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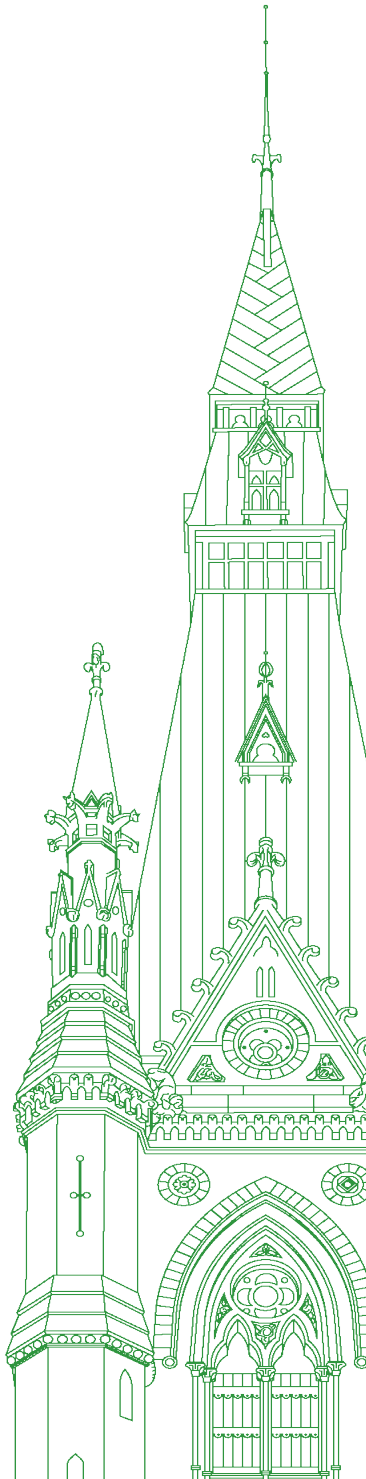

Chair: Mr. James Maloney

Standing Committee on Natural Resources

Monday, November 30, 2020

● (1110)

[*English*]

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

Welcome to meeting number six of the natural resources committee. I'm sorry that we're starting a little bit late. We had some technical challenges, as is periodically the case in our current environment, but nonetheless we're good to go here, so thank you for joining us.

Just so everybody knows, in the last 15 minutes of this meeting we are going to move to committee business. We're going to address the scheduling, the balance of the study and some other appearances. We can deal with that at the end and focus now on the witnesses we have today, which is a total of five groups.

We have ERS Fuels, GreenNano Technologies, Vision Biomasse, a representative from the Department of Natural Resources, and Coopérative Forestière de Petit Paris.

Thank you to all of our witnesses for joining us today. The process, so all of you know, is you will be given up to five minutes for each group to make a presentation. After all the groups have done their presentation we will open the floor to questions from members of the committee. You are welcome to speak in English or French or both. Interpretation services are available. You should have them on your end and we have them on ours.

Thank you very much for joining us today. I am going to start with ERS. I don't know if that's Mr. Small or Mr. Kazemeini. I'll leave it to you. You have five minutes.

Mr. John Small (Chief Executive Officer and Founder, ERS Fuels Inc.): Good morning, Mr. Chair. I am extremely pleased to appear before you and your colleagues at this virtual sitting of the Standing Committee on Natural Resources.

I will start with some background on my business partner, now deceased, and me. Doug was the founder of Bird Tool in the U.K. He was frequently presented honours for having the first lights-out facility in automotive tier one, was the centrefold of the industry publication, and was visited by the founder of Toyota Motor Manufacturing Corporation, Mr. Toyoda. His firm was purchased by my employer.

Doug and I worked to relocate a large contract from Japan to Canada, because Canada had higher-quality supplier ratings for the dynamic sealing systems. My employer, Standard Products, was the largest for this product worldwide. I was engineering lead for the group to accomplish this task on behalf of Ford in St. Thomas.

Prior to holding positions from technical management up to director over 30 years in automotive tier one, I spent six years in Florida as engineering manager of an ophthalmic lens manufacturer, where I developed the patented system to injection-mould ophthalmic lenses with the prescription already in the lens. I was asked to be the keynote speaker for the Society for the Advancement of Material and Process Engineering that year in California.

Later, when I returned to Canada, my team invented the single piece fastener injected bow seal for Pininfarina, an Italian coachmaker for Ferrari, Bentley and Rolls-Royce. We located manufacturing in Stratford, Ontario.

About five years ago, we wanted to make a difference and help the planet. We decided that if we could design a solid, renewable, odourless, smokeless, biomass-based fuel as a direct replacement for coal, we could have a huge impact. ERS Fuels was born after meeting our eventual president and financier, Mr. Sam Kazemeini. He is a serial entrepreneur with a real soft spot for initiatives that help our environment. We created a team and located our worldwide development centre near Stratford, Ontario.

All biomass-based competing products share a number of common flaws, which over two years we were able to formulate our way clear of. Chief among them is that they produce only 5,000 to 7,000 BTUs, while coal is around 12,000 BTUs. We identified an unwanted part of every landfill in the world that would be chemically correct to use as a binder. Then, over another year, we did a series of tests to manufacture the fuel. The result is a fuel that produces 12,000 BTUs, has little or no emissions, with 99.995% combustion efficiency, and the 0.05% ash can be added immediately to agriculture on the soil.

We partnered with ICFAR, the Institute for Chemicals and Fuels from Alternative Resources attached to Ontario's Western University, chaired by Dr. Berruti, who was very helpful and became quite enamoured of our work. ERS Fuels has developed a patented process and is able to recombine the biomass and binder into a new material—patented—that has a density of one. It takes the oxygen from the binder and adds it to the oxygen in the biomass, resulting in our fuel having twice as much oxygen as in the air we breathe. ERS Fuels self-supports combustion, producing a clean blue flame. We continue to test different biomass from around the world, and validate testing through an independent lab in Toronto.

The path was tortuous and expensive. Our first fuel puck was three minutes' manufacturing time; now, four equipment iterations later, it is three seconds through automotive-based continuous improvement techniques.

As time progressed, we realized the government was espousing green strategies where we could align with them and make it happen in Canada. Of particular interest were off-grid northern and indigenous communities where the government flies in diesel to keep them running—and polluting. Our sales director and I were guests at an indigenous convention in Calgary—James Cree First Nation—attended by their assembly, and had a booth on the main floor, which was heavily trafficked by many band leaders.

● (1115)

The response was overwhelmingly positive and we set out to develop purpose-built equipment that would replace diesel, provide electricity, heat greenhouses and municipal buildings, and produce solid fuel for off-reserve properties while providing employment for its members.

We will establish seats at local colleges to train members of these indigenous communities in forestry management and small utility operations.

We have the technology, the team and the vision. We are only missing the support from our federal government at this time.

We need the government to act on their environmental goals, support Canadian innovation in that regard and help us facilitate this move to a cleaner, more sustainable future for our country.

Thank you for hearing these comments.

● (1120)

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

We'll move over to Dr. Sain.

You have five minutes, sir.

Dr. Mohini Mohan Sain (Chief Consultant, GreenNano Technologies Inc.): Chairman Maloney, I am very pleased to appear before you and your committee today.

In my capacity as chief consultant for GreenNano Technologies, I will give a brief description of the company, its products, outlets and history.

GreenNano Technologies was established in 2015 as a start-up company associated with the University of Toronto and GreenNano management to commercialize the invention of nanocellulose technology and carbon technology developed by inventors at the University of Toronto.

Since 2015, GreenNano Technologies has developed two facilities: one in Toronto close to downtown, and another in Windsor. The Windsor facility has actually been developed in collaboration with Ford Canada to foster innovations in lightweight manufacturing using light, nanofibre-based composite products.

In downtown Toronto, the facility is involved in nanofibre production, nanofibre-based products and device manufacturing, and also sales and marketing initiatives there [*Inaudible—Editor*] automotive and disposable smart packaging.

To give a little bit of my history, as a consultant I have affiliations at the University of Toronto as a professor and as former dean of the faculty of forestry at the University of Toronto as well. Being globally involved since 1993 to commercialize research innovation, the forest products for value-added applications.... I was one of the founders of the world WPC forum: the wood fibre plastic composite forum in 1989 at the University of Toronto.

Since then, in 1993, we launched our first company in Toronto, followed by several companies in the United States. The WPC industry today, globally, is worth about $8 million. We did have in Canada about 21 companies at one stage. That was the peak of the business in Canada, which was about 2005. In 2008, we lost practically all of them, except for two that still exist in the Toronto area.

Beyond these, the business has gone to being mostly centred in the Asia-Pacific and China. Last year, China had a market of over $6 billion itself. This shows the potential of the forest product industry for value-added applications.

Since that time, our university has ventured into another company, which has been developed in co-operation with Magna and Ford Motor Company, with the involvement of a few other OEMs from Ontario, to develop lightweight composite materials for the automotive industry.

In 2009, we demonstrated that microfibre based on wood pulp could be used and perform as a structural material. The first time, globally, was as a structural door model in the Nissan Sentra GXE. Unfortunately, after 2008, because of the fibreglass market pricing from China, the market at that point in time could not compete price-wise; therefore, we had to move to some more value-added applications at that point.

As a result, in 2015, GreenNano Technologies was created. Since then, it has been working toward value-added applications in two sectors, primarily. One is the automotive sector, where we are looking mostly at very high-value applications in EV powertrain development, where the powertrain components contain a battery, battery casing and battery packs with about 40% more lightweight material reducing the metal materials that are being used right now.

● (1125)

An interesting invention happened during this time. At the same time GNT was able to use nanocellulose in a very small quantity, to the level of about 5%, in combination with forest-based advanced carbon, nanostructured carbon materials, which were actually categorically combustion residues of the forest floor, which gave nanostructured graphene-like carbon materials, were being introduced in these automotive structural components for the EV powertrain applications.

That actually helped these nanofibres, the cellulose nanofibres, to overcome one of the largest demerits of cellulose fibres, i.e., poor resistance to high-thermal barrier properties.

As a result of these hybrid combinations, at GreenNano Technologies we were able to have a product that can withstand as high as 170°C on a continuous basis. This is one of the achievements that was patented by them and then commercialized.

Since COVID came, GNT has also been involved in the health care sector. Very recently they developed a new product for renewable masks. This was done in combination with the University of Toronto's copper-coating technology. They have developed copper-coated renewable fibre technology, which is used as a filter for disposable masks.

They also have products that have gone—

The Chair: Dr. Sain, I'm going to have to ask you to wrap up quickly, sir.

Dr. Mohini Mohan Sain: Yes. It will be 30 seconds.

On disposable packaging, not only are they now marketing hand disinfection agents, but they are also marketing coffee lids and other packaging materials, where they are looking at the needs for the high temperature resistance.

On that note, I want to thank the committee.

The Chair: Thank you.

I jumped the gun on interrupting you. I appreciate you wrapping up.

Mr. Arsenault, I believe you're next. I heard you say you're in Sherbrooke. I used to live in Lennoxville, so I hope things are well in that neck of the woods.

Mr. John Arsenault (Co-spokesperson, Vision Biomasse Québec): Yes, they are.

I see that Madam Rancourt has joined the committee.

[*Translation*]

She will be giving the presentation.

I can answer any questions later.

Ms. Emmanuelle Rancourt (Coordinator and Co-spokesperson, Vision Biomasse Québec): Thank you, Mr. Chair and committee members, for inviting us to appear today and for studying an issue as important as the economic recovery in the forestry sector.

You already met Mr. Arsenault, who is joining me today. He is a co-spokesperson of Vision Biomasse Québec.

Vision Biomasse Québec brings together some 20 organizations from the co-operative, municipal, environmental and sustainable development, and business communities. They have all chosen to join forces in pursuit of a common goal: promoting a robust industry that uses forest biomass to provide heating in Quebec.

We help build and share expertise regarding the use of forest biomass for heating through communication and education. We are working to help shape the industry through our political outreach efforts.

Some time ago, these organizations worked together to develop a promising vision for the industry, one that could be leveraged to support the country's economic recovery. They identified the potential to convert the heating systems of buildings outside major urban centres across Quebec and unlock the following benefits: replace 400 million litres of fossil fuel annually, make use of 1 million metric tons of residual forest biomass annually, prevent 1 million metric tons in carbon dioxide equivalent emissions annually, produce 4,000 gigawatt-hours in renewable energy, improve Quebec's trade balance by $225 million, and create 12,500 construction jobs and 3,600 permanent jobs.

Those benefits could certainly be enhanced if the vision were implemented Canada-wide. The impact of converting emitters such as cement and steel plants would be greater still.

As far as the economic recovery in the forestry sector is concerned, Vision Biomasse Québec believes strongly that forest biomass is part of the solution. After all, forest biomass is a wood product derived from forest residue, previously considered as waste with no value. The forest biomass industry can also help strengthen the forest industry by creating permanent jobs that remain in the regions thanks to the supply chain, from harvesting and transportation to processing.

The benefits are not limited to the forestry sector given that the use of forest biomass helps reduce greenhouse gas emissions, enhance energy self-sufficiency and lower building heating costs. By leveraging a local and renewable energy source available just about Canada-wide—particularly in Quebec—the forest biomass industry is contributing to GDP, as well as provincial and federal government revenues. It can also have a very positive impact on provincial trade balances because money spent to generate this type of energy stays in the province, instead of being spent outside the province to procure fossil fuel supply.

However, the industry has not yet reached full capacity, with the bulk of the market outside Canada. Developing the domestic market is therefore paramount: millions of tonnes of forest biomass could be sold domestically to create renewable energy and support the country's energy transition.

Remote communities hold significant potential for building the industry's domestic market. The fact is that many communities in northern Quebec, British Columbia and Manitoba, as well as in the Yukon and the Northwest Territories, have already converted and are using local forest biomass for their heating needs. Government support programs are nevertheless vital to the success of these projects, which will raise the industry's profile and contribute to its strong development.

Existing federal programs to support this type of conversion should be maintained and even expanded to accelerate conversion and promote economic recovery.

What's more, Environment and Climate Change Canada is developing a regulatory framework for clean fuels. The department will be releasing standards for liquid fossil fuels soon, with regulations for gaseous and solid fuels to follow. Under the framework, a credit trading system will be established to replace liquid fuels with low-carbon-intensity liquid or gaseous fuels.

It would most likely be a biomass-based product, but with significant losses in performance as a result of conversion. Since the current use of solid biomass-based fuel often serves as an alternative to a liquid fuel such as oil or a gas fuel such as propane, without any major loss in thermal efficiency, we believe these types of fuel alternatives should also be considered for credit eligibility. That would support the market's development in Canada, while reducing greenhouse gases.

The current framework provides for the creation of credits for renewable natural gas production as an alternative to liquid petroleum-based products, despite the loss in thermal efficiency. Credits cannot be created, however, for the use of solid biomass as an alternative to oil. To promote the biomass industry, as well as Canada's forest industry, the Standing Committee on Natural Resources should recommend that the proposed regulations on liquid fuel standards allow for the creation of credits for biomass-based fuels as an alternative to any fossil fuel. The future regulations on solid fuels should do the same.

Thank you, Mr. Chair and members of the committee. My colleague and I would be happy to answer any questions you have.

● (1130)

[*English*]

The Chair: Thank you very much. I appreciate that you were right on time.

Next we have Mr. Kurz.

Dr. Werner Kurz (Senior Research Scientist, Canadian Forest Service, Department of Natural Resources): Good morning, Chair, and good morning committee. I thank you for the opportunity to be appearing as a witness.

My name is Werner Kurz. I'm a senior research scientist with the Canadian Forest Service in Victoria. I lead the team that conducts the greenhouse gas inventories and projections for Canada's forest sector.

Today I want to speak to you about the question of whether the Canadian forest sector recovery and climate change mitigation objectives can be aligned. I have distributed my presentation to the committee.

Keeping global mean temperature increases to below 2°C requires net negative emissions in this century. These negative emissions can only be achieved by simultaneously reducing fossil fuel emissions and increasing forest carbon sinks.

Globally at present, forests remove about 30% of human-caused emissions. It is therefore important that when we calculate and estimate mitigation, these must be incremental activities to the existing sinks. Unfortunately, as we witnessed around the world recently, forest sinks are also at risk from climate change, causing large and rapid releases from wildfires. Therefore, developing climate-effective mitigation strategies requires the scientific assessment of the available options.

Turning to slide 3, we are fortunate that we have in Canada a forest carbon monitoring, accounting and reporting system and a series of models. We started developing this carbon budget model in 1989, and the third version of it is now used around the world for similar types of analyses. We use these tools to report on past carbon dynamics as legislated for the state of forest reporting and for international reporting. We also project future carbon dynamics, develop climate change mitigation and adaptation strategies, and lay the scientific foundation for various forest carbon initiatives.

On slide 4 I show you a picture of a million cubic metres of wood. This is containing the amount equivalent to about one million tonnes of CO2. In British Columbia we harvest about 67 times this amount. There's about the same amount of CO2 contained in this wood as the emissions from all other sectors in British Columbia. How we use this wood therefore matters greatly.

Turning to slide 5, what we have learned in our analyses over the recent years is that there are two indicators that we must pay close attention to. These are the carbon retention time, in other words, the amount of time for which the harvest of carbon is retained in the product, and the displacement factor or substitution benefits, in other words, the amount of avoided emissions that we achieve through using a wood product.

Bioenergy has a wide range of displacement factors. The highest are achieved if we replace diesel fuel generators in northern communities, but all bioenergy uses have a very short carbon retention time, releasing the carbon back into the atmosphere that was removed by tree growth.

What we have consistently demonstrated in Canada and around the world is that the highest mitigation benefits are achieved if wood is used in long-lived structural building products, which often retain the carbon for decades or centuries.

On the next slide I show you examples of buildings that are constructed in Canada. These are not only high-rises like the 18-storey Brock Commons building on the campus of the University of British Columbia, but also bridges and other infrastructure like hockey rinks and museums.

How we use the harvested wood matters. I'll give you a numerical example, conducted by my Ph.D. student, Sheng Xie. If we hypothetically were to replace all harvested wood in British Columbia and use it to produce liquid transportation fuels, we could just meet B.C.'s annual demand of about nine billion litres per year.

If, on the other hand, we would, again hypothetically, use all the wood harvested in British Columbia to produce mass timber buildings, we could build around 10,000 of these 18-storey Brock Commons buildings per year.

The big difference is that if we used the wood for mass timber, the cumulative emissions by 2050 would be nearly two billion tonnes of CO2 lower with the mass timber approach, because carbon is retained in the wood and emissions from other products are reduced. The same is, of course, also true for fossil fuel emissions, but we release all the carbon from the harvested wood back into the atmosphere.

Of course, not all harvested wood can end up in mass timber and B.C. does not build 10,000 Brock Commons buildings per year, but this is to demonstrate that how we use the wood matters.

There is this problem of climate change and the impacts of wildfires on carbon retention. In British Columbia, the 2017 and 2018 wildfires have caused 200 million tonnes of CO2 emissions per year.

● (1135)

That is about three times the emissions from all other sectors in British Columbia combined per year. We have, therefore, recently started a new research project funded by the Pacific Institute for Climate Solutions in which we address the question of how we can reduce future wildfire emissions and strengthen B.C.'s forest-based bioeconomy at the same time, for example, by using wood residues from fuel treatments in various applications.

In conclusion, keeping temperature increases to below 2°C requires net negative emissions before 2100, and while this may seem far away, this is within the lifetime of children born today. This requires drastic reductions of emissions in all sectors, but it is not achievable without also greatly increasing future forest carbon sinks. These are unfortunately also at risk from climate change, and we need to take the interaction between forest management decisions and fire risk into consideration.

Climate effective mitigation strategies in the forest sector exist and must be based on sound scientific assessments of their greenhouse gas impacts. Canada's forest sector recovery can be aligned with climate mitigation objectives to improve forest management and in particular the increased use of long-lived wood products.

Thank you very much.

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

Last but not least, we'll go to Mr. Paradis.

[*Translation*]

Mr. Alain Paradis (General Manager, Coopérative forestière de Petit Paris): Good morning, Mr. Chair and members of the committee. Thank you for this opportunity.

Allow me to begin by telling you a bit about who we are. The Coopérative forestière de Petit Paris is a 50-year-old organization based, of course, in Quebec, not in Paris. We are located in Saint-Ludger-de-Milot, in Saguenay—Lac-Saint-Jean, in the heart of the beautiful Lac-Saint-Jean area. We are a co-operative of forestry workers and all of those workers own the business. As a small and medium-sized enterprise, or SME, we are not a multinational, so the forestry sector is very important to a company like ours. It is also important to the residents of our beautiful area.

Some 300 workers are involved in the co-operative, in every area of forestry operations. We own a sawmill, a SME and one of the largest independent sawmills in Quebec. It processes softwood lumber.

I would like to address two things in particular, the current context and the importance of the recovery in the forestry sector.

First, because of the current situation, the industry is having a tough time. I would even go so far as to say that, on some levels, the situation will turn precarious if the industry's future is not properly addressed. Second, keep in mind that the recovery in the forestry sector is fundamental to the fight against climate change and regional development.

Currently, the industry is dependent on a very volatile market—the lumber market. The past two or three years have been quite devastating for businesses. Those that did not modernize before the industry began experiencing these low periods a few years ago are obviously struggling to survive these difficult times.

The pandemic gave us a slight boost, which led to an increase in lumber prices—one that is temporary. We have no idea what is around the corner. Since our market covers the American northeast, we are heavily dependent on what happens in the U.S. In the past few months, we have been able to take a breath, but we are very concerned about the future and the impact on the markets.

Furthermore, the fundamental importance of the recovery in the forestry sector cannot be overlooked when it comes to climate change and regional development. There is an imbalance as far as sustainable development is concerned. As you know, the industry is under tremendous pressure from an environmental standpoint.

Keeping that environmental balance is crucial. There is significant pressure in Quebec to increase protected spaces in various ways. Clearly, we want to achieve the government's objectives, but we face all sorts of pressure with respect to woodland caribou and endangered species, for example. The result is less forest development. Over the past decade, the volume of timber harvested has dropped by at least 10 million cubic metres annually.

I also want to point out that the regulatory regime is not necessarily geared towards the industry's needs. Quebec's forestry regime is highly restrictive, so we can't be nearly as nimble in controlling our prices. Earlier, when I talked about markets, I was to some extent talking about revenue. We have to be able to ensure high productivity while keeping operating costs under control. The current regulatory regime poses significant challenges. We have even called on the government to review the regime because it falls well short of our needs.

Lastly, proper financial support is necessary. That means robust programs to support the industry. I will give you an example. In an effort to promote sector-based development, the federal government introduced a program where 80% of the funding was allocated to British Columbia, when in Quebec, 30% of jobs are related to the forestry sector.

● (1140)

The sector must receive fair treatment. We really need the government's support if we are to play an effective role in the industry.

I mentioned the current context. As we look towards the future, it will be necessary to rethink certain strategies to ensure the forestry sector's survival. That brings me to two important points: one, mitigating climate change and, two, supporting regional adaptation.

The forestry sector is an indispensable partner in the fight against climate change.

First, carbon sequestration is an important consideration. Cutting mature trees, which no longer sequester carbon, and replacing them with young trees supports the capture of carbon.

Second, promoting the use of wood in all buildings and consumer products is an important avenue. By making greater use of this renewable feedstock, which has minimal environmental impact, we can achieve carbon neutrality.

Third, encouraging innovation is essential, particularly when it comes to materials such as lumber. Such an initiative would help the industry become more productive and competitive while providing added value through new products and new markets.

Fourth and finally, establishing tailored regulations and ensuring true sustainable development are of the utmost importance. Balancing economic, social and environmental interests is key. Although we are working hard to maintain that balance, environmental interests are currently superseding economic considerations.

With respect to regional adaptation, the sector's recovery will play a central role in regional development. Nearly 250 municipalities depend on Quebec's forestry sector. If we don't endeavour to preserve that, we will not be able to attract and retain workers. The regions are facing a labour shortage, one that will continue unless they can turn things around. If not, everyone will move to the major urban centres, and I'm not sure how that will do anything for regional development.

I must stress what an asset our industry is to the fight against climate change, so the government should do what is necessary to strengthen and empower the industry.

● (1145)

[*English*]

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

[*Translation*]

Mr. Alain Paradis: Very well.

I will conclude by saying that the forestry sector has had a hand in the regional development of each and every one of Quebec's beautiful regions through hydroelectricity. It is therefore imperative that the government continue to support regional development.

Thank you.

[*English*]

The Chair: Thank you, sir, and my apologies for the interruption, but we have to move on.

Mr. Zimmer, I believe you're starting us off this morning.

Mr. Bob Zimmer (Prince George—Peace River—Northern Rockies, CPC): Yes, good day, everybody.

I'd like to follow up with the notice of motion that was brought forward last week. I'd like to move the motion, which is:

> That, the Honourable Mary Ng, Minister of Small Business, Export Promotion and International Trade, be invited to appear before the committee as part of its ongoing study on Economic Recovery in the Forestry Sector, prior to December 11, 2020, to provide critical information relating to the recent WTO ruling, as the Government Official who appeared on October 30, 2020 was not able to respond to the question and suggested that Global Affairs Canada appear and answer that question at a future meeting.

The Chair: Thanks, Mr. Zimmer.

I know we have people who want to speak to this. Would you consider deferring this until the end of the meeting when we're in committee business?

Mr. Bob Zimmer: I'd like to get it over with now in public, if that's possible.

The Chair: Okay.

Mr. Sidhu, you're up next, then.

Mr. Maninder Sidhu (Brampton East, Lib.): Thank you, Mr. Chair, and thank you to my colleague for bringing this to our attention.

I think, as I said last time, it's important that we also hear from GAC officials about the technical aspect. I would rather do this near the end of our meeting because our witnesses are here and I don't want to take up more of their precious time. I really want to ask them questions that relate to our study. That's my suggestion here.

Mr. Bob Zimmer: Yes, as we said before, the GAC officials are more than welcome to appear with the minister, so it shouldn't be an issue.

● (1150)

The Chair: Mr. Lefebvre has his hand up.

If you want to raise your hand, I would ask people to use the "raise hand" column on the side.

Mr. Lefebvre, you're next.

Mr. Paul Lefebvre (Sudbury, Lib.): Thank you, Mr. Chair.

We're pretty much on the same page. We all want the minister to appear; there's no doubt about that, and we certainly want to hear from officials as well.

We have four meetings in front of us, one of which I believe we're going to try to get Mr. O'Regan to appear at as well. That's two meetings , which leaves us two more meetings. Again, Mr. Zimmer has a lot of experience in this, but we can request if and when she is available in the four time slots we have, and we can take it from there. I'm not opposed at all to the request. The best we can do is ask, and if she can't make it in the next four meetings, then certainly in the new year.

I don't think it's a question of if she will appear. It's a question of when she will appear. On that basis, I don't know if Mr. Zimmer wants to move on that but then we could get going with the witnesses.

Mr. Bob Zimmer: Yes. My apologies for taking so long.

I think it's relevant to the forest recovery, which is the exact topic that's before the committee.

I think the WTO ruling could be argued and is the biggest issue affecting our forest sector, especially in British Columbia, but across the country. I would argue that it's right at the top and I think it validates the reason the minister needs to be here.

The Chair: Thanks, Mr. Zimmer.

I have Mr. Cannings and then Mr. McLean.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): It sounds as if we're all on the same page, and I want to question the witnesses.

Mr. Bob Zimmer: Yes.

Mr. Richard Cannings: Mr. Chair, I would call the question.

The Chair: Mr. McLean, you had your hand up.

Mr. Greg McLean (Calgary Centre, CPC): I think the question has been called, Mr. Chair, so I'm not sure if I have the floor.

The Chair: You don't. I just wanted to highlight the fact that you had your hand up.

Thank you.

Do we want to have a recorded vote on this?

An hon. member: Yes.

The Chair: Okay.

(Motion agreed to: yeas 11; nays 0)

● (1155)

The Chair: Decisiveness is what we like to see.

Mr. Zimmer, do you have some questions for our witnesses?

Mr. Bob Zimmer: Yes, I do. I'll take whatever time I have left.

Thanks, everybody, for that. It's much appreciated.

I have a question for Mr. Kurz.

I had a question for Mr. Nighbor when he was before the committee. I asked him about where we are in Canada.

I know that a lot of Canadians see a lot of trees. I fly over the country quite often and see all the forests beneath me.

There's a question that always comes to mind. Where are we in terms of what we produce carbon-wise versus what we sequester or sink naturally? Do you have a number for that? Where do we stand in Canada in terms of just our own geographical footprint?

Dr. Werner Kurz: The internationally reported estimate of the carbon emissions of the anthropogenic component—that's the human-caused component of emissions and removals in the managed forests, which is the area for which we have reporting obligations—in 2018 was 14 megatonnes.

The important aspect here is that, in addition, we have large emissions from forest fires, which are in the natural disturbance component of the internationally reported emissions. We have an unknown contribution of 118 million hectares of northern forests, that are not managed and that are outside the reporting obligations, for which we currently have no estimates.

Mr. Bob Zimmer: Thank you for that, Mr. Kurz.

What I'm asking for is what we totally produce as a country, as a nation, in terms of carbon output, comparing it to what our forests actually bring in and sink.

You said 14 megatonnes. Does that mean we produce 14 megatonnes more than we sink?

Dr. Werner Kurz: We have to keep the numbers in perspective. The emissions from all other sectors are in the order of 570 million tonnes of CO2. The contribution of forests at the moment is small compared to that. The climate change impacts of wildfires on forests are very large and have been increasing in recent years.

Mr. Bob Zimmer: Okay.

I have one last question. I know my time is very tight.

As a fellow British Columbian, I drive around our forests quite a bit. What I notice a lot is that we used to see a lot of red trees, which the pine beetle killed. Now we're seeing a lot of yellow trees, which the spruce beetle killed. My big concern is how we manage this problem.

What you just talked about, I'm concerned about as well: seeing what is a really good piece of timber that could be utilized in so many productive ways doesn't end up in the atmosphere. How do we manage those forests?

I know that our colleagues to the south in the U.S.—when I knew secretary of the interior Ryan Zinke—were managing their forests to really reduce forest fires.

I have just one last comment. How do you do that from your perspective? Maybe I'll ask it this way. In just a simple number, what is the contribution towards our megatonne total by wildfires every year in Canada?

Dr. Werner Kurz: It varies tremendously between years. We have years like 2020 where we have very few forest fires across Canada. Then we have years like 2017 and 2018 where we have very large areas.

The difference between—

Mr. Bob Zimmer: What's a number? The 570 sticks out. What's an average?

Dr. Werner Kurz: In extreme years, forest fire emissions can exceed half of that value, 250 million tonnes of CO2 equivalent.

Mr. Bob Zimmer: Wow. So, managing our forests could potentially—

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

Mr. Bob Zimmer: Okay.

Thank you, everybody.

Thanks, Mr. Kurz.

The Chair: Mr. Weiler.

Mr. Patrick Weiler (West Vancouver—Sunshine Coast—Sea to Sky Country, Lib.): Thank you, Mr. Chair.

I would like to thank all the witnesses for joining our meeting today.

I would like to pick up on some of the questions that my colleague Mr. Zimmer was asking Mr. Kurz.

One of the really important aspects that I think it's important to have clarity on here is the rate of carbon capture and storage by trees.

Mr. Kurz, in my understanding, trees begin to capture more carbon as they get older. I was wondering if you could speak about what age trees or forests generally need to be before they start rapidly increasing the amount of carbon they store. What type of implications should this have in terms of the types of forests we should seek to harvest and/or protect?

● (1200)

Dr. Werner Kurz: This is a very complex question. I will try to answer it very briefly.

First of all, the rate of carbon uptake of a forest stand increases with its age. It peaks, depending on which part of the country you're in, between, say, 50 and 150 years of age. On the west coast of British Columbia, that peak could be later. In the foothills of Alberta, it will be earlier.

Basically, the age of a forest determines the rate of carbon uptake, as well as the region where it grows, because that determines the overall growth rate and the maximum amount of biomass that a forest can retain.

Mr. Patrick Weiler: Great. Thank you for that.

For my next question, I was hoping you could describe in a little more detail the new national forest carbon monitoring, accounting and reporting system. Also, could you describe how this will better account for GHG emissions from harvested wood products?

Dr. Werner Kurz: The system has been in operation since 2006 for Canada to report to the United Nations Framework Convention. We generate the numbers and we transfer them to Environment and Climate Change Canada, which combines them with all other sectors.

The system combines computer models with measurements from the ground and remote sensing data on the area affected by fire and insects, harvesting, etc. We combine all that to estimate the net carbon update, the net balance of emissions and removals.

Mr. Patrick Weiler: Thank you for that.

You mentioned that there's a number of different ways this is measured from the ground and I assume from aerial views or satellites as well. Could you speak a little more to that?

Dr. Werner Kurz: Yes. The challenge is that it is very expensive to measure a plot on the ground and to have them distributed across the country. In order to get an estimate of the entire area, we basically combine ground measurements with remote sensing from aircraft and from satellites, as well as computer models that help us keep track of the millions of pieces of information that we need to combine to arrive at these estimates.

But in principle, what we do is we estimate, for every hector of forest in the managed forest of Canada, its age, its species, its rate of growth and the impacts that affect its ability to grow, whether that's the spruce beetle, the mountain pine beetle, wildfires, thinning or harvesting. We also track the rate of regrowth. Therefore, the carbon balance can be reported and stratified by different sectors.

There's one other important aspect, which is that the harvested wood products that we extract from the forests are going into a wide range of uses. We also have models that keep track of the carbon storage in harvested wood products, whether that's buildings or bioenergy, and we track the substitution benefits, not for reporting purposes, but for the estimation of alternative mitigation strategies.

Mr. Patrick Weiler: That is very interesting. You mentioned that in your supporting presentation with the chart that compared the different products that can be produced using this.

I am curious. The one you mentioned that has the greatest potential for capturing and storing carbon for the long term was using wood in buildings. I'm just curious whether using wood in this manner would actually capture and sequester carbon for longer than in some forests.

Dr. Werner Kurz: That very much depends on the impacts of climate change on the forest in particular. When we compare the situation on the west coast of British Columbia, where forests can grow to several hundred years of age, the building may not store the carbon longer than the forest would. However, as we have just witnessed in Washington, California and Oregon, even those forests are at risk from climate change.

Among the things we analyze with these tools are the trade-offs and the risks associated with retaining carbon in the forest or harvesting and making use of the carbon. It also differs greatly whether the wood is derived from a stand that was already killed by fire or insects, or from a stand that has the potential to continue to sequester carbon.

Mr. Patrick Weiler: That's a really important point, when you look at, for example, the impacts from the mountain pine beetle and other infestations. Related to that, do you think it would be feasible for Canada to report greenhouse gas emissions from wood products only at the time where carbon is actually emitted into the atmosphere rather than just the time of the harvest?

Dr. Werner Kurz: We actually report exactly that way. Since 2015, Canada, in compliance with the international reporting guidelines of the Intergovernmental Panel on Climate Change, reports emissions from harvested wood products where and when they occur.

That means that, if we export pallets to Europe, we in Canada must report the emissions associated with the burning of the pallets in Europe. If we export a long-lived wood product to the United States to build a mass timber building, we would need to report that when the emissions occur, which would be when that building is torn down or recycled, whatever its fate may be in the future.

● (1205)

The Chair: Thank you, Mr. Weiler. Unfortunately, that's all your time.

Next is Mr. Lemire for six minutes.

[*Translation*]

Mr. Sébastien Lemire (Abitibi—Témiscamingue, BQ): Thank you, Mr. Chair.

From our witnesses' opening statements, it's clear what a difference the use of forest residue can make, especially in Quebec, when you consider natural gas development in western Canada. The potential economic and environmental benefits have been quantified. I think it would be useful to take a closer look at the possibilities.

My question is for Ms. Rancourt, from Vision Biomasse Québec.

Ms. Rancourt, you said that biomass could replace 400 million litres of fossil fuel a year and prevent 1 million metric tons in carbon dioxide equivalent emissions a year.

Which sectors could benefit from transitioning to the use of biomass, and how could the use of forest biomass support Canada's environmental efforts and help achieve the country's targets?

Ms. Emmanuelle Rancourt: Thank you for your question.

Since I gave the presentation, I am going to let my colleague Mr. Arsenault answer questions, if he doesn't mind.

Mr. John Arsenault: Absolutely.

As Mr. Kurz mentioned and as we pointed out in our analysis, one tonne of biomass used as an alternative to fossil fuels can reduce greenhouse gas emissions by approximately one tonne.

If we look at natural gas, a cubic metre of natural gas produces roughly the same amount of energy as a litre of oil. You could actually take the figures we mentioned in our presentation and apply them to natural gas and the result would be the same.

If you were planning to replace 400 million litres of oil, it would be the same as replacing 400 million cubic metres of natural gas. Economically and regionally speaking, though, natural gas does not have a place in Quebec's heating market.

For that reason, our aim is to provide an alternative to oil. That also applies in the rest of Canada. The significant use of oil could be replaced in the Atlantic provinces and in northern Ontario, and the benefits would be the same.

Mr. Sébastien Lemire: As a member of Parliament, I am particularly interested in something. I am really glad that Mr. Kurz and Mr. Lefebvre are both with us to hear the answer.

How can the federal government support the forestry industry in the energy transition? I am referring to specific programs: loans, loan guarantees, R and D support, tax credits and the like.

The question is for either Ms. Rancourt or Mr. Arsenault.

Mr. John Arsenault: The federal government created Canada-wide programs to develop biomass in remote areas. They were implemented four or five years ago, but with mixed success. A few projects were brought forward. In fact, there was a recent news report that described a dozen projects that are being carried out across Canada.

There is a need to enhance these programs and increase their impact, particularly in remote areas. However, they could also be applied in areas that are not remote. I understand that the federal government has an interest in developing indigenous communities and very remote regions, but there are other regions of Canada that could also benefit. I told you about the Maritimes, where there is a high percentage of oil use. In Quebec, we still burn, year in and year out, close to a billion litres of heating oil; remote regions are certainly not the only areas where this is done.

Existing programs that support initiatives to convert heating systems to biomass should no doubt be enhanced. This conversion is the main barrier to biomass use as it represents a relatively large capital cost. Therefore, we need help to convert existing heating systems to biomass.

If the goal is to reduce greenhouse gases by 35%, 40%, 50% or even 100% by 2050, we must start now to change heating systems, which have a life span of 25 to 30 years. We must immediately begin to replace these systems with others that do not use fossil fuels.

● (1210)

Mr. Sébastien Lemire: Thank you.

My final questions in this round will still be for you, Mr. Arsenault, from Vision Biomasse Québec.

According to data provided in the 2017 report “A Forest Bioeconomy Framework for Canada”, published by the Canadian Council of Forest Ministers, Canada has the largest amount of biomass per capita in the world and 6.5% of the world's bioenergy potential.

How do you view the employment outlook for the forest bioeconomy in Canada, and what specific measures could the federal government put in place to encourage the development of new forest biomass products and facilitate the commercialization of new and existing products?

Mr. John Arsenault: I'll give you two examples from our presentation: enhancing existing programs, possibly by increasing their geographic scope, and ensuring that forest biomass is considered for credit eligibility under the Clean Fuels Standard that Environment and Climate Change Canada is implementing.

The objective of Vision Biomasse Québec is to develop the use of 1 million metric tons of residual forest biomass, and it expects to create 12,000 jobs in the construction phase and 3,000 to 4,000 jobs for ongoing activities. We are talking here about jobs in the regions for the extraction of the resource. This will also have the effect of consolidating the forest industry in general, which is currently struggling to find markets for its sawmill residues. Paper mills are in decline. The use of bioenergy could help keep these production units alive.

Mr. Paradis knows this conundrum too. In fact, he has installed a biomass heating system in his facilities. He can..

[*English*]

The Chair: Thank you. I'm going to have to interrupt and stop you there, sir. I'm sorry.

[*Translation*]

Mr. John Arsenault: Yes.

Mr. Sébastien Lemire: Thank you very much, Mr. Arsenault.

[*English*]

The Chair: Mr. Cannings, we'll go over to you for six minutes.

Mr. Richard Cannings: Thank you to all the witnesses here before us. I wish we had all day to ask questions, but apparently I have six minutes.

I'm going to focus all my questions on you, Dr. Kurz, because I've been waiting to hear from you in this study. I think it's very important testimony.

You were saying that mitigation must be incremental and additive to what we've been doing. You pointed out that it's really important to look at how we use our wood. That makes a big difference. I'm wondering if you could talk about how we harvest that wood. I'm wondering what sort of impact that might have—different harvesting techniques, clear cuts or selective logging. How does it compare with what we do with the wood?

Dr. Werner Kurz: Thank you for the question, Mr. Cannings.

The challenge here is that, as with all ecological systems, it really depends. When we manage and harvest wood that was already killed by mountain pine beetle, spruce beetle, wildfire, drought or other calamities, we have a very different impact on the timber and the future carbon balance than if we harvest actively growing forests or old-growth forests.

Scandinavia has much better data than we do. Canada has an ongoing debate about whether a selection cutting-based approach or a clear cutting-based approach is superior. Each has its own advantages and disadvantages. I would say the jury is still out on that, and certainly in British Columbia and other parts of Canada where root diseases, mistletoe and other problems of existing stands can be perpetuated through partial cutting systems. That needs to be considered as well.

How we treat the site also matters. If we slash burn after harvesting, for example, which is often done as a fuel reduction and fire risk protection strategy...but again in British Columbia that causes some five million tonnes of CO2 emissions per year and these are clearly avoidable if we have alternative and better uses for that biomass.

● (1215)

Mr. Richard Cannings: Thank you.

You mentioned there's kind of a lag time after harvest where sequestration is negative. There's more emission than sequestration, as I understand it, and then 20 or 30 years later we get to a point of positive sequestration. If we're trying to get to net zero by 2050, how do we manage that 20 to 30 year lag time? By the time we're getting those benefits, it's already 2050.

Dr. Werner Kurz: First of all, that lag time is not necessarily that long. It could be as little as five to 10 years, depending on the site and the rate of regrowth of forest. But, yes, if we fail to regenerate adequately, that lag time could be longer. It could be as long as 20 years and in extreme cases, perhaps even 30. That's clearly not desirable.

A lot depends on how we harvest, what we do with the residue that is there and how quickly we replant and encourage reforestation.

The point is that the alternative of not harvesting is not necessarily enhancing forest carbon sinks either. We recently completed a study with Parks Canada looking at our national parks—the forests in 31 national parks. We showed that since 1990 these national park forests were not carbon sinks over the cumulative period, particularly in the west where insects, drought and wildfire caused carbon losses.

Conservation and stopping logging in the world of climate change is not necessarily a solution either. These kinds of analyses are so critically important so that we can develop science-based, credible analyses of the alternatives that are available to us.

Mr. Richard Cannings: Thank you.

I want to move to biofuels, such as wood pellets and renewable natural gas, which are being proposed in a couple of places in my riding.

You mentioned that the disadvantage there is that we are releasing that carbon very quickly, but there are the replacement or substitution benefits. Up in Mr. Zimmer's riding and in other parts of northern B.C., there's a lot of wood pellet production and the pellets are being shipped to Europe to get countries like the U.K. off coal.

Is there any advice or direction you would give to us with regard to our climate accountability or climate emissions as to the kind of forest products we use for those pellets and how they're harvested, to maximize our benefits rather than producing two-by-fours?

Dr. Werner Kurz: Yes. I think colleagues in British Columbia and my team are all collaborating at present on various approaches to maximizing not only the value but also the employment and climate change mitigation benefits of alternative uses of wood and biomass.

If we harvest green trees to turn them into pellets, not only is this economically not a good idea but it is also not a good idea from a greenhouse gas emissions perspective.

If, on the other hand, we use wood that is in a slash pile—and appropriately in a slash pile—and convert that into pellets—because that wood would have been burned anyway—we must recognize that by using the energy in the pellet instead of releasing it into the atmosphere, we have a mitigation opportunity.

However, where we use the pellets also matters. If we ship them to Europe, we are accountable for the emissions and the Europeans have the benefits of the use of the pellets. Conversely, if we can use the pellets, the biofuels or the renewable gas in Canada to address our own greenhouse gas emission objectives, we have a better outcome.

Let me remind you, though, that biomass for bioenergy is typically the lowest value-generating opportunity. There are many innovative bioproducts and long-lived wood products that through innovation we need to explore further. Burning the wood as fuel or as a substitute for heat is a low-value, low-mitigation benefit.

The Chair: Thank you, Mr. Kurz.

Mr. Richard Cannings: Thank you.

The Chair: I apologize for interrupting.

Thank you, Mr. Cannings.

We're now moving into the second round for five minutes each.

Mr. McLean, you're starting us off.

● (1220)

Mr. Greg McLean: Thank you, Mr. Chair, and thank you to all the witnesses.

I'm going to be quick today. I'm going to ask a handful of questions here, and I only have five minutes.

My first question is for Madame Rancourt and Monsieur Arsenault of Biomasse Québec.

You talk about the environmental effects of burning biomass versus gas or liquids. My science background indicated that the most residue comes from solid burning as opposed to gases or liquids. I'm wondering how this mitigates the greenhouse gas and other pollution effects associated with hydrocarbons.

Mr. John Arsenault: There is a difference between solid, liquid and gaseous fuels, but it's at the margin. Coal—solid fossil fuel—has a 94% or 95% carbon content; oil has 90% or 92%, and gas has 85% or 87%. They're still very high-carbon fuels. Yes, there is a small reduction, depending on which fuel you use, but biomass can move all of these energies and reduce greenhouse gases.

Mr. Greg McLean: Okay. You talked about a 20- to 30-year investment for conversion of systems. Do you recognize that the conversion itself will have massive CO2 emissions associated with the build-out?

Mr. John Arsenault: Massive is probably not the right term. Yes, there is investment required in equipment and insulations, but a typical home will generate probably 10 tonnes of CO2 emissions, if it's burning fossil fuel, per year. Over 30 years that's 300 tonnes. A conversion, even taking into account the greenhouse gases involved with the equipment, is not close to that range at all.

Mr. Greg McLean: Okay. Thank you very much. It's much appreciated.

I'm going to move to Mr. Kurz now.

Mr. Kurz, you talked about the issue around slash burning. What percentage of a harvested tree goes towards a final wood product, and what part is actually slashed?

Dr. Werner Kurz: When we refer to slash burning, what we're talking about are the branches, the tops and broken pieces of wood that stay behind. I would estimate that, depending on the area in which we harvest, it will be between 5% and 25% of the carbon in the above-ground biomass that is not removed from the site. The remainder goes into the harvested wood product sector, and depending on what we produce from it, we must discount the bark. The carbon in the bark is often used as hog fuel or other energy source.

Depending on the product, 40% to 50% ends up in long-lived wood products and the remainder often goes into pulp or bioenergy.

These are all very round numbers, because it really depends by sector.

Mr. Greg McLean: Sure. As a range of which ones are going to be used for fuel, in the process of burning the biomass in order to power the operations, what percentage do you think would be in the burn-off versus that which is sequestered in the final product?

Dr. Werner Kurz: Again, depending on what the product is, I would say between 30% and 40%, or sometimes 50%, of what is harvested ends up in the final product, remembering that some of these products themselves could be short lived. For example, if the final product is cardboard for packaging, it's still a short-lived product.

Mr. Greg McLean: Okay. Thank you, Mr. Kurz.

I'm going to move now to ERS.

Mr. Small, thank you very much for your presentation. I really appreciated the detail you gave.

On the 5,000 BTUs versus 12,000 BTUs for other carbon products, I want to hear more about your innovation and what it costs on a user basis to get your product up to the 12,000 BTUs that would normally be part of an earth-produced carbon product.

Mr. John Small: I'm going to answer you in terms of cost per gigajoule, because that's the worldwide reference. I'm going to answer in two ways.

Our system allows the user to produce our fuel for approximately $60 Canadian a tonne. What that means is that the cost per gigajoule is something like $1.60. If I compare that to gasoline, for example, where it's $28 per gigajoule, you can appreciate that our gas isn't that inexpensive after all.

The magic here is that we found a way to use what we call a binder that is available in every landfill worldwide, and I'm going to use the evil word “plastic”, LLDPE. There are three trillion—that's with a “t”—shopping bags and garbage bags thrown away per year. We found a way to combine LLDPE with biomass, and it can be any type of biomass, and produce a fuel that's 12,000 BTUs. That is—

● (1225)

The Chair: Thank you, Mr. Small. Unfortunately, I'm going to have to cut you off and move on.

Mr. Greg McLean: Thank you.

Mr. John Small: Thank you.

The Chair: Thank you, Mr. McLean.

We'll go to Mr. Sidhu for five minutes.

Mr. Maninder Sidhu: Thank you, Mr. Chair, and thank you to all our witnesses, Mr. Small, Dr. Sain, Ms. Rancourt, Mr. Arsenault, Mr. Paradis and Mr. Kurz, for being here.

My question is for Dr. Sain.

I know you're in my neck of the woods. You're close to Vaughan. Your company does interesting work in finding new applications for wood pulp. The funding you received from NRCan, $1.2 million under the investments in forest industry transformation program, is for a scale-up production of a composite material that can be used in auto manufacturing.

Can you share more about how that works? What types of products can you create for cars?

Dr. Mohini Mohan Sain: Thank you for having me here.

The way it works is we use wood pulp and forest residue. We have two different processes. One is a chemical pre-treatment and a laminate pre-treatment, depending on the application, which allows us to reduce the amount of energy we need in order for us to produce nanofibres from wood pulp. Normally this is an energy-intensive process because of the pre-treatment it uses.

The second thing is, once you have these, the most challenging area of the technology that we have developed is how to disperse these very small nano-scale fibres, such as recycled polyamides, into recycled plastics material that is coming from some of the disposal sources. Polyamides are a high-temperature polymer for the automotive industry; normally, what will happen is that this kind of material, like biofibre, usually tends to burn. However, because of our pre-treatment process, we found an extraordinary improvement in the heat-resistant property of these nanofibres. Also, our institute's defibration process is a very surplus-energy-based process, which allows it to be dispersed very uniformly in one single state and makes the product a high-performance one, comparable to glass fibres.

That's how this material is being made, and these compounds are now valid to use for applications like EV batteries, battery casings and battery packs.

Mr. Maninder Sidhu: Do you have any estimates on how this technology and the products you create can help reduce GHG emissions?

Dr. Mohini Mohan Sain: Definitely. There are three aspects.

The first one is that the automotive industry is mostly using metals, and in most cases they are very high-density composites. By doing this, we can reduce the weight of the parts by about 50%. That keeps about 10 metric tons of vehicle parts [*Inaudible—Editor*] lifetime. If you look at 50,000 vehicles for a single time it will be about 50 times five metric tons, which can give only a single part. We are expecting about 20% replacement in the next seven to eight years' time, so that would be a significant impact for the transportation industry.

The second thing is, because it is replacing fibreglass and plastics, there is an additional greenhouse gas reduction from those particular industries' emissions.

The third important component is that it is storing biofibre in the car and it's recyclable, so therefore we have a carbon storage value as well.

Those are three aspects we can get out of it.

Mr. Maninder Sidhu: That's great to hear.

Following the completion of the new production facilities, what's next for your technology?

Do you see other opportunities to expand?

Dr. Mohini Mohan Sain: We are looking at smart material right now.

We have a carbon technology where we are generating our next product, which is a self-generating power-based mask, which means that if you cough, it will turn it automatically to energy and that energy can be transferred and give you sensing. This is a unique product known as a nanogenerator. This kind of product is because the fuel biomass carbon can be transformed in a catalytic way to a nanostarter. We can generate power just from sound or from some sort of vibration.

These are some of the examples.

We are also advancing our technology towards giving applications in the area of smart packaging and also bioprinting. Bioprinting is a scaffold. Nanocellulose and this biomass will be used for in situ scaffolding for remote sensing of our present system.

Those are the three new technologies we are looking forward to.

I think biomanufacturing will be the base and the fundamentals of the next generation of the forest production industry.

● (1230)

Mr. Maninder Sidhu: Thank you.

The Chair: Thank you, Mr. Sidhu. I'll have to stop it there.

Mr. Simard, you have two and a half minutes.

[*Translation*]

Mr. Mario Simard (Jonquière, BQ): Thank you, Mr. Chair.

I'm sorry I was unable to be here earlier.

Mr. Paradis, last summer, I had a very educational experience. I was present for a woodcut that took place in a private forest. I was told that you have to be a passionate person to get into this business, since you can only harvest a forest after about 70 years. There were discussions on this subject with the main representatives of the forest producers' unions, Mr. Daniel Fillion and Mr. Pierre-Maurice Gagnon, to name but a few. I was told that it might be interesting to set up an income averaging system for forestry operations. In this way, logging revenues could be divided appropriately.

What's your opinion about this?

Mr. Alain Paradis: Certainly, the industry's wood fibre needs are met to a large extent by fibre from private forests. We now have much less access to the public forest. In the last 10 years, the supply of wood fibre from the public forest has decreased by 10 million cubic metres. So there is a lot of potential in the private forest.

In terms of income averaging projects, the industry must have access to this wood. Mechanisms or benchmarks need to be put in place to ensure a stable supply for forest producers. These are things that need to be looked at.

Mr. Mario Simard: During your presentation, you emphasized the interminable conflict we have with the United States. I have also had discussions in recent months with people at Resolved Forest Products. They told me that one of the main causes of irritation was access to cash. Throughout the entire period of the conflict, because of the way the government's cash access program works, you had to be almost technically bankrupt to be able to benefit from it.

Have you encountered the same kind of problem yourself?

Mr. Alain Paradis: Yes, absolutely. The last two years have been disastrous for our companies. If the market doesn't allow us to have enough revenue to cover our production costs, there's a problem. The production costs are not so much related to production as to the purchase of the fibre, which is now very expensive.

We do indeed need support to get through the low cycle periods that are due to the markets. Otherwise—

[*English*]

The Chair: My apologies, but I'm going to have to stop you there, Mr. Paradis.

Mr. Cannings, it's over to you for two and a half minutes.

[*Translation*]

Mr. Mario Simard: Thank you, Mr. Paradis.

[*English*]

Mr. Richard Cannings: I'm going to turn back to Dr. Kurz.

Thank you again for highlighting the value of long-lived wood products, like engineered wood and mass timber construction. I have a private member's bill that I started in the last Parliament. It's now in the Senate and will be coming back this way. It promotes the use of wood, especially mass timber construction, simply by highlighting those greenhouse gas sequestration benefits you mentioned.

Whenever I promote this online or anywhere, I get push-back from my friends in the cement sector, who say that cement is better than wood because it's longer-lived, and they claim that the forest industry doesn't take into account all the negative emissions from harvest through a life-cycle analysis. I wondered how you would answer that criticism. Does your model take into account the life cycle, the full emissions involved in harvesting wood and the life of that wood, and how does that compare to cement?

● (1235)

Dr. Werner Kurz: Thank you for the question.

I'm very familiar with the study that you are referring to. It does indeed include a number of assumptions and errors that are incorrect.

Our model does track the carbon and the impacts of harvesting, including the impacts on dead organic matter pools in the litter, on the forest floor and in the soil, as well as in harvested wood products. There are limitations to the spacial resolution of the kinds of models that we use to apply to all of Canada. We're currently working on that, to go to much higher spacial resolution and spatially explicit approaches. The specific concern that the industry has expressed is with regard to inadequate regeneration on roads and landings, and they have shown examples of that. This is clearly something that we need to address, but we have also already done analysis of the potential impact of that, and it is much smaller than what is suggested by the report.

Having said that, it is clear that the cement industry will also undertake efforts to improve its carbon footprint. As all sectors evolve towards more competitive greenhouse gas strategies, the substitution benefits and displacement factors that we use in our models need to improve over time as the other sectors become more competitive as well. These are areas of ongoing research, but it's incorrect to claim that we're not accounting for these various issues.

The Chair: Thank you, Dr. Kurz. Thank you, Mr. Cannings.

It's over to you, Mr. Patzer, for five minutes.

Mr. Jeremy Patzer (Cypress Hills—Grasslands, CPC): Thank you very much.

Mr. Kurz, I'm going to stay with you.

Earlier you said that the Scandinavians have better data on climate change and their managed forests. Why is their data better than ours?

Dr. Werner Kurz: It's a simple question of population density. If you look at the size of Scandinavian countries and their population density, they have roads to just about anywhere and you can pretty much access any piece of boreal forest in Scandinavia relatively easily. In Canada, in contrast, we have huge expenses for using helicopters to approach and measure plots that are in distant locations.

It's simply a question of population density and the resources available to do these kinds of inventories. One reason we invest heavily and continue to explore ways to improve our remote sensing satellite based approaches is so we can use data over larger geographic areas with finer spatial resolution to conduct these kinds of analyses and demonstrate how Canada's forest management is sustainable, what the impacts of climate change are and how fast forests recover from harvesting and wildfires, etc.

Mr. Jeremy Patzer: Thank you.

You mentioned 200 megatonnes for forest fires. In your slide deck, it says that's from 2017 and 2018. Do you have a year-by-year set of data that would tell us what the national number is? In your report, that was just from British Columbia, too. Am I correct?

Dr. Werner Kurz: Yes. It was just in the context of this particular slide that I used to highlight the impacts of the fires of 2017 and 2018.

Our system, which I described earlier, calculates the emissions from wildfires from 1990 onward on an annual basis for all of the managed forest broken down by region in the country.

The Canadian Forest Service also maintains estimates of area burned in the north for which we don't have as good emissions estimates, but we're working on that. We also have estimates of area burned further back into the 1950s. The further back you go, the poorer the quality of data. Of course, there were no satellites at that time.

All in all, I will say that yes, we have the tools and the technology to provide estimates and we are reporting these annually in the scientific literature, in the greenhouse gas inventories and in the "State of Canada's Forests" report that are all available publicly online.

Mr. Jeremy Patzer: Thank you for that.

We got a report earlier. I think it was when Beth MacNeil was here. We had 223 million hectares of managed forest land in Canada. It's reported that Canada's managed forests sequester 220 tonnes of carbon per hectare. When I did that math on that, it's 49 billion tonnes of sequestered carbon per year.

When we're discussing carbon sinks and we're discussing what our emissions are, with numbers like that, I'm just wondering...I think you said earlier our footprint was somewhere around 14....

If we're sequestering on our managed forest land per year 49 billion—so, gigatonnes—I'm just wondering....

● (1240)

Dr. Werner Kurz: I think there's a profound misunderstanding.

First of all, I believe that our assistant deputy minister was referring to carbon stocks, not the annual flux. The fact that the average carbon content of forest ecosystems in Canada is around 220 tonnes of carbon per hectare means that this carbon has accumulated in some cases over thousands of years in the forest soil and over hundreds of years in the plant biomass.

What matters here is not how much carbon is stored. It's how much revenue...how much carbon is removed from the atmosphere. I think this is the fundamental problem that so many people misunderstand. When we talk about net negative emissions, we talk about how the annual rate of removal from the land sector must exceed the emissions from all other sectors combined.

It's not how much carbon is stored in the forest. It's the rate of removal of CO2 from the atmosphere that's the indicator that we must quantify and better understand. We also must understand how we can manage our forest to increase that sink.

Mr. Jeremy Patzer: Thank you for clarifying that. I was just running those numbers and wondering where that was all lining up.

Do you have a dataset on the yearly number that is scrubbed from the atmosphere that you could table with this committee?

Dr. Werner Kurz: Yes. It is published in the annual "The State of Canada's Forests" report. It is published in the national greenhouse gas inventory that Environment Canada compiles and reports. The forest sector data, since 2016 on an annual basis and for the period 1990 to the reporting year, are all publicly available on the Internet. Just google NIR 2020 and you will get the numbers, or google "state of Canada's forests report 2018". The 2020 report will be available shortly, if it's not already online.

The Chair: Thank you, Mr. Kurz, and thank you, Mr. Patzer.

Mr. Jeremy Patzer: Thank you.

The Chair: Ms. Jones, you are up for five minutes.

This will be the last round of questions.

Ms. Yvonne Jones: Thank you very much, Mr. Chair.

Good morning to all of our guests.

I have to say this is probably one of the most interesting panels we've had since the forestry study started, because it speaks about innovation and the tremendous research and testing that's happening in the industry sector within Canada. I especially want to thank Mr. Kurz for his presentation and for the research that he's done through Natural Resources as a scientist in this country. I think many of us are, or at least I am, hearing a lot of information for the first time, and I'm excited about it.

Companies in Canada are really innovating in the forest sector, not just in new product development, but also in environmental conservation and all of the other measures that go with that.

We're a committee that's doing a study. This study will make recommendations to the Government of Canada and future governments about how forestry should be managed in this country, not only in terms of management, but also in terms of the programs that fit best, support the industry and allow it to continue to grow and innovate.

That would be my question this morning. What are your recommendations to us as a committee going forward on what you see as being the most helpful and useful in the work you're doing in Canada right now?

Dr. Werner Kurz: Is this question directed to me?

Ms. Yvonne Jones: It's directed to the full panel, but if you want to take a shot at it first, go ahead.

Dr. Werner Kurz: First, thank you for commenting on the work that we're doing. I appreciate that, and I'm sure my colleagues do too.

I'm not here to give particular advice about what government should or should not do, except for one thing. That is to please rely on the scientific facts when you make your decisions on what is climate effective for a sector recovery. We have the tools. We can deploy these tools.

We're working with provinces, territories, multiple states in the U.S., European countries and other countries around the world to deploy these Canadian tools to do these kinds of analyses. The technology is there. The science is there. If you want to make science-based policy decisions, build them on these tools.

● (1245)

Dr. Mohini Mohan Sain: I'd like to comment on that last question.

In my opinion, we see fragmented efforts when we are looking at bioenergy and at some of the value-added products. Then you have mass timber. I think mass timber is definitely going to make a significant part of our economic recovery. At the same time, I think if you do the life-cycle analysis, you will get the type of mitigation of CO2 that you are looking for.

Having said that, CO2 is everywhere. Therefore, trapping CO2 and using it in a way that is appealing to the forest industry would be one of the groundbreaking technologies.

I would like to propose to the government to promote a concept of biorefinery. For anybody who is doing pallets or something similar, the government can probably look at that investment to transform it in the local region, in the northern part, wherever the forests are intensive or there's biomass, and how that compares to a total conversion system, where we're not throwing CO2 away.

If we are really generating CO2, we have to trap it, purify it, and then put it back as a chemical or as a value-added product. I think if the investment goes in that direction, there will be very good effects.

The second thing is a carbon credit. It is difficult for industry to compete with the existing phytochemical, plastics and chemical industries. Therefore, it needs anything to start with to give it revenue generation to grow. I think we need to look at some sort of credit. A carbon credit would be one way to go about it.

Give the innovation a chance; otherwise, these innovations will go outside the country and it won't help. This is what Finland and Scandinavia are doing. We have to do it better. We have to do it more effectively and be more targeted. That is my view.

Thank you.

The Chair: Thanks, Ms. Jones.

Unfortunately, I'm going to have to stop it there, because we have to suspend and then go into committee business.

Thank you to all our witnesses. A number of our members have said this has been a very informative and very interesting meeting and that is because of you, so please accept our gratitude. Also, please accept our apologies because we don't have enough time to go on as long as we would love to do, but we are very grateful for your taking the time to be here.

Mr. Kazemeini, you have your hand up I see.

Mr. Sam Kazemeini (President, ERS Fuels Inc.): If I may, I would like to take just two minutes of your time.

I just want to indicate that following Dr. Kurz mentioning the use of diseased woods and all the discarded fibre from forestry, ERS Fuels' solution is on that matter. We do not use virgin wood or anything else. All we use is discarded wood and discarded fibre that comes from any source of forestry.

That's all. Thank you.

The Chair: Great, thank you for that.

Okay, ladies and gentlemen, we'll suspend.

You all have the link to go into our next segment, which is in camera. I will see you momentarily.

Again, thank you to all our witnesses.

Mr. Sam Kazemeini: Thank you. Have a great day.

The Chair: You too.

[*Proceedings continue in camera*]