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Chair

Mr. Dan Ruimy

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● (0845)

[*English*]

The Chair (Mr. Dan Ruimy (Pitt Meadows—Maple Ridge, Lib.)): Thank you, everybody, for being here today for meeting 61 of the Standing Committee on Industry, Science and Technology.

Pursuant to Standing Order 81(4), we are reviewing the main estimates, 2017-18: votes 1 and 5 under Atlantic Canada Opportunities Agency; votes 1 and 5 under Canadian Northern Economic Development Agency; votes 1, 5, and 10 under Canadian Space Agency; vote 1 under Canadian Tourism Commission; vote 1 under Copyright Board; votes 1, 5, 10, L15, and L20 under Industry; votes 1 and 5 under Western Economic Diversification; votes 1 and 5 under Economic Development Agency of Canada for the Regions of Quebec; votes 1 and 5 under Federal Economic Development Agency for Southern Ontario; votes 1, 5, and 10 under National Research Council of Canada; votes 1 and 5 under Natural Sciences and Engineering Research Council; votes 1 and 5 under Social Sciences and Humanities Research Council; vote 1 under Standards Council of Canada; and vote 1 under Statistics Canada, referred to the committee on Thursday, February 23, 2017.

Today we have the Honourable Kirsty Duncan, Minister of Science along with John Knubley, deputy minister; Kelly Gillis, associate deputy minister; and Lawrence Hanson, assistant deputy minister.

Thank you very much for attending, everybody. I'm going to pass it on to Minister Duncan for opening comments.

Hon. Kirsty Duncan (Minister of Science): Good morning, everyone.

Thank you, Mr. Chair. I'm pleased to be here this morning with our deputy minister, John Knubley; our associate deputy minister, Kelly Gillis; and our assistant deputy minister, Lawrence Hanson.

I'm really pleased to be here this morning as this esteemed committee reviews the main estimates for 2017-18. You will know that this fiscal year the total for our department is up $1.3 billion over last. This is largely due to the investments in research infrastructure that our government made with the post-secondary institutions strategic investment fund. This $2-billion investment demonstrates our priorities when it comes to supporting scientific excellence in this country. When we are investing in such a major way to build and upgrade Canada's research facilities, this is really an investment in the people who make science happen.

This is my consistent refrain in all that I do. It's all about people. It's the lens through which I view all of our support for Canadian science. It's why our approach has been, and will continue to be, to make investments to provide people with the right skills and opportunities to make their greatest possible contributions to Canadian science. For example, through the Canada first research excellence fund, we have devoted a full $900 million to the Canadian researchers who are taking action on grand initiatives like quantum computing, stem cell research, brain science, and so on.

This year's budget is also investing $125 million to maintain and enhance Canada's international reputation for excellence in artificial intelligence. The committee may be familiar with some of the amazing people already doing world-leading work in this field, such as Yoshua Bengio in Montreal, who is a world expert in deep learning and artificial neural networks and Geoffrey Hinton at the University of Toronto, who is doing groundbreaking work in computer science and artificial intelligence.

It's important to remember that all these investments are in addition to the boost we have already provided to our three national granting councils through budget 2016. They now have access to an additional $95 million per year in ongoing permanent funding. This is the highest amount of new annual funding for discovery research in more than a decade. This new unfettered funding supports the efforts of tens of thousands of researchers and trainees at schools and facilities across the country.

That said, we haven't forgotten that more than 20,000 scientists and specialists are engaged in science and technology activities, government science. To help give these world-class professionals the tools they need, we will develop a new federal science infrastructure strategy.

● (0850)

[*Translation*]

We've already kicked things off by providing $80 million to replace the Sidney Centre for Plant Health with a new, world-class research facility.

We're also making investments directly in the work of these federal researchers in all the departments.

[*English*]

On the social science side, we have set aside support for the community and college social innovation fund, which fosters community college partnerships aiming at achieving beneficial social outcomes. Science is helping communities understand and meet the challenges and opportunities around them. This is one of the ways we are making good on our commitment to the multidisciplinary nature of science. I truly believe that we can make so much more of the relationship among the pure sciences, the humanities, and the social sciences.

We do all this because, again, it's all about people. It's about nurturing our domestic talent, even from the very earliest age, and all throughout their schooling and careers. That's why we are investing to teach grade school students to code—the language of tomorrow. We are also providing major support for PromoScience, a highly successful program that encourages young Canadians interested in science, technology, engineering, and mathematics. In addition, we are funding up to 10,000 new work-integrated learning opportunities per year through Mitacs research internships.

As science minister, I want all young Canadians to be able to see themselves taking part in the world of science. As I hope I've shown so far, our government is investing strategically to make the most of today's and tomorrow's homegrown talent, but we also need to make sure that we are attracting the best international researchers to Canada.

[*Translation*]

That's why, in honour of Canada's 150th anniversary, I've announced a new type of research chair to attract top-tier scientists from around the world. We're working on implementing this new chair quickly so that universities can recruit researchers as soon as possible.

[*English*]

Mr. Chair, I'd like to finish this morning by discussing the science review and how it will inform the future of Canadian research and scholarship. As you may know, a broad external review of the federal agencies had not been done since the 1970s. Simply put, it was time.

I am profoundly grateful to all the distinguished panel members, including the chair, Dr. David Naylor, for their service. I am reviewing the panel's recommendations now with a critical eye, through that people lens that I've been talking about. I'm pleased to see that the report talks a lot about talent. It talks about how we can best support students, researchers, professors, and everyone else involved in our research ecosystem.

It particularly highlights diversity and equity as places where we must do better. This rings so true with me. Throughout my own academic career, I have consistently advocated for more diversity in science. Science needs more women and more young people. It needs more indigenous peoples and more Canadians with disabilities. Because, as University of Victoria president Jamie Cassels so eloquently says, “diversity is the foundation of excellence”.

That's exactly why we have instituted new equity requirements in the Canada excellence research chairs competition. Right now, there is only one active female CERC. This is unacceptable. We have to do better. I have told university presidents that I am expecting to see a change.

● (0855)

[*Translation*]

What's more, I'll continue to explore other measures to encourage more diversity and equity in the research community. If Canada wants to achieve its full potential, we need all people to feel welcomed in the lab, the field and the classroom. I can't say it enough. The key word here is people.

[*English*]

The science review also brought into sharp focus the challenges facing early-career researchers and new investigators. Young scientists come with fresh insights and new ways to solve old problems. We have only to think about James Watson, Francis Crick, and Rosalind Franklin. Their ages were 24, 36, and 32, respectively, when their work led to the discovery of the DNA double helix. Think of the science we may be missing out on for want of supporting our early-career researchers.

We hope to announce the appointment of the chief science adviser before the summer recess. He or she will be feeding into this discussion as well.

I am confident that if all partners, public and private, are united in working toward a singular goal, together we will be able to create a research system that is bold, vibrant, and equitable.

Thank you for having me to this committee, and I'm looking forward to receiving your questions.

The Chair: Thank you very much.

We're just going to jump right into questions.

Mr. Arya, you have the first seven minutes.

Mr. Chandra Arya (Nepean, Lib.): Thank you, Mr. Chair.

Thank you all for coming.

Minister, I'm so glad that you're talking about diversity. We had Bill C-25 in this committee, and when that bill was introduced, the government did not show any direction as to what it meant by “diversity”. After deliberation in this committee, the government finally agreed to put into the regulation what it means by “diversity” in the bill. It says that it includes designated groups such as women, indigenous people, visible minorities, people with disabilities, and others.

I noticed in your speech that you talked about diversity. I would like to quote you. You said that science needs more women and more young people, that it needs more indigenous peoples and more differently abled Canadians. I guess it was an oversight that you didn't include visible minorities there in the speech, but that's okay, I know that you mean well.

On the investment in research, I'm so glad that we are back investing in fundamental research. It's very important for us to invest in this because this is what continues to keep Canada at the forefront of the new, global, knowledge-based economy.

One thing I know is that the bulk of the funds that are going to fund research are used very productively by the universities, but anecdotal evidence also states that some of it is going—and I don't know how to put it—to fund deadwood, that it's continuously subsidizing people who are not productive. Is there anything that's measurable? How can you measure the outputs or the deliverables of the huge investments we are making?

Hon. Kirsty Duncan: Thank you, Chandra, for your question. You've raised a number of issues; I'll try to address them all.

Thank you for your commitment to equity and diversity. As you know, our government is the first government to have a gender-balanced cabinet. In this last budget, budget 2017, there is a gender statement.

When I took on this role, I made it very clear that I would make equity, diversity, and science a key priority. I began having discussions with the universities and with the granting agencies. In September we brought back the university and college academic staff survey, the UCASS survey. It had been in place since 1937, but it was cancelled under the previous government. Come this spring, we will have data to know if people are progressing through the ranks at the same rate and whether they're making equal pay.

In October we put in place new equity and diversity requirements for our Canada excellence research chairs. These are among the most prestigious awards in the world. They offer $10 million over seven years. Right now we have only one woman who is a CERC. It's unacceptable.

In October we posted that diversity and equity data on the Social Sciences and Humanities Research Council website. It was the first time. You will know that in the last few weeks we've put in place new requirements regarding the Canada research chairs.

The Canada research chairs have been in place since 2000. They're very prestigious to have. We're saying to the universities that if they have more than five of these research chairs, they're going to have to put in place an equity and diversity plan by the end of the year, that we expect them to meet those targets by 2019, and that if they don't, they won't be having their proposals reviewed.

To come to your point about fundamental science, fundamental science is a key driver of innovation. Our government's priority is economic growth, jobs, and growing the middle class and those working hard to join it. If you want innovation, a key driver of economic growth, you need fundamental science, discovery science, curiosity-based science. It's a continuum through to applied science, innovation, those commercial products and services that we'd like to sell. I want to be clear. It is not an easy continuum. It's actually very messy. Scientists go back and forth seamlessly between fundamental science and applied science.

I'm really proud of the investments our government has made. In budget 2016, we gave the largest top-up in a decade to the three federal granting councils. It was $95 million. That was for 2016-17 and each year going forward.

I won't talk about the fundamental review at this point. It matters. I think it's really important for this committee to understand the world-renowned peer review system we have in this country. When people apply for a grant, the granting councils put together a world-class panel to review each grant application. They're carefully reviewed, and then the results are made public. We have, then, this world-class review system.

● (0900)

Mr. Chandra Arya: Thank you, Minister.

Second, the Ontario Chamber of Commerce released their "Ontario Economic Report 2017" this past February. It's a survey of all its members—small, medium, and large businesses in Ontario.

What they identified as the topmost concern of all members was "acquiring suitable staff". They are finding difficulty in acquiring people qualified to join as their employees. On the other hand, when we were doing the manufacturing study here, the representatives of the universities association mentioned that their graduates were finding it difficult to get jobs.

On the one hand, then, we have the universities stating that their candidates are finding it difficult to get jobs, and on the other hand we have the businesses saying that they cannot get suitable staff. How can we use our funding power to make sure the universities align with, so that they can meet the requirements of, industry and businesses?

The Chair: You have about 10 seconds to respond to that question.

Hon. Kirsty Duncan: Thank you, Chandra, for your question. I'll be as brief as I can.

One of the investments we've made in budget 2017 is for Mitacs. We are funding $221 million for 10,000 work-integrated learning spaces for our students. We want them to have that real-world experience.

The Chair: Thank you very much.

Mr. Dreeshen, you have seven minutes.

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you very much.

Thank you, Madam Minister, for being here this morning, and to all of your folks from the department.

I've just come from a meeting where our interim leader, Rona Ambrose, spoke to the Economic Club of Canada. When we talk about great women in leadership roles, I think of her. I think of Deborah Grey and Kim Campbell. These are people who won their jobs because of the great skills they had.

I remember going into Central America where I talked about how to get women engaged and involved in politics. At that time, 80% of Canadians had a female premier. There are great opportunities for people to work and use the skills they have, and they need to have chances from everybody. Sometimes that comes via political parties, to make sure that you elect strong people who are there to be able to take on these positions.

I say that to tie into the discussions you have when you've said to universities that if they don't meet quotas or diversity targets, something is going to be done. Of course, what we've heard is that there will be a withdrawal of funding, and so on.

I'd like you to tell us what that actually means. How will you roll out that policy? Is it something that your government will be legislating, or will it be departmental policy at the tri-agency institutional programs secretariat? How will you be withholding funding for those institutions that don't meet the targets that you've looked at?

The other aspect of it is, are we going to be seeing decisions about research funding no longer in the hands of the experts who review and evaluate the science but rather in the hands of politicians, consultants, or bureaucrats with little experience in advanced research? What happens to the tri-agency institutional programs secretariat?

● (0905)

Hon. Kirsty Duncan: Earl, thank you for your question.

Let me be clear. Equality and excellence go hand in hand. I've gone across this country and the women I meet with are outstanding researchers. I think of people such as Victoria Kaspi, who won the Herzberg medal, which is, as you know, NSERC's highest prize, just the other year. I think of Molly Shoichet who just won a Killam Prize. There are excellent women researchers.

Our priority is always excellence. That means the proposals are reviewed. I've talked about our world-class review process. However, we have not seen the increase in women and other under-represented groups in the sciences that we should have. We know when we bring all minds to the table, to the lab, to the field, it is good for research; it is good for Canadians.

I will give specific examples of what happens when women and diverse groups are not included. I'll start with the example of heart valves. The first heart valves were created by cardiologists who happened largely to be men, and they made heart valves that fit a male-sized heart and not a woman-sized heart. The first voice recognition software was calibrated only to men's voices. The third example I'll give is air bags. The first air bags in cars were created by engineers who largely happened to be male. They made air bag prototypes that fit a male-sized body. When those cars went onto the road, women and children were injured, or worse.

We need to make sure that everybody is included, that they come with different perspectives and ideas. They might use different methodologies, they might ask different questions, and we might get different results that benefit all Canadians.

I hope everyone is attending Science Odyssey events. We have 600 of them across the country right now. I know you were there yesterday, and Kate, and I thank you for coming.

It's really important that we encourage young people to enter science, particularly women.

Mr. Earl Dreeshen: These are great examples, Madam Minister. However, the question is what the government is going to do when it comes to making decisions about those particular chairs. I understand why it's important. Don't get me wrong. I understand and recognize that. However, the statement was made that the universities are going to have to conform. They are going to have to explain the rationale and everything else, and then decisions will be made.

My question is on the decision-making process and where that is going to go.

● (0910)

Hon. Kirsty Duncan: I want to be clear. These were targets that the universities voluntarily agreed to, back in 2006. These targets were based on discussions, but also on statistics around population. The universities committed to these targets. It is now 2017, and those targets have not been met.

I am saying that we are going to put in place a policy to ensure that they have equity and diversity plans in place and show us how they are actually going to make the targets they voluntarily agreed to. It is always based on excellence, but if they come forward with chairs who are not meeting the numbers, there is the possibility that funding will be withheld until they bring forward new options that are more reflective of the targets they have voluntarily agreed to.

Mr. Earl Dreeshen: I have only a few seconds left.

There have been cuts to both the National Research Council of Canada and the centres of excellence for commercialization and research program. My tax dollars have been moved from certain areas. I'll just pick one, because that may be all I have time for.

Why are you cutting $1.7 million for the centres of excellence for commercialization and research program?

Hon. Kirsty Duncan: I will have our assistant deputy answer that.

Mr. Lawrence Hanson (Assistant Deputy Minister, Science and Innovation, Department of Industry): It's just a product of the competition cycle for the CECRs themselves. They are for a limited number of years. As new competitions are launched, new investments are made. We are expecting to launch a new competition under the CECRs shortly, but it's really an issue of cash flow and competition timing.

The Chair: Thank you very much.

We're going to move on to Mr. Masse. You have seven minutes.

Mr. Brian Masse (Windsor West, NDP): Thank you, Mr. Chair.

Thank you, Madam Minister, for being here.

I do actually appreciate the movement that's taking place at the universities and colleges, because they are also an addition to the overall society problem that we have with the inclusion of diversity. My background is as an employment specialist on behalf of persons with disabilities and youth at risk, and I can tell you that.... A clear example is that women still do not receive the same pay for the same jobs.

It is important that this movement is happening. The unfortunate thing—and I like your commentary about this—is the fact that the legislation that is being proposed by your government under Bill C-25, the reform to the Canada Business Corporations Act, does not do the same thing. You are moving to a comply or explain model for diversity, and the legislation doesn't even mention the word “gender”.

I would like to get your thoughts on how this is really at odds with what's taking place with regard to legislation in the House of Commons. It is clear that the voluntary commitment by public institutions that have a board of directors who are assigned by the public has required this type of step to change the behaviour with regard to inclusion, especially given the populations, diversities, and gender balance that they represent, their customers being students.

Second, why isn't it carried forth in terms of legislation to the Canada Business Corporations Act and Bill C-25? I had several amendments that were defeated at this committee.

Hon. Kirsty Duncan: Brian, thank you for your question.

We know that when boards are more diverse, companies do better. It is the same for science. We want people who come with different perspectives and different ideas. We want people asking different questions to come forward.

I have spent 25 years of my life fighting for more equity and diversity in science. Yesterday, I was at Science Odyssey. I met two incredible women who have reached the level of full professor in engineering. They are saying, as we are hearing from across the country, “Thank you for standing up for the Canada research chairs”. It has been 11 years, and those voluntary targets haven't been made. They are grateful for the changes that they see coming, and that the universities will be held to account.

Mr. Brian Masse: I appreciate that, but your government legislation is not doing the same thing. It's at odds with itself, with this committee, and with the voting in the House of Commons on Bill C-25, so I'd ask you to consider that as that draft legislation works its way through.

The other one to review as a scientist and working so well within our academic communities is Bill C-36. I won't touch on too much of it, but at this point I would appeal for a review of it. It's amazing, Madam Minister, that despite the testimony of Munir Sheikh and Wayne Smith, and other testimony that we had on this committee, not a single amendment was able to pass through this committee with regard to the inclusion of their contributions.

In fact, several witnesses who have high profiles and respect in academia, not only at home here but internationally, and were also the former census operators, both resigning over differences of opinion in the scientific approach to the census going from long form to short form and so forth and also provisions. Not a single word of their testimony, or of any of the witnesses, will be included in the legislation that's been proposed to go back to the House of Commons at this time.

I would like to move though, Madam Minister, to the review panel and the expectations for it. I think that was an excellent approach. In the 1970s we didn't even have the concept of a mobile phone. I think the first time I saw a mobile phone was in a movie with Mel Gibson. The phone weighed about 10 pounds and looked like a World War II phone.

At any rate, can you give us an indication of when we might hear back about that, and what type of movement and resources the government has committed toward that?

● (0915)

Hon. Kirsty Duncan: Thank you, Brian.

I'll talk a bit about the fundamental review. Since the 1970s there has not been a comprehensive review of the funding ecosystem. Can you imagine any other system that has been allowed to go 40 years without being reviewed? Therefore, I was very committed to doing this.

We had this incredible blue ribbon panel chaired by Dr. David Naylor, the former president of the University of Toronto. It included people like Dr. Art McDonald, our newest Nobel Prize winner; Dr. Martha Piper, the former president of UBC; Mike Lazaridis of BlackBerry; and the chief scientist of Quebec, Rémi Quirion.

I want to begin by saying thank you to them. They have worked tirelessly for their commitment, for their insights that will improve the ecosystem here in Canada. As well, I want to thank all the individual researchers, the research organizations, and the universities and other academic institutions that contributed to that review. I was pleased to receive the response on April 10. I was very clear that this report would not be buried. It was released at the Public Policy Forum so that we could begin a national discussion about how we fund federal support for fundamental science.

There are 35 recommendations. They talk about the need for additional funds for investigator-led research. There were also issues of governance and coordination, the need for more equity and diversity, the need to support early-career researchers, and the need to make the system more nimble and responsive. For example, if Zika or Ebola hit, money would be available that we could get out to the research community quickly and also support multidisciplinary research.

We have big challenges, whether it's climate change or antimicrobial resistance. We need to bring different disciplines to the table and to support risky research. Those are some of the recommendations from the report.

The Chair: Thank you very much.

Mr. Longfield, you have seven minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Mr. Chair.

Thank you, Madam Minister, and the support people for being here today.

Getting back to the estimates, it looks as if there's an increased focus on the Natural Sciences and Engineering Research Council with $86.8 million of planned spending.

Madam Minister, you talked about the need for fundamental research in a previous conversation we had when you were down in Washington. You were talking about the separation between fundamental research and innovation, and how innovation can come from fundamental research, but there is really no guarantee; that's why it's fundamental research.

Could you comment on the need for catching up on NSERC funding, where we are, and where we need to be to regain our ground there?

● (0920)

Hon. Kirsty Duncan: Thank you, Lloyd. You've brought in a number of pieces here. You started with the National Research Council, so I'll address that first.

National Research Council has a proud 100-year history in this country, and we want to make sure it succeeds going forward. You will know that we have a new president, Mr. Iain Stewart. He comes with a tremendous background of both academic and government work in science, technology, innovation, and economic development.

When he came on board, my colleague Minister Bains and I sat down with him. I said that there needed to be a lot of listening, and he has had hundreds of conversations with employees of the NRC. In the spring we'll come forward with ideas of how we can strengthen the NRC.

I've been clear that I don't want it to be a political football any longer. We want to make sure that its industrial research assistance program, IRAP, which has 250 advisers across the country, provides help to small businesses—last year, it was 2,500 businesses, and helped support 11,000 jobs—continues, and is strong.

I'd also like to see fundamental research strengthened, because that's where the innovation will come going forward.

You've also talked about needing to support fundamental science. That's part of my research mandate, so we have put in place the top-up of $95 million to the granting councils. That is unfettered money, representing a real change from the previous government that tied money. If you look at the Social Sciences and Humanities Research Council, in 2005 there was no tied money. In 2006, 9% was tied, and before budget 2016, that was 37%. So this is unfettered money.

Mr. Lloyd Longfield: Thank you.

Within the Social Sciences and Humanities Research funding, I notice something that Mr. Dreeshen also brought up, in terms of the reduction in centres of excellence for commercialization in research.

I spoke yesterday with Universities Canada and they mentioned some concerns around the intellectual property mobilization program that was cancelled in 2009. We have brought it back, but there are some reductions in funding around intellectual property mobilization. This committee is just about to start an IP study, and I think a key part of that study is going to be technology transfer. I'm concerned that we may be heading in one direction and the government may be heading in the other direction in terms of technology transfer and funding of technology transfer.

Is there anything there that I'm misreading into it, or where are we in terms of a focus on technology transfer?

Hon. Kirsty Duncan: Thank you, Lloyd, for your work in this area.

I actually would like to thank all of the committee for being down in Washington, D.C., two weeks ago. Thank you for being there to recognize and celebrate Dr. Art McDonald, and thank you for the important meetings you had down there.

I'm going to use artificial intelligence as a way to highlight the shift from fundamental research through to applied and on to commercialization. Canada really is a world leader when it comes to artificial intelligence. I think of people like Geoffrey Hinton and Yoshua Bengio, and we have these incredible areas from Toronto to Waterloo, the hub in Montreal, and out in Edmonton. Our talent and our ideas are in high demand around the world. We want to make sure that the activity stays here in Canada.

In this budget 2017, we're investing $125 million in artificial intelligence to create a pan-Canadian artificial intelligence strategy, and we know that with these research hubs—and, Frank, I think of you in Montreal. Montreal has the Canada first research excellence fund, and part of that funding went to artificial intelligence in Montreal.

I will just remind the committee that we had a $900-million investment in artificial intelligence in September. The idea is that if we create these research hubs, we know that companies will be attracted. We also know there will be applied research and that we will get commercialization.

● (0925)

Mr. Lloyd Longfield: Thank you.

Mr. Knubley, did you have something to add?

Mr. John Knubley (Deputy Minister, Department of Industry): Yes. I would just add that very consistent with Minister Duncan's example of artificial intelligence, broadly speaking, in the innovation agenda, we are looking at a number of points of interest, if you like, with respect to tech transfer.

Another concrete example would be the initiatives related to our incubators. We have funded incubators over the last few years. Basically, these are entities that are specifically designed to help take the excellent science, which Minister Duncan is focused on and talking about, to the marketplace. The Honourable Navdeep Bains will also want to speak more broadly about intellectual property and the issues at play there, and how we need to move forward, from the innovation agenda perspective, to really promote a strong intellectual property regime in Canada to make sure that tech transfer happens.

Mr. Lloyd Longfield: Thank you, and thanks for your support for agriculture. I just had to sneak that in.

Hon. Kirsty Duncan: I just wanted to add to that actually, and I'll be really quick.

Lloyd thank you for being such a champion in this area. As you know, $70 million was invested in budget 2017 in agricultural research. When we were down in Washington, the National Science Foundation told us that the areas it wanted to come up to Canada to see in terms of our research were related to research in neuroscience, quantum, and Arctic, but also in biodiversity at the University of Guelph and the bar-coding that's done there.

Mr. Lloyd Longfield: Thank you.

The Chair: Thank you very much.

Mr. Lobb, you have seven minutes.

Mr. Ben Lobb (Huron—Bruce, CPC): Thanks very much, Minister, for coming here today.

I want to go back to touch briefly on the diversity you set out for universities. Again, I know there have been a couple of other members that have talked about this.

In the regulations, again, Mr. Masse and I fought really hard to get it actually into the bill. We weren't able to do so, but in the regulations, it's basically just comply or explain. There's no target set.

When you and Minister Bains are sitting around the table having discussions, does that come up where in one piece we're talking about the makeup of our corporate boards having a much weaker and lesser standard than the chairs at these universities? Does that come up? Why would the department come at it from one direction on one, then another direction on the other? Why wouldn't it be the same?

Hon. Kirsty Duncan: I will speak a bit, and then I will turn it over our deputy minister, John Knubley. I really want to bring home that we're taking a very different approach on science than the previous government.

The previous government—

Mr. Ben Lobb: Sorry, I don't want to get into the before or after. It's 2017 now. Your colleague, Minister Bains, brought a bill forward that had one set, and yours had a different. We don't need to talk about Stephen Harper. We're talking about you two. Why would one have one, and the other have a different one?

Hon. Kirsty Duncan: Ben, I am going to do two sentences before I hand it to my deputy minister. We are taking a very different approach than the previous government.

The previous government cut scientists, muzzled scientists, scientific evidence—

Mr. Ben Lobb: If that's the approach you're going to take Minister, then don't.

Mr. John Knubley: I would like to talk about Bill C-25. I know the Honourable Navdeep Bains will have another opportunity on Thursday to speak to that.

In that context, the bill does identify a name and comply approach. Similarly, with respect to the CRC program, we're proposing that all institutions with five or more chairs—these are specifically the medium and large universities—must table a plan. It's not enough to do targets; they must also table a plan to reach the targets.

As Minister Duncan was mentioning, the challenge, when you look at the targets they set of their own will, is that they have not been meeting those targets. What we're asking them to do is, again, name and identify what it is they are doing.

● (0930)

Mr. Ben Lobb: Fair enough. All I was trying to get at was how can two people in the same department have two different approaches on what you're trying to achieve, which is kind of the same thing. I'll leave it at that and move to a different topic now.

Within the lobbying registry with whom the minister has met with, Minister Duncan has met with almost all who one can say are reasonable, they're universities, etc.

The one that I would question though or try to understand, and maybe you can't comment on it, is how is it that the Minister of Science meets with the Woodbine Entertainment Group? Basically, it's a casino and horse racing track. What relevance is there to that? Is that a constituent of yours? How does that happen?

Hon. Kirsty Duncan: Thank you.

Yes, Woodbine Racetrack is a constituent in my riding. They come to see me in my riding office.

Mr. Ben Lobb: That makes a lot of sense, then.

Another question I have for you is on the opioid crisis. There will be some research and there has been some research, but what else is there we can do? This goes back to when we did studies on this when I was the chair of the health committee.

Are chair positions going to be appointed from coast to coast, to try to understand the issues with the opioid crisis—and the other fallout from it—from an urban perspective, a small urban perspective, or a rural perspective? I come from a rural area. We have the same issues. They have different roots, perhaps, but what are we looking at here for funding to research this issue?

Hon. Kirsty Duncan: Ben, thank you for the question and for highlighting this very sad tragedy in our country. I just want to begin by saying that my heart goes out to all those who are affected, their families, and their friends.

This issue—as you know—would fall under the Minister of Health. The Canadian Institutes of Health Research falls under her jurisdiction. The Minister of Health and I work very closely across research, but this specific example comes under her jurisdiction.

Mr. Ben Lobb: I have one more—

The Chair: Your time has run out.

We're going to move to Mr. Sheehan. You have five minutes, please.

Mr. Terry Sheehan (Sault Ste. Marie, Lib.): Thank you very much, Minister. I appreciated the presentation, and congratulations on the launch of Science Odyssey.

There are a couple of things happening in the Soo, including Entomica, which is a little business set up by a scientist working for Natural Resources Canada. It's just a side business that he runs, which employs a lot of young people. It's all about bugs, and it's really exciting.

A couple of weeks ago he was part of the science week they hold in Sault Ste. Marie. Your friend and mine, Dr. Roberta Bondar—Canada's first woman in space and the first neurologist in space—was there speaking. I was pleased that they had these young elementary students with Entomica at a senior citizens' home, and they were teaching the seniors science. Also, I was pleased to see that it was about 65% young ladies, so we're starting to see some changes since Dr. Roberta Bondar came on the scene.

On that topic and about education, in your presentation—in the estimates—you noted that $1.3 billion is going to be spent on SIF for post-secondary institutions. I know in the Soo that Algoma University, Sault College, and the Anishinabek discovery centre received some funding, and I understand on a local level the significance that it's having. Could you tell this committee—on the macro Canadian scene—what the $1.3 billion is doing for this country?

● (0935)

Hon. Kirsty Duncan: Thank you, Terry, and thank you always for your strong support of science. I think this committee would want to recognize that it's the 25th anniversary of Dr. Bondar's first space mission.

Dr. Roberta Bondar always talks about creating a culture of curiosity. This is what we want to do in this country. All children are born curious. They want to discover and explore. We want to foster that through elementary school, high school, and beyond. Of course, we're happy to do that, whether it's our investment in PromoScience of $10.8 million in this last budget, whether it's Science Odyssey's 600 events happening across the country, or whether it's $50 million to teach grade school children to code.

The last area you hit on was the SIF. As you know, in budget 2016 we made a $2-billion investment in research and innovation infrastructure across the country. Much of our infrastructure was 25 years of age. This is good for our students. We want them to have the most up-to-date labs and tools. They are going to be the ones out in the workforce in the jobs of the future. The $2 billion could be matched by the provinces, the territories, and other organizations. We're really pleased. We've announced 300 projects. Whether it's Holland College in Prince Edward Island, Centennial College in Toronto, or SAIT out west, this will make a real difference to our country.

With that, I will just highlight that in budget 2017 we're also looking at federal science infrastructure. My job is to work across government to bring together the science-based departments. In budget 2017 we've announced that we will work to create a science infrastructure strategy for the federal government, so that they have the best labs and tools.

Mr. Terry Sheehan: Excellent.

I noted in the estimates that the Natural Sciences and Engineering Research Council of Canada is seeking $101.8 million in grants under the Canada first research excellence fund. That's $70 million more than in the 2016-17 estimates.

This funding is a joint initiative of the three research granting agencies. How will this funding be distributed between basic and applied research? Perhaps you could talk as well about how this particular group makes it easier for the private sector to collaborate with academia and private business.

Hon. Kirsty Duncan: I'll just start by reminding this esteemed committee that in budget 2017 we have the superclusters. It will be $900 million-plus that will go to areas such as agriculture, agrifood, advanced manufacturing, clean tech, and clean energy.

The Canada first research excellence fund invests in research across the country. Last September we made an investment of $900 million in areas such as neuroscience, agriculture and agrifood, and quantum computing. These are really areas where Canada has tremendous strengths and can lead.

As I said, I was at the National Science Foundation. They want to partner with Canada. They want to see our good Arctic research, quantum research, neuroscience research, and—again, I'll highlight—biodiversity research.

Lawrence, would you like to talk a bit about CFREF?

The Chair: Please respond very briefly.

Mr. Lawrence Hanson: I'll be very brief.

In terms of your question about basic versus applied research, the CFREF was directed more toward the end of funding basic research, but it was very much focused on areas where the institution had significant, demonstrated capacity, areas that could be ultimately demonstrated to be of significant economic benefit to Canada and had a strong plan for implementation. Again, although it was more toward the basic research end of the spectrum, it was very much designed to be able to lever areas of expertise and create future economic benefit.

The Chair: Thank you very much.

We're going to move to Mr. Dreeshen.

You have five minutes.

Mr. Earl Dreeshen: Thank you very much.

Just to come back a bit, you mentioned the $70 million that is there as far as added research is concerned. As I mentioned in my last question, we have $59.6 million that is from the National Research Council of Canada's numbers. Mitacs is down $7 million, and there is a cut of $1.7 million to the centres of excellence for commercialization and research program. You start to get into real money there as well, things that are in the main estimates and get moved around.

As someone who has a base in agriculture, I'm extremely happy to see the research dollars that are there. I disagree vehemently with the suggestion that those kinds of dollars and that kind of research and the research clusters were not there in the previous government. I think it's unfair to make those types of statements, in so many ways.

In your presentation, you talked about joining with the Minister of Agriculture and Agri-Food at the Central Experimental Farm to announce $70 million to support agricultural discovery science and innovation in the country. Included in that then, we need to have some real discussions on agriculture about things like GMOs. Health Canada has to be taking a look at things like gluten-free diets, whereas 0.7% of the population has a problem with gluten, yet there is a fad such that 2% to 3% of people believe that they should be taking on these kinds of diets. Therefore, you have 1.3% to 2.3% of the population that is not benefiting from gluten.

Take a look at some of the science and some of the decisions that have been made regarding neonicotinoids. These are the kinds of things that make me a little bit concerned when I hear people talk about agricultural discovery science who don't live out there on the farms, on the ground, or see exactly what this does.

Yes, it's important, but where are the researchers? Are there researchers out there in western Canada who can take a look and actually talk about what neonicotinoids do and why it is that the guys who have bees want to make sure that their bees aren't out there where the canola is that is treated with that substance? There are reasons there, but we get caught up in a bunch of rhetoric that comes from people who just don't want to have a dandelion sprayed on their lawn in downtown Toronto.

Those are the concerns that I have. I really want us to make sure that when we talk about agricultural discovery science, it goes back to agriculture and the people who really recognize what is there. I see too much of, “Here's this fad. Here's that fad. Let's talk about this. Let's satisfy some other group,” whether it be in Europe, the U.S., or China. In reality, all that is happening is they're using these for trade irritants and causing problems there.

How can we be assured that our scientists are going to pay attention to the real part of science instead of getting caught up in this social science aspect of things?

● (0940)

Hon. Kirsty Duncan: Thank you, Earl, for your question. You've highlighted a number of areas, so I will try to address them all.

Regarding the National Research Council, we're actually making an investment of $60 million in budget 2017 into the NRC, so that is an investment. On Mitacs we are making an investment of $221 million to the NRC. That will be for 10,000 work-integrated learning spaces. You've asked about social sciences, and then I'll come to agriculture.

Social sciences and humanities are incredibly important areas. When we talk about science, we include the natural sciences and engineering. We include the physical sciences and health sciences. We also include the social sciences and humanities, and the reason is that they help us understand who we are and how we relate to one another.

Now I'll come to agriculture—

Mr. Earl Dreeshen: I'll just quickly interrupt before you get to there, and there will be time.

I've said this so many times. It is the difference, though, between physical science and political science. The moment that a physical scientist will not say there is zero chance for something to happen, that's when the political scientists jump in and say, “Okay, great, that means you can't guarantee this” and that's what creates this situation where people go after agriculture. They go after people on the ground. It's happened in oil and gas, and it's happening in agriculture right now. If we don't pay attention to it and if we're not ahead of the game, we're going to have trouble. Going back to agriculture, then, please inform me.

Hon. Kirsty Duncan: I will remind this committee that we have a world-class peer review system in this country. The grant applications come forward, we fund the very best research, and we strongly support the social sciences and humanities.

On agriculture, I come back to this investment we made through the Canada first research excellence fund, the $900-million investment last September, and part of that investment was out in Saskatchewan for agriculture and agrifood.

I'll let my deputy minister finish.

● (0945)

Mr. John Knubley: The honourable member and the chair will know that I am the former deputy minister of agriculture. I would like to indicate that, in doing the innovation agenda, I think we see a huge opportunity in terms of the agriculture sector. I think we are well aware of the high level of science that is in Canada in the agriculture sector. It really seems to be world leading. As the honourable member points out, we really want to take full advantage of it.

Just to the innovation agenda in particular, we've been asked to set up six sectoral tables, one of which is in agriculture and agrifood. Dominic Barton, in terms of the advisory council on economic growth, has put a great deal of emphasis on agriculture and the opportunities we really have in Canada to take fuller advantage of those markets that are growing in Asia and elsewhere in the world.

I'm looking forward to working with all of you towards improving the success of agriculture on the science side as well as on the commercialization side.

The Chair: Thank you very much.

We're going to move to Mr. Baylis.

You have five minutes.

[*Translation*]

Mr. Frank Baylis (Pierrefonds—Dollard, Lib.): Thank you, Mr. Chair.

Hello, Minister Duncan. Thank you for being here today.

[*English*]

My first question was going to touch on the excellent work that the University of Montreal is doing on AI, but I think you've answered that very well. I'll just point out that I think it's fantastic that we're making a strong investment there.

During one of the rounds of consultations we did in the pre-budget, I had a gentleman come to me and he was very adamant. “I'm in the high tech business“, he said, “and if you can give one message, teach kids to code.” He was very strong on that. I was very happy to see we had some money put aside in the budget. Can you elaborate on the amount of money and how you see that playing out?

Hon. Kirsty Duncan: Thank you, Frank.

We really do want to create that culture of curiosity that Dr. Roberta Bondar talks about. That means investing in our children from elementary to high school and beyond. Some of the investments we make around the promotion of science. We really want to bring science, technology, engineering, and mathematics to our youth and to everybody and include art and design in that, so there's $10.8 million for PromoScience in budget 2017. I've talked about the 600 events happening across the country right now. I'm really pleased that in budget 2017 there is investment for $50 million to teach grade school students to code. It is the language of the future.

Mr. Frank Baylis: In that same consultation, I had another businessman, who's actually an extremely successful businessman. He has a young daughter who's a scientist, and his frustration was her inability to get funding for her research. I see that's something you're looking at tackling. Could you touch upon that, too, please?

Hon. Kirsty Duncan: Frank, I will just bring forward that we really are taking a different approach on science. The previous government cut science, cut scientists. It muzzled our scientists and funding was cut. This government is committed to research science and scientists, the important work they do, and evidence-based decision-making. The very first act of this government was to reinstate the long-form census. Why? Because we want science, evidence, and fact at the heart of decision-making.

The second act was to unmuzzle our scientists. In the spring, we brought forward a new communications policy that would reinforce that scientists can speak in an official capacity without being designated. They could speak publicly where they have scientific and technical expertise or responsibility. We're taking a different approach, and that's the same when it comes to equity and diversity.

I mentioned that these targets for equity and diversity, for example, in the Canada research chairs, have been in place since 2006. Universities were not held to account. That's going to change with our putting in place those diversity and equity plans, and saying there is the possibility that funding will be withheld. I do not want to go across the country and hear comments from women researchers such as “Do I have a child or do I have an academic career?” Having a child is risky. Wearing a larger lab coat for seven months to hide a pregnancy should not be happening. We want all people to have a chance at our research funding.

● (0950)

Mr. Frank Baylis: A lot of that unmuzzling of science and that drive towards a more scientific approach, I see wrapped up in the chief science officer, that position you're creating. Can you elaborate on how you see that position playing a role in promoting science and a scientific approach?

Hon. Kirsty Duncan: As you know, part of my mandate letter was to create a chief science officer. I'm happy that on December 5, 2016, we launched the search for Canada's chief science adviser. This position was cancelled under the previous government. A chief science adviser will ensure that government science is made available to Canadians, that government scientists can speak freely about their work, and that scientific analyses will inform decision-making.

There's an open competition. That competition closed on February 13. This person will advise the Prime Minister, the Minister of Science, and the cabinet. As well, cabinet can come back to the chief science adviser and give charges to him or her. We hope to have this person in place by the spring. This is really exciting. We know one person isn't going to change the system, but it will be important to build that advisory role going forward.

The Chair: Thank you very much.

Mr. Masse, you have the final two minutes.

Mr. Brian Masse: Thank you, Mr. Chair.

Thanks again, Minister, for your input.

I want to get to the social sciences, but, again, I guess I would implore upon your government to look at Bill C-25. This is act that is amending the Canada Business Corporations Act. Part 1, in particular, deals with the structure of corporate boards and governance, and the inclusion of women and persons with disabilities. The bill shied away from actually defining "human rights". It wouldn't even comment on what a human right was with regard to racial equality. Secondly, it didn't address the issue of gender by including the word "gender" in the bill.

Lastly, it's moving to a model called "comply or explain", which, the way that the legislation is written, if you follow the legislation after we finish it, at the very best you're looking at probably seven years in the time duration before it can actually be reviewed once it's actually passed. You're probably at up to 10 years from this date in terms of reviewing that legislation from the time we pass it in the House of Commons. Because you have a majority and you do have a lot of allies looking to change that, I would implore your government to reach out to those allies who want to actually make the bill relevant, because you're now doing this in your own department, under this initiative, with the universities.

With my remaining time, I will ask this in particular and pass it over to you. Social sciences and the humanities again have come up. We've heard a lot of discussion about it. Are you making any efforts, or is the government doing any work to bridge the social sciences and the humanities to some of the work of trying to privatize or bring ideas to market, so, more of the hard sciences for innovation? Are you doing anything with the social sciences and the humanities to help in that? That seems to be a lost piece of the puzzle for getting items to the marketplace, ideas to production, so to speak?

Hon. Kirsty Duncan: Thank you, Brian, for highlighting the importance of the social sciences and the humanities.

There is a large gap between the funding that goes to the Canadian Institutes of Health Research and the Natural Sciences and Engineering Research Council. I hope people noticed in budget 2016 that I started to close that gap because social sciences matter. It matters because it's talking about people, whether understanding how we relate to one another or how our societies operate, but also when one wants to commercialize, you need to understand people and the social sciences can be of real help there.

Mr. Brian Masse: Thank you.

The Chair: Thank you very much.

On that, we will end our session. Minister Duncan, thank you very much for coming to our committee today, as well as your colleagues.

We're going to break for a very strict two minutes while we switch over. We'll suspend for the moment.

Thank you very much for coming.

● (0955)

Hon. Kirsty Duncan: Thank you.

● (0955)

(Pause)

● (0955)

The Chair: We're back for part two. I have a couple of housekeeping notes. We are a little short on time. Our guests will do their briefings, then I think the best thing to do, rather than going with seven-seven-seven, is to keep your time short if you have questions and we'll try to address it that way, if that's okay with the committee.

Finally, I want to remind everybody that on Thursday, we have Minister Chagger for the first hour and Minister Bains for the second hour. I'm going to ask that we keep our preambles short. Today, we went over because we had preambles and I try to leave the minister to answer questions. I will have to be a lot more strict or else, on Thursday, we won't get through it and I want to make sure that we do. Make sure that you keep your preambles short and we have to stick to the time because there will be a break in there. You are forewarned.

Go ahead, Ben.

● (1000)

Mr. Ben Lobb: Did you send a message to Minister Bains and Minister Chagger to omit their preamble as well? Today, you may have noticed that every time Minister Duncan started to speak, she didn't provide an answer but she provided much preamble. I agree that, if the members keep their preamble to a minimum and just ask a question and the ministers keep their preamble to a minimum, it works well for both. It can't be a one-way street.

I know you talk to them a lot. If you could advise them of that from good old Ben, that would be appreciated.

Thank you.

The Chair: I will keep that in mind.

Once again, I cannot control what comes out of the witness' testimony, but I will cut people off. I'm just forewarning you or else we won't get through it on Thursday. That's where we are.

We now have.... I will remind everybody that we're not televised. The first hour was televised, but we are in public right now.

This morning we have from the Department of Industry, Mark Schaan, director general, marketplace framework policy branch, strategic policy sector; Konstantinos Georgaras, director general, Canadian intellectual property office, corporate strategies and services branch; and Alison McDermott, director general, program coordination branch.

Today, we're getting a technical briefing on intellectual property and tech transfer in Canada.

Mr. Schaan, the floor is yours.

Mr. Mark Schaan (Director General, Marketplace Framework Policy Branch, Strategic Policy Sector, Department of Industry): Good morning. It's nice to be back.

My name is Mark Schaan, as you have just heard, and I'm the director general of the marketplace framework policy branch at Innovation, Science and Economic Development Canada. Along with me are my colleagues, Alison McDermott and Konstantinos Georgaras, who also have interests on the technology transfer and intellectual property administration side.

[*Translation*]

To start off our presentation, I'll provide a brief overview of our intellectual property laws and of how they benefit our marketplace frameworks.

Then, my colleague from the science and innovation sector will provide more details regarding the relationship between IP and universities, and technology transfer in the post-secondary sector.

Finally, my colleague from the Canadian Intellectual Property Office, or CIPO, will provide an overview of CIPO's mandate and responsibilities and some information regarding public sector patenting activity.

[*English*]

First, just to put our IP laws in the broader policy context, they are considered to be key marketplace framework laws in Canada. We recognize that they play a critical role in encouraging innovation, attracting investment, and supporting other key drivers of the Canadian economy.

As you can see from the statistics, Canada has a decent track record when it comes to our marketplace frameworks. That said, we know we need to do better, particularly in the use of IP by firms. IP laws create terms of protection enshrining public and private rights.

As you see, copyrights protect original creative works, such as books, movies, music, and video games. Copyright lasts for the life of the author plus 50 years, or 70 years for sound recording. Patents protect novel inventions, such as advancements in technology, pharmaceuticals, and processes. Patents last for 20 years from filing.

Trademarks promote certainty in the marketplace by protecting distinctive branding used in commerce, such as a logo, a slogan, or brand names that distinguish the goods and services of one person or organization from those of others. Once amendments to the Trademarks Act come into force, a trademark registration will last 10 years, renewable indefinitely for additional 10-year periods.

Industrial designs protect product designs, such as the shape of a lamp or the design of a chair. Once the amendments to the Industrial Design Act come into force, industrial design rights will last the later of either 10 years from the date of registration or 15 years from the date of filing. These rights prevent others from using, copying, selling, or manufacturing without authorization of rights holders.

IP laws establish the requirements to obtain or challenge the rights, their use, length, and scope of protection, and the administration governing the granting, registration, and maintenance of IP rights. IP rights are domestic but are anchored in treaties, which set minimal requirements.

[*Translation*]

Canada's IP regime has three main objectives. The first is to support innovation and enable innovators to extract value from their creations and recoup investments. The second is to ensure Canadians have access to a wide range of innovative products, new technologies, and new goods and services. The third is to promote consumers' confidence in the marketplace.

Well-functioning marketplace frameworks generate positive outcomes for Canadians. They provide incentives for innovation and creativity; ensure access to the latest technologies and ideas; foster competition; promote confidence in the marketplace; and balance competing stakeholder interests as well as the common good.

● (1005)

[*English*]

IP-intensive industries are key drivers of the Canadian economy. As this chart shows, the orange bar demonstrates that they account for almost 14% of all jobs in Canada and more than 25% of our GDP. About 40% of all Canadian exports are from IP-intensive industries. We know that SMEs that own IP are more like to grow to scale and have a greater propensity to export. For example, SMEs that hold formal IP are four times more likely to export, 64% more likely to be high-growth, and 32% more likely to seek financing.

Canada has made strides to improve and align its IP regime with those of our international partners. For example, we introduced amendments to ratify the CETA agreement, which included an additional period of protection for eligible pharmaceutical patents.

In 2016 Canada played a leading international role in intellectual property. Canada amended its Copyright Law to implement and accede to the Marrakesh treaty to facilitate access to published works for persons who are blind, visually impaired, or otherwise print-disabled. Canada was the critical 20th country needed to bring the treaty into force internationally.

Our agenda for 2017 is very ambitious. We know that there will be a parliamentary review of the Copyright Act. The five-year review is mandated by section 92 of the Copyright Act, which requires that Parliament review the Copyright Act every five years. Five-year reviews are intended to ensure that the act remains responsive to changes in technology.

Budget 2017 also announced that the government will develop a new comprehensive intellectual property strategy over the coming year. This strategy will help ensure that Canada's intellectual property regime is modern and robust and supports commercializing Canadian innovations in the 21st century.

The purpose of the IP strategy is to support the objectives of the innovation and skills plan—namely, fostering an ecosystem that supports businesses to grow to scale. The strategy will work to do this by ensuring that the IP regime is efficient, that it fosters innovation, and that firms have the awareness and incentive to strategically use IP to grow and compete.

With that I'll turn it to my colleague, Alison.

Ms. Alison McDermott (Director General, Program Coordination Branch, Department of Industry): Great. Thank you, Mark.

As mentioned, I'm the director general within ISED's science and innovation sector. We work closely with the granting councils and the post-secondary education sector.

Mark has started off with a good overview of the overarching context for IP. In my remarks I will try to narrow in on the topic of IP and technology transfer in the post-secondary education sector.

[*Translation*]

I prepared my remarks in English, but I would be happy to answer questions asked in French.

[*English*]

Post-secondary institutions serve a variety of important functions, including training, the creation of scientific knowledge, and the transfer of that knowledge to those best placed to put it to use. We'll call that “technology transfer”.

IP protection is an important component of technology transfer because it allows academic researchers to publish their research while still providing industrial partners with the incentive to commercialize. Technology transfer offices—we'll call them TTOs—facilitate technology transfer activities at universities and colleges. These can be as varied as managing IP, developing and supporting partnerships between academia and knowledge users, and supporting entrepreneurship and company growth. Universities and colleges play different roles in the mobilization of knowledge, with university research often driven by researcher and student curiosity, and college applied research driven largely by industry needs.

As we've been asked to be brief, in this presentation, I'll focus on university technology transfer.

The Government of Canada provides support for technology transfer through the federal granting agencies, NSERC, SSHRC, and CIHR, including many programs designed to encourage post-secondary and private sector research collaborations. These seek to bring a wide range of research and technical expertise to bear on specific industrial challenges. These are also about exposing researchers to these industry needs.

These include several NSERC programs under the NSERC strategy for partnerships and innovation; the tri-council business-led networks of centres of excellence and the centres of excellence for commercialization and research programs, generally known as the BL-NCE and the CECR programs; as well as the Mitacs scientific internship program, which received significant sums of money in the last budget. Many of these programs include the training of highly qualified personnel as another means to help ensure knowledge is also mobilized into the workforce.

I'll mention another program, the research support fund, formerly known as the indirect costs program for those familiar with that. This is a tri-agency program that provides Canadian post-secondary institutions with support to help them defray the indirect costs of research that is funded by the federal granting councils. Under this program, the Government of Canada directly supports costs related to technology transfer, including the creation, expansion, and maintenance of a TTO, and costs associated with IP protection and supporting industry partnerships.

Metrics are an ongoing challenge in technology transfer. There are no available metrics that fully capture the economic impact of technology activities at post-secondary institutions on a national scale. Instead, we tend to follow narrower outcomes related to IP, which are the easiest to measure. You will hear talk of and we'll keep track of things such as patents, licences, start-ups created, and licensing revenue generated.

There can be some downsides associated with the focus on those kinds of metrics, dangers that TTOs can sometimes be pushed to chase those kinds of metrics, sometimes at the cost of the quality of the broader objective of transferring technology.

The majority of Canadian university TTOs, when last asked, suggested that these common IP metrics, while the best that we have in some ways, don't effectively measure the full extent of what they do in their offices. That also reflects some evolution that's taken place in recent years over the way TTOs work. Many of them are now more focused on other technology transfer outcomes that are not IP-related but better suited to advance the Canadian economy in the long run. These are things like forming academic industrial partnerships and transfer through HQP, highly qualified personnel, of skills to the workplace.

In terms of IP ownership policies, there is no national uniform policy governing IP. I know this is an issue you're interested in. Provincial governments have the jurisdiction to set IP policy at post-secondary institutions. The majority of these will actually defer to the institutions to set their own policies, which in turn are often embedded in faculty collective agreements.

● (1010)

This has led to an overall diversity of approaches to intellectual property protection policies, which can be more or less summarized in two broad approaches. There are the inventor-owned policies and the university-owned policies. Both of them are associated with high-quality technology transfer outcomes, or they can be. Some universities have a policy that contains features of both. We refer to this as the joint ownership approach, where both the inventor and the institution share IP rights.

With respect to federally funded research, the granting councils do not require institutions to follow any particular IP policy. With respect to community colleges, the role of applied research in Canadian colleges is to help solve an industry problem. Canadian colleges normally do not own their IP. It remains with the industrial partner.

In terms of a comparison of IP ownership models, for a university that adopts an inventor-owned IP policy, the research or inventor has the right to decide whether to sign over his or her IP to an industrial partner. Some of the advantages of this approach are that it can be highly motivating for academics. It encourages them to get more actively involved in the commercialization of their research. It also gives them flexibility to adjust to the licensing preferences of the firm that they're dealing with. In contrast, a TTO may be constrained by broader institutional policies.

On the downside, the success of this approach can be highly dependent on the individual concerned and whether they have the kinds of skills, the ability, and the motivation to commercialize their IP and/or launch a successful start-up. This model assumes that researchers are motivated by the concept of capturing monetary benefits from the results of their research. It can also increase the complexity of negotiating licensing agreements due often to the inventor's lack of experience in this area.

Now we'll look at the university-owned ownership model. For a university that adopts a university-owned IP policy, the university has the right to sell or retain the inventor's IP once it's disclosed. Some advantages of this policy are that it seeks to simplify the process of commercializing and licensing by centralizing ownership and taking maximum advantage of the expertise in the TTO. It also gives universities flexibility to pool the licensing of relevant IP that may have been invented by different researchers from diverse fields. They might package different patents together and sell them to an appropriate company that could take advantage of that. This policy recognizes that researchers may not have the interest or expertise to further develop and commercialize their intellectual property independently.

On the downside, this kind of policy can create a barrier to technology transfer when university TTOs, many of which operate on cost-recovery models, sometimes tend to overvalue IP in terms of trying to maximize their financial benefits. TTOs can also be less nimble and have less flexibility to adjust to the licensing preferences of an individual firm than an inventor would, or a single person would. Inventors may be less inclined under this policy to be involved in this critical stage of developing the technology towards commercialization. This is the counter-side of the motivation issue that was mentioned in the inventor-owned model.

We have some examples of international experience. There's a lot of interest in the United States, where IP ownership rights for government-funded university research have been governed by the Bayh-Dole Act since 1980. This act essentially states that the rights to inventions resulting from federally funded research belong exclusively to universities and are subject to a number of obligations regarding disclosure and royalty sharing.

The Bayh-Dole Act has often been seen as an important catalyst for the increases in patenting and licensing activity that took place in the 1980s and 1990s. It's hard to say unambiguously that this is responsible for that in the sense that this strong, upward trend in patenting and licensing did begin before the implementation of the act. You could attribute many elements of this increase to other factors, for example, the broader scope of patentable inventions, and the fact that there was an increasing propensity to patent over this time, and just the nature of technological progress that took place in certain fields. Bio-medical sciences, for example, really picked up a lot in the eighties and nineties.

● (1015)

Other countries, such as the U.K., Spain, Switzerland, Denmark, Finland, Germany, and Norway, all maintain a university-owned IP model. In Australia, as in Canada, universities are able to develop their own policies. The majority of these use a university-owned IP model. Italy and Sweden use a professor-privilege IP policy in which IP ownership remains with the inventor.

Overall, we would say there's little evidence that the policy governing who owns the IP rights of an innovation has an overriding impact on the success of technology transfer between institutions and industry as measured by the volume of patents and licences. As mentioned before, there are successful examples of both models of ownership. I'll give you a couple of examples. The University of Waterloo is often cited as an example of an inventor-owned policy that's very effective. UBC would be an example of a university-owned model that works very well. They're both considered to be leaders from a technology transfer perspective.

Other factors that are often pointed to as contributing to the success of technology transfer would include things like how many resources a university puts towards its technology transfer office and towards these activities in general, and the quality of contractual agreements. As well, overall the level of education and awareness about the importance of intellectual property protection and commercialization, as well as overall culture, are seen as very important. Waterloo is an example of a university in which there is a strong culture of entrepreneurship that supports and values technology transfer, and that culture has a strong influence as well.

Some other channels of technology transfer can be arguably as important or more important than IP licensing. As mentioned before, there is this idea of movement of people, students in particular, from universities to the private sector or public sectors and the know-how they bring with them. Company creation is another mechanism. There is publication of research results and interactions through things like meetings and conferences. We mentioned the Mitacs internships that create connections between universities and firms, and there are just general research partnerships and co-operative research centres.

I'm going to turn it over to Konstantinos now.

Mr. Konstantinos Georgaras (Director General, Canadian Intellectual Property Office, Corporate Strategies and Services Branch, Department of Industry): Thank you very much.

[*Translation*]

Hello. My name is Konstantinos Georgaras.

[*English*]

I'm from the Canadian Intellectual Property Office, a special operating agency of Innovation, Science and Economic Development. We are responsible for the administration of the intellectual property acts and the registration of IP.

I'd like to give you a brief overview of some of the counts and trends in IP and do a deeper dive into where the technologies are coming from and what those technology areas look like, where the collaboration is happening, and then finally give you a debriefing on interactions we've had with technology transfer offices to identify the barriers they have in using the IP system and what we are doing to address it.

As my colleagues have mentioned, there are a number of broader objectives for research and technology transfer, and not all of these discoveries will make it to the Canadian Intellectual Property Office, rather we see a smaller subset in patenting. In our overall applications, we receive about 100,000 IP applications per year. In 2015 there were 37,000 patent applications and 22,000 patents were granted. If you look at Canadian universities patenting in our office at CIPO, the University of Alberta, for example, had 27 patent applications in fiscal year 2015-16.

Again, this is just applications in Canada. If we look at where Canadians and universities file for patents, you will see that most Canadians will file outside Canada. The top blue line on this chart represents all Canadians, and it shows that about 13,000 patent applications were made in the U.S. Patent and Trademark Office in 2014. If you look at the green line, there were about 4,000 patent applications by Canadians in Canada, so about three-quarters of the applicants will go to the U.S. first, and that's a business decision. Likewise, if you look at the red and purple lines, that represents university filings, and it's the same proportion. About three-quarters of universities will file in the States.

We conducted what is called IT analytics. This allows us to dig deeper into the data that's provided in the patent applications, and here you see the spread of technology that Canadian universities are patenting worldwide. You can see this landscape of peaks and valleys. The snow-capped peaks represent the specialty areas in which Canadian universities are filing for patents. Two to highlight are alkyl and optical light beams, for example, and I'll get back to that. That's the general landscape, if you will, of technology that Canadian universities are patenting.

Now we'll look at just one university, so we can go deeper. Here, looking at McGill, for example, in the last 15 years they filed for 273 patents in Canada. Worldwide they filed for 758. When we look at the patent applications, we can unbundle where the collaborations are happening, and I understand that is an initiative this committee is interested in looking at—where the collaboration is happening. In 52% of these worldwide patent applications that McGill pursued over the last 15 years, over half of them had collaborations with other universities and companies. We did the same thing for UBC, but let's skip forward.

● (1020)

If you dig even deeper into the patent data, you can identify where the collaboration is happening. Here at the University of Ottawa this is a collaboration map looking at optical transmission and communication systems, and you can see how these patents are coming forward as collaborative applications with the University of Ottawa and companies such as X-Ray Optical Systems or Spectalis Corp., as well as Harvard and Waterloo universities. Once you start digging deeper and deeper into the data, you can see where the collaboration is happening.

Now let me step back. At CIPO our mandate is to support innovation and help pull through the ideas once they come to our office. We tried to better understand some of the challenges that technology transfer offices and universities were facing in applying for IP, and they identified five key challenges. There is a fifth one that is not on this slide, but I'll start with that: cost. Clearly technology transfer offices have to make business decisions as to what they pursue to patent. Our office provides a 50% discount to university applicants. It's our contribution to help reduce costs for the university applicant.

A second issue that came up was the issue around awareness and education. We heard throughout, from technology transfer offices and the community around universities, that there's a need for awareness of how to effectively use IP. With that, CIPO is launching very extensive work on developing educational programs and material for IP strategy. We have something called IP case studies. We work with students in universities to help them understand IP, as they're part of the spin-off, if you will, for university discovery.

A third element that came up in terms of a barrier or a challenge that universities face, is, as I mentioned earlier, that three-quarters will file outside of Canada. There was the issue of harmonization internationally. CIPO is working very hard to implement some international IP treaties, and we're targeting 2019 for them to come into force. This will help to ensure that there's a harmonized system, and it will help facilitate IP filing in Canada and abroad.

A fourth element was trying to understand the breadth of technology and what's coming forward. What we're doing, and I demonstrated earlier through IP analytics, is trying to show where the technologies are coming up. That helps identify the collaboration. This type of information can help inform professors, technology transfers, where the collaboration can happen.

The final element was really directed at the office itself. Our databases are lacking, and we are working hard to modernize them. We have done quite a bit over the last few months to bring more information forward to users.

To sum up, you've seen some of the trends. We've done a deep dive into the technology areas. We are taking action at CIPO, for those coming to our door, to help facilitate their applications going forward.

I'll wrap up with that.

● (1025)

Mr. Mark Schaan: Great.

Just quickly before we get to your questions, I want to note that where we indicated that provincial governments have jurisdiction to set IP policy, we should be clear that IP policy and IP legislation are constitutionally federal, but education is provincial. When we talk about those IP policies, we mean university-owned versus inventor-owned.

We're very interested in your questions. Thank you so much.

The Chair: Thank you so much for this extremely detailed technical briefing. It will help us. Because we are public, we can request that this be entered into the study if we want to, and we can call them back.

We don't have a lot of time, so I'm going to go down the speakers list that we have. Please keep it short so everybody has a chance to ask at least one question.

Lloyd, you're first.

Mr. Lloyd Longfield: Thank you.

Thanks for a fantastic presentation here this morning.

In the short time we have, you mentioned the development of the IP strategy in 2017. Our committee is looking at getting into this study. At what point is your study going to need input? We don't want to miss the train.

Mr. Mark Schaan: You'll have seen in budget 2017 that the commitment was for a comprehensive national strategy within a year. We are looking and working closely with Minister Bains and his office to help him undertake that strategy and lay it out. Given that it is aimed at being comprehensive, I think the sooner the better is obviously great, because we're in the thick of working on some of the ideas now. We're very much aiming to try to have something within that year deadline at the latest.

Mr. Lloyd Longfield: We're getting into our mid-year break when we go back to our constituency offices. Is the fall too late?

Mr. Mark Schaan: The fall as an input would be quite useful. If the fall was the beginning of your study, I think that would be challenging.

Mr. Lloyd Longfield: That's helpful. Thank you.

The Chair: Earl.

Mr. Earl Dreeshen: Thank you very much.

Of course, as you may be aware, we just came back from Washington, D.C., and we were talking about intellectual property and that type of thing there. One of the things that was brought up was patent trolls. I think, Konstantinos, that has to do with the education, the awareness, and so on, although there are a bunch of other things.

From your perspective, can you let us know what that is and how you feel that governments or universities might be able to protect themselves? Some of us heard what was going on there, but could we all get a feel for that?

Mr. Konstantinos Georgaras: I'll start the response, and then I can turn to my colleague on the policy issues.

With regard to patent trolls, we've been looking at this very closely over the last few years. What we have determined from an IP office perspective is that the more challenging issues are largely focused in technology areas such as software, and that seems to be concentrated more in the United States. We patent software differently here in Canada, and we are not noticing the same kind of trolling activity here. In fact, it's very limited.

That said, as I mentioned, most Canadians will be filing in the United States. Anything we can do to help inform them of the market, whether it's the U.S. or other markets, that is our job, to bring that to light.

● (1030)

Mr. Earl Dreeshen: Before you go on, could you explain what patent trolling is so that everybody knows and it's not just a term?

Mr. Konstantinos Georgaras: I'll turn to my colleague.

Mr. Mark Schaan: I'll be super brief.

There's an important distinction to be made. There are non-practising entities, or NPEs, that essentially have patent portfolios or IP portfolios that they use for the purposes of extolling rents—licences or otherwise. I would make a distinction between an NPE and a troll.

A troll is someone who essentially has acquired vague or ambiguous patents or intellectual property licences purely for the purposes of shaking someone down for rents that they might not have been able to get in a courtroom but are frightening enough to the university or innovator that they're willing to pay, simply because of the generalized nature of what they own.

To complete your question, we're looking at this issue in great detail, both in terms of its incidence in Canada and the degree to which our rules can help prevent some of those bad behaviours, but more importantly, on the strategy side, the degree to which our firms are IP-savvy in their capacity to prevent it themselves and be defensive at the outset.

The Chair: Thank you.

Brian.

Mr. Brian Masse: Thank you.

What about patent unicorns?

I'm just kidding.

Mr. Mark Schaan: Mr. Masse, you stumped me.

Mr. Brian Masse: At any rate, we have investor angels and patent trolls.

With regard to the top 10 university filers at CIPO, I think we should attach this presentation to anything we do for the public. It's very helpful.

Could you explain why the universities are being ranked the way they are? I don't know if it's just a judgment call or if there's a particular reason. I'm interested in that. I'll leave it for you, and that's all.

Mr. Konstantinos Georgaras: The ranking here is just a straight count of the number of applications. This includes patent files as well as trademark filings. As you can see, many universities are very active on the trademark side. It's just a listing.

Mr. Brian Masse: Maybe in the future, though, we could see something with application to market, or something like that. I don't want us to be continually on that, but that would be an interesting part of it.

At any rate, thank you for the information and presentation.

The Chair: Thank you.

Frank.

Mr. Frank Baylis: My questions are to do with metrics. I have a couple of questions, first of all on the AUTM metrics. My understanding is that those metrics are very weak because not everybody submits their data. In fact, I think something like half of them don't even bother submitting. When you put these numbers up here, then, am I right in understanding that they're very weak numbers?

Ms. Alison McDermott: I could come back to you with more information on the strength. I'm not aware of their being terribly weak on the basis of participation rates, but I could find out—

Mr. Frank Baylis: I am. Maybe you could double-check to see how many responded to the last study that was done, how many universities are part of AUTM, and how many are bothering to submit data or not.

Ms. Alison McDermott: Okay.

Mr. Frank Baylis: This is a tease-out of a broader study that they did for the United States primarily, and Canada fit into it. If you would, please look at that.

It brings me to a second question about metrics. You've been able to tease out some numbers on Canadian universities filing in Canada. If I understand correctly, you don't have that kind of information on filing in the United States, or can you go piece by piece to pull it out, although there's no repository for it?

Mr. Konstantinos Georgaras: We rely on a number of databases, including the World Intellectual Property Organization's, to pull together this data. In fact, I'll refer to the number of Canadian universities filing in the United States. In 2014, there were 550, approximately.

Mr. Frank Baylis: How did you tease that information out?

Mr. Konstantinos Georgaras: The individual offices from around the world contribute their data to the World Intellectual Property Organization. That's the United Nations body for intellectual property.

Mr. Frank Baylis: If they have bothered to submit it, then, you can get it. If they haven't, you can't.

Mr. Konstantinos Georgaras: That's correct. Now, a very important issue here also depends upon the IP ownership. Some universities will file in the name of the institution. Others will file in the name of the researcher. That becomes a little more challenging to pull together.

When we try to understand the value of the metrics, some of these metrics need it to be understood that there are—

● (1035)

Mr. Frank Baylis: I appreciate that. I think you mentioned very clearly that the metrics are weak. I don't want people to look at these things and think these are strong numbers, when I believe they are not.

The Chair: We're going to move on to Majid.

Just for your reference, bells have been delayed to 11:05. The vote is at 11:30.

Mr. Majid Jowhari (Richmond Hill, Lib.): Thank you. You've done a great job. I have a quick question.

In your opening remarks you stated that you only focus on universities. Do you have any data or information you can share with us on any type of the following partnership models: universities, colleges, businesses, and governments? We are trying to look at how we can expedite commercialization. We know that in the colleges, applied research and partnering with businesses recently has been very successful. Right now, we are not considering it, and I didn't see anything in this report. I'm not saying you excluded it. I just want to know whether you have any input on that issue.

Ms. Alison McDermott: We are quite interested in studying the level of interaction that's taking place. For example, working with some of our stakeholder groups, Polytechnics Canada and CICan, we can probably get you some information about the levels of activity and partnerships that take place. It's more a question of tracking activities that take place than of getting a sense of what an overall baseline at a national level might be. This is an area in which we have an interest in doing a better job of metrics tracking. The focus for today being on intellectual property protection meant that the focus wasn't so much on colleges, because they tend not to—

Mr. Majid Jowhari: I'm going more from a technology transfer side. I know time is limited, however, so we'll come back to you.

Mr. Chandra Arya: There is a great degree of information regarding the number of patents filed by universities. Is somebody tracking the number of such patents that are actually commercialized?

Mr. Mark Schaan: We have a number of metrics that we continue, and to Alison's point, the challenge of getting at the right metrics in the intellectual property space is a hard one. The number of patents filed is only one indicator. We have licensing revenue, for instance, that comes into the institution.

However, to Alison's point from earlier, licensing revenue often doesn't tell you a complete story either, because you can tell how much the university has earned from it, but that's not necessarily a full indication of whether or not that was the best value you could have gotten out of the intellectual property. There may have been a race to license as opposed to a race to bundle.

Mr. Chandra Arya: We are not talking about the amount of revenue earned here. We are talking about the number of patents actually being commercialized.

Mr. Mark Schaan: Licensing revenue is a good indicator of that, in part because licensing suggests that someone's paying you for the use of the intellectual property, which means it's actually in application. In terms of the degree to which you can then actually look at use, it would vary by the type of intellectual property. In trademarks, for instance, there are searches, and then your freedom to operate would vary enormously depending on the intellectual property zone.

The heat maps—as they were, about activity and collaborations—are an indication that can often give you a sense, because you know who the commercial actor is and then you can do the digging as to what the actual value is.

The Chair: Thank you.

Earl, do you have a question?

Mr. Earl Dreeshen: Perhaps. Frank talked about metrics and so on. The ratings that we see—second in technology and technological and economic value with the OECD, and so on—are all international rankings that have come.... I was with the minister in Germany, and we had a chance to talk about the actual investments. Quite frankly, we hear things about dollar figures and so on, but in the past we were putting the same dollars into research as Germany was on GDP and per population.

The problem of course is when business comes in and asks, where are we going to jump in? We've just heard it. We have issues with each of the provinces having their own jurisdictions, and then the universities within them. We still have six time zones. We have all of this, quite frankly, even off the draw, so I think that's another part we need to take a look at. The dollars are there and the research is there, but too often it seems we're just checking off the box to say we did a study, instead of saying how we innovated and commercialized.

Those are some of the things we'll be looking for. If you're able to give us information on that as we go through the study, or if there's anything you could quickly respond to now, at least it gives us a direction that we could travel in.

● (1040)

Mr. Mark Schaan: A superquick response would be that those commercialization and innovation outcomes and the weak performance were really at the heart of the innovation and skills plan. The IP strategy is a part of that partly because we recognize that one of the tools in getting to better outcomes is more sophisticated use of intellectual property by our firms. We often have invention, but we don't often get the rent that comes out of that invention. That's one of the things we know we need to focus on.

The Chair: Frank, you have the last one.

Mr. Frank Baylis: My question relates to the Bayh-Dole Act in the States. That came about because the Americans found that they had an awful lot of IP stuck in their universities, and they were looking for ways to get it out.

As you mentioned here, they had some obligations, particularly disclosure. We fund our universities to the tune of over $1 billion, with zero strings attached. I'm not necessarily looking for royalty sharing, but have you considered looking at a forced request for disclosure tied to this funding? That's my first question.

The second is, have you done any type of study on the Bayh-Dole Act that you might be able to share with us, what value it has brought to the American economy, and why they brought it in?

Ms. Alison McDermott: There have been a number of studies on the Bayh-Dole Act. Overall they're not incredibly conclusive, as mentioned, about the.... A lot of things happened at the same time, so there aren't a lot of studies that would conclusively point to the Bayh-Dole Act in itself as being the factor responsible. There are many people who think that it is an important factor, but it's one of those things that's hard to tease out specifically.

We're actually quite interested in these questions. I would add a caveat that a lot of the IP rules are tied up with universities and their collective bargaining agreements. These are relatively hard things to change.

Mr. Frank Baylis: What about the disclosure part—the disclosure of who's patented? I don't think that's tied up.

Mr. Mark Schaan: There is a transparent registry of patent filings that does have the disclosure. The only other point I'd put on the disclosure is—and Alison and I have been talking about this in the context of the IP strategy—there have been a number of initiatives that Alison pointed to, including the centres of excellence for commercialization and research, for instance, where a CECR like MaRS Innovation has a disclosure requirement within their member institutions that gets disclosed to MI. MI then bundles, works on that IP, and figures out how best to get it into a commercialized market.

We are looking at some of those important mechanisms for who are you disclosing to, not just a patent registry, but potentially, whether there is a receptor on the other side that can help really bring full value to that intellectual property.

Mr. Frank Baylis: And help you collect the metrics that you need specifically....

Ms. Alison McDermott: One of the things we're doing is that we have just been been surveying. In 2016 we undertook a survey of universities and colleges with respect to issues around IP, technology transfer, the work of the technology transfer offices. We're just compiling that data, and disclosure is one of the issues that was on there, so we'll likely have more information to share with the committee as we do the follow-up and put that data together, but a large number of universities have their own policies on disclosure.

The Chair: Thank you very much to our Department of Industry officials for coming.

Before we break, I just want to mention that we have the minister coming in on Thursday. Next Monday we have another technical briefing, so we'll have the Department of Industry, but we also have CRTC coming in that day as well.

If we could start getting in preliminary witnesses for both studies, we might be able to actually use the first to start witnesses or at least the following one. If we can actually start to try to give preliminary witnesses, that would be great.

Thank you very much to our officials for coming in, and great day, guys.

Thanks. We're adjourned.