. Zon.

You'll note that our bells are ringing, but we have unanimous consent to make sure all of your valuable testimony is recorded.

We'll go to Mr. Lazaridis for six minutes, please.

Mr. Mike Lazaridis (Co-Founder and Managing Partner, Quantum Valley Investments): Mr. Chairman, members, guests, and my esteemed colleagues, thank you very much for giving me this opportunity today.

I know that the buzzword today is “disruptive” technology. I find that word has too many negative connotations, so I'd like to expand the discussion to what I would describe as transformative technologies.

Transformative technologies create jobs, build value, and improve society. I'd like to share a bit of history of one of the most powerful transformative technologies and give you a sense of why we're trying to recreate a modicum of that success by building a quantum industry in Canada for the 21st century.

The discovery of quantum mechanics by theoretical physicists from 1905 to 1927 in Europe, the U.K., and the United States led to our understanding of how the subatomic world works. AT&T founded Bell Labs in New Jersey in 1925 and went on to recruit the best physicists, chemists, and engineers in the United States to exploit this new understanding to provide long-distance telephone service across the United States. Within 22 years, on December 23, 1947, Bell Labs discovered the solid-state amplifier, calling it the transistor. They went on to invent the integrated circuit, laser, and fibre optics—among other transformative technologies—in New Jersey.

Two of the inventors of the transistor left Bell Labs and went to California, because they liked the climate better, and in 1956 they formed the first transistor start-up company, Shockley Semiconductor. It failed, and the employees went on to found Fairchild Semiconductor and Intel, among many others, to build Silicon Valley in California, fuelled by Bell Labs' inventions and researchers, and Silicon Valley's first real innovation: venture capital.

The massive investment in the silicon industry, research, and venture capital in California helped the United States become a 20th-century powerhouse. Canada, however, missed this first quantum revolution, the silicon age. Ironically, Silicon Valley's success was based on a largely classical application of quantum mechanics in the Turing machine paradigm for computation.

In 1981 researchers in France experimentally and reliably proved that the world was entirely quantum mechanical. In 1982, Dr. Richard P. Feynman showed that a classical Turing machine would experience an exponential slowdown when simulating quantum phenomena, while his hypothetical universal quantum simulator would not. Now, Dr. Richard P. Feynman was quoted in his keynote "Simulating Physics with Computers" in 1982, as follows:

> And I'm not happy with all the analyses that go with just the classical theory, because nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical, and by golly it's a wonderful problem, because it doesn't look so easy.

In 1985 physicist David Deutsch took the ideas further and described the universal quantum computer. In 1994 mathematician Peter Shor discovered the first quantum algorithm, an algorithm that runs on a quantum computer, for integer factorization. In 1996 Seth Lloyd showed that a standard quantum computer can be programmed to simulate any local quantum system efficiently. In 2001 Shor's algorithm was demonstrated by a group at IBM who factored 15 into 3 times 5 using an NMR implementation of a quantum computer with seven qubits. The race to build the first scalable general purpose quantum computer was on.

Jonathan P. Dowling, professor and Hearne chair of theoretical physics, and co-director of the Hearne Institute for Theoretical Physics; and Gerard Milburn, director for the Centre of Excellence for Engineered Quantum Systems at the University of Queensland, said, on August 15, 2003:

> ...there is a Second Quantum Revolution coming—which will be responsible for most of the key physical technological advances for the 21st Century.

Canada cannot afford to miss out on the second quantum revolution, one based entirely on quantum mechanical computation, simulation, materials, and instrumentation.

● (1200)

The strategy and investments to make Canada a leader in this second quantum revolution and build a quantum industry in Canada began in 1999 with a successful public-private partnership that continues to this day. It began with the founding in 1999 of the Perimeter Institute for Theoretical Physics in Waterloo, Ontario. Its mission is to make fundamental breakthroughs in our understanding of the universe, thereby laying the foundations for the technologies of the future. Stephen Hawking is quoted as saying that the Perimeter Institute is now one of the world's leading centres in theoretical physics, if not the leading one.

The institute has become the largest theoretical physics institute in the world, with more than 150 scientists in residence, including 44 post-doctoral researchers and 73 Ph.D.s and master's students. Major private sector support includes donations from me and my business partner, Doug Fregin, of more than $200 million. Major public support includes large investments by the Government of Canada and the Province of Ontario.

This was then followed on, in 2001, with the founding of the Institute for Quantum Computing at the University of Waterloo. Its vision is to bring together the world's leading quantum information researchers, harness the power of quantum technologies, and play a fundamental role in the development of the "Quantum Valley", an economic engine for Canada. While maintaining a lead on scientific discoveries, in the coming years IQC will translate fundamental research into devices that will have societal impact.

David Wineland, the 2012 Nobel laureate in physics, is quoted as saying that as far as he can tell, IQC is the single largest centre in the world for quantum information science. The experimental quantum physics institute has nearly 200 researchers in Waterloo, 25 faculty and research assistant professors, 46 post-doctoral fellows, and 126 graduate students. It was made possible by major sector support, including donations from me and Doug Fregin of more than $150 million, and by major public support, including large investments by the Government of Canada and the Province of Ontario.

● (1205)

The Chair: Mr. Lazaridis, I'm sorry, you will have to conclude. I want to be fair. I've given everybody six minutes, and you're substantially over.

Mr. Mike Lazaridis: All right.

In 2013 we founded Quantum Valley Investments and its vision is to complete the analogy. We believe we can establish, in the region of Waterloo, Canada, commercialization infrastructure focused on quantum technologies, and can build on the culture of entrepreneurialism and innovation that already exists in this region with the same kind of success achieved by the pioneers of Silicon Valley.

The second quantum revolution will change how we view matter and energy, materials and computation, and medical diagnostics and medicine, and will enable advances that would be impossible with even the best classical technologies. It holds the potential to create whole new industrial super-cycles on the order of industrial and information revolutions. Canada is not large enough to be a successful late follower. It must leverage these early investments in order to be able to capitalize on the substantial future opportunities.

We are now in year 15 of a 25-year strategy to position Canada as a leader in the second quantum revolution and build a quantum industry in Canada. If we are to maintain this lead and achieve this goal, we will have to continue and to expand our investments in these great Canadian institutions over the next 10 years.

Ultimately, Canada's success will depend on the talents and drive of those researchers, scientists, engineers, and business leaders who will build these institutions and companies. We must strive to make Canada the destination of choice for students, researchers, engineers, technicians, business leaders, and the capital that will help ensure our success.

Thank you.

The Chair: Thank you very much, Mr. Lazaridis.

Thank you very much to all the witnesses. I apologize that this is all the time we have, but I'm very grateful that we have your testimony on record. We'll be getting back to you as well. Please submit any additional notes to the clerk.

Colleagues, we're adjourned for the votes.