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Chair

Mr. James Maloney

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● (1105)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): Good morning, everybody. Thank you for joining us.

This morning we have two sets of departmental witnesses from the Department of Natural Resources and the Department of the Environment. Thank you, everybody, for taking the time to be with us today.

You know the format as well as we do. Each department will be given up to 10 minutes to do a presentation, which will be followed by questions.

Why don't we jump right in. I understand, Mr. Jones, that you're going to lead us off. Is that correct?

Mr. Matt Jones (Assistant Deputy Minister, Pan-Canadian Framework Implementation Office, Department of the Environment): Yes.

Thank you, and good morning.

I'm happy to be here to talk about the role of energy efficient measures in the pan-Canadian framework on clean growth and climate change.

As you know, the framework is our national plan and is intended to make Canada more resilient to the impacts of climate change while allowing us to reach our emissions reduction target of 30% below 2005 levels by 2030. The framework accomplishes this through a number of complementary measures across four pillars.

Increasing energy efficiency has always been an important part of reducing greenhouse gas emissions, here and everywhere in the world, and features quite prominently in the framework. To give you some context for the role that energy efficiency measures play, I will give some quick background on the pan-Canadian framework and how it was developed.

The first ministers meeting in Vancouver launched a process that involved a number of working groups, one for each pillar. The groups were composed of officials from provinces, territories and the federal government. We did work with indigenous peoples, did some public consultation with stakeholders and developed a long list of options that were brought forward for consideration. This input provided the basis for the development of options in the reports, and ultimately in the pan-Canadian framework, which was agreed to in December of 2016.

I was the chair of the mitigation working group, along with a counterpart from British Columbia. From the early stages, energy efficiency was considered and has remained an important component of that suite of measures to reduce emissions. In the report produced by the working group, our proposed options to reduce greenhouse gas emissions through energy efficiency measures covered industy and the built environment in general.

Energy efficiency measures reflected in the framework were drawn from those options. They include a long list that you'll hear more about today, including improved industrial energy efficiency; model building codes that are designed to be net-zero ready; retrofitting of existing buildings, including the development of a model code for existing buildings; improving energy efficiency for appliances and equipment by setting new standards for heating equipment and other devices; and supporting building codes and energy efficient housing in indigenous housing and indigenous communities.

We've made quite a bit of progress in all areas of the implementation of these measures. We have an annual report that goes to first ministers on this data, which we could share with the committee if you're interested.

On industrial efficiency, the federal government introduced some amendments to the energy efficiency regulations, which came into effect in June of 2017, for a number of product categories. This will be important for improving the performance of those devices. The new Energy Star for industry certification program was launched and a new industry challenge program has been announced.

With regard to the built environment, the federal, provincial and territorial ministers of energy are collaborating on improving energy efficiency in buildings through the Canadian energy strategy, and energy ministers have released Canada's buildings strategy, which is tied to the pan-Canadian framework. Energy efficiency requirements for new buildings are also being implemented and retrofits are being supported though financial assistance programs.

In addition, key funding envelopes have been announced to support energy efficiency measures, all of which are currently in the process of being rolled out and implemented at the moment.

I'll pause there, and perhaps turn it over to my colleague Helen, who will tell us more about Environment Canada initiatives related to energy efficiency.

Ms. Helen Ryan (Associate Assistant Deputy Minister, Environmental Protection Branch, Department of the Environment): Thank you.

I'm also pleased to be here today to speak about the role of energy efficiency in Canada and its contribution to Canada's Paris climate change commitments. As you've heard already from my colleague, Matt Jones, the pan-Canadian framework on clean growth and climate change is our national climate change plan. It is intended to make Canada more resilient to the impacts of climate change while helping us reach our greenhouse gas reduction target of 30% below 2005 levels by 2030.

Energy efficiency is an important part of reducing greenhouse gas emissions and forms part of the regulatory aspect of the complementary measures we're implementing to reduce these emissions. I'm going to talk further about some of those complementary measures, including some of those related to methane in the oil and gas sector, to transportation, to electricity and to the clean fuel standard.

As part of the pan-Canadian framework on clean growth and climate change, we've reaffirmed our commitment to reduce methane emissions from the oil and gas sector by 40% to 45% below 2012 levels by 2025. For those of you who don't know, methane is quite a potent greenhouse gas. It's 25 times more powerful than carbon dioxide and makes up about 15% of Canada's total greenhouse gas emissions. The oil and gas sector is the largest contributor of methane emissions in Canada.

In April 2018, Environment and Climate Change Canada published federal methane regulations to deliver on this commitment and reduce methane emissions. We've consulted extensively with provinces, territories, industry, environmental organizations and indigenous people to put in place a robust and cost-effective regulation. The regulations were designed to promote innovation and provide flexibility to enable industry to choose the most cost-effective compliance options.

Transportation accounts for about 25% of Canada's total GHG emissions, half of which are from passenger vehicles, or what we call light-duty vehicles. Our current light-duty vehicle regulations limit greenhouse gas emissions and have associated impacts on reducing energy consumption and increasing energy efficiency. The regulations are designed to promote innovation and provide flexibility to industry to choose the most cost-effective compliance options. New 2025 model year vehicles are expected to burn about 50% less fuel and emit 50% less greenhouse gas than vehicles built in 2008.

Canada's new heavy-duty vehicle emissions regulations, published in May 2018, introduce greenhouse gas standards for a full range of heavy-duty vehicles and engines. These standards increase in stringency from model years 2021 to 2027. It's estimated that some vehicle types can expect pollution reductions of up to 25% for model year 2027 heavy-duty vehicles.

With respect to electricity, about 80% of Canada's electricity generation is from sources that do not emit greenhouse gases, such as nuclear, wind or hydro. However, the remaining 20% is from emitting sources. On February 16, 2018, Environment and Climate Change Canada published proposed amendments to our traditional coal-fired electricity regulations to accelerate the phase-out of coal by 2030. At the same time we published draft standards for natural gas-fired electricity generation.

We expect these regulations to be finalized later this year. They will help Canada achieve its goal of 90% non-emitting electricity by 2030, and they form an important part of the pan-Canadian framework on clean growth and climate change. That is not only part of our plan to reduce emissions and grow the economy, but will also help us to transition as part of our mid-century strategy. The regulations will set greenhouse gas emission intensity performance standards for new gas-fired generation, ensuring that new gas-fired electricity generation is cleaner and more efficient. The new natural gas-fired capacity will be required in the coming years to ensure reliable and affordable electricity. A large amount of coal is coming offline, and it will provide a bridge for increased deployment of renewables.

With respect to clean fuel standards, using lower-carbon fuels in transportation industries and in buildings is one of the biggest steps we can take to reduce carbon pollution and make our economy cleaner and more competitive. The government is committed to developing a clean fuel standard to reduce carbon pollution by 30 million tonnes by 2030, which is a reduction in pollution equivalent to taking about seven million cars off the road each year.

● (1110)

In terms of the development of the standard, we announced in 2016 that we were moving forward with it and then recently announced in the summer that we're taking a phased approach. We'll be starting with liquid fuels. We'll be requiring a reduction in the carbon intensity of the fuel over its life cycle.

That regulation will have flexibility in terms of its compliance mechanisms, which will include things like energy efficiency or other efficiency measures that the refiners or upstream producers can put in place to lower the carbon intensity of their fuels, in addition to a range of other compliance flexibilities.

It's built in two parts. There will also be an element in the second phase to deal with solid and gaseous fuels such as natural gas and coal, and elements to see them moving forward and lowering their carbon intensity.

As mentioned by my colleague Matt Jones, there are a number of research and development initiatives that are designed to support provincial and territorial actions to reduce greenhouse gas emissions and spur clean growth across several sectors. Those funds are there to help support both the innovation that's needed but also the development of these measures that are needed to help us meet our commitments.

I thank you for your time. I'll turn it over to my colleagues from Natural Resources Canada.

The Chair: Thank you.

Ms. Levesque, I believe you're going to start.

● (1115)

[*Translation*]

Mrs. Kaili Levesque: Thank you, Mr. Chair.

My name is Kaili Levesque, and I am the senior director of Demand Policy and Analysis in the Office of Energy Efficiency at Natural Resources Canada.

I am pleased to be here this morning at the committee's second meeting on the economic opportunities for energy efficiency and its contributions to the Canadian Paris Climate Change commitments.

I will share the time set aside for us for opening remarks with my colleague Cynthia Handler, who will speak to innovation through research, development and deployment.

I will speak to programming on energy efficiency and low-carbon transportation.

[*English*]

I understand from reviewing the transcripts that last week the Canadian Home Builders' Association and Efficiency Canada both appeared. These are stakeholders that we work and meet with regularly. While it's unfortunate that we couldn't appear on the same day, it's nice to know that they were here and our stakeholders have laid the ground a bit for this.

Speaking of engaging with our stakeholders, on November 1 we will be joining Efficiency Canada and other efficiency leaders from across the country to discuss the enormous potential of energy efficiency as a source for energy savings for Canadians, as well as the economic opportunities that energy efficiency provides in creating jobs, increasing GDP and improving competitiveness.

To set the stage a little bit I would like to briefly tell you about the office of energy efficiency and place our efforts in the context of the government milestones and our efforts to reduce emissions.

The office of energy efficiency, or the OEE as we call it, administers the Energy Efficiency Act and the associated energy efficiency regulations. It provides other programs and information that promote energy efficiency in the major energy-using sectors of the economy. These sectors include residential, commercial, institutional buildings, industry, appliances and equipment, transportation and alternative fuels.

Energy efficiency is an area of shared jurisdiction and shared responsibility, which is why we work closely with all levels of government and the stakeholders. It is not something that any one level of government can do alone. Our activities help address market barriers that prevent investments in cost-saving energy efficiency technologies. We help Canadian consumers and businesses save money, embrace innovation and reduce greenhouse gas emissions.

I won't retread the history put forward by my colleague, Matt, but one thing that NRCan is very proud of in the context of the pan-Canadian framework is that we do play a significant role in the implementation of the PCF, leading or supporting 30 of the 50 initiatives developed under the umbrella. These initiatives span areas including clean electricity, the deployment of electric vehicle infrastructure, forests, adaptation, clean technology and innovation and, of course, energy efficiency. Energy efficiency itself is a critical component of the PCF. More than a third of estimated GHG emissions reductions are expected to come from efficiency measures.

Since the launch of the PCF in 2016, we've moved from commitment to implementation mode. Funding has been mobilized. Regulations to cut emissions have been drafted and consulted on. New policies and programs to build resilience, support clean tech and reduce emissions have been developed and are being implemented. We are making progress on all fronts. This is documented in the publicly released synthesis reports on the implementation of the PCF and also, as Matt alluded to, through the Energy and Mines Ministers' Conference, which is held annually each summer.

Canadians expect action and progress on this front. They care about the environment and they want us to do our part to help fight climate change. Highlights of the work we've done through consultations include the launch of Energy Star for industry challenge, working in close collaboration with industry, and the updated regulations on equipment standards.

The global demand for cleaner economic growth is opening up trillions of dollars of opportunity around the world, giving Canadian developers of clean solutions access to new markets and creating jobs for Canadians. We want to create the conditions that enable them to capitalize on these opportunities.

We work closely with the International Energy Agency. I'm fortunate enough to chair a committee there and work with colleagues from around the world on these issues. Last year, we actually worked with the IEA to develop a potential report for Canada on where the untapped potential on energy efficiency is. This was reiterated in the energy efficiency market report released last week from the IEA that poses the question, “What would happen if policy makers realised all the economically viable potential for energy efficiency that is available with existing technologies?”

● (1120)

The answer is that a range of direct and indirect economic benefits can flow from improving energy efficiency, including employment, productivity and incomes of individuals and businesses. However, enabling investment in energy efficiency at scale is critical.

Energy efficiency generates savings for Canadians. For example, a better insulated home costs less to heat and cool. More efficient equipment, such as a fridge or an air conditioner, lowers electricity costs. Fuel-efficient vehicles save consumers money at the pump. From 1990 to 2014, energy use in Canada increased by 31%, but would have increased by 55% without energy efficiency measures. This means an avoidance of 90.5 megatonnes of GHG emissions and energy savings of $38.5 billion over the same time period.

Energy efficiency also supports competitiveness and innovation. Companies with lower energy needs have a leg up on the competition as a result of reduced operating costs. Our programs and tools, such as the promotion of the ISO 50001 international standard, the superior energy performance program, and the Energy Star for industry, help businesses track, analyze and improve their energy efficiency.

Energy efficiency standards can also drive the development of innovation that can be marketed in the international energy efficiency marketplace. As committee members may know, the Standing Committee on Environment and Sustainable Development issued a report in June of 2018 entitled “Better Buildings for a Low-Carbon Future”. That report recommended the use of financing tools to accelerate the transition to more efficient existing buildings.

Given that 75% of Canada's current stock of homes and buildings will be standing in 2030, deep building retrofits will be crucial to achieving our GHG emissions reductions targets and facilitating Canada's transition to a low-carbon economy. However, federal investment and interventions are not enough on their own to meet our energy efficiency goals. We need to leverage the untapped private sector capital potential and further cultivate Canada's retrofit economy to reduce emissions from existing buildings.

Retrofits can offer broad gains and a strong return on investment to stakeholders. However, barriers and challenges are currently preventing more meaningful take-up from financial lenders, leading to a lack of confidence and risk aversion on the part of lenders. In its fall interim report, the expert panel on sustainable finance identified retrofits as a key theme, an opportunity for growing a sustainable finance sector in Canada. The panel observed that a national investment road map, supported by a national institution that would source high-potential projects, engage capital providers and facilitate cross-sectoral collaboration, will be an important enabler.

Quite simply, we have to shift from seeing energy efficiency only in terms of reducing our demand for energy, and wake up to its potential to deliver concrete economic and social benefits. That's why we're developing new building codes and standardizing rating systems for the energy efficiency of buildings. We're investing in research that will produce the high-efficient building technologies of tomorrow.

We are lucky here in Canada. We have world-class energy assets and a vision for our energy future. With that comes an enormous responsibility to emphasize the importance of being efficient with these resources as well.

We also work in the area of transportation at all levels of government and industry. We have worked collaboratively to improve energy efficiency and improve GHG reductions in the transportation sector, where efficiency has improved by 36% since 1990, saving $17.9 billion in total by 2019.

With that, I will turn it over to my colleague Cynthia Handler—I am mindful of the time I have been allotted—to speak more broadly about efforts in innovation and clean technology.

Ms. Cynthia Handler (Director, Office of Energy Research and Development, Energy End-Use, Department of Natural Resources): Thanks, Kaili.

As committee members know, clean technology and innovation make up a pillar of the pan-Canadian framework. Investing in clean technology innovation amplifies carbon pricing signals, enables smarter regulations and drives improved performance from technologies supported by deployment programs. In short, innovation redefines what's possible and lowers the cost of adoption for Canadian businesses and households.

To drive emerging technologies from the lab to the market, NRCan is investing across the energy and natural resource sectors. Budget 2017 funded seven program streams focused in whole or in part on clean technology innovation. This includes the energy innovation program, which is funding research, development and small-scale demonstrations, both those conducted by federal labs and research centres as well as external organizations. Currently we're supporting a wide range of projects, including renewables, smart grids, energy efficient buildings, vehicles, and carbon capture, use and storage.

In addition, four of NRCan's five green infrastructure programs include a demonstration component that funds innovative clean energy technologies to support mitigation efforts. This includes the smart grid demonstration program, the clean energy for rural and remote communities program, the electric vehicle infrastructure demonstration program and the energy efficient buildings program.

Budget 2017 also established the clean growth program, which is providing $155 million over four years for industry-led projects across the natural resources sector in partnership with provinces and territories. This program will better support small and medium-sized enterprises by allowing them to leverage the expertise and resources of the federal laboratories. We believe that by coordinating these investments we're maximizing the impact, further accelerating technological innovation and increasing the odds of success for these projects.

Overall through these programs, we're parallelling efforts internationally through Mission Innovation, a coalition of 22 countries as well as the European Union, which is dedicated to accelerating breakthroughs in clean energy technology.

Why do we do all of this? Because investments in innovation drive both environmental performance and economic competitiveness.

In short, the emissions reductions are driven by demonstration projects that validate new technologies. The additional reductions occur as projects are replicated and commercialized in Canada and around the world. These projects generate significant economic benefits. For example, the Conference Board of Canada found that $1.6 billion invested by Natural Resources Canada in energy technology leveraged $4.3 billion of investment from partners, increased household—

● (1125)

The Chair: I'm going to have to ask you to wrap up really quickly, please.

Ms. Cynthia Handler: —and business income by $5.6 billion and created 58,700 job-years of employment.

I will stop there.

The Chair: Thank you.

Mr. Harvey.

Mr. T.J. Harvey (Tobique—Mactaquac, Lib.): I guess my first question is for all of you. Your testimony is very relevant and very in line with what we've been hearing throughout this study so far.

I will start with you, Ms. Levesque, and then maybe give all of you the opportunity to chime in.

In going forward, how do you feel the federal government can best take steps to increase funding and programming for energy efficiency and recognize the opportunities as we're beholden to do?

Ms. Kaili Levesque: Thank you very much for the question. It's something that I spend a lot of time thinking about.

I mentioned the work we did last year with the IEA, the International Energy Agency, in looking at our potential through 2050. The IEA concluded that the buildings in Canada have the most untapped potential for further lowering greenhouse gas emissions beyond what's already being pursued in looking at the existing framework and going beyond.

That's greater than any other sector in Canada, including transportation and industry, but industry is a close second, particularly when we're looking at resource industries or extractive industries as a source. Canada could lower GHG emission intensity in commercial buildings by 60% by 2050 if all currently available policy tools and technologies were applied, including those focusing on motivating retrofits. We've seen significant returns already—by 23% in this space—but we know there's a significant gap yet to be filled. It's buildings first and industry second, and transportation follows as a close third.

Mr. Matt Jones: I'll just add, very quickly, that I agree that the building stock is particularly important. Certainly, the code is related to new buildings. Given the long-lived potential of all the buildings once constructed, applying the logic of "when you're in a hole, step one is to stop digging," we can start building buildings that are much more energy efficient. Those technologies exists. That ability exists. It's really just a matter of mainstreaming their application. That's something that I'm quite optimistic about.

In terms of generating longer-term emission reductions, they won't generate significant emission reductions prior to 2030, but have considerable potential to drive deeper reductions in the longer term.

We're trying this collection of policies through the pan-Canadian framework. We've tried to focus both on things that can drive near-term reduction and on things like building codes, equipment standards and other things that can provide deeper reductions in the longer term.

Ms. Helen Ryan: I would just echo the point about the further reductions that can happen in the transportation sector. As I mentioned, the way in which we regulate in that space is to look at model years for the vehicles you purchase, making them more and more efficient. We don't regulate the efficiency, but that's what the net outcome of the regulations is, in terms of vehicles consuming less fuel and emitting less greenhouse gases.

Then we see the uptake of new technologies—things like zero-emissions vehicles and the role they play there. That will continue to play an important role as we move forward.

Finally, I would mention the importance of a clean fuel standard, which helps to drive down the carbon intensity based on the life cycle. I know that's a complicated statement, but essentially what that means is that, from using or extracting the elements that form the fuel to the way in which you combust it, if you can make that more efficient, it drives down the carbon intensity and results in fewer greenhouse gases.

The design of that will be an important element, and it will influence the emissions from all sectors of the economy because it's related to fuels that you use in your homes, in industry, in your cars and in business. It will be an important tool moving forward. It will be a way to help move forward with continued reductions in that 2030 time frame as well.

● (1130)

Mr. T.J. Harvey: Mr. Jones, you talked about building standards and how we move forward in that direction. Do you feel that the most viable first step is a focus on government-owned infrastructure or privately-owned infrastructure, or both?

I'm wondering especially about housing developments and residential construction, so that we can get to where we need to go as quickly as possible.

Mr. Matt Jones: I'll say a few quick words and then turn to the real experts to my right.

Mr. T.J. Harvey: I only came to you because you mentioned it.

Mr. Matt Jones: I mentioned it, yes. I did want to emphasize its importance, and I think it's also worth noting that there are international comparisons that are helpful in this regard. For example, I know that a number of Scandinavian countries with similar climates consume less energy per square foot.

I think there is significant potential in the commercial, retail and residential sectors, and certainly on the industrial side of things. I'll turn to my colleagues to speak to whether there is greater potential in one area or another, but there is similarly significant potential in each of those areas.

Ms. Kaili Levesque: This is actually an area of collaboration. We talk about shared jurisdiction. This is shared with our colleagues at the Treasury Board Secretariat, whom I believe have appeared either before this committee or another on the greening of government operations. I was just looking for the specific number. NRCan is responsible for the federal buildings initiative. We work with current building owners—there are land holdings from coast to coast to coast—and try to green these operations at the point.... Helen mentioned life cycle. Buildings have a life cycle as well.

When you're getting to the point of needing a retrofit of a building, or a full-scale gutting in some cases, as we move to further densification in urban areas, there has been a commitment made through the greening government strategy to reduce our carbon footprint by 80% by 2050. That's the long-term piece, but we're also taking immediate measures through the federal buildings initiative, as well as on the fleet side, by greening the fleet of ministerial vehicles as well as those for deputy ministers.

Thank you.

The Chair: Thank you.

Ms. Stubbs, you're going to start.

Mrs. Shannon Stubbs (Lakeland, CPC): Thanks, Mr. Chair, and thank you, everybody, for being here today.

I just have some questions for you around the various competitiveness analyses going on related to the carbon tax. No other top 10 oil-producing country in the world except Canada is imposing a carbon tax on itself, aside from China, which is considering a cap-and-trade system in the next year. Given that, I understand there's a phase-three competitive analysis going on about the carbon tax, particularly related to emissions-intensive, trade-exposed sectors, which obviously would include oil and gas.

NRCan has also launched the study on competitiveness in the oil and gas industry, saying, “investment in Canada's oil and gas industry has fallen by over 50%,” while investment has recovered from the low point. It's not expected to reach previous levels any time soon.

I just wonder, are all of these efforts on the competitiveness analysis of the carbon tax on the energy sector being coordinated? Are all departments involved?

● (1135)

Ms. Judy Meltzer (Director General, Carbon Pricing Bureau, Department of the Environment): Hi, I'm Judy Meltzer, from Environment and Climate Change Canada, and I'll give you the first part of the response and then turn to my colleagues to add.

Thank you for that question. The short answer is yes, insofar as there is close collaboration and folks across the departments who are working on this are working together. I will flag that while competitiveness is a broad theme that cuts across these various pieces of analysis that are under way, there are some important differences, which is why they're being done in different ways.

The one I'll speak to is with respect to the federal carbon pollution pricing system and the approaches, as you said, for the big, heavy industry—the output-based pricing system that we're still in the process of developing. When you reference the phase three analysis, what you're referring to is the analysis that's still very much under way. As you've said, we've done a three-phase systematic process for those sectors that will be part of the federal output-based pricing system.

The first phase is looking at a static analysis, looking at historical data. There are some commonly used metrics to assess competitiveness. When we talk competitiveness in terms of pollution pricing, what we're concerned with is the risk of carbon leakage, and how it may impact a shift of economic activity to other jurisdictions with different types of polices.

The first phase is based on historical data, static testing. The second phase is taking the same metrics—and these are used in other systems, including Alberta's—and looking at it through the dynamic model we have at Environment and Climate Change Canada, which is used and referenced. We have a third phase under way to recognize that there are additional considerations. We are looking to industry to provide additional considerations, whether it's to their particular facilities, their competitors in other jurisdictions or the impact of indirect inputs, etc.

We're in that process, but that's very much part of feeding into the design of the output-based pricing system regulations. For that reason, this is a very particular analysis.

Mrs. Shannon Stubbs: Is that connected or integrated with the competitiveness study being done—I think by Finance or is it by NRCan—on the oil and gas sector? When can Canadians expect the conclusions?

Ms. Judy Meltzer: I'll finish on my point and then turn to that. It's related insofar as some of the themes are common, but remember, in our case, we're looking very specifically at the risks to carbon leakage and competitiveness that result from the application of the pollution price.

There is of course a wide range of factors that influence competitiveness impacts on a given sector. For these particular regulations, we're focusing very specifically, using these pretty consistent metrics that are used when you develop other similar systems, to try to distill the impact of that carbon pollution price signal. That's where it's a little more focused than, for example, the broader analysis that I'll let my NRCan colleagues speak to.

In our case, we're the next big milestone in terms of information. I think there have been ongoing updates, including recently this past summer, in terms of where we're at. The next big milestone I would flag is that we will be releasing draft regulations for the output-based pricing system that will include the sector-specific output-based standards, at least the proposed ones.

Mrs. Shannon Stubbs: When?

Ms. Judy Meltzer: It will be later this fall, and certainly before the new year. Again, those will be draft and we will be continuing to consult. We have a pretty intensive systematic consultation going on with industry, the provinces and territories through 14-plus working groups, so that's still very much under way.

Ms. Helen Ryan: I can speak more specifically. There was a joint working group that was put in place with Natural Resources Canada, Environment and Climate Change Canada, Finance Canada, some of the oil and gas industry and the provinces of Alberta, B.C and Saskatchewan. The purpose of that was to come together and do some collective analysis on what we think the competitiveness considerations are for the oil and gas sector.

● (1140)

Mrs. Shannon Stubbs: When will the outcome of that study be released? I personally think the competitiveness issues for the Canadian energy sector are blindingly obvious. Economists, experts and industry proponents have been raising the red alarm and blaring on about costs and new red tape, and that this what is driving energy investment out of Canada at catastrophic levels, which should concern every Canadian in every part of the country, given that the energy sector is the largest private sector investor in the Canadian economy.

When will the results of that study be released? I also find it somewhat alarming that what's actually being admitted here is that the policy is being imposed before the competitiveness analysis has actually been concluded. When will the NRCan competitiveness study and conclusions be released?

Ms. Helen Ryan: As I was saying, it is a joint working group with all of those players. The purpose of the—

Mrs. Shannon Stubbs: Is there no timeline, then?

Ms. Helen Ryan: The purpose of the working group was to come together and do shared analysis—

Mrs. Shannon Stubbs: I understand the purpose, but what is the timeline?

The Chair: Why don't you let her answer the question?

Mrs. Shannon Stubbs: I can't, because I have two other questions.

The Chair: You're out of time, so I can cut her off now, or you can get an answer. It's up to you.

Mrs. Shannon Stubbs: What's the timeline?

The Chair: She was trying to answer and you interrupted her.

Ms. Ryan, if you can finish your answer very quickly, then we can move on.

Ms. Helen Ryan: The working group was to come together to do joint analysis and look at the competitiveness considerations. From that, industry has put forward specific recommendations to government around what it thinks the nature of the issue is and what the findings are. That's how the results of that work have come forward.

With respect to looking at overarching competitiveness considerations at large, outside the oil and gas sector, there is also another working group that involves industry that's looking at all of the considerations—

Mrs. Shannon Stubbs: What about the timeline?

Mr. Chair, we're just talking about the clock here.

The Chair: She's trying to answer the question.

Mrs. Shannon Stubbs: My question is very simple. It should be like—

The Chair: We'll move on.

Mr. Cannings, the floor is yours.

Mrs. Shannon Stubbs: —in the fourth quarter or May, or next week.

The Chair: We gave you the chance to get the answer, and you didn't like it.

Mr. Cannings, the floor is yours.

Mrs. Shannon Stubbs: But that wasn't an answer. The question was, when will the conclusion of the study be released?

The Chair: You didn't like the answer.

Mr. Cannings, the floor is yours.

Mrs. Shannon Stubbs: No, it's not a matter of me not liking the answer. It's a matter of everybody with a brain cell seeing it wasn't an answer.

The Chair: We're moving on.

Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you for being here. I'm going to change direction perhaps dramatically.

We've had a couple of reports come out in recent days and months, one being the IPCC report. It pointed out that the world's efforts to meet the Paris Agreement targets have been inadequate. Canada's efforts have been classed as highly insufficient by other watchers. We also had the environment commissioner's report on the pan-Canadian framework that shed some concern about how things were going there.

First of all, I want to ask a very broad question. Again, you don't have to spend too much time on it, because my time is limited as well. Have you had any direction about stepping up our game? Our present targets are 30% below 2005. IPCC says we need 45% below 2010. That's 130 megatonnes we have find to somewhere. We were going to have a hard time meeting those 2030 targets.

Has there been any talk that we really have to be a lot bolder than we are to just meet those Paris targets going from 80% by 2050 to 100%?

Go ahead, Matt.

Mr. Matt Jones: This kind of comes back to the big picture of the impacts of climate change, the challenge in front of us.

I think that, from the federal perspective, we have our target, but we're very much aware that it is a step and that it's not the only step in terms of reducing emissions. The Paris Agreement has built into it a mechanism to require all parties that have signed on to it to continuously come forward on a regular cycle with more ambitious targets.

Our approach has really been to develop the policies, get the policies approved and implement the policies. Our focus right now is very much on implementing those policies quickly and effectively and on getting emissions reductions in the near term. However, all the while, we're very much aware that we can't just declare victory if and when we achieve our Paris target.

We have done some long-term visioning. I believe the mid-century strategy was mentioned. That looked at different scenarios and at the deeper reductions that are required to avoid the worst impacts.

● (1145)

Mr. Richard Cannings: Okay.

I just want to get down into more detailed things here. Somebody mentioned that the built environment is the most profitable way to jump in first, that this is where we could make the biggest impact.

One of the things that I talk a lot about in this committee and in the House, as people will know, is the eco-energy retrofit homes program. It seemed to be punted over to the provinces in the pan-Canadian framework, where I can say there have been mixed results at best with regard to the provinces taking it up. We've just seen Ontario drop its program.

I'm just wondering if there's any reason why the federal government can't just bring that back—put it on steroids, if need be—to get Canadians to retrofit their homes. Have it applied to commercial buildings, as well, somehow. We have to do something bold here. You just mentioned that this is where we can do it. It seemed to be a very efficient way. It leveraged four times the amount in private funding.

Perhaps, Ms. Levesque, you could comment on that. Why haven't we seen that brought back?

Ms. Kaili Levesque: I'll start by saying that I won't speak for my colleagues at Environment Canada.

However, under the pan-Canadian framework, the buildings have their own table. It's one of the pillars under the strategy, under mitigation: the building strategy, which we've coined “Build Smart”. It has been endorsed by all provinces and territories through the Energy and Mines Ministers' Conference process. It sets forward the shared commitment to meeting the milestones in the implementation set forward in the pan-Canadian framework.

The desire to have a truly pan-Canadian approach to this, where regional programs are able to reflect the national commitments that were made, is the commitment that was made and was endorsed. While there are some shifting realities, there are still significant investments being made at the provincial level in partnership through programs such as the low-carbon economy fund. To presuppose the outcome of that would be.... I couldn't speak to that at this point in time.

We also are seeing innovative tools being developed at the provincial level—such as Energy Efficiency Alberta, the Crown corporation there—in addition to any programs done through federal programming. They're also launching their own PACE program, which is property assessed clean energy. People are getting money up front to do the retrofit, and it's paid off through energy savings. We're seeing complementary efforts to federal, provincial and territorial programming in real time.

Mr. Richard Cannings: I just want to throw that out there as something that the federal government could just do across Canada and get the results.

On a similar vein, Ms. Ryan, you mentioned programs to make vehicles more energy efficient through.... I assume you're talking about gasoline and diesel-fuelled vehicles. Is there any federal plan to step up the game around zero-emissions vehicles, electric vehicles? I know that there's been some funding put through for infrastructure on charging stations, but right now the problem is that people want to buy electric vehicles and don't have the vehicles to buy. That's because some jurisdictions have these stepped programs demanding that retailers have those vehicles in supply.

I'm just wondering if there's anything that the federal government can do or should be doing to incentivize this—maybe have a stepped program saying 10% by this year, 50% by this year, etc., so that we can move there. This is the kind of bold action that we need to meet those Paris targets.

Ms. Helen Ryan: That's a good question.

The Chair: You're going to have to answer very quickly.

Ms. Helen Ryan: Okay.

As part of the pan-Canadian framework, there is a commitment to working collaboratively with provinces in the development of a zero-emission vehicle strategy. That work has been ongoing and analysis has been done about the importance of moving forward on four elements. The first is the idea of needing the infrastructure to be able to support the vehicles, and my colleague spoke a bit about the work that NRCan is doing with respect to building that infrastructure. Then there's raising public awareness as well, because there are people who want to buy vehicles and there are others who don't have any idea what it means to drive a zero-emission vehicle. It is a slightly different driving experience, so there is the importance of raising public awareness.

The other element that was put forward was the importance of trying to reduce the costs of zero-emission vehicles because they are more expensive to produce and there is less uptake of them. There's a little tension in the market right now about how much is produced and how much is sold.

● (1150)

The Chair: I'm going to have to interrupt you and cut you off. I'm sorry.

Thanks, Mr. Canning.

Mr. Hehr.

Hon. Kent Hehr (Calgary Centre, Lib.): Thank you very much, Mr. Chair.

I appreciate the comments of all the people who have come this morning to ensure we are trying to get the best information we can with regard to our move to a more energy-efficient future. We are a government that wants to see the environment and growing the economy as two sides of the same coin.

I was struck by Ms. Levesque's testimony. I may be paraphrasing here, but you felt that by implementing prices on carbon, by doing things more energy efficiently, we are increasing business competitiveness. Is that what I heard from you?

Ms. Kaili Levesque: No, it's by implementing industrial energy efficiency that we are definitely.... We do it on a voluntary basis though, whereby businesses can conserve. They work to reduce their monthly energy footprint and it impacts the balance sheet in dollars saved, so it does increase the productivity of the energy as an input. It's like any input in a business. You're getting more out of a unit but you're also allowed to keep more in your pocket for the bottom line of the industry.

Hon. Kent Hehr: In the long run, do you think more carbon reductions are going to be in the interests of businesses going forward? Do you think it will be more competitive to do it that way, rather than simply to leave it as business as usual?

Ms. Kaili Levesque: I'll also let the innovation angle speak to this. I won't speak to carbon pricing per se, but we do see the significant returns of energy efficiency at the industrial level.

I have a specific example. We found that in one case an investment of $50,000 through a contribution to an energy management system yielded $2 million in energy savings in a business over time, so when you look at a powerful multiplier such as that—and that's the energy management itself—it's not the big innovation pieces, but by supporting innovation in real time we're helping to reduce the immediate expenses while also making available technologies that will support the long term.

If I can use the analogy of seeing where the puck is going and skating toward it, in the short term the energy efficiency shores it up and in the longer term the innovation is the—

Hon. Kent Hehr: Ultimately you're seeing a move toward energy efficiency and carbon pricing and the like as being where the puck is going.

Ms. Kaili Levesque: I can't speak for carbon pricing. I can only speak to the energy efficiency side. We consider it the first fuel, so if you can manage what you don't need in advance through energy demand, that allows you to effectively build out your capacity going forward.

● (1155)

Hon. Kent Hehr: Okay, then maybe I'll ask a similar sort of question. In Alberta and throughout Canada, we've had major oil companies like Cenovus, Suncor, CNRL, Husky, Shell and pipeline companies like TransCanada and Enbridge all call for putting a price on pollution. They believe that's where the puck is heading, and that to be more efficient they need to see this come into play in this country.

Are you working with these organizations to move competitiveness issues forward, on how we're instituting a price on pollution and how it affects our businesses?

Ms. Cynthia Handler: Maybe I'll just very quickly say that, regarding carbon pollution—the carbon pricing issue aside—we are working with these companies in innovation. There was a budget 2016 program called the oil and gas clean technology program and we now have—I referenced it in my speaking notes—the clean growth program, which we've just launched. In both programs, as well as in work that NRCan does in its CanmetENERGY laboratories, we work to look for innovative opportunities to lower the cost of environmental technology through clean technologies in the context of the oil sands, as well as all of the other natural resource production sectors.

I will pass it over to you guys.

Ms. Judy Meltzer: I'll just make two quick comments on that topic.

With respect to explicitly pricing carbon pollution, we have seen significant support across different business and industrial sectors. I'd point to the Carbon Pricing Leadership Coalition, which is an international organization that has significant representation from a range of Canadian businesses, including the five big banks, the oil and gas sector, etc.

The other thing I'd point to is a bit more granular. Within the system that we're developing—again for heavy industry, which is what I'm focusing on—the output-based pricing system, we actually monetize the incentive, so clean performers will be able to capitalize and will sell their surplus credits as part of an emissions trading system. There is very clear economic benefit to clean performance, so they can capitalize on that.

More broadly—and maybe Matt will have more to comment on this—there is a very significant global economy for low carbon-intensive goods and services. Facilities, industries and businesses that are well positioned to take advantage of that would see an economic advantage.

Do you want to add to that?

Mr. Matt Jones: Maybe just very quickly, to wrap up on this point, the idea is to create the incentives or the requirements to move towards more efficient and lower emissions options and in so doing, there are cost savings associated with that. There's also the opportunity to create the solutions that can be exported around the world because the need to reduce emissions doesn't just exist in Canada; it exists elsewhere. There's great demand for solutions and Canadian companies are already starting to and increasingly providing those solutions and seizing economic opportunities associated with that.

Hon. Kent Hehr: I know that 45 nations and 24 subnational governments have moved towards pricing pollution and moved towards these types of standards. In your view, do you see that number increasing or decreasing in the future?

Mr. Matt Jones: Maybe I can go very quickly and then turn to Judy.

Thus far, that trend is only pointed in one direction and with some momentum. Certainly putting a price on carbon pollution is an efficient tool. People see the advantages of applying that tool and given the scope of emission reductions that are needed globally, it's hard to envision achieving deep reductions without using all the tools available to us, including putting a price on pollution.

The Chair: We're going to have to stop there. Sorry, Mr. Hehr. We've run out of time.

To our witnesses, thank you very much. We only have so much time available to us each hour, so we're very grateful for you taking the time to join us today.

We'll suspend, while we get ready for the next panel.

● (1155)

(Pause)

● (1205)

The Chair: Welcome back, everybody. We're all set to start with our next witnesses. We have the National Research Council of Canada, and Mr. Dumoulin and Mr. Nightingale.

Gentlemen, thank you very much for joining us today.

The process is that you will collectively be given up to 10 minutes to do a presentation and then that will follow with questions from around the table. You can deliver your remarks in French and/or English. There are translation devices there if you need them. I anticipate you will be asked questions in both languages.

On that note, the floor is yours.

[*Translation*]

Mr. Michel Dumoulin (Vice-President, Engineering, National Research Council of Canada): Thank you, Mr. Chair.

Thank you for the invitation to appear. My name is Michel Dumoulin, and I am the vice-president of Engineering for the National Research Council of Canada. I am joined today by Trevor Nightingale, the principal research officer with our Construction Research Centre.

[*English*]

We are very pleased to have this opportunity here today to speak with you. We would like to highlight the NRC's recent initiatives and contributions to help the Government of Canada and commercial asset owners achieve increased energy efficiency in buildings specifically, and realize compelling returns while contributing to our commitments to the Paris climate change agreement.

Initially, I would like to provide you with an idea of the scale and scope of the NRC. Our work covers a broad range of scientific and engineering disciplines, the outcomes of which have changed the lives of Canadians and people around the globe. We are a national organization, with some 3,700 highly skilled and innovative researchers and staff located across the country. Our 14 research centres operate out of 22 locations and are mobilized to deliver on 26 targeted research and development programs.

Over the past century, the NRC has produced breakthrough inventions and innovations such as radar, the pacemaker, the black box, canola, the Canadarm and many more. Each year our organization works closely with industry, conducting research and development work with over 1,000 companies as well as numerous research hospitals, universities, colleges, federal departments and international partners.

[*Translation*]

This brings me to NRC's contribution to the Pan-Canadian Framework for Clean Growth and Climate Change. As we heard in the previous session, this framework includes the Canadian government's vision for action to achieve its climate change objectives. As part of the pan-Canadian framework, the NRC, in close collaboration and partnership with Natural Resources Canada, is working with industry to help produce needed technology at the right cost.

I'd like to highlight three of the NRC's recent successes in turning energy-efficiency technologies into market-ready innovations, enabling commercial building owners to significantly reduce greenhouse gas emissions while also improving their bottom lines.

[*English*]

First, the Royal Bank of Canada partnered with the NRC to accelerate its rollout of green building technologies and achieve the triple bottom line of reduced environmental impact, lower operating costs and improved employee well-being. This work referenced preexisting datasets from RBC's HR department, real estate group and the facilities manager, compiled from the dataset of close to 71,000 RBC employees and more than 1,600 North American facilities. lt focused on comparing data from 10 larger green-certified buildings with 10 matched conventional buildings. An annual RBC employee opinion survey confirmed that overall green-certified buildings demonstrated higher job satisfaction, value to clients and stakeholders, evaluation of management and corporate engagement. ln addition, we noticed there was a tendency for higher job performance reported in annual manager evaluations of staff.

The second example is a collaborative project between NRC and PSPC to leverage the big data analytics in real time to support increased operational efficiency and maintenance of Canadian federal government buildings.

NRC piloted technologies in 13 PSPC buildings in the national capital region. This two-year pilot realized 15% energy cost savings with a very simple payback of eight to 12 months. The technology also brings collateral or stacked benefits, making the business case even stronger. The technology also improved maintenance efficiency, because the opportunity costs of not fixing the faults were automatically estimated. This project received the 2017 Real Property Institute of Canada Excellence Award for Energy Efficiency of Federal Buildings.

● (1210)

The final example is a deep energy retrofit undertaken by the Ontario Association of Architects to move their 1980s headquarters building from an energy hog to a highly energy efficient building, with a design performance that is zero-carbon and close to net-zero energy. NRC provided support to the integrated design team and leveraged the project as a platform to demonstrate innovative Canadian energy technologies.

After the building is reoccupied in February 2019, NRC will provide measurement and verification of energy and carbon reduction as well as measurements to assess improvements in organizational productivity KPIs similar to those mentioned in the RBC study. This deep energy retrofit will deliver essentially a completely refurbished building.

[*Translation*]

These examples help illustrate a few key points.

First, individual component replacement strategies can offer significant energy reduction and cost savings.

Second, there is a range in the simple payback that is based on energy cost savings, with deep energy retrofits typically offering lower returns.

Third, there can be stacked or collateral benefits that should be considered when developing the business case for energy retrofit.

[*English*]

NRC continues to work closely with industry and government collaborators such as NRCan to develop, in government labs, new energy technologies and improve the performance of existing technologies.

We use pilots and demonstration projects in both public and private sector buildings to validate the energy performance and accelerate uptake of new and existing energy technologies. Pilots in DND, PSPC, CNL and other federal department buildings are contributing significantly to the GHG emission reduction of federal custodial departments, while the substantial energy cost savings can be invested in new programming.

We are also performing leading-edge research with industry collaborators to quantify the collateral benefits and develop monetization frameworks for organizational productivity gains, which are required to motivate investment in deep energy retrofits and scale deployment of new energy technologies.

In addition to these long-term impacts, the creation of a low-carbon economy would result in positive impacts immediately, as we help the industry innovate in terms of wealth and job creation.

In the course of achieving these impacts, NRC will lead the way in collaborative research and development with other science-based departments. We will be validating hypotheses and claims, developing new knowledge, asking new questions, providing validated answers and solutions, and filling the knowledge gap. This R and D will be invaluable for industry when responding to the new business opportunities created by the upcoming low-carbon reality, and we'll do all this, while ensuring cost-effective solutions are available where and when needed.

Reducing the carbon footprint of our buildings will support Canada in achieving its commitment, under the Paris Agreement, of a 30% GHG emission reduction by 2030. The work we do at the NRC to address the challenges of today inevitably results in the long-term solutions and innovations that Canada and the world have been waiting for.

● (1215)

[*Translation*]

Thank you for your interest in the NRC. My colleague and I would be pleased to answer any questions at this time.

[*English*]

The Chair: Thank you very much. You're right on time.

Mr. Tan, you're going to start us off.

Mr. Geng Tan (Don Valley North, Lib.): Thank you, Chair.

Thank you, gentlemen, for being with us today.

One of the responsibilities of NRC is to fulfill government mandates. We know that using energy more efficiently represents a lowering of the costs and making the most use of our energy resources in Canada.

How does NRC's work in the area of energy efficiency support the government program in this area? You mentioned in your presentation quite often about your close collaboration with NRCan, but not very specifically. What kind of program do you have? What kind of a plan do you have to support government programs?

Mr. Michel Dumoulin: I'll take the question at a high level first, and then my colleague Trevor will come in with very specific examples of how we do this.

First, let me say that overall at NRC, our mandate is basically that everything we do falls into three categories. Our mandate basically is threefold. First is developing new knowledge, so pushing the boundary, developing new knowledge for Canadians and for Canada to be at the forefront pushing the envelope. Second is business innovation, helping companies. It's working with companies, directly with them and for them, in projects to make sure that the technology transferred is adopted and their technological level is increased. Third is our public policy mandate.

We are addressing the energy questions in all three parts of the mandate, but quite specifically in terms of our public policy mandate, our role is to develop data to support our colleagues in Environment and Climate Change Canada, basically providing evidence, providing data, doing the basic underlying research and development work so that they have good solid evidence to make good policy decisions.

Mr. Geng Tan: You don't give any advice. You just provide data, or your researchers do, to the government to make a decision.

Mr. Michel Dumoulin: Absolutely. Our role is to provide data evidence to support good policy development.

Mr. Geng Tan: Okay. I want to mention one example, or a future example actually. Later this week, the Government of Canada will launch an initiative called Efficiency Canada—probably you have heard that already—with the purpose of advocating to make Canada a global leader in energy efficiency. As a specific example, what kind of support can you provide to this important initiative in Canada? Please give one example.

Mr. Michel Dumoulin: I would have to go back to the basics, the same approach. Whatever program the government comes up with, we still have the same three-pronged approach. We work with our federal departments, and the provinces and territories as well, to help support developing the technology, so that it's going to be implemented and so that the technology is available. We'll work with companies to make sure they reach market.

Perhaps, Trevor, you would have an example to address this particular question.

Mr. Trevor Nightingale (Principal Research Officer, Construction Research Centre, National Research Council of Canada): Sure.

Maybe I could take a step back and say that NRC collaborates very closely with NRCan and other government departments on a number of important initiatives. In fact, the Canadian centre for housing technology, which is located in the NRC, is a shared facility among NRCan, NRC and CMHC. This is a platform for which many residential energy technologies are demonstrated and validated, and essentially it becomes a gateway to the marketplace.

We collaborate on federal programs like the program on energy R and D and on eco-EII—or eco-energy innovation initiative—programs, where the researchers come together and focus on R and D and developing the information necessary to develop the policies and inform technology development.

We also support the greening of the government through the centre for greening government, run out of Treasury Board. There is strong collaboration between many of the government departments that have a capacity in the area of energy efficiency to bring measures that are the most effective in terms of efficiency and most cost-effective to the Government of Canada buildings.

We have a lot to offer in this area. As my colleague Dr. Dumoulin said, we're ready and able to support these programs as they become available.

● (1220)

Mr. Geng Tan: Okay.

What is the current status of Canada on the research on energy efficiency in the world? Are we a leader now? Do we have the leading-edge results? What's our current status? How do we collaborate with our peers in other countries?

Mr. Michel Dumoulin: Thank you for the excellent question.

It's a difficult question to answer. It varies. We clearly are at the leading edge. We are with the others, if you take into consideration our size, of course. You could measure that out of, for example, the number of publications or patents, and we are holding our own on the world scene. Absolutely in terms of publication and in terms of production of knowledge, we are right up there. If you look at the economic activity, yes, we have very solid representatives on the industrial scene, absolutely. We have great engineering firms.

As you know, the energy sector is extremely broad, very diversified. In the oil and gas sector, we clearly have a leading edge with leading companies, but it varies.

Mr. Geng Tan: Mr. Nightingale, for example, you are from a construction research centre. I'm quite curious about making buildings more energy efficient. Of course, we have two ways. One way is to retrofit the current buildings, as you mentioned a lot in your presentation. Another way is to just simply demolish the current buildings and make new ones.

In general, which way is preferable, economically, based on your experience?

Mr. Trevor Nightingale: I'd like to be able to say there's a very simple answer, but unfortunately, there isn't because it really depends on the building itself and what its condition is. If there's been a ton of deferred maintenance, and maybe there are requirements for upgraded seismic resistance, there may be no choice but to demolish the building and start over again. I think, from an overall sustainability point of view, it really behooves us to look and see if the building has “good bones”, in other words a good structure that we can save, and we can rehabilitate that building.

The answer is that very many factors must be taken into consideration—economics, safety, health and the availability of technologies to rehabilitate that building.

The Chair: Thanks very much. I'm going to have to cut you off there.

Mr. Schmale.

Mr. Jamie Schmale (Haliburton—Kawartha Lakes—Brock, CPC): Thank you very much, Chair.

Thank you, gentlemen, for all the work you are doing. Thank you for coming to our committee and answering our questions. We do appreciate it.

My first question is on the use of technology in terms of energy efficiency, building codes and those types of things. Has there been any analysis done? I know you talked about energy savings on the one end. I think we have pretty high standards anyway, and if you up the bar, that cost always goes up. Has there been analysis to say whether you're better off, ahead or not ahead, based on potential savings, based on initial investment and those types of things?

Mr. Michel Dumoulin: That's an excellent question and not an easy one to answer, of course. It's not my first time here, and I know you're good at that.

Let me try to answer it in this way. I'm sure you know that we are custodians of the process for building codes, for the model codes. This is a fairly complex endeavour. Basically, the codes are developed on a consensus basis by the national Commission on Building and Fire Codes. Every time there's a task force, or these technical committees will actually look at changes to the codes, to really raise the bar, as you mentioned, to increase the quality of our building safety, oftentimes technical assessments and economic assessments also have to be done. This is where we come in. This is one of our key roles. We will actually take on lab work, research work or technical assessment work to see whether that will create market disruptions, what the impact on safety and the health of Canadians will be, and what impacts there will be on the market and whether the technology is there. Then we take it back to the working group, to the task force at the commission, so that they can actually make wise decisions.

I cannot answer in general. This is done on a case-by-case basis when changes to the code are being presented, when they are being tabled.

● (1225)

Mr. Jamie Schmale: If I were to renovate my house as it exists, I would be thinking, what gets me the biggest bang for my buck? It could be windows, insulation or a combination of both. What have your research and your consultations told you?

Mr. Michel Dumoulin: To go back to what Trevor was saying, there's no simple answer. I guess it depends on the situation. Is it a commercial building? Is it residential?

Mr. Jamie Schmale: Let's say it's a typical residential house.

Mr. Michel Dumoulin: I would have to go back to, basically, a discourse, whether it's for business or operation. You need to look at the business case and the expected outcomes. I'd add that what's key is looking at life cycle analysis or cost of operation, and not just at capital costs. Oftentimes in the past, and still now, we look only at the investment, the capital costs. You need to look at the whole operational cost, the life-cycle cost. This is where you will get the cost savings from energy savings. You need to look at the big picture, looking at the life of the operation of any asset.

Mr. Jamie Schmale: For sure.

Did you want to add something?

Mr. Trevor Nightingale: In general, we look at a basket of technologies. Obviously, one of the weakest links in a building's envelope is with the glazing and windows. Airtightness is often overlooked. If you have a leaky envelope, then make it airtight.

It comes back to this: What are we starting with? At this juncture, all we can say is that there's a basket of technologies and there are many different pathways to get where you want to go. It's kind of like going from Ottawa to Montreal. You can take a detour via Cornwall or some other location. If you know the right path, it's comparatively short. If you don't know the right path, you'll go in a large number of different directions and log a lot more miles than you really need.

I think the key issue, as Michel indicated, is to understand what you have and develop a sensible plan to get to it. There are audits and programs that will help you develop that plan. It scales from a home all the way up to a national level.

Mr. Jamie Schmale: I agree. I'm glad you said that, because it was kind of what I was thinking. For us in government circles, and in industry or whatnot, there's a bit more when it comes to resources. How do we move forward in terms of the typical Canadian who is trying to make that determination?

Where can they get the information if they don't have a lot of time or if they're just frustrated with the whole thing and they just want new windows or whatever? I know that there is an energy guide on most windows and new appliances and that kind of thing, but is there anything else coming down the line that could help with these decisions?

Mr. Trevor Nightingale: Many of those tools and resources are coming from our colleagues at NRCan, so we're feeding into that. Not to be overlooked are the provincial utilities, both electricity and gas. They have information and programs that are very valuable to the homeowner. They're typically regionally specific. There's a wide range of information.

The other thing would be to engage the CHBA and one of their home builders who's certified in high-efficiency homes. There are also consultants available. There is a wide range of options, all the way from doing it yourself to engaging a professional.

Mr. Jamie Schmale: There's the other thing, “engaging a professional”. As we heard from the Canadian Home Builders' Association, there is a shortage of skilled trades in Canada. I think it's everywhere. I don't think it's just a provincial thing. I think it's in every province, every territory.

With these new building codes and these new upgrades, there's always a cost. Of course, as a homeowner you weigh the benefits, the pros and cons. Any new policy or new regulation always adds to the price. With the skilled trades being in very short supply, is there any organization—yours, perhaps, based on your research—or is there anything that you know of engaging high schools or colleges to kind of point people to the skilled trades field, telling them, for example, “This is something you can make a good living at very quickly and we need it”?

● (1230)

Mr. Michel Dumoulin: There are different things we can do, and there are different actions we are taking. You know, of course, that teaching and education are not part of our mandate, but we do ensure that we work with colleges and universities to make sure that the students are exposed to that. We will hire them or we will co-supervise graduate students to make sure they are exposed to the latest applications of science and technology—

Mr. Jamie Schmale: Are they making that next choice to say—

The Chair: I'm sorry, we're over time.

Mr. Jamie Schmale: But he wasn't done answering.

Voices: Oh, oh!

The Chair: That's why I was letting him talk but not letting you talk.

I can give him a brief moment to finish.

Mr. Jamie Schmale: It was just a supplementary.

Mr. Michel Dumoulin: Well, the best bit was coming. I was going to say that when we issue new national model codes, we also ensure there's a training aspect to it. We do seminars across the country and webinars, and we go out. For example, for a building inspector, we make sure they understand the changes to the codes and what that implies. There is a training aspect to make sure we touch across the sector.

The Chair: Thank you. I have to stop you there.

Mr. Schmale, I'm not sure whether you're planning a career change or you're doing home renovations.

Mr. Jamie Schmale: Hopefully there won't be a career change.

The Chair: Mr. Cannings, over to you.

Mr. Richard Cannings: Thank you.

Thanks to both of you for coming here today.

Monsieur Dumoulin, you were here before the committee a while ago, speaking about my private member's bill on the use of wood in government infrastructure. The way that ended up was more broadly a life-cycle analysis of materials used in buildings.

Mr. Nightingale, you were talking about some more recent developments. I wonder if you could expand on that and on the importance of the NRC's work on these life-cycle analyses. How could that help us move forward in Canada to meet our targets and just improve the environment of the country?

Mr. Trevor Nightingale: As part of one of the initiatives coming from the Treasury Board's centre for greening government, they are now asking that federal infrastructure projects submit a life-cycle analysis and a total cost of ownership assessment of the asset. It's not going to be used in the bid selection. Essentially, it is to raise awareness and capacity, and the Canada Green Building Council in their net-zero standard also requires submission of those two items.

We found in the development of this is that we do not now have sufficient maturity right now, and accuracy in the LCA, to embark upon a competitive bid analysis, where we're looking at the total cost of ownership and the total carbon footprint. The problem was traced back to a lack of a national database for LCI and LCA materials.

About two weeks ago, Treasury Board and NRC hosted a joint workshop where we brought together government departments and industry leaders and associations to look at what the next steps should be in developing a national database whereby the inputs are regionally specific, validated, open and transparent. This database would allow us to engage in more accurate LCA and LCI evaluations and ultimately get to the end state of adjudication of bids where some of the KPIs are total cost of ownership and total carbon footprint over the entire life of the building—embodied carbon, operational carbon and end-of-life carbon.

● (1235)

Mr. Richard Cannings: Thank you.

To change gears for a minute, I have a constituent I met with perhaps a year or so ago who was one of these real idea guys. He started off in computers and then got into energy-efficient heat pumps and designed a new kind of enclosed heat pump that was highly efficient. I think he was speaking with NRCan and they brought him up to the Arctic to look at communities there. He looked at the buildings and said that there was no point in putting a heat pump in these buildings because their energy efficiency was so bad. He went back home and designed a new building. That's the kind of guy he is.

I haven't talked to him recently, so I don't know where he is at that level. I'm just wondering at what level NRC gets involved in helping businesses like that, helping innovators who have an idea. Does NRCan send them over to you and tell you that these guys have an interesting idea? Do they ask you to help them test out these products? What level do you get in on?

Mr. Michel Dumoulin: The simple answer is all levels. If I may be a little bit simplistic, I'll tell you that a strong difference between NRCan and us is that we are sort of the operational arm. We don't do policy and regulation. We don't enforce. We do actual work, and we work, as I mentioned in my opening statement, with thousands of companies a year, from the entrepreneur who knocks on our door with an idea he wants to test, to the multinationals and global giants of this world.

To be more specific, we often work with small companies such as entrepreneurs where we actually go in the lab and do pilot testing or scaling up with them, testing to see if the invention obeys the laws of physics, the first few tests, and/or we can also use IRAP, the industrial research assistance program, which is for companies with 500 employees or less. IRAP funds the development of small or initial projects, which are actually fairly large sometimes. Our IRAP network will support finding the right resources and it will open doors.

So absolutely we do.

Mr. Richard Cannings: I know NRC has done some work in studying building technologies for the north.

Could you tell us a bit about that and the energy efficiency in those communities where it's so important?

Mr. Michel Dumoulin: We have worked with local Inuit corporations in transferring some technology or testing some heating ventilation assets, for example, in housing in the north. We've done some specific projects, but we also are working at updating the national model codes to make sure that they will be adapted to the north.

I don't know if Trevor has specific examples.

Mr. Trevor Nightingale: No. I think one of the areas that NRC excels in is a multidisciplinary approach. Often when we look at energy efficiency, we can realize collateral benefits. We also need to ensure we don't bring along unintended consequences. Increased air tightness means fewer air exchanges, which can mean reduced air quality.

Where NRC is engaging specifically in the north in one collaborative activity with our colleagues at NRCan is in looking at the air quality inside highly energy-efficient homes and looking at ERVs and HRVs—energy recovery ventilators and heat recovery ventilators. We're making sure that the technologies that were developed for the south are applicable in the north and that there's a northern solution that works for the northern people, given their unique set of cultures and needs.

The Chair: Thank you.

Mr. Whalen.

Mr. Nick Whalen (St. John's East, Lib.): Thank you very much. That's really interesting research you're doing there.

A lot of what we're trying to do in the climate plan is to allow Canadians, either homeowners or building owners or the contractors who are trying to help them, to make better decisions. It's all about decision-making and having a standard in place so that everyone is comfortable that decisions can be made.

I'm looking at this great big data analytics program that you had for the PSPC, the 11 buildings and all the different technologies that were piloted there. If a Canadian wanted to find out what the different technologies were and the benefit each of those individual technologies had, would they be able to find that simply online, to figure out whether or not they could adapt some of those technologies for their buildings?

● (1240)

Mr. Trevor Nightingale: That's a really good question.

It all boiled down to the national master standing offer. If they were to adopt and use the national master standing offer, they would be able to procure the exact same technology that is being used in the Government of Canada buildings right now and is realizing those energy savings and cost benefits to the Government of Canada.

Mr. Nick Whalen: Great.

Regarding the national standing offer, is there enough information there for a layperson to determine what, if any, aspects of those technologies might be of interest to them, or is this really a technical document for contractors to understand? Would they have to go further and reach out to the individual suppliers of each of the technologies to determine appropriateness?

I'm not saying that you guys should have done this. I'm just trying to think of recommendations, how we can leverage the full potential of this project.

Mr. Trevor Nightingale: Maybe an analysis of what's required all the way through the procurement chain would be really good to make sure we have all the i's dotted and the t's crossed, and where we can help, we'd be very glad to.

That would complete the technology transfer, I would think.

Mr. Nick Whalen: It looks as if it's going to be about 111 buildings totally within the PSPC, which is a minuscule proportion of the number of square feet of buildings in the country as a whole that could benefit from the technologies that are suggested in the national standing offer.

If someone were to build to one of those standards, how would they know they've attained the benefits they were expecting? Do you also set or help in the development of standards for energy efficiency auditors to make sure that people are receiving the bang for their buck that they're expecting to receive from adopting these national standards?

Mr. Trevor Nightingale: We do not develop standards. We develop information that others can develop standards from. Energy professionals now have accreditation. Engineers do that service as well. We feed into those groups so that they can develop the documents they need for their members, and they can ensure that they have the right training to do the work in the field.

Mr. Nick Whalen: Presumably, with this data analytics project for the government buildings, some type of energy audit must have been done. Are the details and the scope of that energy audit available online for other professionals to use to adopt the same standards and procedures?

Mr. Trevor Nightingale: The answer to that is that it's probably too recent.

We've submitted the reports to PSPC. What NRC did, was a very detailed pre- and post-energy audit. We looked at the delta in the energy consumed and the cost. We are working with PSPC to make those data publicly available in a generic form. That's one thing on the to-do list. It's so very recent that we haven't gotten to it yet. I'm sorry.

Mr. Nick Whalen: Going back to Mr. Cannings' question about life-cycle analysis, I think of the massive undertaking that redeveloping the parliamentary precinct has been.

I'm wondering if there has been any engagement of NRCan or your group in determining what the best materials are to use to provide some energy efficiency within the parliamentary precinct while maintaining the historical character. How would Canadians find out what types of technologies are being used to make the parliamentary precinct more energy efficient?

Mr. Trevor Nightingale: NRC was engaged by PPB, the parliamentary precinct branch, at the very early stages of developing the work plan for the parliamentary precinct, including the Centre Block.

We developed a report for them that outlined innovative technologies that could respond to use cases that were identified through ongoing and historical engineering reports. Not only was it energy, but it could be seismic. It could be a number of things that those buildings had issues with. We mapped those issues, or use cases, to innovative technologies. We made that report available to PSPC, PPB and their consultants.

I think at this point it's not in the public domain. Again, that report was handed in only a few months ago.

● (1245)

Mr. Nick Whalen: Is there any reason, from a confidentiality or intellectual property standpoint, that this information should be confidential?

It seems to me that anytime the Government of Canada creates information to allow Canadians to make better, more energy-efficient decisions, that information should be available to Canadians by default.

Mr. Michel Dumoulin: It's an excellent question, absolutely.

We make sure that we engage with our partners on terms that will satisfy our partners. If we work with a private company, it will remain confidential. They are the clients. They pay, so they decide.

When it comes to our own work, of course, we make sure we publish. It's going to be publicly available. In this particular case, PSPC's the partner. They have to make the decisions of when and how to make it available.

I must say, to pick up on the comment that you made earlier about the fact that this footprint is minuscule, yes, we agree with you.

Perhaps I may take a minute to go over the mechanics of how we work. We do have advisory boards of industry experts who come and look at our work and then give advice. They looked at a number of our projects. When they looked at that, they said “Wow, fantastic work, but with the scope of this project and the pace at which you're going, it's going to take decades before we have an impact.”

The next step is to engage with PSPC and to see how we make it broader and bigger—

Mr. Nick Whalen: You've anticipated my next question.

What recommendation would you have—

The Chair: Unfortunately you don't have time to ask it.

Mr. Nick Whalen: Come on, Chair. It's the scale.

Maybe somebody else can ask it. How do we scale this up?

The Chair: I'll give you 10 seconds.

Mr. Michel Dumoulin: It's to engage the value chain, making sure that the whole sector can actually engage and look in real time at these results and then move that out to the market.

The Chair: Perfect. Thank you.

Mr. Falk.

Mr. Ted Falk (Provencher, CPC): Thank you, Mr. Chair.

Thank you both to Mr. Dumoulin and Mr. Nightingale for your presentation.

I want to tell you right up front how much I appreciated it and how refreshing it was. You used some terminology that resonates with me, and those are words like “benefit”, “cost” and “return”. Those have been conspicuously absent from some of the other presentations. There are some in this House, mostly on the other side, who would believe that reducing emissions at all costs is our objective. You spoke always of what's the cost and what's the benefit. I appreciate that.

I would like to know whether you work with certain matrices when you do evaluations of certain processes, as far as a cost-benefit is concerned? What kind of return are you looking for?

Mr. Michel Dumoulin: I would have to go back to our main mandate. Our main mandate is to push the envelope, develop knowledge that's available so that there is evidence, scientific data that others can use to make decisions.

Having said that, I guess in answer to your question, it really depends on the case. We will use whatever matrix of KPIs that we have at hand for the project at hand, and it varies widely.

Mr. Ted Falk: Has this current government approached your department at all, asking you to consider different options as far as carbon tax and different ways to reduce carbon emissions here in Canada?

Mr. Michel Dumoulin: They haven't specifically on the question of a carbon tax. We are in constant conversations with NRCan, Environment Canada and PSPC on questions of energy efficiency, demonstrating or testing new technologies and new approaches, and doing life-cycle analysis on buildings. Trevor has led a number of these activities in the last few years. It's on a project-by-project basis. We basically bring science and technology data to the table.

Mr. Ted Falk: Your department also makes recommendations for building code adjustments based on some of your projects or studies. Is that right?

Mr. Michel Dumoulin: Technically, we don't make recommendations. We support the national commission on building and fire codes from an administration point of view. We manage meetings on all these things, but most significantly, we convene the best brains to answer the questions that are being posed by Canadians.

Anybody can propose a change to the code. The commission will actually look at the request or the proposed change and apportion that to a technical committee. This is where we come in. We'll make sure that all the data needed to make a decision is there. We don't make the recommendation. We bring the data that is solid.

● (1250)

Mr. Ted Falk: On the tests that you've done and the data that you've collected, is there a kind of standard that you like to see, as far as a return on investment?

Mr. Michel Dumoulin: I'm not sure I understand the question. In terms of a standard of return on investment, it depends on the case. It depends on the industry. We work in such a broad sector.

Mr. Ted Falk: Most of yours is in the building construction area. Both of you gentlemen are responsible for that. Isn't that right?

Mr. Michel Dumoulin: Trevor is directly in the construction sector all the time.

Mr. Ted Falk: In one of my previous roles as president of a very large credit union I built three separate branch offices, two of which were geothermal heated—one with the closed loop and one with the open loop geothermal system. The first was 45,000 square feet and the second was 95,000 square feet. One of the things we looked for there was a return on the investment, because it does cost money to be efficient.

Is there a guideline you could give of what you would like to see for that, or do you just collect data?

Mr. Trevor Nightingale: The return on investment that is going to motivate investment is owned by the building owner or the person who will make that investment, not by NRC or a government agency. They are the ones in control of their expenditures. We want to try to create technologies, information and guidance so that they can make the most informed decision and have access to the technologies that offer a compelling rate of return.

Mr. Ted Falk: Okay. That makes me think of another question. What are some of the recent technologies that you've been testing that are compelling to explore?

Mr. Trevor Nightingale: For existing buildings, there's no question.... Technologies called building energy management systems essentially sit on top of the building automation system. Using algorithms and logic rules, they look for faults in the way in which the building is operated. They're very appealing because they typically have a return—on the office buildings that we looked at—of somewhere between eight and 12 months and typically you will pick up about 15% energy cost savings.

If you think about opex and capex, you could easily pay for this out of opex. It's really compelling in that regard.

Another thing that's really compelling is that it's non-disruptive. That system could be installed in a building without anybody ever knowing it, except for the person who pays the bill. It provides collateral benefits.

The Chair: Thank you. I have to stop you there.

Mr. Serré.

[*Translation*]

Mr. Marc Serré (Nickel Belt, Lib.): Thank you, Mr. Chair.

I would also like to thank the two witnesses.

In my riding and in my colleague Paul Lefebvre's, there is SNOLAB, which is a research centre, and Laurentian University, respectively. I would like to thank NRC very much for its support to these two organizations and for all the work it does. We greatly appreciate it.

My first question concerns data. You said there was no national data. Our committee did a study on national energy data.

To help you in your work, do you have any recommendations for us on data collection for Statistics Canada, Natural Resources Canada and Environment Canada? Have you ever done a study to see if departments can collect better or more recent data, that is, data that is not five or seven years old? Have you ever made any recommendations in this regard?

Mr. Michel Dumoulin: Thank you for your question and positive comments about the NRC. We are always happy to ensure a presence in the regions.

In terms of recommendations to that effect, I don't think we've done it formally. It is always very important in our field to have access to solid data. Mr. Nightingale referred earlier to a validated national database. There are many databases, and the amount of data is huge. What is important is what we call in our jargon properly organized and stored data. An organization is responsible for validating and maintaining the data. You were talking about Statistics Canada, which is the perfect example. Someone is in charge of validating the data and ensuring its veracity. In our sector, the energy sector in the construction industry, it is still very fragmented. I don't have any specific recommendations to make.

● (1255)

[*English*]

Trevor, do you have specific recommendations on how to move forward without having a more validated, more unified database?

Typically, we respond to industry needs. We respond to the sector needs. We would like to have an easier life, of course, with access to great data already, but that's not the point of our....

[*Translation*]

Mr. Marc Serré: All right, but I will come back briefly to what my colleague Mr. Falk said.

We are talking about the role you play with companies, but I would like to know what your role is in commercialization. Some starts are like crossing the valley of death. There are many research projects, but it seems that everywhere, it is difficult to achieve commercialization.

Do you have a specific role to play? Do you have any examples or recommendations for commercialization, especially in the area of energy efficiency?

Mr. Michel Dumoulin: I will try to answer in a general way. Mr. Nightingale may have specific examples to give you later.

In the area of commercialization, our role is to support companies that are active and want to do commercialization, such as the industrial research assistance program, IRAP, which I mentioned earlier. So we'll support them financially, but we'll also network and direct them to the appropriate resources. We will support them by scaling up, which is very important. You mentioned the valley of death. You have to move from something that works in the laboratory 80% of the time in small quantities to something that will be sold and bought. This is a critical step, and it is in this sense that the IRAP program will be useful. For our part, we will be doing demonstrations.

It is essential for us to have key players around the table throughout the value chain, so that small businesses understand the challenges of large companies and it is possible to establish connections. In our opinion, our role is very much about making connections between large and small so that everything goes faster.

The first component of NRC's formal mandate is to develop new knowledge. The ones we develop using our budgets, the government's budget, take the form of publications, but also patents. We have several thousand patents that we are trying to commercialize by making them available to Canadian companies.

Mr. Marc Serré: Mr. Nightingale, do you want to add anything?

Mr. Trevor Nightingale: Yes, I'll give you an example.

[*English*]

In a recent study that we did for Siemens Canada and New Brunswick Power, we looked at the effectiveness of specific smart thermostats that could be controlled by the Internet on the ability for the utility to shift heating loads in the wintertime.

We used this as an opportunity to identify Canadian SMEs that could respond to that opportunity. As a result, two Quebec smart thermostat companies stepped into that arena and are now developing the unique product that is now sold in North America.

That is an example of one of many projects where we work with the industry and we try to find hooks where there are technology gaps. We try to connect those gaps to capable Canadian companies. That's another way that we help out.

The Chair: I'm going to have to stop you there. That's all the time we have for today.

Gentlemen, thank you very much. We appreciate your inputs, and your evidence will be very helpful.

We'll see everybody on Thursday.

Mrs. Shannon Stubbs: Mr. Chair, before you hit the gavel, I just wanted to ask whether you've invited the minister to come to committee for supplementary estimates.

The Chair: I don't know the answer to that. I'll get back to you.

The meeting is adjourned.