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Chair

Mr. James Maloney

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● (0850)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): Good morning, everybody.

Welcome back. I hope everybody had a productive and enjoyable two weeks in their constituencies or wherever they may have been.

We're back with two sets of witnesses this morning. First, we have Mr. Joseph Galimberti, President, and Ms. Aleksandra Pogoda, Director, from the Canadian Steel Producers Association. We also have Mr. Scott Marks from the International Association of Fire Fighters.

Thank you all for joining us.

The process, in case you're not familiar with it, is that each group gets up to 10 minutes for their presentation, which you can and are encouraged to do in either official language. There are hearing pieces there if you need interpretation. You may be asked questions in French or English afterwards.

After your presentations, we'll go around the table for questions from the members.

My job is to keep time, so if I have to interrupt you or cut you off, I apologize in advance. Unfortunately, that's one of my jobs.

Ms. Pogoda, why don't we start with you to lead us off?

Ms. Aleksandra Pogoda (Director, Environment, Canadian Steel Producers Association): Good morning.

I'll actually be deferring it to Joe for most of the introductory remarks.

Mr. Joseph Galimberti (President, Canadian Steel Producers Association): Thank you.

Good morning, honourable members of the committee, and thank you very much for the opportunity to present to you today on behalf of the Canadian Steel Producers Association as regards your study of Bill C-354, An Act to amend the Department of Public Works and Government Services Act (use of wood).

The CSPA is the national voice of Canada's $14 billion primary steel production industry. Canadian steel producers are integral to the automotive, energy, construction, and other demanding industrial supply chains in Canada. Our members produce roughly 13 million tonnes of primary steel and an additional one million tonnes of steel pipe and tube products on an annual basis. This provides direct employment to over 22,000 Canadians while supporting an additional 100,000 indirect jobs.

To start today, I think it's important to state that all of our members support a healthy Canadian construction industry. Wood, steel, brick, concrete, and other construction materials are all important links in a competitive Canadian business environment focused on meeting the needs of domestic supply chain stakeholders. With that open and competitive market balance in mind, the CSPA cannot support Bill C-354 as currently constituted. We are concerned that this legislation would create a permanent legislative preference for wood over other construction materials, which would undermine competition and ultimately inflate infrastructure costs by limiting the types of materials available for use on federal projects.

Further, we worry this bill will limit the design freedom of construction professionals in the selection of materials and create potential conflicts with Canada's National Building Code. We worry that the legislation could call into question Canada's obligations under domestic and international trade agreements, and we worry that the legislation threatens green procurement policies by discouraging ongoing assessments of total carbon and life-cycle footprint for the products that the Government of Canada uses in its projects.

The federal government is a significant purchaser of construction material across the country. Its activities affect the national economy and can influence the price and the availability of goods and services, including construction services within the marketplace. Moreover, the Government of Canada's decisions on procurement practices not only influence the practices of other levels of government, but also those of the private sector. As such, any change in federal procurement policy—in this case the creation of a permanent legislative preference for the use of wood over other construction materials—should be carefully considered so as to avoid unintended market consequences.

Our association believes that it is neither good nor acceptable public policy for our governments to promote one building material by excluding alternative, viable, and competitive Canadian materials from Canadian construction markets. We strongly believe that all construction material should operate on a level playing field, and in a competitive, fair, and open economic environment. We believe the proposed Bill C-354 to be philosophically contrary to the performance and procurement policies and methods currently employed by the Department of Public Works and Government Services to actively promote and ensure openness, fairness, and transparency. If enacted, we believe the bill would distort these fundamental equalities and send a clear discriminatory signal as regards other construction materials and industries.

As I indicated earlier, Bill C-354 will also limit and undermine the freedom of a design professional or experienced contractor to select the most appropriate construction material for an intended function and service. Legislation that compels or influences design professionals to specify the preferred product for use where it is not suited to the function or service has attendant risks. There becomes an increased likelihood of non-performance, permanent failure, and higher initial costs for construction, and elevated ongoing costs for repair and maintenance.

The National Building Code of Canada serves as the basis for specifying materials, testing, design, and construction. It is specifically designed not to limit the application and use of any material, component, or assembly. A “wood first” policy inherently undermines that neutrality by seeking to actively influence a designer's choice of construction material. The selection of appropriate building materials must remain under the purview of those qualified and licensed to practice in the area of building design and construction. The Canadian built environment is founded on that principle.

We also believe the bill implies significant unintended legal and trade consequences. By virtue of the federal Competition Act, the federal government has an obligation to maintain and encourage competition in Canada and to promote equitable opportunities for economic participation. This bill hinders competition and skews the market balance. It clearly violates the spirit of the Competition Act.

● (0855)

We should also be mindful of respecting Canada's trade agreements. The procurement requirements of Bill C-354 would likely violate several international trade agreements, including NAFTA, CETA, and the WTO agreement on government procurement.

At this very moment, while the Government of Canada is working to negotiate and implement globally inclusive agreements while at the same time resisting protectionist policies like Buy American, the implementation of a “wood first” policy is inconsistent with the direction of Canada's government and may be seen by other nations as a non-tariff barrier violating several areas of Canada's international agreements on trade.

The bill further seeks to grant preference to projects that promote the use of wood, taking into account the associated costs and reductions in greenhouse emissions. Appreciating that the government is working in partnership with industry across Canada towards a low-carbon economy, this bill remains commercially discriminatory.

Instead of focusing on the permanent establishment of a place of preference for a single building material, the government should consider the implementation of complete life-cycle analyses at the centre of all projects involving construction materials moving forward. A sustainable, circular economy is one in which society reduces the burden on nature by ensuring resources remain in use for as long as possible, and that once the maximum value has been extracted, the resources are then recovered and reused, remanufactured, or recycled to create new products.

As a permanent material that can be recycled over and over again without losing its properties, steel is fundamental to the circular economy and has inherent advantages throughout a full life-cycle analysis. While it is not our intent today to promote the use of steel over any other construction material in government projects, we would rather encourage the government to consider maintaining a fair, competitive construction market.

We would suggest the government can further support the entire domestic construction industry by implementing government-wide procurement policies that give significant recognition to the total carbon and life-cycle footprints of the products it uses in its projects.

In conclusion, while we all agree that we want our domestic economy to continue to grow and for all of our Canadian building products to be more widely used, we would also suggest that it remains our belief that no construction material or assembly should be awarded a legislated priority over others.

Professional judgment, practical application, fair competition, respect for our building codes, and the evolution of construction practices and product innovations should determine the best materials for the application and service.

With this in mind, we respectfully request that Bill C-354 or any similar legislation not be recommended for additional consideration by the House of Commons.

Thank you for your time, and I'm happy to take any questions the committee might have.

The Chair: Thank you very much.

Mr. Marks, over to you.

Mr. Scott Marks (Assistant to the General President, Canadian Operations, International Association of Fire Fighters): Thank you, Mr. Chair, for the opportunity to share our views on Mr. Canning's Bill C-354 today. It's a pleasure for the International Association of Fire Fighters to return to this committee after our appearance in December.

To briefly introduce our organization, the IAFF represents 310,000 professional firefighters across North America, including 25,000 here in Canada. In Canada's largest cities and towns, our members are on scene in minutes, in any kind of emergency large and small, including structure fires, medical emergencies, water and ice rescues, hazardous materials incidents, and more.

I'd like to reiterate the remarks made by our 13th district vice president, Fred LeBlanc, which were conveyed last December, about our concerns with the expanded use of wood products in construction in the context of firefighter safety. The IAFF certainly supports a vibrant economy and a successful, sustainable wood and wood products industry, including the expansion of the forestry sector and opportunities for its workers both domestically and abroad.

At the same time, as national and provincial building codes are responding quickly to the need for innovation and the expanded use of wood products, we urge the committee to exercise caution and do what it can to regulate or encourage the regulation of adequate fire protection, meaning firefighter and public safety. As fire protection is a municipal responsibility that is also provincially regulated, we suggest that this should be the topic of discussion for the federal government's municipal and provincial partners.

National and provincial building codes currently include provisions for mid-rise, and recently high-rise wood-frame construction. The rush to allow wood-frame construction of up to 12 storeys, which is proposed for the 2020 edition of the National Building Code, has been billed as an economic boost for the forestry sector. As we have formally stated to the Canadian Commission on Building and Fire Codes, and to the federal government, we remain unconvinced about the fire performance of tall wood structures and whether our urban fire departments and front-line personnel are prepared to safely and effectively protect the public in the event of a fire inside of a tall wood structure.

We are aware of studies that discuss the fire performance of cross-laminated timbers and glulam, and the charring effect that supposedly protects these materials from failure. I was a firefighter in the city of Toronto for 28 years, and I can attest to the fact that what happens in a large structure filled with modern combustible materials can be very different than what happens in the confines of a controlled test environment.

Our chief concern is that a majority of urban fire departments in Canada probably lack the equipment, resources, and the training to safely and effectively respond to a fire in a tall or large wood-frame structure. Firefighters may be required to be inside a burning structure long after other occupants have escaped in order to search for and rescue anyone still trapped, and to provide aggressive interior suppression in order to save the building and its contents. That's what the public expects from us. Firefighters will be inside or in close proximity to one of these structures in the event of a collapse.

In our view, there are too many unknowns about the way that a completed six-storey, 10-storey, or 12-storey combustible wood-frame structure would respond in a real fire situation. It's hard to predict the weight load and the fuel load of a particular structure once it's built and populated.

There is also the prospect, as was tragically seen in the Grenfell Tower fire in London, U.K., last year, that modifications—in that case, a flammable exterior cladding—may be added to an existing structure many years later. Neither the National Building Code, National Fire Code, nor respective provincial building codes address fire department response capabilities as they relate to the suitability or safety of a particular structure.

There was no reference in proposals for mid-rise wood-frame construction to any fire protection standards, such as NFPA 1710, a science-based standard from the National Fire Protection Association, that quantifies the adequate fire department deployment in an urban setting. The truth is, very few Canadian cities currently meet the response time and personnel standards for existing two-storey structures, let alone high-density structures made of combustible materials. Even if a community does have adequate fire protection resources to protect a particular structure, there's no guarantee that they will be there during the entire lifespan of that building.

What we are seeing in many communities across Canada right now is the propensity to reduce fire department resources and capabilities for political and budgetary reasons. I can point to numerous communities in Canada, large and small, that have experienced station closures and firefighter layoffs, and many that are contemplating initiatives that would increase response times and decrease the personnel and equipment available to respond.

● (0900)

This common scenario would leave occupants of any given structure with even less protection than builders and authorities anticipated when it was built. Commonly, when these kinds of cuts are made, fire prevention and inspection are amongst the first to be targeted. These are the fire safety individuals on whom occupants of these structures would rely the most to ensure the structure is always in compliance with codes and regulations; for example, when modifications are made.

Firefighter safety is another concern. In our view, the move to permit higher and taller wood-frame buildings in the National Building Code is set against a backdrop of an objective-based code that does not include firefighter safety as an objective. As a result, firefighter safety cannot be used as a basis for a code change request. I would also note that the National Building Code, despite being a model code, establishes an absolute minimum performance that builders are required to achieve. It's not a Cadillac level; it's a minimum

Six-storey wood-frame structures were first permitted under the British Columbia building code. The first such structure was consumed in a massive blaze in Richmond in May 2011, confirming that they are particularly vulnerable when they are under construction.

In December 2013, the four-storey wood-frame student residence under construction in downtown Kingston, Ontario, caught fire, sparking a massive inferno that spread to two adjacent buildings while taxing the city's emergency response infrastructure to its limit for 48 hours. The builders were subsequently charged by the Ontario Ministry of Labour with 22 offences, 11 of which were related to fire safety precautions that were not followed.

Having fire safety regulations and having an existing level of fire protection in the community are not guarantees that any particular structure is safe. The truth is that every working fire represents a danger not only to the public but to the firefighters who respond. Large blazes such as the Richmond and Kingston wood-frame blazes also reduce the resources that fire departments have available to handle simultaneous responses.

In closing, the IFF is not opposed to the context of Bill C-354, but if we are going to give preference in federal procurements to promote the use of wood, we urge a more thorough discussion of firefighter and public safety considerations against the backdrop I have described of inadequate fire protection and the prospect that any given municipality may reduce its fire protection capabilities in the future.

Again, I appreciate the opportunity to present our views to the committee on behalf of Canada's professional firefighters, and I look forward to answering any questions.

● (0905)

The Chair: Thanks very much, Mr. Marks.

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

Mr. Geng Tan (Don Valley North, Lib.): Thank you, witnesses, for being here with us.

My first question goes to the CSPA. We have heard from producers and users of wood products in construction, and in the next weeks, we're going to hear from a similar witness from a cement producer and users in construction.

You just mentioned in your statement that the CSPA does not support giving preference to the use of wood over other construction materials because of less competition or higher costs, from what you said in the statement. Can you give us more details on your argument?

Mr. Joseph Galimberti: Clearly, if you establish a preference for one building material over others, then that is inherently a disincentive to take a look at.... I'll use the example of a building design that fundamentally frames the building or completes the structure with steel or concrete or an alternative construction material. There is an inherent competitive imbalance in saying we give preference to wood construction.

As to increasing costs, generally the way these things work is that, once you've introduced an inhibitor as far as competitiveness is concerned, you introduce a cost escalation. That's what logically follows. There may be instances where, in designs or projects, there would be a more economical path to take with steel or cement or whatever sort of combination solution, which could include wood, but if you were to give preference to wood, you might see an elevated cost that way.

Mr. Geng Tan: Can you tell the committee roughly what percentage of all the steel consumption in Canada the domestic building construction industry accounts for?

Also, suppose we encourage more use of wood for the construction industry, what kind of impact might we see of this wood building material in construction on all steel usage in Canada's building construction industry? Is it negligible or very significant?

Mr. Joseph Galimberti: It fluctuates year to year. Traditionally, the consumption pattern in Canada for steel has been about one third of domestic production; domestic consumption is in automotive. One third is in energy and one third is in building and infrastructure. Traditionally, that's kind of the mix.

With regard to influence, I would be concerned about a knock-on effect or a signal to the market. The federal government has significant purchasing power. Clearly, the steps that the Government of Canada takes influence the market generally, so I would be concerned about a bleed forward.

I hope that answers what you're looking for.

Mr. Geng Tan: On your website, you promote your product as the “greenest” steel made in Canada. The numbers, from what I see, are very impressive. How do you account for the huge difference in the CO2 levels between Canada, at only 42 kilograms of CO2 per tonne, and India, for example, at more than 900 kilograms? How do you do this kind of comparison or calculation?

● (0910)

Mr. Joseph Galimberti: From a steel perspective, Canada is a very unique market in that we are extraordinarily close to the natural resources that are required for the process of making steel. We have close proximity to metallurgical coal, to iron ore, to the raw materials that go into steel. We are also the beneficiary of really efficient supply networks. The Great Lakes shipping network and the rail network between Canada and the United States are outstanding for these purposes. Canada's largely renewable energy grid contributes to that significantly. When you take a look at the GHG benefit implied from using Canadian steel in Canada versus imported steel from elsewhere, where they don't have that same access to natural resources and the clean energy supply, and you are incurring the GHG costs of shipping to this market, then yes, the benefits are really significant.

I should also mention that Canada's steel producers are also Canada's largest recyclers by volume. Steel is an infinitely recyclable material. You get bridges that have been made out of old bridges. You get in automotive the recycling of cars. Old cars are turned into new cars. From a recycling perspective, it is a tremendously efficient material.

Mr. Geng Tan: Thank you.

Mr. Marks, thank you for being a firefighter for the past 28 years. Thank you for your contribution and for your service to the country. As it happens, I'm also from the city of Toronto.

You just voiced your concern about the use of a combustible wood-frame structure in a real fire situation. Similar to your comments, though, the committee heard from firefighters who have already expressed the concern, from a health and safety perspective, for firefighters and residents from engineered wood buildings.

On the other hand, the past president of the B.C. association for fire chiefs, Mr. Garis, describes this fire safety concern, and I just quote here, as a “red herring”. According to Fire Chief Garis, “Once [wood buildings] are constructed and operating, they are no different than any other building constructed of other material.” As a result, the B.C. association of fire chiefs has already endorsed the B.C. code change as long as the buildings are equipped with a sufficient number of sprinklers and smoke alarms.

Can you give us some comments about the endorsement made by Mr. Garis?

Mr. Scott Marks: Yes, I'm very aware of Fire Chief Garis's view on the subject. I would not disagree with the statement he made there, which was that once these buildings are made, their fire safety performance is equal. Where I think Mr. Garis and I would differ is with regard to his belief that somehow things will always remain the same.

I've spent a lot of time in high-rise buildings where we had fires, where all sorts of safety precautions were in effect that did not respond or do the job that they had originally been intended to do, in most cases because the occupants in those buildings had made modifications. Some modifications are actually done by building personnel unknowingly doing things that breach the code or that impact the ability of those protections to do what they're supposed to do. More often, it's individuals in a building who decide they want a new cable TV outlet in a bedroom, and they poke a hole through a wall, and now you have a possible breach of the fire protection that's there.

A lot of the wood-frame fire protection relies on using gypsum board and different things to wrap around the combustible materials to ensure that they meet the same kind of standard as other non-flammable materials do. Again, as someone who has spent a lot of time working in the industry, I think that's great, but I also think that there's a huge potential for modifications or vandalism or some other impact or thing to change the ability of that material to perform as it was intended to.

Again, the Grenfell fire in London is an example of how no one really anticipated that wrapping that building would have the impact it did. That's a building that was built with non-flammable materials. Again, I'm not suggesting that this bill would allow something like that to happen, but when you make major modifications to a building 20 or 30 years later, whether or not all the considerations of what was originally put into that building are being looked at when those modifications are being made, you're relying on a lot of different people doing the proper analysis of it. I'm talking about building code people, fire code people, fire inspectors, and fire prevention people. As I said, what we have seen, particularly in the city of Toronto, is that the minute they look at saving money in the city of Toronto, they cut fire inspection jobs, and they cut fire prevention jobs. Those are the people we're relying on to do that.

● (0915)

The Chair: I'm going to have to stop you there, Mr. Marks.

Mr. Falk.

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

I'm going to be splitting some of my time with Mr. Schmale.

Mr. Galimberti, I'll start with you. I appreciated your presentation. I think it was very clear. I think you have a good understanding.

Just to clarify a little further, what would be your thoughts on individuals or groups receiving preference, receiving funding, based on ideology?

Mr. Joseph Galimberti: Based on ideology?

Mr. Ted Falk: Yes, because the way I look at this bill, that's kind of what it is, right?

Mr. Joseph Galimberti: I don't think you want to create a competitive imbalance among materials in the Canadian marketplace. I guess I draw a bit of a distinction here. I appreciate that there are arguments to be made for using domestic infrastructure funds to support the domestic economy, to ensure that those funds stay close to home and generate employment here. I think it's also important to be mindful of the fact that there are Canadian employees in all of these industries that supply building materials.

I appreciate that there are levers that the government can try to pull to mitigate GHG and that environmental benefits are something the government should consider in infrastructure. I also think that there are solid arguments to be made, examining the full range of projects in which the government participates, that there is a right material solution for the problem, and it may not all be one material.

As far as conferring advantage on anyone goes, I think the competitive environment sort of dictates that whatever is best and whatever provides the best solution should be allowed to prevail.

Mr. Ted Falk: I think your presentation was clearer than your last explanation. I think in your presentation it was very clear that you don't think a government should be giving preference to one industry over another when it comes to building construction or the ideology behind a building construction. You were very clear then, but your last statement kind of muddied the waters.

Mr. Joseph Galimberti: Well, yes, I don't think—

Mr. Ted Falk: I think you know where I was going, and I think you were skating around that, so that's fine, and I appreciate that.

Mr. Joseph Galimberti: I don't think it's good government policy to lock in a preference for any one material, just bluntly.

Mr. Ted Falk: Okay.

Can you also tell this committee a little bit about the challenges facing your industry today and how a bill like this would impact that?

Mr. Joseph Galimberti: I think we have some great success stories to tell in the Canadian steel industry in more innovative advanced manufacturing with some of the most efficient and advanced producers in the world.

Clearly, the last several weeks in steel have been remarkable, given the sort of action south of the border. Ultimately, Canada has a temporary exclusion as relates to the U.S. tariffs, but it is a temporary exclusion, and we need to be mindful that there is going to be a challenge in our largest export market going forward. We are also significantly challenged in accessing the U.S. market by a suite of Buy America and Buy American policies.

Having that as our largest export market and being challenged there, then having another challenge domestically as far as another material being granted preference for bidding on government infrastructure work would create an additional unnecessary challenge from our perspective.

● (0920)

Mr. Ted Falk: Thank you.

Mr. Jamie Schmale (Haliburton—Kawartha Lakes—Brock, CPC): I appreciate your comments.

I think basically your presentation summed up exactly what we have been talking about the last few meetings when we were studying this bill, that picking winners and losers in the marketplace bidding on government contracts does not benefit anyone. Especially when you're talking about government, you're also spending taxpayer money, so you made a good point that, by choosing one sector over another, it distorts the price artificially and unnecessarily as well.

Mr. Joseph Galimberti: Yes, that generally tends to be the knock-on effect from this.

Mr. Jamie Schmale: Yes, and I think that's a very important part we need to recognize if you exclude steel, cement, and you name it.

You also talked about the innovation sector, too. Over the years, wood, has improved based on the fact that it had to compete with other sectors, and that's a good thing. As you pointed out, if you exclude a whole bunch of others for the sake of one, you basically slow down the innovation, because wood would have the marketplace.

Mr. Joseph Galimberti: Yes. I'd make an argument that you would not only slow down the innovation in wood, but by disincentivizing a material like steel or a material like cement from participating in the infrastructure environment, you would disincentivize innovation there.

Steel, from an infrastructure perspective, in terms of its strength, its weight, and its generalized capacity, has improved immeasurably in the last however many years. This is a very different kind of steel that we're talking about. As for recyclability as well, our ability to reuse the product has improved significantly.

So yes, I'd argue that you're not just disincentivizing innovation in wood, but you would be artificially stalling innovation in other sectors.

Mr. Jamie Schmale: Yes, absolutely.

Thank you very much.

I have only a little bit longer.

Mr. Marks, I will quickly go to you. I'm from a rural area, so I get what you're saying about resources and fire departments. In my riding, there are probably a dozen or fewer full-time firefighters, so most of the rest are volunteers. As you mentioned in your statement, equipment, resources, and training vary from station to station. If we were to get a federal building in my area, and this wood bill goes forward, this could pose very serious concerns to many, I'm sure, given the fact that response times aren't probably as good as they would be in the city.

Mr. Scott Marks: Yes, response times, the number of personnel you're getting at the scene.... It's even dependent on what resources they have available to them. The problem does exist. The simple fact in this country is that there is no required response capability for municipal fire departments, even in large urban centres.

Mr. Jamie Schmale: As you mentioned in your speech, you're saying budgets are being cut. I think we're all probably seeing municipalities trying to struggle with that.

Mr. Scott Marks: Yes. Most fire department budgets are predominantly made up of the wages that go to the employees. When they start cutting fire department budgets, it comes down to one thing. It's personnel.

Mr. Jamie Schmale: Thank you.

The Chair: Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you to all for being here. I appreciate your presentations.

I'm going to start with Mr. Galimberti, on steel. In Canada, British Columbia and Quebec already have “wood first” or *charte du bois*policies. The B.C. one has been in place for almost a decade now. That's a significant chunk of Canada.

Could you comment first of all on the effects that has had on the steel industry in Canada?

Mr. Joseph Galimberti: It's difficult to take a granular approach to examining it. Clearly, there has been an incentive to using wood in those markets. We've seen increased wood construction in those markets. Those are jobs the steel industry is not going to participate in so there's an effect. That is a potential sale or business or piece of the economic pie that the steelworkers in Canada were not allowed to fairly compete for.

● (0925)

Mr. Richard Cannings: We heard at our last meeting from British Columbia that one of the reasons they brought in that policy was the way procurement was set up for building schools, for instance, you could pretty much only build a school with steel and concrete. There was a disincentive for wood so they wanted to have wood considered. At its heart that is really what this bill is all about. It's not about tilting the field in favour of wood per se, but just getting the government to consider wood in building, partly because of these newly engineered wood construction methods.

You say a third of the steel industry is involved in building. I don't know what federal procurement is, but you say you're worried about the knock-on effect. At most, we're talking about an impact of 8% or something.

If all the policies from Quebec and France, for instance, are trying to get 30% of their buildings built with wood, it seems it would have a minimal impact when you consider that steel and concrete have had the playing field to themselves for the past century. We're just trying to get the government to consider wood.

Can you comment on that?

Mr. Joseph Galimberti: Our position is it should be a fair and open competition where the right material is chosen for the right job. I tend to believe in a lot of those instances, given the performance of the material, given its advantages in construction, given the advantages from a GHG perspective over the full life cycle, that in a fair and open competition on equal grounds, steel is going to be the material that prevails. A "wood first" policy would not generally be acceptable.

You used the example of a school. If you were looking at a construction where the right solution for that particular school involves a combination of wood, cement, and steel—whatever the solution ultimately is—so long as there is no undue interference and the design professionals and professionals who are taking a look at how this building will perform from a construction-through-maintenance-through-decommissioning perspective are concerned, then that's the decision.

Mr. Richard Cannings: If I got your comments right earlier, if you wanted the government to look at the life-cycle costs of the material, the life-cycle carbon footprint of the material, for the government to consider wood or any other material, you would be—

Mr. Joseph Galimberti: —yes, the right solution.

Life-cycle analysis generally is an evolving science. I'll speak to steel specifically. Production in steel, the way we make steel, is constantly evolving. I would argue that no industry is more focused on reducing its GHG emissions than steel. A life-cycle analysis is not a static thing. These evolve, so I would argue that professionals should be allowed to make that choice on a go-forward basis. Your LEED certifications are going to change over time. What constitutes a green building is going to change over time. I don't think we should be locking in policies that grant preference to a particular material.

Mr. Richard Cannings: Mr. Marks, I have a quick question. You talked about wood-frame construction of 12 storeys. I just want to clarify that we're talking about mass timber construction of anything over six storeys or something like that, and you say that you lack the equipment and training. You talked about two fires that occurred during construction. You talked about charges that were laid. Would it be fair to say that when we're building with wood in larger buildings, if they're built correctly, they're built like the Brock Commons building at UBC, where fire protection was added to each storey as it was being constructed? These buildings are as safe as any other buildings, and once they're constructed, they're just as safe to live in or to fight fires in as any steel or concrete building.

● (0930)

Mr. Scott Marks: As I said, even in response to Mr. Garis' quote, theoretically, and certainly based on the codes and everything, I would agree with your statement. The concern we have is that the building is never modified, never changed, or if those things happen, that all the same kinds of safeguards, analysis and inspection, and preventative materials are followed up and the building retains that kind of safety. Experience has shown us that this doesn't always happen, and when we continue to cut back in so many sectors on the oversight of building codes, fire codes, and everything, there is an inherent risk.

Certainly to your point about buildings under construction, it is a different issue. There's no question that the experience has shown that these buildings, in the construction phase, appear to be much more at risk. A lot of things have been done to try to mitigate that, but certainly the experience we've seen in Canada in the last few years gives us an idea of the fuel load that exists inside those buildings when we see what has happened at the construction stage. If they're encapsulated, if everything works properly, they're very safe; if something doesn't, we know that they have a much larger fuel load than a steel- or concrete-based building.

Mr. Richard Cannings: To make it clear again, you're talking about stick-frame construction, not mass timber construction in that case, because all the evidence shows—and we'll hear more evidence in the next hour—how mass timber buildings react very differently from wood stick-frame buildings.

Mr. Scott Marks: Mass timber does react differently from traditional wood-frame construction, but with mass timber, there's combustibility potential there as opposed to steel or concrete.

The Chair: I'm going to have to stop you there. Thank you.

Ms. Ng.

Ms. Mary Ng (Markham—Thornhill, Lib.): Thank you, everyone, for coming.

My first question is to Mr. Galimberti. Thank you very much for your testimony. You talked about the market forces that will help with greater innovation. Can you talk to me about whether at present the industry has been involved, in this jurisdiction or others, in construction that actually has put material together that is a type of wood-steel hybrid? Is there anything being done in that regard at all? I'm just curious.

Ms. Aleksandra Pogoda: Actually, in speaking of innovation, the Canadian domestic steel industry is really moving forward on this idea of incorporating wood into steelmaking. That adds a means of reducing our total CO2 emissions as an industry. The Canadian industry, through an organization called the CCRA, is actually looking at—we haven't coined a name yet—this idea of bio-steel, or wood-based steel, in which we use waste-wood pellets or any wood from the domestic wood industry and turn it into biochar, which is a material that can then be put into the steelmaking process. Through that, we can actually reduce CO2 emissions, from one of our facilities, by up to 500,000 tonnes per year. As a carbon-intensive industry, this is a very big, innovative step we can take.

● (0935)

Ms. Mary Ng: Right. A consideration for wood, then, is...would it help accelerate or explore that greater level of collaboration? Overarchingly, it is to reduce GHG targets, but are you saying there is a real opportunity to have more products that include wood in construction products?

Ms. Aleksandra Pogoda: Yes, of course. That opportunity exists with or without this kind of "wood first" bill that has the potential to be passed. The domestic industry is really looking for ways to integrate this idea of a circular economy, which above all takes into consideration recyclability, remanufacturing, and GHG reductions—the full analysis of the entire sweep. That's something this bill would have the potential to affect, in the sense that it has a discriminatory basis. Regardless, the entire domestic industry is going to continue to move forward on being innovative and being a Canadian pillar for international construction materials.

Ms. Mary Ng: I forgot, Chair, that I'm actually sharing my time with my colleague, but I have just one really quick question to Mr. Marks.

You talked about the challenges that occur with modifications. Can you just help me understand? Is there a particular, greater challenge to modifications that exist now in existing structures? In existing structures now, the same modifications take place, and we know they're not made out of wood. Aren't those risks already present? Doesn't the suite of regulations and obligations around building codes and what people have to comply with already exist, and how would it differ from wood for a structure that, if safe when constructed and all the rest, would change?

Mr. Scott Marks: The potential and the concern exist today, the difference being that there are more materials used to protect the underlying wood products. For instance, there was a lot of discussion on whether a stairwell or an elevator shaft should be required to remain made out of concrete or whether those could safely be built out of wood products. They talk about double-layering gypsum board around it. The protection from fire is equal once you use double layers of gypsum board or whatever.

The difference right there is that with concrete you don't need that to protect it from combustibility. The difference is that if the gypsum board is breached, or modified, or vandalized, the wood could be exposed behind it or there might be a conduction of fire—something that conducts the heat into where the wood is and results in the wood behind it being on fire.

Again, from experience, I have been in a situation where we're ripping out a floor, looking for the fire, because we're seeing smoke and flames, only to find that the products that are actually burning are a significant distance away because of the conductivity of heat and how the fire occurred. Once you modify or remove the layer of protection from the wood, or breach it in some way, it no longer has the same safety protection.

Ms. Mary Ng: Thank you.

Mr. Harvey.

Mr. T.J. Harvey (Tobique—Mactaquac, Lib.): Following on Ms. Ng's questioning to you, Mr. Marks, the IAFF has been very vocal about the lack of appropriate training in place or a knowledge base among firefighters in Canada around tall wood structures and the need to gain a greater knowledge of how to deal with those proposed structures and fires if this were something that would move forward.

How do you think that shift toward greater accessibility within new construction and visitability—the idea of zero barrier entry, wider hallways, zero barrier access—could help mitigate some of those issues from a firefighter perspective? Because there's been a lot of talk about re-entry from firefighters and the inadequate nature of the building code as it pertains today for firefighters going back in to fight a fire. Do you think that plays a role within this conversation, or do you think that there needs to be greater allowances made for accessibility and visitability in tall wood structures in order to level the playing field?

I want to get your thoughts on that.

● (0940)

Mr. Scott Marks: Well, our overriding concern with the National Building Code is the fact that fire safety is not an objective of the code. For instance, as we have proceeded over the last 10 to 15 years, we have been trying to get firefighter safety added as an objective of the code. The problem with the code as we see it right now is if there exists an issue that puts firefighters at risk and we believe an amendment to the code or a revision to the code would mitigate that risk, we can't link it to an objective. A revision or an amendment of the code has to be linked to one of those core objectives, so we end up being pooled in with general occupancy; and clearly we're not in the same situation as general occupancy.

To your point, access, wider hallways, all of those may mitigate the impact on firefighter safety. Personally I don't know enough about the research on that. I do know that, as I pointed out, the National Fire Protection Association in the U.S. has standards in place to deal with all the fire safety. In the U.S., NIST, the National Institute of Standards and Technology, has done a number of experiments on fighting fires in high-rise buildings and the requirements around that.

There are studies and documentation on it. I'm not familiar exactly as to how it would relate to this, but firefighting, in general, is still a very labour-intensive job. Going back to the building code, I think it's imperative that where we can show there's a risk to firefighters, we can at least make the request for a revision or an amendment and have that looked at under the risk assessment process.

The Chair: We're going to have to stop there. Thanks.

Mr. Schmale, I can give you about two minutes.

Mr. Jamie Schmale: Okay, Thank you, Chair.

Just so you know, we agree with both of your testimonies. We'll be working with this committee to look for a way to amend the bill as a way to put every industry on a level playing field and not picking winners and losers in the marketplace. I'm just giving you notice, Richard.

Voices: Oh, oh!

Mrs. Shannon Stubbs (Lakeland, CPC): You're speaking about ideology.

Mr. Jamie Schmale: We'll see how that goes and we do take note of your comments, Mr. Marks, that when you do make changes to the initial building structure, and I'm assuming that will happen over time, it does create a problem, because if the fire does get inside, then it spreads. I do take note of that.

Since I do have a short time, maybe I can ask this to my friends from the steel industry. How else can the government help with the steel industry in terms of competitiveness in the marketplace, whether it be dealing with the tariffs south of the border or just in order to provide opportunities for your industry?

Mr. Joseph Galimberti: First, to the tariffs, I think the entire Government of Canada should be commended for the work that it did and I include the work of the steel caucus. David Sweet, from the Conservative Party, was part of a delegation that went down and met with congressional colleagues in June to talk about the underlying section 232 investigation of the tariffs. That really took a complete team effort, so I congratulate the Government of Canada writ large on that one.

As for things the Government of Canada can do, I continue to believe encouraging innovation and talking about the Canadian success story in steel is important. I mentioned our competitive advantage from a GHG perspective. We really do view that as a competitive advantage as you get into things like LED certifications and as you get into a low-carbon economy, I think we have a great story to tell.

Some of the things we're doing with lightweight, high-strength steel in fields like automotive.... We supply steel for the Tesla out of Hamilton. I think there are a number of things the government can do to encourage the continued application of technology and advancement of advanced manufacturing in Canada.

● (0945)

Mr. Jamie Schmale: Thank you.

The Chair: We'll have to stop there. Thank you all very much for joining us this morning. It has been very helpful evidence.

We're going to have to suspend now for one minute to get ready for the next witness.

● (Pause) ●

● (0950)

The Chair: Let's get going here.

We're going to start whether people are in their seats or not.

Mr. Dumoulin and Mr. Rizcallah, thank you for joining us today. You know the process. You'll have 10 minutes to make your presentation, which will be followed by a round of questions. Thank you for joining us today. The floor is yours.

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

[*Translation*]

Hello.

My name is Michel Dumoulin and I am the Acting Vice-President of the Engineering Division at the National Research Council of Canada.

[*English*]

I'm joined here today by Philip Rizcallah, who is the Director of Research and Development at NRC, within the engineering division.

We are very pleased to have this opportunity to speak with you today. We would like to start by highlighting the NRC's recent contributions to help the Government of Canada achieve its targets for Canada's national model codes, a low-carbon economy, and reduced greenhouse gas emissions.

[*Translation*]

Initially, I would like to provide you with an idea of the scale and scope of the NRC. Our work covers a broad range of scientific and engineering disciplines, the outcomes of which have changed the lives of Canadians and people around the globe.

[*English*]

We are a national organization with some 3,700 highly skilled and innovative researchers and staff located across the country. Our 14 research centres operate out of 22 locations spanning Canada's geography.

[*Translation*]

Each year, our organization works closely with industry, conducting research and development work with over 1,000 businesses. We provide technical advice to 11,000 small and medium-size companies, and we collaborate with tens of universities and colleges, research hospitals, federal departments, and international partners.

[*English*]

More specific for today, our organization is the coordinator and custodian of Canada's national model codes, including the model building code and model energy code. We provide administrative support to the Canadian Commission on Building and Fire Codes and perform research in support of the work of its technical committees.

We facilitate uptake in the marketplace of the model codes and new technologies that support the code. We also support development of standards, best practice guides, and tools for the construction industry, as well as pilot projects and techno-economic assessments. Speaking of codes, these evolve in response to advances in construction practices and product innovation.

In working with the Canadian Commission on Building and Fire Codes, we are using an extensive consensus-based process that has involvement from all sectors of the construction community and the public over a five-year cycle. This approach provides a reasonable compromise among stability, flexibility, and economic considerations.

This collaborative engagement ensures that the best available knowledge drives meaningful change. As building codes evolve along with new technologies and materials, this knowledge provides a level playing field that gives construction professionals the confidence to innovate safely, reduces risks, and keeps compliance costs low. Building codes keep these costs even lower by establishing uniform, trusted regulations that keep pace with industry change.

● (0955)

[*Translation*]

One example of this meaningful change is the NRC's collaboration in the Pan-Canadian Framework on Clean Growth and Climate Change. This framework is Canada's vision for action to help meet its climate change objectives by reducing the carbon emitted by buildings' operations.

[*English*]

The NRC also works closely with the Canadian Commission on Building and Fire Codes and its technical committees to meet the timelines outlined in the pan-Canadian framework. Given the committee's interest, I should add that this process will include wooden structures. Standing committees on energy codes have been created and are undertaking thorough cost-benefit analyses. We are taking into consideration factors such as building types, geographic location, and availability of needed trades and technologies.

Research and validation are ongoing at NRC to support meeting the GHG targets while at the same time identifying costs and benefits. As we work in close collaboration and partnership with Natural Resources Canada, our goals are to make new buildings more energy efficient, to retrofit existing buildings, and to support building codes and energy-efficient housing in indigenous communities. The Canadian Commission on Building and Fire Codes' long-term energy policy was developed in response to the pan-Canadian framework, and the code targets were set to be as closely aligned with the framework as possible.

[*Translation*]

Relevant for our discussion today is NRC's role in ensuring that the technical and safety research requirements are undertaken and applied to building codes as regards commercial and residential wooden structures. As you know, there is increasing interest by industry in multi-storey wooden buildings. These buildings are often designed to reduce the total carbon footprint while providing added economic benefits for Canada's forest products industry.

[*English*]

In response to this trend, the NRC launched the mid-rise wood buildings research program in 2012. In collaboration with industry, government, and other research organizations, the NRC provided over 1,800 pages of technical information to the codes committees, which enabled changes to the National Building Code to permit wood buildings up to six storeys as an accepted and safe solution. Before the program's completion in 2016, there were over 250 wood buildings between four and six storeys built or under construction across Canada.

As you have heard from the testimony of others, advances in wood technologies, such as cross-laminated timber, have enabled wood buildings to reach even greater heights. One example is the 18-storey Brock Commons Tallwood House at the University of British Columbia. Working with the commission's technical committees, the NRC provides support to develop the unbiased knowledge needed to support changes to the building code. This reduces the time and effort required to design wooden buildings up to 12 storeys tall without compromising safety. Results are expected in time for the 2020 code revision.

The ongoing research at NRC is aimed at first validating the performance and then quantifying the risk of the effects of climate change and extreme events that could have impacts on the performance and durability of tall wood building envelope materials, components, and assemblies. This will permit validated design options for massive wood buildings, including Canadian timber products, in the numerous geographic and climate regions of Canada.

[*Translation*]

As the government strives to reduce the carbon footprint of government buildings, increasing attention is being given not only to the carbon emitted during operation by considering energy efficiency, but also the carbon used to create the building materials.

Also, we must be cognizant of the additional carbon that may be required to decommission the building when it reaches its end-of-life cycle. To reduce the total carbon footprint of a building over its life requires forethought, good design, and engineering, as well as diligent operation.

[*English*]

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

To close, it is the NRC's breadth of expertise, our unique scientific infrastructure, and our national scope, all combined, that enable us to convene players and technologies from across Canada and abroad, which should result in the highest chance of innovation success. This will make a difference to Canadians in the decades to come.

Thank you for your interest in the NRC, Mr. Chair. My colleague, Philip, and I will be happy to take questions at this time.

● (1000)

The Chair: Thanks very much.

Mr. Whalen.

Mr. Nick Whalen (St. John's East, Lib.): Thank you both for coming today. It's nice to be able to get down to the brass tacks of what we're talking about.

Mr. Dumoulin, we've heard, in general terms, the concerns about fire safety risk. I would like you to talk a little more specifically about some of the research your organization has done to demonstrate how Canadians can be confident that mass timber or encapsulated mass timber buildings are just as safe, once constructed, as steel, and that they don't have risk associated with the drying out of the wood or the combustion of the wood. If you could provide some scientific evidence to back up that claim, I think it would be helpful for everyone.

Mr. Michel Dumoulin: As I mentioned in my opening statement, we are actually doing research and development and testing to support the committees. We work really closely with the technical committees of the commission on building and fire codes. The committees meet and, based on advice taken from broad public consultations, identify the risks we need to assess. We then design the research and development and testing methods that are needed.

A previous witness mentioned work going on at National Institute of Standards and Technology, NIST, in the States. We work very closely with NIST. We do some of the work here in Canada, and we also do some in the U.S.

We are fortunate to have here today Philip Rizcallah, who's actually our top expert in all these questions, so I'll ask Phil to complete.

Mr. Philip Rizcallah (Director, Research and Development, Construction, National Research Council of Canada): I will try not to get too technical with the response, but generally, when the National Research Council started the project about six years ago on mid-rise, there were a number of tests conducted. We looked at modelling. We looking at fire load in these buildings. We looked at fire spread with this type of construction and encapsulation. How do we protect these structures once they are built? We've continued with that now. That led to a six-storey transition in the building code. Now we're moving towards a 12-storey transition.

Right now, what we've been doing as late as last week is, we would build a room, a compartment, and we would introduce fire for about four hours, and we would see how the structure would react. It has been very favourable. The results have been that they basically self-extinguish.

For four hours the unit is burning. We take measurements. We take smoke. We take all kinds of data from this. We can translate that into technical provisions into our building codes. If the structure failed after one hour, we would say we need this much more protection. If it failed under three hours, we would need this much protection.

There's quite a bit of research. We're working with our United States counterparts as well and taking some of that data and incorporating into our research.

One of the biggest concerns that Scott, one of our colleagues here, mentioned was construction under fire, so we've also been looking at what we need to do to protect a site during construction, because that's the biggest risk. It's not generally when the building is built. Then, it's like any other building. It's protected. It has sprinklers, and everything is fine, but what do we do during construction to save that building from arson or any type of fire condition? We've introduced requirements into the fire code to mitigate that risk as well.

Mr. Nick Whalen: What about with multiple failures? When people look at disasters that happen in the airline industry, in nuclear safety, or in other efforts, it's not that one thing has gone wrong; it's that multiple things have failed in order for a disaster to occur. Maybe as many as seven things might go wrong.

What about in buildings where the sprinkler systems fail? An apartment on the sixth floor catches fire. They have computer servers in the apartment, they have plastic furniture against the wall, and the sprinklers fail. How do we know the spread is going to be just as safe in this type of building as compared to steel-frame construction?

Mr. Philip Rizcallah: That's a very good question. When the fire tests are conducted at NRC, for example, even though the building, when it's built six storeys and above, is required to have sprinkler systems, we don't conduct our test with sprinkler systems. We're already assuming there is no sprinkler protection in that building. We're testing it, and it's withstanding two, three, or four hours depending on what we're testing it for. It withstands that fire for that duration of time.

The sprinkler system is just an added benefit. It's an additional precautionary measure to keep the fire from starting. Let's assume the sprinkler fails, and the fire has started. We still have other measures in that building to protect us. There are multiple redundancies built into this system.

If I can go back to the six-storey building, the National Building Code used to allow four storeys. You can build a four-storey, stick-timber construction with no sprinklers, and it is no problem, you were fine. We went to six storeys. We went with mass timber. We went with sprinklers. We went with wider corridors, less flame fed. We built the Cadillac version for six storeys, which is actually safer than the four-storey building.

That's the premise we're taking with the 12-storey building. We built in multiple redundancies because we want it very safe. We don't want people getting injured or firefighters getting injured in the building. As it starts getting built and we have more data, we start ratcheting back, or we start adjusting those requirements as we go forward.

● (1005)

Mr. Nick Whalen: Something we've heard in the committee up to this point.... Maybe there are two things I'm hoping this bill can achieve. I'm not sure I agree with everything that has been proposed, but certainly around making sure current codes don't impede wood from being used in construction.... When I look at the limitations that are placed on wood, only up to six storeys, and maybe by 2020 only 12 storeys, there are impediments to the use of wood in construction, because those impediments don't exist for other materials.

I also look at the value of this carbon sequestration of using wood in the buildings, and then more forests grow, so there's an opportunity to sequester carbon that way. How far advanced is the thinking, and how close are we to having accurate codes that can say the carbon value of using this amount of wood if you use this type of wood? If the wood comes from this plant in British Columbia, here's how much carbon is being sequestered versus one from Newfoundland and Labrador. How would this allow us to make sure we're accurately measuring the benefit so we can compare it against other programs or other products so we're not unduly influencing the market, so that we're providing a true measure?

Mr. Philip Rizcallah: Unfortunately, with regard to carbon, when the technical committees develop their building codes, they are not looking at carbon reduction or carbon-neutral construction. They are looking primarily at safety. How can we build this building so it's safe? It's not one of the objectives of the committees when they are looking at that. It is an added benefit. Obviously, if you are going to use a certain product over another, you may get an added benefit from carbon reduction.

To get to the first part of your question, there were impediments in the code originally. You used to be limited to four storeys. Anything over four storeys, you had to go to steel, concrete, or another non-combustible material. The committees' whole objective is to make this material agnostic. We're not giving one group an advantage over another. We're allowing the builders, the designers, the owners, and the government to choose which material they want to use. We've gone to six storeys, and the hope is that we will go to 12 storeys, and the next transition will be that it's material agnostic. We don't care what you build it out of as long as it meets these performance requirements.

Mr. Nick Whalen: Mr. Dumoulin—I'm not sure if you went through this particular paragraph because you skipped forward, and thank you for that—in paragraph 18 of your written remarks, you talk about committees that support meeting the greenhouse gas targets and identifying costs and benefits.

Is there another committee? How far advanced is the thinking of that committee? What role can the federal government play to help encourage your committees to properly assess and quantify the carbon value of wood construction so we know we're not prejudicing the steel industry, we're providing real measures?

The Chair: Please answer that as quickly as possible.

Mr. Michel Dumoulin: My recent statements and comments allude to the pan-Canadian framework on climate change. Numerous processes and different teams of people, as Phil pointed out.... The building code is focused on safety. It should be material agnostic and that's what the technical committees are focusing on.

We're working with NRCan, Natural Resources Canada, on the pan-Canadian framework where we are looking at the best practices through life-cycle analyses. The previous witnesses mentioned that this size is evolving all the time. It has come a long way in the last 10 to 15 years to assess everything that goes into a building or a car or any products to take into account the carbon footprint. It's not the building code. It's other.

For example, all the green growth initiatives that are being presented to Treasury Board. We're working closely with Public Works to assess the carbon footprint of downtown buildings here. There are numerous teams, a wide variety of initiatives.

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

Mr. Falk.

Mr. Ted Falk: Thank you to our witnesses for coming to committee today; you've made a very interesting presentation.

I was looking over and listening very carefully to your presentation. You mentioned that you work with your American counterparts. At what point are they along the journey that you've embarked on as far as endorsing tall-frame timber buildings?

● (1010)

Mr. Michel Dumoulin: The American counterpart I was alluding to is NIST, National Institute of Standards and Technology, which is one of our equivalents in the U.S. in terms of standards. They have facilities that complement ours in fire testing. We send our teams down there to carry out large-scale tests. We do have some of these facilities in Ottawa but they have complementary ones. A few weeks ago, we sent one of our teams down there to look at the fire resistance of structures of cross-laminated timber. We share the data from a science and technology point of view. We choose a model simply to help us minimize the cost to taxpayers and gain knowledge more quickly.

I cannot speak to their regulations or legislation. We're not looking at that. We're working with them strictly on the science and technology exchange, information knowledge exchange.

Do you want to add to that?

Mr. Philip Rizcallah: I can speak a little to the regulation piece. Canada is more advanced than the U.S. when it comes to construction of tall and mid-rise wood buildings. They look to us for a lot of the information. We have moved forward on this approach. We work very closely with both the Canadian Wood Council and the American Wood Council, and that information goes back and forth.

Mr. Ted Falk: In your research and in some of the tests that you've conducted with timber-frame buildings that are six storeys and greater, quite often in the presentations we've heard, we've had the Brock Commons referenced. It's nice that it's been built, but it's relatively new, and it really hasn't withstood the test of time. Obviously you've done enough research that you've endorsed the project or at least not adversely objected to the project or the facility being constructed.

Can you talk a little about some of the comparisons you've done and the testing you've conducted to ensure that a building like that is structurally sound?

Mr. Philip Rizcallah: Thank you for qualifying. We didn't endorse that building. The provincial government has the mandate to endorse the design, although we did work with some of their provincial counterparts on that design.

With regards to the structural testing, NRC has a wide spectrum of expertise. We carry out structural testing. We carry out seismic. We look at mould, expansion, climate change. All these factors are put into the provisions when we introduce them into the code. Over the last year alone, we probably conducted 50 tests on various elements, and all these features are put into the code.

We're fairly confident that it's going to withstand the Canadian environment, seismic zones, fire, and issues like that. We have expertise from probably the world's finest experts working on fire.

From a technical perspective, we believe it will function as well as, if not better than, any other building of any type of material, otherwise it would never go into the code.

Mr. Ted Falk: When you've done your carbon footprint analysis between the two different models of construction, or three—concrete, steel, and wood—when you've done the full analysis of the cost of production of materials, the life-cycle operation, and also the decommissioning of these buildings in the future, where does your analysis end, from a carbon footprint perspective?

Mr. Michel Dumoulin: It's very broad. It really depends, it's on a case-by-case basis. You have to look at one project at a time.

In general, one could say that using wood would actually help the carbon footprint, but you need to look at the whole project.

Mr. Ted Falk: Okay. It's not always the case?

Mr. Philip Rizcallah: It may not always be the case. If you're located in an area next to a quarry and you have access to steel and cement, it may be better to use that product in that community. If you have to ship in your product, you have to take all of that into account, so it's very hard to say without looking at the geographic location.

Mr. Ted Falk: When you look at wood-frame, mass timber construction, what concerns would you have, based on your analysis and your research?

● (1015)

Mr. Philip Rizcallah: I'll just get the misconception out of the way. We're not looking at timber construction, we're looking at mass timber construction when we're talking about six storeys or 12 storeys. These function completely differently from other types of wood—two-by-four or two-by-eight type of construction.

The concerns we have are the same concerns we would have with a steel building or a concrete building: smoke travelling through the building in the event of a fire, fire spreading throughout that building, or the fire protection system is not operating. These are the same issues we would deal with regardless of the nature of the building.

We would also look at under construction, which is probably a little more risk than if you're going with the conventional concrete-steel type construction. Under construction would be one of the biggest risks, I think, for this type of construction.

The committees are doing a very good job of coming up with methods for building these safely, and reducing fire load around the site—security, fencing, and water supply. All these sorts of features are being incorporated under the construction mandate to, hopefully, reduce that risk. We won't get it to zero, but we'll reduce it.

Mr. Ted Falk: Just to follow up a little bit more on the decommissioning aspect of your presentation, I'll give you an example in a different industry. The electric car industry is cited as being very carbon-friendly and very green. One of the challenges that hasn't been adequately addressed when it comes to electric cars is what happens to those lithium batteries once their life cycle has been completed. That's going to potentially create an unmitigated burden on the industry at some point in time.

I'm just wondering, when it comes to the timber-frame construction that we're talking about here today, what are the potential flies in the ointment, so to say, when it comes to decommissioning, or the potential adverse effects that we could be looking at?

Mr. Philip Rizcallah: I can't think of any adverse effects. With CLT, for example, you can decommission and reuse a CLT beam or column. So you're not taking it and chopping it up and reusing it, you're using the entire beam again—if you wish to use it again.

I can't think of any adverse effects that are different from any other type of building. There are elements within that building that are going to be recycled, there are elements that will not be recycled, similar to any other types of building.

Mr. Ted Falk: Okay.

The Chair: Thank you.

Mr. Cannings.

Mr. Richard Cannings: Thank you for your presentation and for being here for us.

You mentioned encapsulated mass timber construction and how some of your tests are around exposed mass timber construction. You face the architects. We had Michael Green here before us in a previous study. He is one of the leading architects on mass timber and he is very much a proponent of exposing that mass timber for aesthetic purposes. He understands the caution people feel around encapsulating mass timber components in large buildings, such as Brock Commons, with gypsum board for extra safety. We also heard from the firefighters regarding their concerns after the building is built, that people will modify the interior construction by taking out chunks of that gypsum board to put holes in walls, or whatever. Michael Green, I think, would say that it doesn't matter.

I'm just wondering if you could comment on your studies and how they would answer that question: Is that gypsum board necessary all the time or does the exposed mass timber work just as well?

Mr. Michel Dumoulin: I can start quickly. I'll go back to the comments that Phil made earlier about the tests we are carrying out, just to give you a bit of the detail perhaps. For example, we have here in Ottawa facilities where we are basically duplicating apartments and rooms. We're building the four walls with openings, typical openings.

We have a series of architectural designs, some with timber exposed and some without, and we're basically putting thermocouple sensors all over the place, monitoring the temperature rise and temperature evolution in different conditions with different amounts of timber exposed, to get all the data to be able to feed that back to the technical committees who will look at this and then make recommendations to the commission. We're providing the data. Of course, gypsum will have an impact, but we are there just to provide the knowledge, the scientific basis for decisions.

● (1020)

Mr. Philip Rizcallah: To that point, the last four tests that we conducted over the last two months alone looked at varying degrees of exposed wood, for that reason. We know that architects are going to want to have nice beams exposed, so we've looked at anywhere from 30% to 40% exposed. The tests that we were talking about where they self-extinguish were exposed beams, exposed columns, and exposed walls. They're performing quite well.

Obviously, that data still has to be analyzed and given to the committees, and they can make a decision, but the codes will look at providing a provision that says you can have up to 30% of an exposed wall, exposed wood, and *x* amount of exposed ceiling. That will be spelled out in the code, based on the results of this test. If somebody pops a hole and removes some of the gypsum board, it's probably going to be factored into that table.

Mr. Richard Cannings: Right. We also heard from the firefighters their concerns that these tests are carried out with a couple of apartments that are built. You know, you're not building 12-storey buildings. Could you comment on how you mimic the pressures on the beams, and so on, to go to the fire safety, when you set these on fire and you want a three-hour or four-hour safety period when firefighters can be in there? How do you test how that would perform when there are 12 storeys on top of it?

Mr. Philip Rizcallah: Generally, you would never build a 12-storey building and burn it.

Mr. Richard Cannings: I appreciate that.

Mr. Philip Rizcallah: The fire's not going to start there. You're going to have an area of fire origin, and that fire is going to be contained within a compartment.

What the committees do or what the researchers do is build a fire compartment, as would typically be seen in terms of what's currently required under the code. Usually, when you build buildings, they're compartmented by floor, at the very least, and sometimes they're compartmented by rooms. We take an area that's indicative of what would be built, and we conduct the fire in that area.

If that fire were to breach that area, then we would do the calculations to determine what would happen when it reached the second fire compartment. It's not generally going to go from this compartment to the next, all the way through.

We do have plans over the next two years to actually build a six-storey building outside and burn it. We will be taking data from that and using that in our codes. We haven't gotten to that stage, but we're comfortable with the information that's coming back now, just with the compartmentalized non-sprinkler tests that we're conducting.

Mr. Richard Cannings: Right. It's my understanding from reading the results of some of your studies that they're actually done under pressure.

Mr. Philip Rizcallah: There are loads on them.

Mr. Richard Cannings: That's what I was trying to get at.

You mentioned smoke travel. Are those tests favourable in terms of smoke getting into elevator shafts and into stairwells? Are they comparable to normal readings?

Mr. Philip Rizcallah: They're comparable to any other type of construction. Obviously, if you leave a door open, whether it's built out of wood, out of concrete, or out of steel, you're still going to get smoke in that stairwell. The structure itself is intact and will perform as well as any other structure. Other factors such as doors opening and people piercing holes in them, we can't control.

Mr. Richard Cannings: I remember reading about, I think it was one of the NIST studies in the States, where they built a small mock apartment and set it on fire. It was done with mass timber construction, and it had the furnishings and everything in it. Basically, the results were that the furnishings burned and the fire went out. It didn't burn the structure at all.

Do you know about that study? Perhaps it's similar to the ones that were recently done. I'm just wondering, getting back to this encapsulated, exposed.... Was that done with exposed timber?

Mr. Philip Rizcallah: Yes. We don't put furniture in there. We put in cribs, which simulate furniture, with the same fire load. That's exactly how we do it. We put what would be typically in a room. We know, roughly, what the fire loads are in rooms, and that's what we set on fire. In some cases, we actually have to go back and introduce more flame because it extinguishes faster than we expected it to. We are modelling based on what real life would be.

Mr. Richard Cannings: Okay, thank you.

The Chair: Mr. Harvey.

Mr. T.J. Harvey: Mary.

Ms. Mary Ng: Thank you for the time.

I'm just going to ask a really brief question to both of you.

We heard earlier some testimony from the firefighters around concerns with a wood structure: that when modified it poses a different risk than construction made out of other materials like steel or concrete. Can you help us understand from the research that you have done what is being done, or whether that was also a consideration as you were doing your research? The issue was modifications after a building has been built.

● (1025)

Mr. Philip Rizcallah: Obviously, any type of building, whether it's wood or concrete or steel, is going to have some modifications after the fact. Hopefully, in many cases, they'll draw a permit and do it correctly, but we know that that's not always the case. In the case of a wood building, for example, if somebody decides to tear out a wall and that wall is integral to a fire separation, it could have an impact on the way the fire is going to perform in that building, not unlike in any other type of building. We're hoping that the redundancies that are built into the building, such as the sprinkler systems and the fact that there are fire compartments between floors —hopefully they're not taking out a ceiling or something like that— are going to play into protecting that structure.

The tests that we conduct always have openings. We don't just build it, encapsulate it completely, and then do a fire test. We assume that there will be a certain percentage of openings for electrical fixtures, light fixtures, air vents. Those are all incorporated in the building, in the room, when we do the burning. That sort of mimics some of these situations, like where somebody puts a cable through a wall. It will mimic that type of assembly, yes.

Ms. Mary Ng: Thank you.

Mr. T.J. Harvey: Thank you both for coming, of course.

I was just sitting here thinking about the testimonies that we've heard so far. One thing that we haven't heard much about is remediation. If a fire were to occur in a tall wood structure like Brock Commons.... Let's say there was a fire on the fourth or sixth floor of a laminated wood structure. Has there been any testing done or any analysis done of what the process for remediation would be to ensure that the structure is allowed to be repaired and to carry on? I'm assuming that if you have a fire in one bedroom of a 600-unit steel and concrete construction apartment building, you would have to make reparations that would allow that structure to stay in place while respecting the integrity that needs to be in place in that confined space. Has there been any testing done? What's the process if you have a fire in one portion of a tall wood structure? How does that look?

Mr. Philip Rizcallah: That's actually a very good question because we've had discussions about this as recently as about two weeks ago. The big concern is not the fire. If you have a fire in a compartment, you remove those elements, like a box, and you replace them. The bigger concern is water. If you get water in the system and the water goes into the walls, what impact is that going to have on mould growth or any other type of concern in that building? We are now putting together a research study and some testing to actually see this. Does it dry out? Do we have mould? Is this really a concern?

We are in the process of determining what the requirements would be to ensure that we don't have mould growth. That's really the bigger concern: the water coming in through those walls. However, that's not just from fire. If somebody has a leaky washing machine, you're going to have the same concern.

With regard to fire, I don't think it's any different than any other building, whether it's wood or whether it's non-wood. You're replacing those pieces within that compartment, and the engineers will come back and certify that it's structurally sound.

Mr. T.J. Harvey: In the pictures that we've seen of those structures, a lot of times those laminated wood panels are, I don't know, 10 or 15 feet by 10 or 15 feet. They're massive panels, plus the supporting structure. If you have a supporting beam that's a laminated wood beam over top of that to support those individual panels and the last 15 feet of it is charred off, then how does that...? I understand what you're saying, but I don't really understand what you're saying. How do you repair that in a way that allows it to continue to be structurally sound?

Mr. Philip Rizcallah: Well, the beams are generally built in pieces. You're not going to transport something that's 60 feet.

Mr. T.J. Harvey: I recognize that.

Mr. Philip Rizcallah: You would take that piece out and replace it with another piece wherever it's charred.

The beauty with the CLT, the composite laminate timber, which is what we've been testing, is it just burns and creates a barrier. It acts as a protection for the wood, and then it burns and it creates another layer.

There is so much redundancy in that wood that it could probably burn for several hours before you've impacted the structural sufficiency of that beam. You come back and you replace those pieces, or you replace the entire beam. It can be done. Even in our labs, when we do burning when we build the CLT walls, we do the test and then the wall is still perfect. We take the wall and flip it around and do the test again. The wall is in great shape. We've done four hours of testing, we flip the wall, and we do another four-hour test with the same wall.

You get quite a bit of redundancy in that system.

● (1030)

Mr. Michel Dumoulin: If I may add, fundamentally, when you remediate, you fix, you repair, you have to go back to code. The engineers or builders will have to look at the code and make sure that the building is rebuilt to code.

Mr. T.J. Harvey: I recognize that. What I was trying to get at is whether you feel there could be a higher instance of inability to go back to the code.

Mr. Philip Rizcallah: We don't believe so.

Mr. T.J. Harvey: Okay, perfect.

That's all I have.

The Chair: We have a couple of minutes.

Richard.

Mr. Richard Cannings: Thanks for this unexpected opportunity.

I want to touch on seismic testing. You briefly mentioned seismic. I know it's a big concern in British Columbia where I'm from.

I wonder if you could comment on the seismic performance of these buildings and how you test that.

Mr. Philip Rizcallah: We've just engaged in a collaboration with British Columbia and Natural Resources Canada to look at seismic, because there are a series of projects in B.C. on a fault that are running into some difficulty. How do they build these buildings completely out of wood and meet the high seismic zone requirements? We understand that.

Technically, it could be resolved. Right now they do it one-off. The engineer has to come in, look at that building, look at the seismic zone, and say how you will design it. Sometimes that will mean you're going to use a concrete base or it's not going to be all wood.

Over the next 12 months, NRC will come out with a technical guide that will address how to build completely out of wood in the high seismic zones. We have that on our radar. We're starting the work on that.

Mr. Richard Cannings: But the buildings themselves—

Mr. Philip Rizcallah: Will be just as safe as any other building.

Mr. Richard Cannings: Okay, that sounds like a good place to end.

The Chair: Gentlemen, thanks very much for joining us this morning. I appreciate your time.

We're going to suspend for a minute, let the room clear out, and then we have some committee business to deal with.

[*Proceedings continue in camera*]