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Chair

Mrs. Deborah Schulte

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● (1105)

[*English*]

The Chair (Mrs. Deborah Schulte (King—Vaughan, Lib.)): Good morning, everyone. We are still studying clean growth and climate change in Canada with the built environment. We have a full suite of witnesses with us today, and also one by teleconference.

We have five speakers, so that's going to end up taking all of our time. We're going to give them 10 minutes each. That means that our questioning will need to be succinct.

Mr. Mike Bossio (Hastings—Lennox and Addington, Lib.): Their testimony is more important.

The Chair: I think so.

We have Thomas Mueller from the Canada Green Building Council; Michael Giroux from the Canadian Wood Council; Michael McSweeney and Adam Auer from the Cement Association of Canada; Martin Luymes from the Heating, Refrigeration and Air Conditioning Institute of Canada; and by teleconference, Bijan Mannani and Haitao Yu from Landmark Homes Canada.

Welcome to all.

[*Translation*]

Mr. Joël Godin (Portneuf—Jacques-Cartier, CPC): Madam Chair, will the teleconference be running for the whole meeting? Do we have the witness on teleconference right now?

[*English*]

The Chair: They are on the phone. It's not a video; it's a teleconference.

Because of difficulties sometimes with lines, and we know they're live on the line at the moment, I would like to have them go first. I'm going to have them make sure that as they go to speak, they introduce themselves. Every time they speak for a little bit, until we get to know their voices, they should just say who's speaking. That would be helpful.

Monsieur Godin.

[*Translation*]

Mr. Joël Godin: Madam Chair, why aren't we using video conferencing?

[*English*]

The Chair: They didn't have it available. It wasn't available at their end, and they couldn't do it in the short time that they had. We haven't had a lot of time to prepare the witnesses, so they actually weren't able to get it organized, unfortunately.

Ms. Duncan.

Ms. Linda Duncan (Edmonton Strathcona, NDP): In the future, can we provide locations?

The Chair: We always try, but unfortunately, it couldn't work out, given the timing and their obligations, to have them in a different location. We absolutely try, and we're doing our best to make sure they have a chance to speak to us today.

I'm going to start with Landmark Homes Canada. I will let you know after nine minutes of your testimony, when you have one minute left, so that you can wrap it up at 10 minutes.

Mr. Mannani.

Mr. Bijan Mannani (President, Landmark Homes Canada): This is Bijan Mannani speaking on behalf of Landmark Homes Canada. I have here Dr. Haitao Yu, who is our lead researcher for Landmark Homes Canada.

Landmark Homes' primary business is building new residential homes in Alberta. We have a small operation in Phoenix, Arizona, as well. We started in the home-building business in Alberta in 1977. We have built more than 15,000 homes in Alberta.

The company started venturing into building energy efficient homes back in 2006, and in 2008 we adopted the four principles of sustainability, as defined by The Natural Step Canada, and we made a business. The strategic driver behind our business was to have environmental sustainability combined together with industrialization of construction processes for the residential construction industry.

In 2011 we started a manufacturing facility, panelizing homes in different sections, different segments like Lego pieces. We focused on reduction of waste throughout the processes, the reduction of greenhouse gas emissions during the course of construction by eliminating the need for various contractors and trade partners to travel in individual vehicles to deliver materials to sites and the inefficiencies that we get when building on-site through stick building operations. We also started having very tight building envelopes to one millimetre accuracy, gaining air exchanges significantly below one air exchange per hour—the best we have done is 0.41 air exchanges per hour—and then focusing on making net-zero homes, energy efficient homes, to become the norm for all of our product lines and exceeding the national building code by a minimum of 15% for all of our product lines that we are delivering in the market.

In 2017 we placed our fifth net-zero show home under $400,000. That includes the land, the building, all of the options, upgrades, and GST for a single family home in Edmonton. We are currently on the way to building two other net-zero homes as a normal offering in the Edmonton market. Both are single-family developments.

We have been recognized by CHBA as one of the 22 net-zero qualified builders in Canada and one of the three qualified builders of net-zero homes and energy efficient homes in Edmonton.

Our mandate, what think we need to be accelerating, is to make mandatory labelling and energy modelling of homes both for new homes and for the resale market. The reason for that is to create and raise awareness in the consumer's eye so that it would create a demand for that and change the mindset and the paradigm that the status quo is acceptable. That's a big change that is needed.

The second part is, from the federal government standpoint, investment in research and development in the areas of HVAC and windows, but the biggest part, in our opinion, is the building envelope and the building science side of things.

● (1110)

With respect to funding for special projects or pilot projects, I think that's where the federal government can step in and have a plan for progressively, on an accelerated basis but in a stepwise manner, introducing higher energy efficiency requirements, adding that to the building code, and making that a requirement across Canada. Right now, different provinces are doing different things. It needs a well-coordinated effort from the federal government to be pushing the agenda for energy efficiency in housing.

There have been questions asked about the retrofitting of existing buildings. We currently do not have any particular program in Alberta. We are not in that line of business, but I think that would significantly impact the market by focusing on energy efficiency. If everybody is talking the same language, and the requirements are clearly outlined in a stepwise manner, then we all will be able to benefit from that and make the change that is needed.

With respect to how we can further reduce our carbon footprint and have energy efficiency, we think that in Alberta, where we have set up the manufacturing facility, the off-site manufacturing and panelization facility, it will not only diversify the economy. We are also able to introduce job creation opportunities, and it's a safer working environment. As I indicated earlier, the average home building operation has about 15.4 tonnes of greenhouse gas emissions during the course of construction. This is not during the operation.

Through the manufacturing process, we have been able to reduce those greenhouse emissions to 6.42 tonnes. It's a significant reduction. If Canada is producing an average of 250,000 homes, just the impact of that, similar to the automobile industry manufacturing facilities that are off-site, means that we will be significantly reducing the industry's greenhouse gas emissions and the carbon footprints we are leaving behind, and lessening that impact.

I think we need to have a gradual process of introducing higher energy efficiency requirements. That target needs to be gradual, with a specific schedule and timeline identified in order for the whole industry to gear up with business partners—from builders to HVAC to windows to building envelope installation—where everything goes hand in hand.

Beyond this, if you have any questions, I will be more than happy to answer them.

● (1115)

The Chair: Thank you very much. You have two minutes left, if you still have anything else you want to share with us.

Mr. Bijan Mannani: No, I said what I needed to say. If there are any questions, I can answer them at the end.

The Chair: Thank you very much. We appreciate that. We'll be back to you at the end of all the presentations.

We'll hear from everyone and then we'll start into the rounds of questioning.

Yes, Monsieur Godin.

[*Translation*]

Mr. Joël Godin: Madam Chair, would it be possible to go straight into questions for the people on teleconference? I just thought I would ask, and I know the other committee members will want to hear the answer as well.

[*English*]

The Chair: I don't think that would work very well. We're already very crunched in terms of the questioning. Having to schedule questioning for one person versus another I don't think will work, so we'll do it the regular way.

Ms. Linda Duncan: Can they stay for two hours?

The Chair: Yes. He's being very generous with his time and he's going to stay on.

Next up is Mr. Mueller from the Canada Green Building Council.

You have 10 minutes. I'll hold up a card to let you know when it's time.

Mr. Thomas Mueller (President and Chief Executive Officer, Canada Green Building Council): Please do. I would appreciate that.

Mr. Darren Fisher (Dartmouth—Cole Harbour, Lib.): Let the record show that we finally have Mr. Mueller on interrogation. I know that Trump's.... There's something going on down in the United States with a Mr. Mueller.

Voices: Oh, oh!

Mr. Thomas Mueller: I can tell you that if it's a Mueller doing it, it will be done right.

Voices: Oh, oh!

The Chair: It's all good.

All right. Thank you. You're up.

Mr. Thomas Mueller: Thank you very much, Madam Chair, and thank you for inviting me to come to the committee.

I would like to provide an overview from our council's perspective on how green buildings can help Canada achieve its GHG commitments and climate change commitments. There's a common understanding now in Canada and around the world that 30% of greenhouse gas emissions are associated with buildings—building construction and operation—and that also applies to Canada.

I have a slide deck here that we will share with you. Here you can see that up to now a lot of progress has been made in the building industry, through the application of voluntary rating systems and voluntary standards such as LEED, leadership in energy and environmental design. We currently have over one billion square feet of LEED buildings in Canada, and it has grown to be the most widely accepted standard for green building in Canada.

Green building not only benefits the environment, but it also creates jobs and promotes economic growth. We did a report that's available on our website. At the end of 2014, the green building industry contributed about $23 billion in GDP, and there were 300,000 direct jobs involved in green construction. You can see that these jobs actually exceeded the jobs in forestry, mining, and oil and gas extraction. It's a significant boon to become a significant economic sector in Canada beyond just the environmental benefits.

Today—and these are the figures at the end of 2016—we estimate that LEED buildings across the country and those built by the federal government save about 1.8 million tonnes of greenhouse gas emissions every year, save about 18 billion litres of water, and so far have avoided about 2.1 million tonnes of landfill waste from construction and demolition.

These are just some of the figures that are available now to highlight the environmental and economic benefits. What we recommend and want to share with the government is that it's really important that you continue to support voluntary industry standards. LEED, and not just LEED but also other industry standards have really built industry capacity. They have built knowledge, and they have worked over time to put the industry on a path of continuous improvement in water efficiency and recycling, and those types of things, but most importantly, energy efficiency.

You can see that LEED standards have played a very important role in delivering buildings that are above the building code, and in that way they have really informed the codes to be more ambitious in terms of the thresholds that are being established for national and provincial building codes.

Finally, the government has established a LEED gold policy since 2005. We do recommend to the government that you have a very important role to play in terms of procurement of real estate, either for construction or for renovation, or for leased space. We recommend that the government continue to support the application of voluntary standards through its own procurement policies, and that would include through upgraded green building policies to LEED platinum, which is the highest level of performance both for new and existing buildings, but also start to look at the new standard in the marketplace, which I'll talk about in a minute, about getting to zero-carbon performance in buildings.

The council believes that in order for us to reach our carbon goals, we need to start thinking less about energy but more about carbon, which is really a slightly different metric. We're really supporting a shift from not just energy, but energy and carbon. If you have two buildings that are identically energy efficient in Quebec, and you heat one with gas and you heat the other with electricity, the one with gas produces 36 times as much greenhouse gas emission as the one heated with electricity.

That speaks to the point that the energy source you're using is hugely important, and where the building is located across Canada is hugely important. We need to take advantage of Canada's clean energy sources. I live in Vancouver, B.C., and hydro is 95% carbon free. In Quebec and Manitoba, we need to take advantage of these clean energy sources to move the building sector towards a low-carbon performance.

● (1120)

There's an area that Canada and the council has embarked on to produce zero-carbon buildings from an operational perspective. This is really to create the building stock of the future. In 10, 20, 30, or 40 years from now, we will need buildings that emit as little carbon as possible. This, of course, needs to be balanced with energy costs and energy efficiency. The goal is to produce buildings that are very low on the energy side.

We introduced a zero-carbon standard last year. There are 10 other countries that have approved zero-carbon standards for buildings—Australia being one of them—or that are in the process of developing one, like Germany and Brazil. Across the world this is an area of innovation.

Zero-carbon standards really balance high levels of energy efficiency, because we still need to pay energy costs, of course, as we all do in gas and electricity. It also needs to be combined with sources of renewable energy. This renewable energy comes either as generated on-site in part or can be procured off-site through renewable energy certificates and, like I said, through our hydro sources of clean, almost carbon-free electricity.

We currently have 16 projects of that standard across the country. The industry is confident that they can meet that standard. In fact, the federal government has one project in the pilot as well, as does the Ontario provincial government and other local governments in Canada. There are also private sector projects. We have projects that range from a small water project in Walkerton, Ontario, to a 60-storey office tower on Bay Street in Toronto. You can really see that the industry is ready to make this kind of investment, and that also needs to be supported by government policy and R and D to move this part of the work forward.

Having said that, we took a broader look at the building sector, and having done several research reports, which again are available on our website, we came to the conclusion that we cannot reach our carbon goals from the building sector without building retrofit. When I talk about building retrofit, I'm not talking about single-family homes right now. I'm talking about larger buildings, those over about 25,000 square feet. Depending on who you talk to, because we don't have perfect data, we have up to over 400,000 large buildings in Canada that have an opportunity to be retrofitted. If you retrofit buildings, you can realize, by 2030, three times as much greenhouse gas emissions savings than if you build every building between now and 2030 as zero carbon. That's the potential of the retrofit sector. In this area, Canada can really take the lead globally in retrofitting existing buildings.

Building retrofit involves very specific strategies from the recommissioning of systems to deeper retrofits that produce 20% to 40% reductions in energy use, and then, a combination of solar or other renewable energy sources along with fuel switching. Fuel switching is when you go from a fossil fuel to a carbon fuel, either electricity or on-site renewables, geothermal, and those types of strategies.

These are the four strategies, and we did a road map. This goes to one of the questions that you asked us to answer for this committee. We developed a road map for retrofits in Canada, and you can see from the map that the strategies differ depending on where your buildings are located. For example, in a low-carbon credit area like Quebec, you really should focus on recommissioning and deep retrofits and on fuel switching, while renewable energy generation is probably less important because you already have a good source of clean energy. On a high-carbon grid, you need to invest more into the generation of renewable energy versus fuel switching, which doesn't make a lot of sense because you would switch fuel with something that's what we call a dirtier grid.

There's an opportunity to really lay that out and really target policy depending on region, building age, and building type across the country to have a really targeted approach, and that actually narrows from 100,000 buildings to about 50,000 to 60,000 buildings.

● (1125)

In finishing off, the Government of Canada has an opportunity to invest in a retrofit economy. We recommend that all custodian departments and agencies of the government develop multi-year retrofit strategies for their portfolios. We are also recommending that the government allocate $1 billion from the Canada Infrastructure Bank for retrofits of commercial and multi-residential buildings in both the public and the private sector. Also, there needs to be insurance to make sure that these retrofits also deliver on their performance improvements both in terms of energy and in terms of carbon.

I'll stop here because the recommendations at the end are very self-explanatory.

Thank you very much.

The Chair: Thank you very much. Sorry to have to cut you off. It's just that we have a full slate. I appreciate that we have your presentation in front of us. That's very helpful.

Next up will be Michael Giroux, from the Canadian Wood Council.

Mr. Michael Giroux (President, Canadian Wood Council): Good morning. My name is Mike Giroux. I'm the CEO of the Canadian Wood Council, as you mentioned.

My background is varied, and it includes working in entrepreneurship, building houses using light gauge steel. I've worked in the cement industry, and I've now been in the wood products industry for eight years. I also spent a little time with the National Research Council.

That's a little about me, but now about the Wood Council itself. The Wood Council has one mission but two elements to the mission. The first is to ensure the fair recognition of wood products and building systems in the national codes of Canada. That's very important because what gets recognized gets built. I'll make the point with respect to green sustainability in a minute.

The second area we're engaged in is in the education of the construction sector itself, everybody from architects to engineers to builders to students. We provide tools and software for this clientele.

In doing all that we invest heavily in the codes development process. We are engaged not only in Ottawa with the National Research Council at the model level, but we are also engaged at the provincial levels where these national codes are adapted and adopted. We are also engaged very much in demonstration. We work with both our funding partners and our R and D partners to demonstrate buildings built with wood in this case, and the idea is to de-risk these buildings so they or their elements eventually can be introduced into building codes.

That's what we do. I'm a little worried about some comments about the building code itself. You probably all know this, but developing building codes and the standards related to them is a five-year cycle. It's a long period of time. In the U.S., it's three years.

In doing that, we might say that's an innovation killer. It's arguably not because they focus very much on their core objectives in the code and these need to be protected at all costs. These stand-alone objectives, which all the technical requirements point to, include energy and water use, fire and structural protection and safety, and health and accessibility. You'll notice there is no core objective in there for sustainability, energy, or CO2. These have been discussed but they have been determined to be complicated. It would really take political drive to have them introduced into the codes.

That is my introduction, and I would like to comment on some of the key points here. I'm not necessarily an expert in them.

First, with respect to greenhouse gas emissions, the reductions in the building sector, and how they can be accelerated prior to the next building code, obviously it's too late to get an objective into the code. Second is that public sector leadership is really helpful and it's also necessary. We can look at real property practices within governments at the federal or provincial level. They need to be less prescriptive, more material neutral. They need to go beyond the first costs to consider life-cycle analysis impacts as these are environmental impacts.

In our case, this is important because we not only look at the operational and sequestered nature of our product. We can make any building the same if we want to. In the end, you look at products that can sequester carbon. Concrete is one of them. There are other products where the embodied energy is interesting. If you make your decisions in part based on the embodied energy of the product you end up with reducing immediately the carbon content of that building and it's really important that be considered.

● (1130)

In Quebec there's *la charte du bois*, and in that policy they look at wood equally. They don't say "choose wood" or anything. They say that you must consider wood equally to other materials. That's very interesting for me and it provides an opportunity, but you shouldn't even have to use the name "wood" in the policy. You should say, "You should be considering all materials." What's really interesting about the policy is that they go to this next level where they say there should be a carbon metric associated with the policy. Then they introduce the need for a tool that is being developed in Quebec right at this very moment and which is now being partnered in Ontario as well, and will be partnered in B.C.

This tool will help at the LCA life-cycle level to determine the actual carbon metric for those buildings, in particular at the body level now and then operationally later, and should allow proper decision-making. Carbon avoided now has this tendency to accumulate or to be a better story over time, because if you avoid it now it's avoided impacts in the future as well. That said, there's no use having that type of program if you don't monitor and enforce it.

There's another opportunity here and that is to adopt an industrial vision, a vision to where we want to go. If you look at the opportunity, you have existing products, you have new products, and they're going to blend into the buildings of the future. For those buildings of the future we don't have a lot of R and D in that area. We don't do any sort of life-cycle impacts. We have no real idea if these new products, or those new buildings, are an improvement over the last generation of buildings. I think Thomas's group and some of the other programs that we have are starting to lead towards that, but we need to really look at this in terms of an overall vision that includes industrialization in terms of pre-manufacturing of these buildings. That way then that vision can be one of CO2 reductions, or it could be of energy reduction.

At the end of the day it's the environmental impact. The flavour of the day could be water in the future, but when we know what the vision is then industry can go along and follow along in that area. What I find interesting is that once you know that you're going to do this, you can also report on it. You can put out sustainability reports that show that you've improved it and show the audience that you're interested in improving this too, that you've proven this direction.

Retrofits are huge. Like Thomas said, it's probably a bigger market than the new building market in the future. I don't have very much more to add than what Thomas added except perhaps with the carbon taxing that's being considered one of the advantages is that, because it impacts product level and makes some products more expensive than others, as a result of that it might drive a behavioural change. I think that's very interesting, and I would encourage that we continue along that way.

The other thing in the retrofit market is adaptability. At the end, if a new building is not made to be adaptable—you can use the word "durability" in this as well, the longevity of the building—if it's not designed to be adaptable then the costs of the future will be greater. That is an opportunity for building codes.

How could we further accelerate net-zero energy? There's a lot of work being done in that area. What I find very encouraging is that companies like Landmark and others are not only looking towards what we're doing in Canada, but they're looking offshore. I'd like to say that a lot of what we do in terms of our R and D is that we try to invent things here when there's really no necessity for it. In the end we can achieve an awful lot by becoming very expert at adopting and adapting innovation from elsewhere. There is marvellous technology available from Germany, Austria, and offshore that we could bring to Canada.

● (1135)

Those are the points that I'm interested in making today.

Thank you very much for allowing me to speak.

The Chair: Thank you very much, Mr. Giroux. That was great.

From the cement association, we have Michael McSweeney and Adam Auer.

Mr. Michael McSweeney (President and Chief Executive Officer, Cement Association of Canada): Thank you very much, Madam Chair and members, for this great opportunity to address you today on what our industry feels is society's greatest challenge, which is the fight against climate change and how we tackle that through reducing greenhouse gases from the industry building sector and the transportation sector.

The cement and concrete industry represents a direct and indirect economic contribution of about $73 billion to Canada, and we employ about 151,000 Canadians. Our industry supports strong action on climate change, including putting a price on carbon. As of this year, all cement facilities in Canada but one operate in a province that already has a price on carbon.

As governments move towards carbon pricing, they have had to consider the impact of carbon pricing on competitiveness, especially for energy-intensive, trade-exposed industries. Cement is among the most trade-exposed, energy-intensive industries in Canada, and we are very vulnerable to our competitors in the import and export markets that do not have similar carbon-pricing systems, such as almost the entire United States, with the exception of California.

Thankfully, though, with the exception of British Columbia, carbon-pricing systems across Canada, including the federal backstop carbon-pricing system, on the whole strike the right balance between incentivizing emissions reductions while introducing other measures to protect and even enhance Canadian industry and competitiveness as we transition to the low-carbon economy.

Why are carbon pricing and energy-intensive, trade-exposed industries important to a discussion about climate change and the built environment? Because, while well-designed carbon-pricing systems can foster low-carbon innovation in industries that support Canada's built environment, these innovations cannot flourish in a policy environment that does not actively pull them into the built environment decision-making discussion.

Consider that, on aggregate, all three levels of government purchase, directly and indirectly, some 60% of all building materials consumed in Canada, and concrete makes up the majority of those building materials. Further consider that our building and energy codes are minimum codes. Our building codes are not the gold standard that you or most Canadians believe them to be, and unless they are significantly changed, they will serve to impede low-carbon innovation, not accelerate it, as Michael Giroux mentioned in his comments.

Procurement decisions made by governments in general emphasize low-cost tenders. We always award tenders to the lowest-cost bidder, and only rarely do they ever consider GHGs or climate adaptation. When governments have considered climate change in a built environment, they've done so with prescriptive policies—for example, policies like “wood first”, rather than leveraging markets towards comprehensive and systemic clean energy or clean growth innovation.

Let me offer an example. Our sector recently came together in total across Canada to promote a new cement, portland-limestone cement, as an opportunity to reduce greenhouse gases from concrete. Portland-limestone cement will reduce the GHG footprint by 10% at no cost. If adopted as a full replacement for all cement sold in Canada, portland-limestone cement could yield annual CO2 reductions of almost one megatonne and, as I said, at no additional cost.

While portland-limestone cement meets the same performance standards as general use cement, has been used in Europe for decades, and is recognized in the 2010 national building code of Canada, it does not enjoy deep penetration across Canada. This is because construction industry codes and standards bodies in the public procurement agencies responsible for planning and commissioning infrastructure projects do not yet value or incentivize new innovations in the low-carbon construction materials and design industry.

Governments, as purchasers of more than half of all concrete produced in Canada, with the stroke of a pen could make portland-limestone cement the default cement in the majority of all projects across Canada, yet our industry's efforts to get this done are inexorably rebuffed. With this one innovation, we can address about 2% of the emissions gap that this government has identified and needs to fill to realize our 2030 target.

Pavement infrastructure offers an important example. Robust third-party life-cycle assessments irrefutably demonstrate the cost and climate benefits of concrete pavements over asphalt pavements. Asphalt pavements last seven to 12 years. Concrete pavements last 40 to 50 years, cost less over their life, and can actually improve fuel efficiency by 7%. These properties alone could result in savings of up to 12,000 tonnes of GHGs per lane kilometre over a 50-year lifespan, compared with a typical asphalt road.

● (1140)

Contrast those two examples with the incessant political interventions in building codes across Canada and the hundreds and hundreds of millions of dollars spent by federal and provincial governments, being poured into championing wood products, especially tall wood buildings, as a significant carbon mitigation strategy. You can then see where our exasperation lies.

The implications of such policies on the built environment, including the prospect of a robust, open, and competitive market-driven clean growth strategy for buildings and building materials, are profound, yet the underlying assumption that wood buildings yield net carbon benefits over alternatives has never, ever been fully articulated, let alone subject to a comprehensive peer review. This is all the more troubling considering the increasingly well-documented shortcomings with the current understandings of the carbon profile of wood products.

Research on GHG impacts of commercial logging suggests the effect on the carbon profile of wood products is significant. A Bureau of Land Management report in western Oregon proposes that when land-use change impacts of deforestation are taken into account, even accounting for regrowth, some 13 tonnes of greenhouse gases are lost to the atmosphere for every tonne sequestered in a wood product. That's a far cry from the carbon neutrality claimed by the wood industry and federal and provincial natural resource ministries.

You can therefore understand our frustration when we saw in budget 2017 that this government is spending some $40 million to support preferential treatment of wood building materials at the expense of other building materials across our country, or recently, your vote on Bill C-354, which has passed second reading, attempting to tilt the playing field towards wood in government infrastructure despite a growing body of evidence that this in fact may increase greenhouse gas emissions and make our buildings more vulnerable to climate change.

In Canada, the most significant carbon impacts from buildings relate to heating and cooling. These operational energy needs account for over 90% of the global warming potential for buildings. Even if the claims the wood industry makes that they are carbon neutral were true, and they're not, the impact that the substitution of wood for steel or concrete would have on the life-cycle emissions of a structure would be marginal. In fact, concrete's thermal mass capabilities can play a significant role in reducing greenhouse gas emissions by reducing operational demands. Today, the strategic use of thermal mass has reduced operational energy needs of large commercial buildings, such as Manitoba Hydro Place, by over 70%.

We need stronger building codes. We need stronger energy codes, and concrete can play a significant role in affordable strategies to meet the much sought-after net-zero building target. Only a robust cradle-to-cradle life-cycle cost and life-cycle climate change assessment can draw out these GHGs and cost-saving performance attributes. Policies by politicians that favour one building material over another without considering the whole are definitely not in the public interest.

More exciting but less understood is the role that concrete will play in the emerging game-changing class of technologies known as “carbon dioxide utilization”. Concrete is a critical source and sink for captured carbon. By virtue of the sheer volume of concrete consumed every year, more than any other material on earth with the exception of water, our sector will be pivotal in developing technologies that will ultimately reduce carbon.

Canada's clean growth strategy for the built environment must look to the future it wants, a low-carbon climate-resilient future, and make space for transformative innovations that will get us there.

Let me be clear. We're not asking for government to mandate concrete roads or buildings, nor are we disparaging the competition from other building materials. We are simply asking that government take a sector-neutral approach to planning and using tools focusing on GHGs as we transition to low-carbon and climate-resilient economies.

In conclusion, our primary request is that you recommend that the Government of Canada mandate the use of full life-cycle and environmental assessments for all federally funded infrastructure projects at all three levels of government.

Thank you.

● (1145)

The Chair: Thank you very much. That has given us a lot to think about.

Next up is Martin Luymes. He is with the Heating, Refrigeration and Air Conditioning Institute of Canada.

Welcome.

Mr. Martin Luymes (Director of Programs and Relations, Heating, Refrigeration and Air Conditioning Institute of Canada): Thank you, Madam Chair and the committee, for providing this opportunity to speak to you and be part of this important conversation.

I will not be talking about building materials. I'll be shifting focus to an equally important, if not more important, segment of the climate change solution, which is the HVACR sector. I want to talk a little bit about the role of the HVACR industry in promoting energy efficiency and mitigating climate change.

First, just to be clear on the scope of the HVACR sector, HVACR is heating, ventilating, air conditioning, and refrigeration. I know most of you know that. The scope of our organization is the space heating and cooling of buildings through various methods—hydronic or air systems—which obviously is an essential service in this country. It includes domestic hot water, ventilation, indoor air quality products and services, and refrigeration processes that serve the needs of industry, grocery stores, institutions, hospitals and schools, ice rinks, and various other specialty applications.

Building controls is part of our sector as well. It ties all of these systems together. It's a roughly $7 billion a year activity in Canada, and as I mentioned, it's an essential industry in Canada given our climate. Our members and the industry in general are active in every corner of the country, wherever it's a home or a building, yet our industry is largely hidden from sight because we're behind the walls and under the floor providing these essential services. We're mostly out of sight and out of mind for Canadians.

HRAI, the organization I'm representing here, has been around since 1968. We have roughly 1,350 corporate members. That includes 90 manufacturers, 60 or so wholesalers-distributors, over 1,000 contractors across the country, and a number of associates: utilities, colleges, training institutes, consulting engineers, and so on. Across the country, we have 28 staff, a dozen instructors who are very active in training, five regional managers, and 20 chapters.

Our primary services, like any industry association, mostly have to do with industry advocacy, but we are also heavily involved in industry training, including technical design and business management. The technical design courses that we offer are primarily designed to help technicians meet building code requirements. There's a very heavy energy-efficiency component to that.

We own a trade show that's held every two years called CMPX 2018, which is running in about a month from now. We are also actively involved in environmental stewardship programs. We run a number of programs that the industry manages, taking back products of the industry that have harmful environmental impacts, such as mercury thermostats and spent refrigerants, which are no longer allowed, per regulation.

I want to talk a little about the role of our industry in relation to the pan-Canadian framework. Under the PCF, as I'll call it, there's a significant emphasis on GHG reductions. I think you're all aware that the most significant contributor to greenhouse gas reductions, not only in Canada forecasting into the future but also globally, is investments in energy efficiency. Roughly half of the expected goals will be achieved through investments in energy efficiency. That's significant for our industry because that's where our members live and breathe.

Federal government consultations are well under way now on a variety of issues that affect our industry. There's a consultation that we're participating in called the “market transformation for space heating and water heating equipment in Canada”. We're very happy to be engaged with that.

The PCF acknowledges that space heating is an important part of the solution to reduce greenhouse gas emissions in the building sector and also in relation to water heating. Heating on average represents between 56% and 64% of energy use in homes; in buildings, it's the single largest source of direct-sector emissions. Therefore, improvements in the performance of space heating technology can reduce energy use significantly for a typical residential home or building. As per NRCan, if all residential heating systems were replaced with heat pump technology by 2040, for example, this would reduce residential energy use by 25% and greenhouse gas emissions by 24 megatonnes.

● (1150)

A variety of measures related to buildings have been contemplated under the PCF. They include net-zero energy ready building codes by 2030, a model retrofit building code by 2022, labelling and rating requirements as early as 2019, and setting standards to the highest level economically and technically feasible for heating equipment and other technologies. Our industry, I want to emphasize, supports these measures but with a number of important caveats, which I'll come back to shortly.

Just to illustrate, some of the technologies we're talking about include commercial gas furnaces, cold climate air-source heat pumps, gas-fired heat pumps, ground-source or geothermal heat pumps, micro combined heat and power, and integrated systems building controls. This is the tool kit that our industry works with.

The government's plans include what the government has referred to as strategic interventions in the market to accelerate the adoption of high-efficiency space-heating technologies between now and 2035. The government has what has been defined as aspirational goals. A lot of our members have difficulty with the term “aspirational goals”, because they're very hard to pin down, but they include such things as that by 2035 all major space-heating technologies for sale in Canada will have an energy performance of more than 100%. For those who aren't familiar with heating technology, that essentially means that all technology for heating homes will be electric by 2035 because there is no gas-powered or oil-burning technology that can beat 100% efficiency. If that's the goal, that has important implications for our industry.

The plan will also identify barriers and challenges to achieving these goals, and those are part of the big discussion we're having with NRCan and others right at this moment. We'll be looking to implement a variety of measures to overcome barriers using all available tools.

The pan-Canadian framework and all of the things that spill out of that present tremendous opportunities for our industry. As it happens, HVAC unitary products are becoming more and more efficient. The transition to heat pumps presents an opportunity for all of our contractor members across the country. It's a job-growth strategy in a sense, because heating systems will have to be converted in existing homes and buildings. Building smart building controls and implementing systems that will allow better management of buildings creates all kinds of opportunities for our industry. An emphasis on not just product innovation but also building-systems innovation focusing on best practices and enhancing trade skills is very important for our sector. All of that is to say there are tremendous opportunities for our sector. As I mentioned, the industry has a variety of tools in its tool kit to help achieve the goals that the government has set out.

I'm not going to talk about those right now. In fact, I realize I left you at a disadvantage, because I'm looking at a presentation that you don't have. I will make it available to the committee if there's interest in having it. It includes some references to these technologies. The challenge the industry has around the pan-Canadian framework and the transition to a low-carbon economy is the need to adapt. The changing energy mix and transition from oil and natural gas heating to electric pose challenges for many of our members and participants across the country.

Production innovation is feasible, but the reduction of per unit cost for equipment in the context of increasingly stringent performance standards is a challenge. The growing sophistication of codes and building systems poses additional challenges for our sector. In terms of transition to who's going to do the work and how they are going to do it, there's a need for emphasis on skilled labour transitions, which means training.

The HVAC industry is prepared to engage with government at all levels to assist in meeting the challenges of the Paris Agreement. I want to make that clear, but there are some really important principles that need to be seen or adhered to if we want to have constructive engagement. The first is that manufacturers of products that are brought into this country need a runway. There's a product cycle, a time frame to develop and refine products in relation to standards and regulations, and they need time. They need to have foresight on where the regulations are going with time to adapt. Industry consultation is paramount to good program and regulatory design. Knowledge of products comes from our industry and knowledge of our customer base. Consultation facilitates advance preparation for the industry.

● (1155)

We have a strong consultative relationship with NRCan, especially the office of energy efficiency, and with NRC, CanmetENERGY labs, and so on. I want to emphasize that we do have that positive relationship.

I also want to emphasize, however, that the support for climate change needs to be tempered by the need for regulatory harmonization for products coming into Canada and into provincial and territorial markets to keep costs manageable both for industry and consumers. Therefore, we support the work of the regulatory cooperation council and are very interested in the NAFTA renegotiation process and in making sure the recently adopted Canadian Free Trade Agreement can be supported.

I'll leave it on the note that we have a number of other policy priorities and there are a lot of specific policy ideas that come from our industry, but the message I'd like to leave you with is that it's important, from our perspective, to consult early and consult often with industry to achieve effective outcomes.

Thank you for your time.

● (1200)

The Chair: Thank you very much.

I see that you have more there that you might want to share with us, so we would very much appreciate having the presentation. I know there were other documents that were provided as well, but if they're provided in one language only we can't distribute them until the translation is done. If you have your presentation already translated, that would be great, as it will get to us faster. We are looking forward to quickly absorbing the material you're providing, so the sooner we get it, the better. Thank you.

I'll turn it over to questioning now, but first, I want to welcome Mr. Webber.

Welcome to the committee.

Mr. Len Webber (Calgary Confederation, CPC): Thank you, Madam Chair.

The Chair: I do want to remind you that we have witnesses on the phone, so don't forget them. I know we often do when they're not in front of us.

Mr. Fisher.

Mr. Darren Fisher (Dartmouth—Cole Harbour, Lib.): Thank you very much, Madam Chair.

Thank you very much to everybody and the gentlemen on the phone. There is an incredible amount of expertise on this panel. Sometimes we get two people on a panel, and sometimes we get four or five. There's so much that I want to ask. I'll start off with a little bit of a general question. I'm going to lean towards Mr. Mueller on this one, even though I could ask any of you.

We've talked about retrofitting and about transitions. We've heard that federal codes are a guideline for provinces and territories to follow minimum standards; some match it, and some exceed it. We know that the private sector, certainly in the innovation sector, exceeds federal codes.

I always bring up the return on investment—the right thing to do for the environment versus the cost of retrofitting or building versus the payback. I know this is an overarching question, but how do we get there? How do we encourage reaching up to do better than those minimum standards? Is it with grants? Is it with rewards? I want your thoughts and recommendations on how we could proceed in order to do better.

Mr. Thomas Mueller: That's a really good question.

The Canada Green Building Council is in the business of setting higher thresholds and driving this forward. I'll go back to when the council started 15 years ago and what happened then.

There are three areas. One is that you're in charge of the code, but we have to keep in mind that the code is back-loaded. You first have to develop it. Then it comes in, and it takes years before it takes effect in the marketplace.

Your question is really on how we can move faster and be more ambitious. These volunteer systems have a big role to play. I would like to re-emphasize that the federal, provincial, and municipal governments have tremendous procurement power. In the early days of LEED, it was the federal government and some of the cities that de-risked the approach for the private sector. Even though you need to be responsible with taxpayers' money—I'm a taxpayer too, so absolutely—there's no doubt, and the business cases are so many now, that there is a positive return on your investment if you build to high performance. It's energy savings, water savings, and it differs by building and by owner. If government is procuring buildings, if you build yourself or you renovate or you lease space, it's hugely important.

The other part is just the fact of policy. When this government came into power, just due to the fact that there were policies about carbon, there was a 180-degree change in the industry. That was just from knowing that government was going in this direction and the industry needed to respond to that.

That goes beyond the code. It is more aspirational, because it's not an easy path. It's the combination of procurement, policy, and code, and they need to work in tandem. You need to attack this problem from many different areas.

But the business case is clear that there is a return on investment in this area.

● (1205)

Mr. Darren Fisher: I want to talk about concrete for a moment, but I love wood as well.

There's major innovation in the production of concrete. I'll give you a couple of examples. I went to Dalhousie University during a regional chairs session, and we saw that you can take the columns of concrete that you see holding up overpasses in Canada and make them half the size, wrap them in Kevlar, and they actually have more strength. It's incredible.

You've probably heard of CarbonCure, Mr. McSweeney, which is about capturing greenhouse gas emissions. They're reducing costs, they're increasing the quality of the product, but they're also promoting environmental sustainability. I'm certainly proud that the government is investing in innovation.

What else is out there for concrete, for innovation? It is such an important thing we use every day. We use it in industry and buildings. What else is out there? What's the next big innovation for concrete?

Mr. Michael McSweeney: I'm going to let my colleague, Adam Auer, answer that one.

Mr. Adam Auer (Vice-President, Environment & Sustainability, Cement Association of Canada): Probably the most exciting, forward-looking innovation is an extension of the kinds of technologies that CarbonCure is exploring, which is the beneficial use of captured carbon in concrete as a material. As Michael noted in his remarks, the cement and concrete industry together is both a source of carbon dioxide that can be captured and used, and also a potential sink.

There are literally dozens of different technologies exploring how to take captured carbon and put it into concrete as a material. Concrete is the most used material on the planet after water, so just by volume that means that concrete represents an enormous opportunity to take carbon from the atmosphere and permanently sequester it into our built environment. I see that as the most exciting space in terms of innovation.

However, you're right, there's a menu of strategies that our sector is exploring to get toward that Holy Grail of carbon-neutral and even potentially carbon-positive with some of these carbon capture technologies. There's material efficiency, which is what you're mentioning in the context of that bridge example.

We're looking at substituting the use of fossil fuel in the manufacturing of cement with lower carbon alternatives. That is a nearer-term technology that's already well deployed in a lot of places around the world, and we're working very hard with governments in Canada to facilitate that here as well with some recent successes with the attention on climate.

The two most important messages are yes, there's a ton of innovation happening in this industry, but much like your iPhone, it is not one technology. It is the synergy between hundreds of technologies working together that's going to get us to a very exciting place, not just in our industry but where our industry interfaces with the HVAC industry, for example, and other folks working in the built environment space.

The Chair: Monsieur Godin.

[*Translation*]

Mr. Joël Godin: Thank you, Madam Chair.

Gentlemen, thank you.

I also want to thank the people on the phone. Are you still there?

[*English*]

Mr. Bijan Mannani: Yes, we are.

Mr. Joël Godin: Excellent.

[*Translation*]

My first question is for Mr. Mueller from the Canada Green Building Council.

You presented four important elements to consider for improving sustainable development, which is a goal shared by all. Could you rank those elements in order of importance? They were listed on slide 3 of your presentation, I believe.

[*English*]

Mr. Thomas Mueller: Thank you for the question.

[*Translation*]

Mr. Joël Godin: I am asking because we can't focus on all of them at once.

[*English*]

Mr. Thomas Mueller: I have two slides with four areas there. Is it with regard to the retrofit, or zero carbon?

● (1210)

[*Translation*]

Mr. Joël Godin: It had “GHG” in the title.

[*English*]

Mr. Thomas Mueller: Retrofit, very well. These four areas are actually established practices in the industry. We rank them in terms of the percentage of buildings, or the number of buildings, that need to pursue these practices. In the next slide, you'll see where these buildings are located.

It is really important that it's not just a discussion about energy, but that it's also a discussion about carbon.

The recommissioning is something that industry is already doing, but it needs to be expanded. It just means that the system in the buildings work well and they work as they're intended. There's an instant savings for anybody who pursues that.

What we're really looking for, which needs to be incentivized and drawn forward, is retrofit. We say deep retrofit because these are savings of 20% to 40%. It's not just what we call a shallow retrofit, where you just replace the lighting and make a little bit of an improvement. It needs to be a deeper retrofit that looks at the building's systems, not just the lighting but all the building's systems, which, eventually, looks at the building envelope and looks at the energy source.

You could improve a building by simply switching to improve energy efficiency, but also, as the gentleman Mr. Luymes has said, switching from fossil fuel to a heat pump, for example, that uses electricity. They're highly efficient now. You can achieve a lower carbon building that way.

What I'm trying to say is that it really depends.

[*Translation*]

Mr. Joël Godin: I'll stop you there, if I may.

In the table on slide 3, under the heading “Pathway to Improved Performance in Existing Buildings”, you suggest working with “jurisdictions and the private sector to switch fuel sources in 20% of buildings”. We know that there is an impact of about 65% on heating and that heating has significant effects on greenhouse gases, or GHGs, and you suggest a reduction of 20%. That percentage may be for buildings alone, but shouldn't we prioritize this 20% if we want a greater beneficial impact on the environment? Do you follow me?

Heating has a huge impact. I see from your table that these elements are not ranked and that you want to work on all four solutions at once. However, I would ask you to rank them in order of priority. My own opinion is that we should tackle heating fuel sources first.

[*English*]

Mr. Thomas Mueller: Exactly.

You're right. These are not priorities. These are four strategies that need to be applied to all buildings. It depends on the building and where the building is located.

If you're in Quebec, fuel switching makes a lot of sense because you have clean electricity. In Alberta, fuel switching doesn't make a lot of sense because you have a dirty grid that still uses coal to generate electricity. These strategies need to be adapted depending on where you are. You need to pursue all four of them. However, on the next slide, you see where the priorities should be, depending on the location.

Does that answer your question?

[*Translation*]

Mr. Joël Godin: That doesn't quite answer my question, but it is a possible solution.

My next question is for Mr. Giroux from the Canadian Wood Council.

I'm not sure it was a good idea to seat the representatives of the cement and wood industries right next to each other. I sensed a bit of rivalry during your presentations earlier.

Mr. Michael Giroux: Just a bit.

Mr. Joël Godin: I understand you yourself worked in the cement industry at one point.

In your introduction, you said that it is important to go beyond costs. Could you expand on that? I see your point, but money is everything, so there is an impact.

You represent companies in the wood industry, and the other witnesses represent companies in the cement industry. However, in terms of cost, you both need to consider affordability and viability. Isn't that the case?

Mr. Michael Giroux: Yes, and it's a question of social values as well. Instead of prioritizing CO_2 or greenhouse gas emissions over cost, I would say it's important to take them both into account. That would allow us to consider the cost and measure carbon at the same time, which would help us make good decisions.

Mr. Joël Godin: I agree with you.

It is important to strike a balance between economic development and greenhouse gas reduction, or else it is not viable. As a society, we will not be able to...

How long do I have left, Madam Chair?

● (1215)

[*English*]

The Chair: You are over time.

[*Translation*]

Mr. Michael Giroux: If you have two solutions of equal value, both of which promote carbon, choose that solution.

[*English*]

The Chair: Thank you.

Ms. Duncan.

Ms. Linda Duncan: Thank you, all of you. It was all very important testimony. Some of you may have also testified when we did the government operations review a number of years ago, making very similar kinds of recommendations at the federal level so that they could save money on energy efficiency. It's good to have you here again.

I'm sure that all of my colleagues here join me in congratulating Mr. Nasseri, the owner of Landmark, for his recent Order of Canada, in part for his innovations in affordable energy-efficient housing. I'm really glad that Landmark could join us here.

Mr. Bijan Mannani: Thank you for the opportunity.

Ms. Linda Duncan: I'm wondering if you could tell us a bit more about this innovation, the ACQBUILT, this advanced construction and then assembly. Could you speak to what your experience is with customers who are seeking the Landmark approach to building? Do they put energy efficiency high on their list? Are the builders ahead of homeowners, or where are we at there in Canada?

Mr. Bijan Mannani: The ACQBUILT facility is a 150,000-square foot indoor closed manufacturing facility in Edmonton. It is equipped with equipment from Germany, machinery and robotics. It currently has the capacity of manufacturing panels for four homes per day. In essence, the manufacturing facility enables us to do all of the framing, all of the installation of the doors and windows, and rigid installation on the exterior, putting the cladding, siding, and all of the shingles on the roof in segments. It panelizes every single component, delivers them to sites, and erects a roughly 2,000-square foot single family home in less than a day.

It significantly reduces the construction cycle time. The best we have been able to do from excavation to key release is 46 days for a single family home, and this minimizes the impact on the environment and on the neighbourhood.

From the customer standpoint, our customers are the general public. Our homes are no different than any other home as long as we are able to identify and put the home in a three-dimensional model using building information modelling. Then we digitize that, and we feed it into computer-controlled machinery and robotics. The machines don't care whether it's an 80,000-square foot home, or 800-square foot home. They build panel by panel. They optimize the natural resources and minimize waste from the lumber, for example. We have been able to use engineering as well as the machinery building multiple panels at the same time—

Ms. Linda Duncan: Mr. Mannani, you're getting into more detail than we have time for, unfortunately. I think it would be really helpful if you have any kind of material that summarizes this production and how it reduces time and costs, but I have some other questions to ask, and I just wanted to say congratulations to you, so thank you.

Mr. Bijan Mannani: Thank you. I can send you a video of our manufacturing facility.

Ms. Linda Duncan: Okay, thank you very much. We'll share that with the committee.

My next question is about this issue of the delay in the net-zero code. From my perspective, if that code is not in place until 2030, there's a huge delay then in reducing after that, because it's time to catch up.

I'm happy to hear from anybody here about what the federal government can do to move this ahead and identify what's needed for the skilled labour, what's necessary for R and D, and what we could do to speed this up so we could have benefits sooner. I'm wondering if any of you could speak to that part of it. Should we not be including the costs if we don't do the retrofit for the energy efficient housing?

Maybe we'll start with you, Mr. Mueller.

● (1220)

Mr. Thomas Mueller: I'm not a code expert, but I think the code cycles need to be faster. It's not only that the federal government finishes the code. It's then the adoption by the provinces, of course. That can result in long delays. In a way, the code could be a very good tool, but time is against us.

Ms. Linda Duncan: Mr. McSweeney and then Mr. Giroux.

Mr. Michael McSweeney: I think Michael Giroux and I would agree, since we're very active players on the national building code, that today they're fixated on the distance between spindles on a staircase so that kids' heads don't get stuck in them or so that kids can't launch themselves over the railing. However, they're not fixated on climate change and GHG reduction. Michael spoke to that in his comments.

Ms. Linda Duncan: Yes.

Mr. Michael Giroux: First of all, it is the step code for energy. We'll get there, but with time. It's a question of continuous improvement.

I think you need to support the continued improvement process, and you can accelerate that by investing in the proper R and D with that condition established. You can use LCA to measure it—a life-cycle analysis or something—but what you want to do is make sure that everything that leads to that 2030, and maybe before, is measured, is quantified, and is better than the last iteration. That's what you have to do.

The Chair: Great. Thank you very much.

Mr. Rogers.

Ms. Linda Duncan: Those were good quick answers in a short time.

The Chair: Very good, yes. We should be quicker at our questions so we can get to all our answers.

Mr. Churence Rogers (Bonavista—Burin—Trinity, Lib.): I just want to ask a couple of questions.

I thank all the presenters for being here today. It's great information.

For the group, Landmark, out in Edmonton, I'm just going to repeat a question Darren asked earlier. For home buyers who come out looking for net-zero homes, what kind of additional cost is associated with buying one of these versus a traditional home, and what is the return on the investment? How long does it take to recoup that extra cost?

Mr. Bijan Mannani: The costs have come down. There used to be around a $40,000 to $60,000 premium for that. Apparently, with the rebates and so on, you are looking at about $18,000 extra that you are paying for a net-zero home. There are additional incentives. The CMHC, for example, has rebates that it is providing. Customers, particularly first-time home buyers, are more interested in capitalizing on the energy efficiency option, and customers are gaining more interest. The number of interested parties is increasing right now. We are having quite a bit of an increase with regard to energy efficient homes in the marketplace.

Mr. Churence Rogers: In terms of recouping money, how long does it take? Do you have a number of years?

Mr. Bijan Mannani: Dr. Yu is going to respond to that.

Mr. Haitao Yu (Lead Researcher, Landmark Homes Canada): In Alberta right now, the energy prices are really low, including the natural gas and electricity prices. They both are at historical lows. Now a single payback for a net-zero home is about 75 years or so. From an economical point of view, it's not that attractive actually. But we need to consider that net-zero homes are highly energy efficient homes and also provide a more comfortable living environment. There are now a lot of homebuyers...and we are also kind of marketing the net-zero homes and highly energy efficient homes from that perspective.

Mr. Churence Rogers: Okay, thank you.

My next question is for Michael McSweeney.

Good you see you again, Michael.

● (1225)

Mr. Michael McSweeney: Good to see you.

Mr. Churence Rogers: I've seen you a number of times with FCM stuff.

You mentioned the use of concrete pavement versus asphalt pavement and the lifespan. What about the cost comparisons of doing cement versus asphalt? Obviously, the lifespan is much, much better. It makes a lot of sense.

Mr. Michael McSweeney: From Ontario east, concrete today should beat asphalt pricing almost every time. We've won the last 12 or 13 tenders on the 400 series in the Toronto area, and we won those at first cost.

Concrete from Manitoba west is a little bit more expensive than asphalt on first cost. However, if you have to rebuild that asphalt highway four or five times in 50 years, that should be factored into the life cycle at the outset, and you make your decision based on the building material that's going to last the longest.

Mr. Churence Rogers: Thank you.

Madame Chair, that's good for me. I'll pass it over to Will, who wants to ask a question.

Mr. William Amos (Pontiac, Lib.): Thank you, Madam Chair.

My question is for Mr. Mueller and also for our guest on the phone.

I want to go a bit further down, from the homeowner's perspective. I appreciate that the big picture message is retrofits and new, large institutional settings. But I think that for society to shift, it will be a lot about new homeowners and what they are looking for.

What incentives does the federal government need to put in place to change the mindset of the individual homeowner, the person who is looking to build a home? I may look to build a new home. I like the idea of net zero. Convince me. How does that work?

I'm trying to move down the line my colleague Churence was going with that question. How do you get your money back?

Mr. Thomas Mueller: Maybe I'll let Landmark answer that first.

There have been programs over the years for homeowners to buy green homes. I think a percentage of homeowners will buy those homes, but there's not enough supply on the market. I would say that there's probably about 30% who will buy them because they want to buy them. They believe in it. Honestly, I don't think there's enough supply on the market across the country.

You talked about homeowners needing to be incentivized to buy a home like that. For me—and this always comes back to this cost discussion—actually, I don't necessarily believe that a green home is that much more expensive than a normal home, just like a green building is not necessarily more expensive than a conventional building. It depends on how you look at it. There have been many studies where they put down a list of green versus non-green, and the costs were.... It depends on what you want. People spend more on countertops—

Ms. Linda Duncan: Hear, hear!

Mr. Thomas Mueller: —than on energy efficiency. They were willing to spend the money there. They were just not willing to spend the money on energy efficiency. It's a preference for a certain type of home.

I don't buy that it's more expensive. I think I would challenge the home-building industry, actually, to step forward, because they could bring down those costs to a level where everybody could buy a home like that. It doesn't need incentives. It just needs the industry to step forward.

The Chair: Thank you very much.

I'm sorry we couldn't get more answers on that, because I think that's a good....

Mr. Thomas Mueller: Sorry that I took up all the time.

The Chair: No, it's okay. We may get back to that question. I think it's an important one.

Mr. Webber.

Mr. Len Webber: Thank you, Madam Chair.

It's good to be here sitting through this committee. It's my first time here. I usually sit on the health committee. With a background as a journeyman electrician, I find this a little more interesting than talking about Lyme disease and such.

The Chair: Welcome, then.

Mr. Len Webber: It's good to be here.

Anyway, I want to direct my question to Michael McSweeney.

I found your presentation very interesting. Concrete and cement, is there a difference between the two?

Mr. Michael McSweeney: If anybody ever offers to give you a set of cement shoes, that's the option to go for.

Mr. Len Webber: Is that right?

Mr. Michael McSweeney: Cement is a powder, like baby powder. Concrete—well, they're still looking for Jimmy Hoffa.

Mr. Len Webber: All right. Good to know.

You talked about portland-limestone cement. I live about an hour from Lafarge, in Exshaw, Alberta. Have you been out there?

Mr. Michael McSweeney: Yes.

Mr. Len Webber: That is a limestone cement plant. Correct?

Mr. Michael McSweeney: Yes.

● (1230)

Mr. Len Webber: Is that the portland limestone that you're talking about, that you want as a default product for...?

Mr. Michael McSweeney: Yes. We make two kinds of cement: portland-limestone cement and general use cement. The general use cement goes through the kiln at about 1,500°C for two or three minutes. When you make portland-limestone cement, you add limestone at the end of the process, so you're not using as much energy—petcoke, coal, natural gas. You reduce the energy. You have a net savings of 10% GHGs with that new cement.

Mr. Len Webber: Interesting.

Mr. Michael McSweeney: The same equivalency of product.

Mr. Len Webber: Same product equivalency....

Mr. Michael McSweeney: Same product and no price differentiation. It's the same price.

Mr. Len Webber: Why is it not our default cement, then, if it is this good for our environment at reducing greenhouse gas emissions?

Mr. Michael McSweeney: Tender writers, specifiers, and procurement individuals are very slow to change. It's “we did this last year; we did this 10 years ago”.

We believe in the CO2 road map that I referred to, and we will be sure to get that to you.

Government will have to have a role in regulations and mandates if we are going to get to our 2030 and 2050 targets. We cannot let municipal tender writers or provincial tender writers or federal procurement people set the details. There needs to be vision and direction from the top down, from the Minister of Public Procurement, the Minister of the Environment, and the Minister of Infrastructure, that every dollar we spend needs to be looked at through the lens of climate change. Only when you do that will you see reductions in greenhouse gases, and generally at no cost.

First, employ life cycle, choose building materials that last the longest, then look at every dollar you spend through the climate lens. Finally, to Darren Fisher's comments, choose the best available technologies, like CarbonCure, and our new cement, Contempra. Sometimes it needs to be mandated. We're asking that governments mandate that new product because you will see a 10% reduction immediately, at no cost to Canadians.

Mr. Len Webber: That sounds like a no-brainer.

Quickly, you mentioned a private member's bill in your presentation, about prioritizing wood products over other construction products. It was passed to go into committee—

Mr. Michael McSweeney: Second reading.

Mr. Len Webber: —at second reading.

Were you consulted on this at all?

Mr. Michael McSweeney: No, and that's typically what happens with the wood industry. They take tens of millions of taxpayers' dollars and then they lobby all of you and get what they want.

Canada is founded on fur, fish, and lumber. Whenever we talk about fish on the east coast or lumber across the country, or if we're talking about fur in Newfoundland, the politicians say, “Oh my God, we've got to answer this.”

Our belief is, choose the best building material for the job that gives you the best life cycle, that gives you the lowest carbon footprint.

Did you know that with a tree that is harvested, they go into the forest, strip all the branches, leaves, and bark, and leave it there to burn in slash piles or to rot. That creates greenhouse gases right away. Then they take the log to the timber mill and they square it off, and all that material is then turned into pellets to power the timber mill. By the time you get to this piece of furniture, there is only 12% of the original carbon sequestered there, and 88% of the carbon has been left on the forest floor or used to power the mill.

These are the facts and they are starting to come out now, as we force the wood industry to tell a truthful story, from cradle to cradle.

Mr. Len Webber: Thank you.

Mr. Michael Giroux: Does the wood industry have a chance to reply on that, or are we letting that stand as fact?

The Chair: That's up to Mr. Webber to let you speak.

Go ahead.

Mr. Len Webber: Please, Mr. Giroux, if you have anything else to say....

Mr. Michael Giroux: It's a bit disturbing.

I mean, we could say a lot about the cement industry as well. With portland cement, where limestone has been around for 20 years, they've had it for the last 10 years and it's not been adopted. Even within their membership, many silos need to be.... There are huge capital costs. At the end of the day, they're trying to get legislation in place to force their members to adopt the product as well.

In terms of the forestry products and Richard Cannings' private member's bill, that is one of the 450 communities that produce lumber, and he is there representing his riding and his interests. It is not the overall wood industry that is putting that forward. If they were, we would be pushing *la charte du bois* from Quebec.

● (1235)

The Chair: Thank you very much.

Those were good responses on both sides. You're both great advocates for your industries, and we appreciate it.

Mr. Aldag.

Mr. John Aldag (Cloverdale—Langley City, Lib.): Thank you.

We've heard that 75% of the buildings will be in place when we get to the 2030 targets, 2050 targets, so I was pleased to hear the mention in a number of your comments, particularly from Mr. Mueller, on the idea of recommissioning and deep retrofits. I found it interesting listening to Landmark and what they're doing in the new construction world.

It's this whole dilemma I have about meeting our targets with what we know and what we have right now for codes and technologies. For the retrofits that are needed within that 75% of the existing building stock, will that carry us to where we need to go, or is there more work that needs to be done on the retrofit piece so we're not having to landfill existing buildings and bring in new construction to get us there?

I don't know if anybody has any comments that you want to offer about the existing standards to move us forward for retrofits and the idea of working within the 75% existing stock in order to meet targets. How do we get there? Is it a matter of doing it, or what else is needed to get us there?

Mr. Thomas Mueller: It's a really good question. I'll keep it really short. It's a bit complex. We modelled it, and actually by targeting about 60,000 buildings over the next 13 years leading up to 2030, we get a 30% reduction. It's not everything. It just needs to be more targeted and you need to go deeper. If you do a shallow retrofit, then people won't touch the building again for decades. It is has to go deeper. You have to do it and the technology exists. The technology exists right now to do it at a reasonable cost.

The owners who have done retrofits get the return on investment. There are just certain steps involved that need to be done, such as performance assurance. There needs to be investment. It cannot just be building by building, because the transaction costs are so high. That's why we've been talking to Infrastructure Canada about the Infrastructure Bank and that there needs to be bundled investment, and how we can reduce risk for investors and those types of things. These discussions are already going on.

It is critical that those 50,000 to 60,000 larger buildings of over 25,000 square feet are the ones up for renovation. There are plenty of models on how this can be done and there's the expertise, the contractors, the designers, and the equipment providers. This can be done right now. It's a matter of going over the three barriers. One is the initial cost, so access to capital is very important. Performance assurance is really important as well.

You have to commend the federal government. You're planning to introduce a renovations code by 2022, which will be another piece of the puzzle to move this sector forward.

Mr. John Aldag: Okay. Does anybody else have any comments?

Mr. Martin Luymes: Can I add to that? I support the idea that a renovation code would be a big driver in this particular area. One of our views has been that certainly the emphasis should be on retrofit to a large extent because the opportunity is so enormous. A code would be very helpful, but we think incentives can help drive that business.

Another organization, of which I'm the chair, is the Canadian Energy Efficiency Alliance. They did a study a couple of years ago that said Canadians want to do more and they want to start at home. They want to do more in their homes, but they don't know where to start.

We believe that providing good science-based information would be a very good start and that coming from the federal government could be very powerful. Related to that, there are programs for labelling of homes, or relabelling. The tools exist now. The federal government has the EnerGuide rating system for homes that hasn't really been deployed to its full potential across the country.

Our feeling is that homeowners, if they're given proper information, will make these investments in their homes either for a return on the investment or just because they believe it's the right thing to do. The evidence shows that Canadians think it's the right thing to do, so that would be a major driver for activity.

Mr. John Aldag: I'll come back to you in a second.

Mr. McSweeney, go ahead.

● (1240)

Mr. Michael McSweeney: You are the legislators, so legislate. Bring Jim Carr in, bring Navdeep Bains in, and ask, “Does Natural Resources and Navdeep Bains' department work with the Minister of Environment and Climate Change?” We have policy going up here, and then we have line departments. What we need is something coordinated.

The federal government, for example, has no problem telling me I'm going to have to pay a $50 carbon tax by 2022, and we're willing to do that. If you want to see retrofits, mandate retrofits. Just as you're mandating us in industry, mandate that anybody who is going to renovate a building must do this. There's a real role for mandates and regulations.

Mr. John Aldag: Thank you.

Mr. Michael Giroux: I'm going to come at it from a slightly different angle.

Every Canadian wants to live in a community that is safe and green. Whether it's for buildings or for infrastructure, if you go out of your way to make visible the state of that infrastructure as it is today, whether it's crumbling or whether it's low or high energy, people will make the choice not to live there and will force the owners of the buildings to actually do something about those buildings.

I'm a great believer personally in the fact that we need to have community report cards or some way of making this more visible to people so that people feel obliged to do it.

The Chair: You're out of time. Sorry about that.

Go ahead, Monsieur Godin.

[*Translation*]

Mr. Joël Godin: Thank you, Madam Chair.

In my opinion, the economy is very important. Help us help the cement and wood industries. I think these two sectors are here to stay.

My question is for Mr. McSweeney.

Let's swap roles. Imagine that you are the lawmaker. What measures would you take to ensure that the wood and cement industries operate in keeping with the goal of clean growth while remaining viable?

[*English*]

Mr. Michael McSweeney: First, if the government is going to choose winners and losers in the economy, that's a wrong fundamental premise. When you're funding hundreds of millions of dollars to the wood industry to promote itself and not the steel industry or the concrete industry, there's something fundamentally wrong there. You should not rob Peter to pay Paul. In every one of your constituencies, there will be a concrete facility, and in some of your constituencies there will be a timber mill. If you are going to favour wood and have "wood first" policies, you will bring unemployment to the people in your quarry, sandpit, and ready-mix facilities in your ridings. These things happen all the time. Governments fund things that they really shouldn't fund.

Treat all building materials equally. If there isn't a market for a product, don't support it. In the seventies, we were supporting the shoe industry in Cape Breton, and all of a sudden the government said, "If we can't make shoes and sell shoes, why is the government supporting a shoe facility in Cape Breton?"

Each industry should stand on its own. We're a small country. We have only 33 million people. We're not like California, which has that many people in one state. We're not like China, which has two billion people. The wood industry needs to look to export markets to try to sell its product, not try to put people in the concrete, aggregate, and sandpit industry out of business. That's not fair.

[*Translation*]

Mr. Joël Godin: I will stop you there because we have very little time left.

You are saying that all activity sectors should be treated equally by the government. Do I have that right?

Mr. Michael McSweeney: Yes.

Mr. Joël Godin: I'm looking at your website now. I will read a short excerpt from it and then ask you a question.

Your website says the following: Today, we are focusing on bringing lower carbon cements to market through two main strategies:

> Substituting traditional fossil fuels, including coal, with lower carbon alternatives. In leading jurisdictions, some cement facilities have achieved carbon intensity reductions of over 50% in the fuels they use; if this were achieved at all facilities in Canada, it would yield GHG reductions on the order of 2-3MT;

What is preventing you from doing that?

● (1245)

[*English*]

Mr. Michael McSweeney: We are doing it. What's preventing us is our politicians and civil servants. We are working very hard in British Columbia, Alberta, Ontario, Quebec, and Nova Scotia to try to replace coal, petcoke, and natural gas, and take those fuels and replace them with biosolids, which come every day and are greenhouse gas neutral; biomasses; and plastics that cannot be recycled. We do not want to take materials that could be reduced, reused, or recycled. Anything that goes to a landfill that will degrade and start to produce greenhouse gases or methane should not go to a landfill.

We are working very hard, but again, it's very difficult to get provincial civil servants, who have the authority over fuels and wastes in their province, to move. In Burnaby, for example, they're looking at doubling the size of the incinerator, which will then double the amount of greenhouse gases in the city of Burnaby. The Province of British Columbia is trying to tell metro Vancouver that it should be sending its biosolids to the two cement facilities there to lower greenhouse gases.

We really need to work more in trying to get the politicians and civil servants to understand that the fight against climate change is the biggest fight of our lives. We cannot wait around for 10 or 15 years until 2030 and still be at the same levels we're at today. It's an urgent challenge, and politicians and civil servants need to be seized with it at every opportunity.

The Chair: We have 50 seconds left. Go ahead, Mr. Sopuck.

Mr. Robert Sopuck (Dauphin—Swan River—Neepawa, CPC): I just want to challenge Mr. McSweeney. In a previous life, I was an environmental director at a paper mill. I want to assure you that especially our conifer trees, which are the majority of trees harvested, are used very efficiently. The best fibre in the tree is on the outside of the tree, so it's a rare mill that would ever burn those pellets.

How it works is that the inner core of the tree, the xylem, is what makes the lumber. The outer core, the phloem, is the high-quality fibre that is chipped and then sent to a paper mill to produce high-quality paper. To denigrate the lumber industry and say that they burn this high-quality fibre is completely untrue, unless a lumber mill is totally isolated. What we burned at our mill was the bark, and that's what happens in most mills. The entire tree is efficiently utilized in Canada.

Mr. Giroux, perhaps I'll let you have the final word.

The Chair: I think I'm going to have to leave it there because we're over time. We really do have a short period of time. I don't want anybody to lose their questioning.

Mr. Bossio, please.

Mr. Mike Bossio: Thank you, Chair, and thanks to all of you for being here.

I live in a 120-year-old home. I have installed geothermal heat to try to offset the footprint I have. I've put three feet of insulation in the attic and have replaced all the windows and doors and all the rest of it, but I still have this massive brick building that has heat bleeding out of the bricks, because, of course, the brick draws the heat out of the building.

I was talking to a friend of mine who said to forget about trying to create any more efficiencies in my home. He said, "You have to create green energy to offset whatever carbon it is that you're still emitting from the facility." When do we reach that balance between where it's more efficient to invest in energy or fuel switching than it is to invest in efficiencies?

Mr. Thomas Mueller: I think the principle of energy efficiency is paramount, because you need to reduce the demand for energy that your house has on the grid or on fossil fuels, whatever it is. That's job number one.

The thing is that at some point it becomes uneconomical for you to become more energy efficient because the costs are going up, so you need to look at renewable sources of energy, as you pointed out, to replace your fossil fuels. You also need to look at that very carefully, because you can generate some of them on site, depending on where you live. If you have land area, you can use solar and you can use geothermal.

You're absolutely right. You need to balance that. It cannot be universally applied, but you know that energy efficiency is job number one, because otherwise you'll need to supply too much renewable energy and that might affect your operating costs: what you pay for the solar panels or if you get electricity. It's that balance between.... At the end of the day, it comes down to cost. It comes down to cost for the best solution that suits your needs and gets you a low-carbon building.

● (1250)

Mr. Martin Luymes: I would echo that. The obvious answer we always give is that energy efficiency is the first fuel. That should be your first investment, the lowest-cost fuel type.

Even when we talk about some of our contractors in our industry promoting geothermal, their first focus—it isn't always this, but it should be—is to seal up the envelope. Draft-proof the building or the home, insulate it to the maximum possible, and then invest in this replacement lower-cost heating technology. You start with the envelope and then work towards the mechanical system, but clearly there are limits, and those are the costs. The answer to your question depends on the vintage of the housing stock and a whole lot of other variables. In an older home—

Mr. Mike Bossio: It's an old house, so it's hard to stop any of the draftiness in such an old house.

Mr. Martin Luymes: There are limits. The right answer might be to tear it down and replace it with a super high-efficient home.

Voices: Oh, oh!

Mr. Mike Bossio: Part of the difficulty, though, with ground-source heat is of course that it's a 60-amp system, and solar can't feed it, right?

Mr. Thomas Mueller: There you go. That's your answer right there. That's why efficiency is so important and your envelope is important, because you cannot possibly—I mean, it depends on how deep your pockets are—expect the same service immediately from renewable energy that you get from fossil fuels. It's a different type of energy.

Now, when we look at cities, we want to electrify everything. We want to electrify our buildings. We want to electrify transportation. That speaks directly to energy supply. When that energy needs to be used by everybody—because everybody's going to come home and turn on the lights and the heat, and plug in their electric vehicle—that's peak demand. That's what you have to manage. You have to really look at efficiency as way to, first, reduce the demand, and then you have to look at your best sources of renewable energy to reduce the carbon footprint.

Mr. Mike Bossio: Thank you.

Mr. Luymes, last week we had BOMA in, and they gave a great presentation on energy efficiency and all the rest, through the retrofit, which is important, but what's even more important is the operational piece of it once you've completed all that and the training that needs to go into that.

Of course, coming from the industry that you're in, you feed a big component of the operational, the smart building type of infrastructure that's available now. Can you comment on what BOMA had to say there?

Mr. Martin Luymes: We've promoted, through what I refer to as good industry practice.... I think someone else on the panel has talked about the building code really just being a fairly low floor. The simple fact of the matter is that, in Canada today, homes that are built to building code aren't particularly efficient by any measure and we don't even have a way of validating the performance of that home. We have been promoting for a number of years creating a standard for the commissioning of homes so that at the end of the process, once the home is built, someone will actually go in and verify that the air distribution system is actually working the way it's designed to work. That's a comfort issue, but also an efficiency, a performance issue. It's not currently done.

Mr. Mike Bossio: It's being done for buildings or any other type of structure.

Mr. Martin Luymes: It's being done more in commercial buildings, but it's almost not at all—

Mr. Mike Bossio: But it's voluntary.

Mr. Martin Luymes: Exactly.

Mr. Mike Bossio: It's not in the code itself.

Mr. Martin Luymes: We would look for a code-driven commissioning process and similarly for commercial buildings.

Mr. Mike Bossio: Okay.

The Chair: Excellent. Sorry to cut you off. There's so much to say.

We have three minutes with Ms. Duncan.

Ms. Linda Duncan: I'm going to take things in a different direction, and it's back to Mr. Mueller because we had the pleasure of you appearing before our committee in, I think it was, 2012. You gave some very valuable testimony, and by the way, you spoke to LEED and we have not had LEED here.

What you testified to our committee was that large commercial landlords use pension funds to invest in buildings and the rates of return on those investments exceed 10%. A couple of years ago I met with the realtors association in Ottawa that actually leases the major commercial buildings, and they've shown a much greater demand for the buildings that have retrofitted and gone energy efficient.

Could you speak to this issue? I'm wondering if this is not a huge potential for the Infrastructure Bank. We keep thinking about building freeways, LRT, but given the potential for rate of return on investing in retrofitting commercial buildings, is there not huge opportunity there?

● (1255)

Mr. Thomas Mueller: I'm really glad you asked that question. There is, and that's why we're having the discussion, because pension funds across this country have been investing billions of dollars in green, energy-efficient buildings and so on, LEED, gold LEED, platinum buildings. Any new office building in Canada now is built to LEED gold or platinum because it generates return for the owner. For the pension funds, they have to be very conservative because they're generating pensions for municipal workers, for hospital workers, for nurses and so on, so they figured out that this is actually very good business.

That's why we suggested that, and are currently working with Infrastructure Ontario and with NRCan—we're actually holding a round table with Minister Carr at the end of this month—that the Infrastructure Bank would be very well positioned to underwrite investments like that into building retrofit, bundled building retrofits that are assessed consistently to achieve a certain level of performance, 20% to 40% ideally, that will generate a return for the investors and will generate a return for the owners.

Ms. Linda Duncan: We talk about affordability, too, so it's fine if we have a good income and we're going to retrofit a nice heritage house we own or we're going to build a new building.

What about the big demand and need for affordable and social housing? Don't you think we need to have guidelines or rules for that kind of housing?

Mr. Michael McSweeney: I'll tackle that one because we're working with the City of Vancouver, the Province of B.C., because they're building 2,000 homes for homeless people. They're going down the road of wood modular homes.

We're trying to say you need to use a building material that's going to last for a long time, you're going to need to pair that building material with smart technologies like geothermal and solar, because the poorest people cannot afford the energy costs to live there, and you want to successfully integrate them back into society so that they move on, but the building is still there to serve someone else for the next 200 years as we work on a national housing strategy that housing is a right for everybody.

It's very important that we try, when we build homes for poor people, for the indigenous communities, to build homes that are very energy efficient and will last forever.

Ms. Linda Duncan: Hear, hear!

The Chair: We're going to end it at that point. Thank you so much. I know we have much more to say. What I wanted to say is that you've heard the questions. You heard what we're trying to get at. If you would like to send us any comments later, we would welcome them. If there's anything you'd like to add, or you didn't get a chance to chime in on a question that you'd really like to inform us on, we would love to hear that response. We have a short study period, so it would need to come in fairly quickly, but we would welcome it.

Thank you very much, all of you, and especially Landmark for just being on the phone. It's very difficult to do that, and we appreciate your being there and hanging in with us. I also want to congratulate you on your Order of Canada for the work you're doing.

Thanks, everybody, and we'll be back at this on Thursday.

The meeting is adjourned.