HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

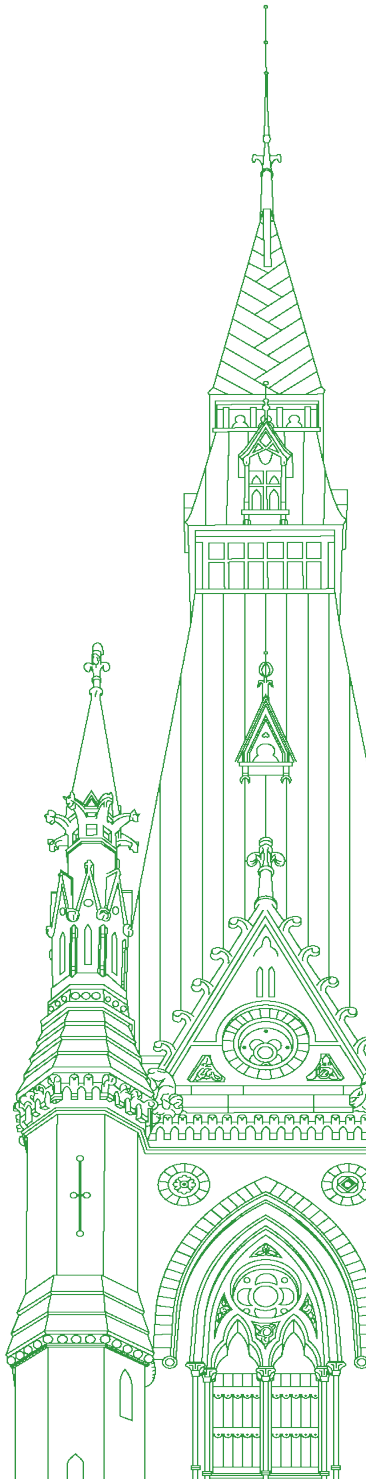
44th PARLIAMENT, 1st SESSION

Standing Committee on Science and Research

EVIDENCE

NUMBER 097

Tuesday, September 24, 2024



Chair: Ms. Valerie Bradford

Standing Committee on Science and Research

Tuesday, September 24, 2024

● (1550)

[*English*]

The Chair (Ms. Valerie Bradford (Kitchener South—Hespeler, Lib.)): I call the meeting to order.

Welcome to meeting number 97 of the House of Commons Standing Committee on Science and Research.

Today's meeting is taking place in a hybrid format, and all witnesses have completed the required connection tests in advance of this meeting.

I would like to remind all members of the following points.

Please wait until I recognize you by name before speaking, and all comments should be addressed through the chair.

Members, please raise your hand if you wish to speak, whether participating in person or via Zoom. The clerk and I will manage the speaking order as best we can.

For those participating by video conference, click on the microphone icon to activate your mic, and please mute yourself when you are not speaking. Regarding interpretation for those on Zoom, you have the choice at the bottom of your screen of floor, English or French.

Thank you all for your co-operation.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Thursday, May 23, 2024, the committee is resuming its study of innovation, science and research in recycling plastics.

It's now my pleasure to welcome, as individuals, Dr. Myra Hird, a professor from Queen's University, and Ziya Tong, a science broadcaster who is appearing by video conference.

Also appearing by video conference, from Sustane Technologies Inc., we have Peter Vinall, president and chief executive officer, and Robert Richardson, co-founder and chief financial officer.

Up to five minutes is given for opening remarks, after which we will proceed with rounds of questions.

Dr. Hird, I invite you to make an opening statement of up to five minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Madam Chair, I have a point of order.

I would like to raise a point of order concerning a request I made on June 18 for answers to my written question from our study on the subject before us today.

My question was put to Dany Drouin, the director general of the plastics and waste management directorate at Environment and Climate Change Canada.

Madam Chair, that was three months ago, and we still have not received a response. As you can understand, I am frustrated by having to ask the committee again for an answer to a question I asked a while ago. This is completely unacceptable, in my opinion, and it shows the lack of transparency of this government, which is unable to follow up on a simple matter after three months.

I did not table a motion to that effect today. I am simply reminding the government, through the committee, that we want co-operation, along with transparency and answers to our questions. I am asking this one simple thing today as we begin our meeting.

I do not want to take up any more time. However, I hope that we will finally get straight answers once and for all to our questions. It's also out of respect for the members of the committee. We take time to do research and prepare. Unfortunately, it is clear that we get no co-operation from the government when we ask simple questions.

I would ask that you, Madam Chair, and the clerk take measures to get an answer to my simple question. Here is my question.

I just wanted to know who will be managing the mandatory federal plastics registry. It's a simple question. We're looking for a simple answer.

Thank you.

[*English*]

The Chair: We'll suspend for a moment.

MP Blanchette-Joncas, that's not a point of order, but I will ask the clerk to follow up on it.

I apologize to our witness. Let me start the timer again for you. We're sorry for that disruption.

Go ahead, please.

● (1555)

Dr. Myra Hird (Professor, Queen's University, As an Individual): Thank you very much for this privilege. I'm very honoured to be here.

I have three basic recommendations for this committee.

The first one is that we need to turn off the tap. Canada's plastic problem is only going to be resolved if we produce fewer plastics. As the metaphor goes, if you go into your bathroom and the bathtub is overflowing, you want to turn off the tap. We've spent over 20 years now debating how good the towels are that we're using to mop up the water. We've deliberated on how much money we should be spending on the towels, etc., and "towels" means recycling. We need to stop doing that. We need to reorient at federal, provincial and municipal levels on reducing the production of plastics.

The second thing we need to do is reject the delay, distraction and derailment tactics that the fossil fuel and plastics industries are using to get us to continue to focus on recycling and distract us from the reduction of plastics, which is the only thing that is going to have a significant and meaningful impact on our environment and human health.

The third thing we need to do is lead the world in plastics production reduction. I noticed that just yesterday, the United States indicated they are going to move forward, depending on which government we see in the next election, on real initiatives to reduce plastics production by the plastics and fossil fuel industries. I firmly believe that Canada can absolutely lead the way in plastics reduction through a whole lot of different foci on reduction, reuse and refurbishment, etc. We have plenty of examples in our country and we need to draw on these examples. We need to draw on the plastics ban in the European Union and in countries such as France and Germany. As a leading oil and plastics producer globally, we need to also lead globally in plastics reduction.

Thank you.

The Chair: Thank you very much. That was lovely and brief.

We will now turn to our second witness.

Ms. Tong, the floor is yours for an opening statement of up to five minutes.

Ms. Ziya Tong (Science Broadcaster, As an Individual): Thank you.

Honourable members of the standing committee, thank you for the opportunity to speak today on the topic of innovation, science and research in recycling plastics.

I'd like to begin by asking a crucial question: Can we really solve the plastics crisis with recycling? Based on the research I've come across, the answer is a resounding no.

Today, we produce over 400 million tonnes of plastic each year—much of it single use—and only 9% of it gets recycled. This is not sustainable.

Even worse, the recycling process itself is contributing to the problem. A single recycling plant can produce three million pounds of microplastics annually, and that is with filtration. Researchers have estimated that it would be 6.5 million pounds without filtration. Scale that up to every recycling plant in the country worldwide, and you begin to get a sense of the enormity of the problem. These microplastics don't just disappear; they enter the air, our waterways, food systems and eventually our bodies.

Emerging research reveals troubling findings when it comes to the human health impacts of microplastics. They have been found in human organs, such as the brain and heart and even the placenta. A recent study suggests that microplastic levels in brain tissue may be rising, with significant concerns about their link to neurodegenerative diseases, such as Alzheimer's and dementia. Another study on cardiovascular health linked plastic particles in carotid artery plaques to a nearly fivefold increase in patient heart attacks, strokes and even death.

While more research is needed to understand microplastics' long-term effects, it's already clear that high-burden plastic exposure in occupational settings is detrimental to human health, and workers in those fields have elevated rates of breast, lung, brain and bladder cancers.

Studies have also shown threats to waste pickers and workers in plastic recycling plants. Plastics e-waste workers in Thailand were found to have doses of a highly toxic fire retardant in their blood that was 40 times higher than that of workers in a nearby farm. Another study in Kenya looked at eggs harvested near plastic recycling centres and "found that an adult eating a single egg from [such a site] could be exposed to a dose of toxic chemicals that would exceed the EU daily safety limit for more than 250 days."

Beyond the health risks, our current recycling systems are also inefficient. In mechanical plastic recycling, up to 30% of the material is lost in the process. The sheer variety of plastics and the chemical additives used also make recycling extremely complex, and because the substances are proprietary and because there is a lack of corporate transparency, we often don't know what those toxic chemical cocktails are made of. When it comes to the misnomer of "advanced recycling", like pyrolysis, it not only fails to solve the problem but also introduces new ones, including higher greenhouse gas emissions and, a key issue of concern, toxic and hazardous by-products. As you likely saw in the headlines yesterday, the State of California is currently suing Exxon for deceiving the public about the merits of mechanical plastic recycling and advanced recycling as legitimate solutions to the crisis.

Given these challenges, we must rethink our approach to the plastic pollution crisis in Canada. In my written brief, I proposed two key solutions that go beyond recycling.

First, promote innovation in home compostable plastics. We should invest in R and D to create alternatives that biodegrade without leaving behind harmful, toxic microplastics. Some Canadian companies are leading the way in producing home compostable plastics from waste materials, but they currently face competition from conventional plastics manufacturers and at times are conflated with problematic bioplastics manufacturers. Supporting the development of home-compostable, non-petroleum-based plastics with R and D and with subsidies could position Canada as a leader in environmental sustainability.

Second, critically, we must encourage a culture of reuse. Rather than relying on a flawed recycling system, we must build a new system that prioritizes reuse over disposability. Here, Canada Post could play a crucial role. With its extensive national network and logistics network, it could be transformed into a hub for distributing reusable, zero-waste goods. It would be like bringing back the milkman, who used to bring refillable glass bottles right to our doors, except scaled up. This would not only reduce waste but also help revitalize Canada Post, which has been struggling in today's competitive delivery market.

In closing, the plastics crisis is not something we can simply recycle our way out of. As there is no panacea, we must take a multipronged approach to change our societal habits. With the right investments in home compostable plastics and a shift toward an infrastructure and network for reuse, Canada can lead the way in solving one of the most pressing environmental challenges of our time.

Thank you.

● (1600)

The Chair: Thank you for that.

We'll now turn to Mr. Vinall and Mr. Richardson. I invite you, between the two of you, to make a statement of up to five minutes.

Mr. Peter Vinall (President and Chief Executive Officer, Sustane Technologies Inc.): Thank you.

Good afternoon, Madam Chair and honourable members of the committee.

My name is Peter Vinall. I am the president of Sustane Technologies. I'm joined by Robert Richardson, co-founder and chief financial officer. We very much appreciate the opportunity to talk to you today about Sustane and how we're positioned.

I listened to the two previous speakers, and I would say that I'm in 80% agreement: We can reduce consumption, absolutely. There's a lot we can do to reduce consumption. It's a huge problem that we're facing with plastics.

We can also improve recycling. I wouldn't agree 100% with the second speaker on chemical recycling, but I'll get to that in a minute.

We're a Canadian clean-tech company founded in 2014. We're on a mission to really improve waste circularity as much as possible and to have a global impact.

We've heard the number of 9% for actual recycled plastic. That's a number we use as well. We have to change it. Conventional recycling is broken. Millions and millions of tonnes of waste plastic are thrown away in Canada, and many more around the world, ending up in landfills or the environment, threatening the health of our species and our quality of life.

However, certain plastics are critical for use in society for health, agriculture and maintaining our quality of life. Biodegradable alternatives are being developed, but not fast enough. More progress needs to be made on all fronts. That's where our Sustane-able solution comes in.

At Sustane, we're focused on improving waste circularity by repurposing single-use and end-of-life plastics that would otherwise end up in the landfills back into feedstocks for plastics. We're not about burning plastics and we're not about making fuels: We're about making feedstocks and manufacturing new plastics or existing plastics, but from plastics instead of fossil sources. Through our proprietary mechanized process, we can recycle up to 90% of landfill-destined waste back into plastic feedstock and negative-carbon biogenic products, replacing the current high-carbon processes.

To give you a sense of scale, Sustane's plant in Chester, Nova Scotia, can process the waste of 150,000 people, reducing greenhouse gas emissions by over 200,000 tonnes per year. In Nova Scotia, in addition to municipal solid waste and rejected plastic from recycling plants that don't work very well, we process plastics from the federal Department of Fisheries' ghost gear cleanup as well as their end-of-life navigation buoys. We turn that into plastic feedstock of the highest quality, with negligible impact on the environment.

We recently signed an agreement with Wetaskiwin county in Alberta to build a facility there, which will be focused not just on municipal solid waste and end-of-life plastics but also on agricultural plastics waste. We have a memorandum of understanding with Washington state as well and are planning our expansion into the U.S.

Madam Chair and committee members, we believe that industry needs to be responsible in the use of plastics, but the government must also recognize that for many processes, plastics are the only economically viable material in the immediate future. In the longer term, miracles might happen, but right now we're facing a crisis, and we need to do something.

Plastic contamination of our precious oceans is a growing concern. While it's true that here in Canada we have processes to prevent this, we currently allow the exportation of our waste plastic to developing countries that do allow large volumes of our waste plastic to enter the oceans. If we're serious about being a leader in protecting our oceans, which we should be, we should take responsibility for our waste. We now have a made-in-Canada solution for plastics, so the federal government should ban the export of this plastics waste and support developing companies, such as Sustane, that are leading the circular economy with innovations that can be exported.

Thanks again.

I'd like to turn it over to Robert, who is going to talk a bit about our journey as we transition from technology developer to commercialization and about some of the challenges we face.

Thanks, Robert.

● (1605)

Mr. Robert Richardson (Co-Founder and Chief Financial Officer, Sustane Technologies Inc.): Thank you, Peter.

Good afternoon to you, Madam Chair and honourable members of this committee.

I want to share with the committee Sustane's experience in interacting with the federal government as a Canadian start-up.

It's imperative that we have the research and development work that's being done by companies such as Sustane. Sustane has had direct interaction with SDTC, ISED, the strategic innovation fund, BDC, BDC Capital, ACOA and EDC, to name but a few.

Since COVID-19, there has been a desert of investors for start-ups like Sustane. The recent increase in the inclusion rate for taxable capital gains from 50% to 67% is a disincentive for investors, making it more difficult to raise capital in 2024. Less than 7%—or only $4 million—of the $60 million that Sustane has invested is federal grants or investment tax credits. Fully 73%—or $44 million—is equity and shareholder loans.

Why is there only $4 million in federal grants and tax credits?

When dealing with the federal agencies and funds, we were told that Sustane didn't qualify because it was too early in the process or too late in the process, or too large an investment, and then, ultimately, too small an investment. Generally, we were considered to be too small. I'll give you an example.

Minister Champagne visited Sustane's plant in April 2022 and introduced us to a senior bureaucrat who advised that Sustane needed to offset one million tonnes of greenhouse gas annually to qualify for a 25% capital refund. A Sustane plant—

The Chair: I'm sorry. I've allowed you to go about half a minute over. You might get a chance to expand further in the questions.

Thank you.

Mr. Robert Richardson: Thank you.

The Chair: Now we will proceed to our first hour of questions.

We'll begin with MP Kitchen for six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Madam Chair, I have a point of clarification.

Are we going for a full hour on this panel and a full hour on the next panel?

The Chair: Yes.

Mr. Lloyd Longfield: Okay. Great.

What time did we start?

The Chair: We started the meeting at 3:50.

Mr. Lloyd Longfield: Okay, so we'll go until 5:50.

The Chair: That's correct. Thank you.

MP Kitchen, the floor is yours.

Mr. Robert Kitchen (Souris—Moose Mountain, CPC): Thank you, Madam Chair.

I want to thank all the witnesses for being with us today, in person and virtually. I greatly appreciate that. I also want to thank them for the presentations they provided us. They helped in some aspects.

Ms. Tong, I got yours only about an hour ago, but I had a chance to read it. It was nice to see that you were able to comment on a lot of what you included within your document.

I'll going to bounce all over the place.

Dr. Hird, I'm going to start with you. In the book you wrote, you talked about four waste hierarchy positions: reduce, reuse, recycle and disposal. A lot of this is what we've heard about the circular pattern when we're talking about plastics and how we deal with them.

My question to you is why you didn't put in re-educate, as in re-educate Canadians. As a professor in environmental studies who educates students at Queen's University, you do that, but that is a huge challenge that we as Canadians need to overcome. To Ms. Tong's point, as Canadians, we could be the leader in dealing with recycling in just one aspect of that circular pattern.

My question to you is on the issue of re-education. Why are we not focusing at least part of that? Instead of there being just those four points, why are there not five?

I see so many Canadians who walk around and throw out plastic. I brought a lid from the soup we get. For those who can see it, it's from downstairs. It says on here it is compostable, which is good and nice to see, but Canadians throw it out. They throw cigarette butts all over the place. They throw garbage and whatever all over the place, and it just scatters. Whether it's a plastic straw.... There's just so much waste.

Why are we not focusing on that re-education?

● (1610)

Dr. Myra Hird: Thank you very much for that question.

My answer would be that the education we've had thus far about waste, since the fossil fuel industry created the recycling logo back in the 1970s, has been largely funded by the oil and plastic industries. The narrative that we have raised our children on, and that we may have been raised with—I was certainly raised with this—is one whereby it is the consumers' fault and the consumers' responsibility, and if we can just get enough people to sort their waste properly, we will significantly reduce our waste problem.

I have obviously devoted my life to education, so I very strongly believe that at this point in Canada, we don't need more education about technologies and recycling as much as we need education about the producers of plastic. We are not going to solve this problem without reducing the production of plastics. We really want to educate Canadians.

As someone who is lucky enough to get regular invitations to community groups all over Canada, I regularly respond to Canadians' questions. I will say I have seen a real change in the last 10 to 15 years. Canadians are no longer talking about what they need to do to recycle better; they're talking about why the government isn't reining in the fossil fuel and plastic industries. That's the education.

Mr. Robert Kitchen: I appreciate that, and I appreciate the comments. It is not just about educating Canadians. It's about educating industry as well on those aspects.

Mr. Vinall, I appreciate your presentation and the chart you provided to us to look at the different aspects of processing.

You commented on the issue of funding and talked a bit about how.... I see, from an article from the Government of Canada, that the federal government gave money to your organization. You talked about things from a financial point of view.

I'm wondering, for example, about investment tax credits. Are those aspects that you've been in discussion with the government about, in terms of providing avenues whereby the industry takes the first step and invests the money? In so doing, does it then get the tax credit based on how it invests, so it's the business that puts this forward?

I'm wondering about your comments on that.

Mr. Peter Vinall: I'll start, and I think Robert would appreciate an opportunity, as well.

We have received some provincial tax credits, which were appreciated. The quantum, of course, can always be larger at the federal level. No, there hasn't been any tax incentive.

Robert, you may want to comment further.

● (1615)

Mr. Robert Richardson: Sure.

I was saying—before I ran out of time, apparently—that Mr. Champagne visited our plant in 2022 and indicated we should speak with his office. We spoke with his office. They were looking for the offset of one million tonnes of greenhouse gas. Our plant only does 200,000 tonnes a year. We could do five plants. That would be $240 million. You would get a 25% rebate, or $60 million, in this case.

It's out there, but my point is that you'd need to be a massive company to access most of this.

The Canada Growth Fund was also looking to promote more on the plastic—

The Chair: I'm sorry. Maybe you can save that for another time. I gave you another 30 seconds.

Now we will turn to MP Diab for six minutes.

Ms. Lena Metlege Diab (Halifax West, Lib.): Thanks, Madam Chair.

Let me continue with Sustane Technologies.

Welcome.

That's a Nova Scotia company. I'm a Halifax West MP, so I know all the good things you're doing in Nova Scotia as you specialize in turning waste into recycled materials.

Let me ask a question about ACOA, the Atlantic Canada Opportunities Agency.

I think that recently there was some money from ACOA that allowed you to do certain things. I'm wondering, from a local perspective, what that has allowed. How has that enabled you to work in the Halifax regional municipality and other parts of the province?

Mr. Peter Vinall: It was fundamental money that enabled us to complete the final stages of our plastic re-forming process to make it very high quality. It was focused on making a high-quality end product that is 100% suitable for plastic production. It was a very successful project. There was $1 million, or $950,000, I believe. There was a 50% contribution from ACOA to do that. It enabled us to receive a long-term contract from a petrochemical group that will feed it into their process to make plastic and replace fossil.

For us, it was a huge step. It validated our quality and enabled us to move forward and get to a long-term offtake arrangement, which we have done.

Mr. Robert Richardson: Could I add to that?

Ms. Lena Metlege Diab: Yes. Go ahead, Mr. Richardson.

Mr. Robert Richardson: That would be great.

When ACOA is funding, they ask that we match it. We would have matched on that $950,000. It's a loan, but it doesn't have any interest, and it's a seven-year payback, so it's a good setup.

There are more generous programs that we're not able to access. I'll give you an example. In 2023, a member of Parliament explained that 60% of the funding for the strategic innovation fund went to one province. The disproportionate funding that happens in the marketplace is a problem for Atlantic Canada. We haven't had a very good audience the number of times we've been in Ottawa looking to access some of the programs there. Often, they're sized for much larger companies. There would be a minimum investment. Most recently, PSP took over management of the Canada Growth Fund. It has a $75-million minimum investment.

I highlight that this is an issue.

Ms. Lena Metlege Diab: I appreciate hearing that. Coming from Atlantic Canada, I understand that quite well.

What recommendations could you make for us that we should be looking at when it comes to Atlantic Canada?

Mr. Robert Richardson: ACOA is a good example of an organization that's on the ground. It has been there for 25 years, doing a good job, and is aware of what's going on. The typical maximum loan it would give is $3 million, and that number has not been changed for about 20 years.

The reality is that there's been a lot of inflation, especially in these last four years. In order to do the R and D work.... As I noted earlier, we have 73% of the $60 million from shareholders. It's very expensive to do, and it would be nice to have more support from the federal government in our region, for sure.

Ms. Lena Metlege Diab: That's fabulous. I couldn't agree with you more. I think that's a good point.

Can you tell me about your involvement with other municipalities in Nova Scotia? I think you also touched upon other parts of the country, and even Washington.

● (1620)

Mr. Peter Vinall: That's a great question.

We have our plant in Chester, which is about an hour outside of Halifax. It's a small community, but it has a landfill. Our goal is to eventually eliminate that landfill. It's a goal that's shared with the municipality. However, that landfill brings in waste from the whole southern part of Nova Scotia and the Annapolis Valley. All of those municipalities are actively engaged with us in the supply of material. We also work with HRM, the Halifax regional municipality. The large recycling plant in Bayer's Lake is one of our feedstocks.

One of the earlier speakers spoke about microplastics. It's true that somewhere around 30%—for a very good recycling plant—has to go to the landfill. It creates microplastic. We take that material and we chemically convert it into feedstock with negligible impact on the environment.

Ms. Lena Metlege Diab: Thank you for that.

Can you speak to your international co-operation with plastic manufacturers to use synthetic naphtha as an alternative to fossil fuel?

Mr. Peter Vinall: That's another great question.

We find that the Europeans are a bit ahead of us generally in waste management. I would say they're at least five years ahead in terms of processing. We don't agree with incineration, which happens in Europe more and more, separating waste into a biogenic fraction and a plastic fraction, which is what we do. We're not just turning plastic into diesel and naphtha. We do a separation of garbage into a biogenic fraction that we turn into renewable natural gas, which has a far lower carbon footprint and actually a large negative footprint compared to allowing it to decompose in a landfill anaerobically.

Internationally, what we've found is that the Europeans are pulling this material into their system. Right now, we are shipping product to Europe and we're shipping product to the U.S. There are no conversion facilities in Canada that are suitable. We hope that will happen at some point, but right now, our product is going into the U.S. and to Europe.

Ms. Lena Metlege Diab: Thank you very much for that.

The Chair: Thank you.

We'll now turn to MP Blanchette-Joncas.

You have the floor for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I would like to thank the witnesses who are joining us for today's study.

My first question is for Ms. Tong.

Thank you for being here, for your opening remarks and for the brief you submitted to the committee. I want to hear from you specifically on what you mentioned about using biodegradable plastics as a solution. I would like to compare what you said with what we heard from other witnesses during our last study, particularly the people from Réseau Environnement and Éco Entreprises Québec. They told us that using biodegradable or compostable plastics causes a number of problems in the recycling system.

Specifically, they said that most composting facilities in Quebec and across the country cannot process compostable packaging and that it ends up in the garbage. Even worse, it could enter the recycling system, where it will actually contaminate plastic bales and, later on, post-consumer resins. They also told us that some bioplastics could spend 428 days in a natural environment without breaking down in the least.

They then added that companies were imposing penalties to encourage people to use other materials, as is done for PVC. They also indirectly pointed out that so-called biodegradable plastic is not really biodegradable. We are seeing that more and more small pieces of plastic, or microplastics, are ending up in the environment and in the human body.

I'm trying to understand all this. You're advocating for the use of biodegradable plastics, and they're opposed to it. Is that science-based? What are your sources for using biodegradable plastics as a concrete alternative to address the plastics recycling problem?

[*English*]

Ms. Ziya Tong: Thank you, honourable member, for your great question.

I want to be clear that I actually made a very clear distinction in my written brief. Industrially compostable bioplastics, which are what you're referencing, and which I completely agree with, are highly problematic. They stay in the environment and degrade into microplastics. What I'm suggesting is that there are other technologies, which leading companies in Canada are developing right now, and they are not only industrially compostable but also home compostable. That means there's a difference. That means they're using waste products, but you don't require an industrial composting facility, which is incredibly rare. It is not available in any of the main cities, actually, in Canada.

With the home compostable bioplastics, what ends up happening is this: Let's say that you're making agricultural mulch, for example, to take care of your vegetables, and let's say that you have a spoon. If you put that in your backyard, it would disappear into water, biomass and CO2 in about 12 weeks. That's a very different technology from what we're talking about with traditional bioplastics.

The problem in Canada is that there's often confusion when we mix these two types of companies together. The people who are actually doing the innovative work are suffering because their work is being conflated with traditional bioplastics. I agree with you, and I agree with the previous witnesses you spoke to, that they are problematic.

I hope that clarifies it, but again, it's written in my brief.

● (1625)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you for your clarifications, Ms. Tong.

From what I understand, this is a new method. To your knowledge, have other countries followed suit and adopted the type of approach you are recommending?

[*English*]

Ms. Ziya Tong: Absolutely.

I am a science broadcaster, as you know, and I just finished doing a film on this topic. For one of our television programs we are featuring companies—I don't know if you want me to name them by name—here in Canada that are already producing these types of biodegradable, non-petroleum-based, home-compostable plastics. I'm sorry that I have to be so clear about it, because that's exactly what they are.

As somebody who has studied innovation in this area for 17 years, to be specific, and who has looked at the capacities of recycling for a long time, I used to have hope, but I simply do not believe in recycling today because of the issue, again, of hazardous toxins and chemicals. You cannot recycle away the hazardous toxins and chemicals.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Tong, thank you for your commitment. I look forward to your report.

What I wanted to know is whether other countries have adopted the suggestion you are putting forward today.

[*English*]

Ms. Ziya Tong: If you are talking about the home-compostable bioplastics again, as far as I know, to be honest, we are leading the way in that. Canada is actually a leading innovator. We have two companies that I am aware of that are leading in this space. However, there are other natural ways to make plastics that are biodegradable and home compostable. Algal bioplastics, for example, is one. The ones that I am aware of, just to be clear, do not require industrial composting facilities.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Tong, I want to make sure I understand, but I'm a bit confused.

You are talking about a new technology, but what I want to know is whether it has already been used and whether scientific studies show that it is effective.

I'll repeat my question: To your knowledge, as a television reporter, have other countries already implemented this type of system for biodegradable plastic use? You're talking about home composting, not industrial.

[*English*]

Ms. Ziya Tong: Yes. For example, there's PHA, which is one example, but there's another example. If you think about surgery and sutures, quite often we have plastics in our bodies when we're sewn together, and they biodegrade, and those are absolutely fine. There have been other forms of plastic, but they might be a lot more expensive and not competitive in that manner. The ones that I am aware of are in Canada and are developing waste by-product bioplastics that are non-compostable.

I hope I'm understanding your question correctly.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Tong, I wanted to know which countries, but, if I understand correctly, you don't know.

Thank you very much.

[*English*]

The Chair: Thank you—

Ms. Ziya Tong: There are other countries. China would be a country that is producing PHA, and there are other countries producing PHA. What I'm actually talking about is not PHA—

The Chair: I'm sorry. Maybe you'll get a chance to make your point with someone else. Thank you.

Welcome to our committee today, MP Blaney. We're happy to have you with us. You have the floor for six minutes.

Ms. Rachel Blaney (North Island—Powell River, NDP): Thank you very much, Chair.

This is a very interesting topic to come and visit and to hear about.

If I could talk with you first, Dr. Hird—through the chair, of course—I heard very clearly from both of the first witnesses that recycling is not working. Only 9% is recycled, and when it's recycled, the outcome is not positive.

From the Government of Canada, what kinds of policies need to be put in place to start addressing this reduction? What do you think needs to happen for us to start to move forward as a country?

Dr. Myra Hird: Thank you very much for that question.

Since all the other witnesses have said it, I also submitted a brief in which I addressed that.

In my brief, I talk about the tiered effect. I think we need to have more regulations at the federal level and certainly more policies at the provincial level that municipalities can then use to bolster their systems.

The federal government has attempted a definition of plastics as toxic. We know we're in a legal battle with the plastics and chemical industries about that. We need to keep pressing with reduction regulations.

Again, countries like France, Germany and the European Union.... I'll give you an example. Just in March 2024, the European Union introduced a number of regulations that will force companies to redesign packaging. When we're talking about plastics, the biggest category of plastics is packaging. It's a low-hanging fruit that we can be addressing. The EU has introduced regulations around how much distance there can be between packaging on tanker ships that are moving all of these goods around the planet. It's looking at packaging and how much content can be plastic. It's looking at alternatives.

We can draw from individual countries like France, which is getting companies to substitute reusable products for single-use and short-use plastics.

We have enough examples of reduction and reuse. We need to really be pushing through right to repair, which will, again, decrease waste.

There are many issues with recycling. We've touched on only a couple of them here, but we can 100% address pollution and the human health effects of plastics by reducing the production of plastics. It's not about the consumption of plastics; if they are not there in the first place, we won't be consuming them. I don't mean that we need to get rid of surgery or anything like that, but we don't need all of the plastics in packaging and so on that we see at Walmart, Canadian Tire and Costco, etc. We don't need all of that.

There are regulations and policies we have that we need to push, and we need to look at the United States, France and the European Union, which have already introduced them.

● (1630)

Ms. Rachel Blaney: Thank you so much.

Ms. Tong, I'm going to come to you next.

I have a bit of a passion myself for microplastics. I'm working on a bill that talks about removing styrofoam—I'll use the word people are used to—from the ocean, because a lot of docks and whatnot are made with that. If there's bad weather and anything happens, all of that's out in the ocean. We know it is causing such destruction to the wildlife in the ocean. It's very concerning to me.

I'm wondering if you could talk a little more—and I think you've done a good job so far—about why microplastics and this discussion are so important.

Where are there scientific or technological advancements that would help mitigate or reduce the microplastic waste and emissions?

Ms. Ziya Tong: I outlined in my brief some of the health hazards in what's happening with microplastics and human health. We're even finding microplastics in the placenta, so our babies are currently being born pre-polluted, which is frightening in itself.

There was a large study done by The New England Journal of Medicine that looked at nearly 300 people and found that individuals with plaque in their carotid arteries with microplastics inside of it were at a much greater risk for heart attack, stroke or even death.

A recent preprint article that I also mentioned in my brief looks at microplastic in the human brain. In 12 of the selected samples they studied, those individuals had Alzheimer's or dementia, and they had 10 times more microplastics in their brain samples than healthy individuals. It is absolutely shocking.

What we must engage in is a system of reuse. We're all used to this. We were actually trained by the plastics companies in the 1950s to live in this disposable culture, which I don't think is very polarizing. I think we all agree that creating a lot of plastic waste and garbage is not a good thing, so engaging in a system of reuse is absolutely critical. I outlined a way in which we can scale a reuse system in the brief, and I think that's fundamental.

I very much agree with the first witness, who suggested that it's so obvious and it's just common sense. We have to turn off the tap. Nothing else makes sense.

I'm so deeply troubled by this idea that we can recycle our way out of it, because plastics are not infinitely recyclable. They are not a renewable resource. You're taking a toxic chemical cocktail and producing more of these toxins, and then you're releasing them into the air, into the water and into our bodies, inevitably. In some senses, it is actually better to bury it in the landfill so that we don't end up creating more fuel and more greenhouse gases and releasing more toxins into the environment, not only into the animals but also into our unborn children.

● (1635)

The Chair: Thank you. That's our time.

We'll start our second round now, with MP Lobb for five minutes.

Mr. Ben Lobb (Huron—Bruce, CPC): Thank you, Madam Chair.

I'm thinking of the old days when you just threw it in the recycling bin and thought it actually got recycled. Those must be the old days, I guess.

I want to ask Ms. Hird a question.

It raised my ear when you said that an oil company designed the recycling logo. I always thought it was just an innocent university student at the University of Southern California.

Are you telling me that an oil company designed this?

Dr. Myra Hird: It was an oil company—Enercor—that funded that competition to, again, focus our attention at the individual level and make individuals and families feel responsible for our national and global pollution problem. It was extremely effective. It's a very popular logo. They have pumped millions of dollars into getting ordinary Canadians and ordinary people around the world to think that it's our fault and that we're simply not taking enough responsibility—that if we take individual responsibility, we will get rid of the problem.

Mr. Ben Lobb: I always thought the dotted line was from a cardboard container company that sponsored it, but we are not here to debate the logo anyway.

My area is a rural area. Usually in June, and maybe July or August, we have the baler twine. Then in certain times of the year, we have the white plastic bale wrap that they use to preserve wet bales or bales they would be using for silage.

On something like that, does the community say, “Look, there is no other way to do this, so we have to be realistic”? What's the opinion of the community on that?

Dr. Myra Hird: It's interesting that you give this example.

Before the wildfires, I was invited by the mayor of Jasper to talk to the township of Jasper and its surrounds. I ended up spending quite a lot of time with farmers who asked me that exact question. They are very concerned about the bale plastic they use—that white plastic. They don't know what to do about it. They informally—I won't repeat it—told me how they deal with that plastic.

I agree with you. There is so much low-hanging fruit when it comes to single-use and short-lived plastics. Let's deal with those first. Let's get some success stories with that.

I've also been invited by surgeons to look at surgical practices. They're very concerned about all the plastics in surgical theatres and hospitals—

Mr. Ben Lobb: I have limited time.

Dr. Myra Hird: Yes, I'm sorry.

Mr. Ben Lobb: You made a good point about “low-hanging fruit”.

I think there was a study from Dalhousie University a few years ago that looked at who the biggies are—the big wasters or big producers. Coca-Cola—we all like to drink a Coke every once in a while, but hopefully not too often—and Pepsi are on the bad list.

There are bottles and there are cans. Why don't they just make it all cans?

Dr. Myra Hird: Well, Coca-Cola is interesting. They used to use returnable bottles, which are better than cans and plastic bottles. Cans require resource extraction for the metals, and they contain plastic as well.

The better option is to have returnable glass bottles, which we used to have back in the old days. I'm that old. There was a consortium of beverage companies that got together and launched a huge re-education campaign to force through—against major public backlash and protest in the United States, in particular—plastic bottles, because they could get more profit. They're lighter, so the transportation costs from fuel are less.

● (1640)

Mr. Ben Lobb: I have one last question. I know I must have at least two or three minutes, or almost.

There's been a debate in this country, in Parliament and everywhere else, on plastics for food and food preservation. A family goes and buys a cucumber and a head of lettuce or cabbage or whatever, and it has plastic protection. We know it extends....

Is that one that we're going to put into the bale wrap scenario, where it's better to have food preserved for a few more days, or are we saying we have to take that plastic off right away?

Dr. Myra Hird: It's an excellent question. It has a kind of long answer.

Let me do the literal low-hanging fruit. We don't need to put plastic around bananas and oranges. We do currently, but we don't need to. They already have this brilliant natural covering that protects them. If we want a sort of literal low-hanging fruit, let's deal with that.

There actually are a lot of alternatives to wrapping all our food in this, but we also need to think about the food system and why consumers are sort of forced into the situation of buying that—

I'm sorry—

The Chair: Maybe somebody else can continue along that line. Thank you. That's interesting.

We'll now turn to MP Chen for five minutes.

Mr. Shaun Chen (Scarborough North, Lib.): Thank you very much, Madam Chair.

Thank you to all our witnesses.

My question is for Ms. Tong.

You have mentioned home-compostable plastics and made the distinction that you support biodegradable non-petroleum-based home compostable plastics.

When I look at some of the literature and research out there, it does point to findings that home compostable plastics don't always work, but this is where your distinction is quite important. What do you suggest to a regular Canadian out there who wants to make sure that their home-compostable plastics are in fact biodegradable and non-petroleum-based, given what you have pointed out in terms of the need for standards and more regulation, as well as the existence of loopholes in this area?

Ms. Ziya Tong: Thank you very much for your question.

I think you're absolutely right. Basically, I think, we don't have Canadians who have any sort of identification system to be able to tell the difference right now between industrially compostable, home-compostable and regular traditional plastics. That's why people for the most part are messing up some of the recycling streams: They're throwing products that are industrially compostable into recycling streams. It's not working, because you can't recycle them in the same way.

I think what we need to do is to support the Canadian companies that are developing the non-petroleum-based home-compostable plastics. Support their R and D and offer them some subsidies so they can actually lead in this arena and start producing those products and make them more available. They are currently available in Canada, but again, they're often wrongly conflated with regular bioplastics or conventional plastics.

Yes, I agree with you. There needs to be an identification system so that people know. It might be just on the product itself: “Hi. You can put this literally with your worms in the backyard and it will biodegrade into biomass.”

Mr. Shaun Chen: Ms. Tong, you worked on a documentary, *Plastic People*, which looked at the impact of microplastics on human health. It's quite frightening to hear some of the testimony, including yours today, that talks about microplastics entering our food, our waterways, our air and, ultimately, the human body.

You, in your documentary, tested your own home, from my understanding, for microplastics. Can you share with us what you found?

Ms. Ziya Tong: Sure.

Very unglamourously, I had to test my own stool and my own blood. Doing that on the big screen was not fun, I will tell you that, but I will say that I tested my own blood and I did have a microplastic burden there. I tested my own stool and found microplastics there. The microplastics were in my dust. The microplastics were coming out of my frying pan. The microplastics were just about everywhere.

That should not necessarily be too surprising. If you think about just drinking out of your average plastic water bottle, you'll be consuming a quarter-million microplastics every single time you do that, right? There are microplastics everywhere. They are leaching out of the plastics. Even something that looks solid, something that hasn't been shredded in the recycling process, can actually have a lot of microplastics. Your tea bags—those plastic tea bags—when you pour boiling water on them, release 11.6 billion microplastics into your system. That can be detected in blood tests.

● (1645)

Mr. Shaun Chen: That's incredible to hear.

Can I ask you what you have done about your desk and your frying pan and if you drink tea? What have you done, given that you've been able to do this in your own home and realize the extraordinary amount of microplastics that exist in the home environment?

Ms. Ziya Tong: On the very small scale, I've removed my chopping board, my plastic chopping board, but the much more important work that I get to do is to have the ability and the opportunity to speak in front of you and to speak before the delegates at the plastics treaty, because this really is something that needs system-level change and policy changes. Leaving this to the individual is not going to make that much of a difference, because we're trapped.

I had the opportunity to travel to the Philippines, and I saw that a lot of people there have no choice but to use the plastic products that they have in front of them. A lot of times, it's cheaper to buy those smaller plastic packages.

At the same time, I had a chance to travel to Rwanda, a leading country, a leading light, in the plastics treaty. When they go to the supermarket, those things aren't wrapped in plastics, so if Rwanda can do it, Canada can certainly do it as well.

The Chair: Thank you. That's all for your time.

I will now turn to MP Blanchette-Joncas for two and a half minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: I'm going to direct my questions to Ms. Hird.

Ms. Hird, I took the time to analyze your work. I congratulate you on your commitment and your work in favour of the environment and scientific progress.

I would like to address the issue of recycling, which we are discussing today. In your work, you say that solving some problems can cause other ones. It recalls what we were told last week about the solution for biodegradable plastics, which leads to contamination problems involving recycled plastics and problems with biodegradability.

I would like you to tell us about the potential problems associated with innovations in plastic recycling.

Dr. Myra Hird: Unfortunately, I will have to answer you in English. I'm sorry, but I'm not comfortable enough in French.

[*English*]

Thank you very much for the question.

There has been a massive promise with recycling, but the reality of recycling is very different.

The first thing is that there is a low-value limit. Plastics are actually not very valuable, so when we go through all of the environmental costs and energy used to recycle plastic, you usually get only one more use out of it, and then it will go to disposal.

It also requires virgin resin. Mechanical recycling doesn't make the plastic particularly recyclable. As I said in my brief, fossil fuel companies and plastics companies are very highly vertically integrated, which means that they're often the same. Fossil fuel companies are using plastics recycling as a way of furthering production of fossil fuels. When we recycle, we increase the use of fossil fuels, and this is true globally. There is so much research that very clearly demonstrates this.

We also have to remember that when we send something to disposal—and the person who was testifying previously mentioned this—we're maybe going down the highway a short distance, but when we're recycling, we may be going to facilities that are hundreds or thousands of kilometres away—

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Hird, I have to move on, because time is running out.

Will producing more oil naturally lead to producing more plastic, yes or no?

[*English*]

The Chair: Give a very short answer, please.

Dr. Myra Hird: Producing more plastic will mean that we're producing more oil, more fossil fuels.

Thank you.

The Chair: Now we'll turn to MP Blaney for two and a half minutes.

Ms. Rachel Blaney: Thank you, Chair.

I'm going to come back to you again, Dr. Hird.

I really appreciated what you said about how much plastic is used in things that we purchase.

Do you think that one of the rules or legislation that Canada should have is limiting that kind of usage? I have literally unpackaged things and have just gone through layers and layers of plastic, for what cause? I don't know, except for somebody who really likes to use plastic.

I'm wondering if that is one of the steps that could be taken.

● (1650)

Dr. Myra Hird: Absolutely. As I mentioned before, packaging represents the largest consumer contact with plastics, so it's something that we need to really tackle, and we can tackle it. We have alternatives. Most packaging isn't actually to protect the product; it's to advertise the product.

When the packaging companies use all of this packaging, they say that it's to protect, but actually research clearly demonstrates that the packaging itself is meant to advertise the product, which means that if we do away with the notion that this is here to protect the product, that changes our approach to packaging. There are many examples of how we can absolutely redesign packaging to minimize it and, in a number of cases, actually get rid of it. That would already do a lot to reduce plastics.

However, again, that's not at the consumer level. That's at the product production level. That's what we need to be targeting—not consumers who want the product and get the packaging, and then are made responsible for it, and then we have to pay taxes for a company to come to take it away: What we need to be doing is focusing on the producers.

Ms. Rachel Blaney: I agree with you. I think it's important, because I agree that a lot of the ideas of recycling have been downloaded onto everyday people. I think that's leading to a sense of frustration, because they want to see the change. Of course, individually, we can do so little compared to what we could do if we had legislation that was meaningful and actually dealt with some of these issues.

I find that when I buy groceries, if anything is in plastic, I take it out, because the plastic makes it go bad faster, actually. It doesn't protect it.

In terms of innovation, are you seeing anything that can fill in some of these gaps around packaging, as opposed to continuing the packaging in plastic?

Dr. Myra Hird: Oh, yes. I work with.... Oh, I'm at time?

The Chair: Yes. Give just a quick answer.

Dr. Myra Hird: Yes, there are certainly alternatives. I'm working with a restaurant right now, for instance, that is using alternatives to all of their food packaging. It's Ms. Bāo restaurant in Kingston, Ontario.

Yes, there are certainly alternatives.

The Chair: Thank you to all of the witnesses—Dr. Myra Hird, Ziya Tong, Peter Vinall and Robert Richardson—for your testimonies and submissions and participation in our study of innovation, science, and research in recycling plastics. Please see the clerk if you have any questions. You may also submit additional information through the clerk.

We'll suspend briefly now to allow for the next witnesses. We'll resume with our second panel.

● (1650)

(Pause)

● (1700)

The Chair: We have a hard stop at 6 p.m., so we are going to try to get the testimony in. I'll try to keep it tight on the time.

It's now my pleasure to welcome, from the Chemistry Industry Association of Canada, Christa Seaman, vice-president, plastics division, and Peter Mirtchev, policy manager, plastics division.

From Competitive Green Technologies, we have Atul Bali, chief executive officer.

From the University of Guelph, we have Dr. Amar Mohanty, professor and distinguished research excellence chair in sustainable materials and director of the BDDC, the Bioproducts Discovery and Development Centre—you must have a very large business card—and Dr. Manjusri Misra, professor and tier 1 Canada research chair in sustainable biocomposites.

Up to five minutes will be given to each of you for opening remarks. For the University of Guelph, that'll be for the two of you, as you have more than one witness, and then we'll proceed with the rounds of questions.

Ms. Seaman and Dr. Mirtchev, the floor is yours for an opening statement of up to five minutes.

Ms. Christa Seaman (Vice President, Plastics Division, Chemistry Industry Association of Canada): Thank you, Madam Chair and committee members.

Our industry, all levels of government and all Canadians want to build a circular economy for plastics. Doing so will require more than the existing regulations and bans. It will require billions of dollars of private capital investment. There's an urgent need for the Government of Canada to establish conditions whereby that investment can flow into, rather than out of, Canada.

In 2022, the Canadian chemistry and plastics industry produced 108 billion dollars' worth of products, with exports tallying $68 billion. By 2030, it is projected that as much as $11 billion of valuable plastics will end up in our landfills annually. A circular economy will allow us to recover this valuable resource, strengthening our economy and our export potential while keeping plastics out of the landfills and out of the environment. Furthermore, by using our plastic resources efficiently, substantial greenhouse gas reductions can be realized, thus supporting Canada's net-zero goals.

However, these benefits can only be realized if we recognize the value remaining in plastic products when we are finished using them.

As a starting point, we recommend establishing federally and provincially harmonized policies that support industry's principles for designing for circularity. Furthermore, aligning with our largest trading partners will allow Canada to capitalize on our competitive advantage of lower-carbon feedstocks, lower-carbon electricity and our innovative mindset. We will also be able to promote economies of scale, letting Canadians enjoy the products they need without risking access or being priced out of the market.

Although Canada has started on this transition, there is still much to do.

To achieve Canada's circular economy, it's estimated that $6.5 billion of capital investment is needed to expand existing recycling capacity, but this goes beyond investing in more of the same. Investment in innovation is going to play a key role in expanding the applications of recycled plastics. For example, improvements in tracking, sorting and cleaning technologies will allow cleaner feedstocks to be processed, providing higher-quality recycled plastics. From a recycling technology perspective, for those materials where mechanical recycling is challenging—like construction materials, textiles and durables—advanced recycling is a solution. In fact, we have multiple members at the CIAC, such as GreenMantra, Loop Industries, Aduro Clean Technologies and Polystyvert, that are scaling advanced recycling technologies right here in Canada right now.

Beyond recycling, a circular economy embraces using the correct material for the job while minimizing the impacts of that material's use. Not all plastics or alternatives to plastics are equally suited for a given application. In recognition of this, we recommend the federal government be science-driven and employ a life-cycle approach to assessing materials and their applications as part of their policy process so that we can avoid regrettable substitutions.

There are two other important roles for the federal government in creating conditions for a successful low-carbon circular economy for plastics.

First, the federal government must remain technology-neutral in its policy development and focus on setting ambitious but achievable targets related to plastics circularity. Just like when you use Google Maps, you put in your starting point and your end point, and multiple routes will pop up based on various applications or attributes. Then if you take a wrong turn, it will recalculate and get you back on track. The federal government should be like Google Maps, setting the starting and end points and providing course corrections when needed while industry traverses the various paths between point A and point B.

The second area is to use existing programs and policy development to incentivize and de-risk the private capital investment that's going to be needed to address that infrastructure gap I mentioned earlier.

Perhaps during the questions, I can respond and provide thoughts on what is working and what isn't working with Canada's efforts to establish a circular economy for plastics.

With that, thank you, and I look forward to your questions.

● (1705)

The Chair: Thank you very much.

That was just under the time. That was terrific.

We'll now turn to Mr. Bali, from Competitive Green Technologies, for five minutes.

Mr. Atul Bali (Chief Executive Officer, Competitive Green Technologies): Thank you, Madam Chair.

Thank you, everybody, and good afternoon to you.

I am Atul Bali, the CEO of Competitive Green Technologies out of Leamington, Ontario, the centre of our universe.

It's an honour to present to this very august gathering.

The Canadian Climate Institute estimates that climate change has caused billions of dollars in damages to Canadian households. That is just the tip of the proverbial soon-to-be-extinct iceberg.

The choice of plastics plays a crucial role as part of the effort to adapt to climate change. We need to adopt a science-based, three-pronged approach to address the subject under discussion: one, using plastics with low global warming potential, or GWP; two, reducing end-of-life greenhouse gas emissions of plastics; and three, promoting material circularity, which my colleague here referred to just now, through end-of-life recycling infrastructure.

The last prong, recycling infrastructure, promotes a “make and reuse to remake” kind of a model, be it for organic or non-organic recycling, and promotes sustainable material circularity. This three-pronged approach facilitates the creation of a low-carbon footprint economy in the world of plastics.

For context, let me cite the Consumer Packaging and Labelling Act, CPLA, that was passed in our country in 1970.

Consumers were provided accurate information on the ingredients of a product. The CPLA underwent revisions as science progressed in 2002, 2011, and 2015. Each revision promoted greater transparency for consumers, for us Canadians, helping to make informed decisions about our well-being. Choices made by the consumer in picking one product over the other accelerated industrial-scale innovation. Market forces played out. The time has now come for transparency on plastics and their impact on the environment, and letting market forces decide.

Biocomposite materials technologies have a tremendous impact on the environment and on the choices we make towards living in a better world. The end of life of the incumbent multi-material pod is an example of something very real. To illustrate my point, I'm going to cite a very quintessential and ubiquitous example: the single-serve coffee pods sold across our nation today .

The end of life of the incumbent multi-material pod is incineration or landfill, with 120 tonnes of greenhouse gases being emitted per million pods at the end of life. The equivalent of 42 tonnes of carbon dioxide is the global warming potential per million pods, so at 42 plus 120, there are 162 tonnes per million pods of total carbon emissions. Canadians use 1.5 million single-serve coffee pods a day. It is impossible to recycle such a multi-material structure for a use-and-dispose convenience product containing biomass at the time of disposal. It made it an ideal candidate for a biocomposite compostable resin solution.

We scaled up and commercialized the BDDC's invention to make the world's first certified 100% compostable biocomposite resin-based coffee pod, with zero microplastics at the end of life. We reduced the carbon emissions by 120 tonnes for every million pods, from 162 tonnes down to 42 tonnes. Since the invention, which was commercialized in 2016, we are very proud to say that we in our country have reduced 50,200 tonnes of total carbon emissions so far, with zero microplastics. Every day, 1.2 million pods are made and sold in Canada as we speak, with an enhanced user experience.

How is it achieved? The biocomposite resins have over 90% renewable carbon content, compared to zero for the incumbent material, as measured using the universally accepted carbon-14 dating system. The GWP is 1.41 kilograms versus 3.57 kilograms CO2 equivalent using the internationally acknowledged ISO 14044 standard.

This is the key insight, ladies and gentlemen. Reduce the total carbon emissions in both making the plastic, and at its end of life—and simultaneously increase the biogenic content, the carbon content, for reducing dependence on non-renewable resources.

This Canadian innovation has created employment, with high-skill and high-paying jobs across the entire country, and reduced the country's dependence on non-renewable resources. There are many other examples we can go through in the question-and-answer session, including in the automotive sector.

● (1710)

The point is that the science and the industrial scaling of that science exist right here and now in our great nation.

Parliamentarians must seize the moment and pass the following laws: Make it mandatory for every brand owner to prominently display on their packaging the renewable carbon content of the plastic used and the total carbon emissions of that plastic, citing internationally acknowledged standards, and mandate them to declare the designed end-of-life of that packaging.

The Chair: That's way over our time. Thank you very much.

Now we will turn to the University of Guelph.

You can divide the time between you however you like for five minutes.

Dr. Amar Mohanty (Professor and Distinguished Research Excellence Chair in Sustainable Materials; Director, Bioproducts Discovery and Development Centre, University of Guelph): Thank you, Madam Chair.

Thank you to the entire committee for inviting us.

My name is Amar Mohanty, and I am from the Bioproducts Discovery and Development Centre at the University of Guelph. My colleague, Professor Manjusri Misra, also joins me here. We are pleased to be here and to contribute to your study.

Our remarks will focus on sustainable solutions for plastic waste management.

The focus of our research centre is on sustainable materials development for green manufacturing that supports a circular economy.

What are sustainable plastics? Sustainable plastics are defined as materials manufactured from renewable, recycled or waste feedstock and their combinations. There are two types: biodegradable, compostable materials that can replace single-use plastic for applications where recycling is not possible, and non-biodegradable but reusable and recyclable materials for durable applications, such as automotive and construction applications.

Currently, the world produces around 450 million metric tons of plastic, but production is projected to be doubled to around one billion tonnes by 2050. That is the truth. The global landfills now swell with nine billion tonnes of plastic. That is around one tonne for every person on earth.

It is essential to design and implement end-of-life strategies for all plastics. We know the ultimate goal is to have zero waste, with no plastic being diverted to landfills. The waste of one industry can be the resource of another industry's application. We need a plan on how to get there.

Around 90% of Canada's plastic waste is not recycled or recovered. Today, 50% of the plastic produced is for single-use applications. This is why we believe that action on single-use plastic destined for landfills is critical. When left in the environment or a landfill, plastic does not biodegrade. Instead, it breaks down to smaller parts—including microplastics—that have devastating impacts on the ecosystem. We need alternative solutions. With respect to plastic packaging, we must target to reach 100% reusable, recyclable or compostable single-use plastic options.

For the committee's consideration, we'd like to highlight three key material segments.

The first is packaging with mixed materials that combine plastic, paper and metals, such as single-serve coffee pods, yogourt and ice cream containers.

The second relates to multi-layer films that recycling facilities cannot separate, like a Tetra Pak, or chip and cookie bags.

The third relates to items that are impractical to recycle even though they are mono-material, such as disposable cutlery, straws and takeout containers.

Implementing compostable alternatives in these three areas is a real opportunity to position Canada as a global leader in sustainability. This is a market with global growth potential.

The advantage of biodegradable, compostable plastics is that they break down to water and carbon dioxide without leaving microplastics. They are designed to degrade within a specified period in a particular environment—for example, six months or less in industrial composting, one year in home composting, or less than two years in soil.

As an example of upcycling, we have successfully used recycled plastic and biocarbons in composite materials. We have invented biocarbons that are derived from various wastes, including agri-food, forestry and plastic waste. We then utilized these to manufacture, for the first time in the world, high-performance biocomposites for durable application. The Ford Motor Company has adopted our biocarbon technology to manufacture lightweight headlamp housing. It's lighter by about 20%.

I would like Professor Misra to conclude here.

● (1715)

Dr. Manjusri Misra (Professor and Tier 1 Canada Research Chair in Sustainable Biocomposites, University of Guelph): Thank you, Madam Chair and honourable members.

In conclusion, while Canada faces significant challenges with plastic waste, it has a unique opportunity to contribute to global solutions. Here are our recommendations.

First, invest in waste disposal infrastructure, including industrial composting, across Canada.

Second, build advanced recycling systems, including upcycling and leveraging artificial intelligence.

Third, embrace sustainable materials from recycled plastics, renewables or waste.

Fourth, and finally, have enhanced education and awareness from schools to the general public and policy-makers on the impact of sustainable material in mitigating climate change.

The path forward requires collaboration, innovation, investment, incentives, de-risking and policy support.

Thank you.

The Chair: Thank you.

We will now begin our first round of questions, starting with MP Tochor for six minutes.

Mr. Corey Tochor (Saskatoon—University, CPC): Thank you so much, Chair.

Thank you to our witnesses today.

Ms. Seaman, you brought up Google Maps, which got me thinking about a couple of our other witnesses here today.

Canadians right now are living in a cost-of-living crisis, obviously. The dollar isn't going as far as it did before. Food costs are up. We heard that plastics actually don't keep food better. I was surprised, because some of the studies I've read, like the ones on cucumbers, say it extends life for 10 days.

If you were planning a route and trusting an expert who says you shouldn't use plastic on cucumbers, would that be what I think you called a regrettable decision?

Ms. Christa Seaman: I would like to respond to that by saying when we talk about a regrettable substitution, it can be either in removing plastic from an application where it provides a tangible benefit through food preservation, for example, or through substituting it with a material that actually, when you look at it from a life cycle basis, provides a worse environmental outcome but is perceived to be better.

Mr. Corey Tochor: We've heard that before as well.

I know the U of S is actually working on a faba bean film that could replace plastic, but it's not there yet. Rushing toward something before the replacement is worked out leads to disastrous results. We're seeing this with the plastic straws. The courts have ruled that it's worse for the environment, worse for your health and worse for our economy in Canada, and this government is still fighting that court decision, which is regrettable.

You also mentioned the circular economy. Other witnesses have spoken about that and the importance of it, but what isn't working in the circular economy right now in Canada?

● (1720)

Ms. Christa Seaman: From a circular economy perspective, we're looking to try to go from plastics back into plastics. It doesn't have to be packaging into packaging. One of the areas where we're seeing some conflict, though, is in some of the policies that have been brought forward by Environment and Climate Change Canada.

As an industry, we absolutely support recycled content requirements in products, and we support labelling a recycled package and trying to gain that consumer trust to say that, yes, it is actually being recycled. We know today that we're not there.

The combination of the recycled content minimums regulation and the labelling regulation is going to create a situation in which we are trying to increase the demand for recycled content through the recycled content minimums requirements. However, based on the thresholds that are going to be used to determine whether or not something can use the chasing arrow symbol, nothing—probably not even our pop bottles, which are recycled at 80% to 90% today—will be able to claim the recycling symbol.

Mr. Corey Tochor: Wouldn't that be misleading the Canadian public, then, when there are things that can be recycled that aren't?

Ms. Christa Seaman: It's the threshold. It says that 80% has to be collected and 80% has to be recycled, which is causing that problem, so yes, there is a challenge.

Mr. Corey Tochor: How does building a...? We talked about Canada. I want Canada to become a world leader and superpower in recycling plastic, but how does recycling both lower greenhouse gas emissions and build a stronger economy for Canadians?

Ms. Christa Seaman: When we look at the demand for plastics right now, we know it's going to increase, because of populations moving out of poverty and moving into more material consumables. In Canada, because we have a lower carbon feedstock and we have the innovation mindset, the more plastic we recycle, the less petroleum we're going to have to extract to create to meet that demand. In fact, they're saying that 60% of our demand can be met from recycled plastics.

What we want to be able to do with a circular economy, and for Canada, is that if Canada is able to capitalize on our competitive advantage, we can actually be supplying the globe with recycled content and with recycled plastics, increasing our economy and reducing our footprint, because the energy intensity and the greenhouse gas emissions of mechanical recycling are significantly lower: They're 95% lower than virgin plastic.

Even when you look at some of the more energy-intensive recycling—chemical recycling or advanced recycling—you're getting reductions there as well, sometimes as high as 80%. Sometimes it's only 5% or 10%, but there is still a savings over virgin plastic.

Mr. Corey Tochor: What are some other areas that Canadians might not be thinking about if this government gets their way and bans all plastic in Canada? What is the most horrendous thing that we can't live without if that ban goes forward? I'm thinking of medical communities and hospitals. It's quite tragic what would come from that.

I'm not sure if they're that crazy, but there is concern.

What are some other ones that maybe Canadians aren't realizing would impact their lives if we had a blanket ban?

The Chair: We'll have a short answer, please.

Ms. Christa Seaman: You've already mentioned medical, so I'll say renewable energy. Renewable energy isn't possible without plastics. You don't have your wind turbines. You don't have your solar panels. Really, that's another area, if we want to meet our GHG reduction goals. That's one area that most people don't think of.

The Chair: Thank you.

We're having to shorten this round to five minutes in order for us to be able to finish at six o'clock.

Next is MP Longfield for five minutes.

Mr. Lloyd Longfield: Thank you, Madam Chair.

I'm going to start with the University of Guelph.

Welcome back to this committee—or was it the environment committee? We've done this study in a couple of committees.

The science of plastics is something that I want to touch on, and how the polymer chains can be modified by using bio-inputs, and also nanotechnology, in that the traditional components of plastics could actually change to new components so that they're in a better position to be recycled.

Am I reading the science correctly on that?

● (1725)

Dr. Amar Mohanty: Thank you very much for this question.

There are two things. Number one, changing the structure of a plastic is one aspect that lets you increase the recyclability of those types of polymers, but having said that, let's say that you have a biodegradable plastic or a bioplastic. People think that biodegradable plastics or bioplastics are not recyclable, which is not true scientifically. Just like petroleum plastic, once they recycle, they degrade in their mechanical properties.

Similarly, research has already been done showing that even a biodegradable plastic can be recyclable two to three times and can be reusable. For example, people talk about a biodegradable plastic like PHA, polyhydroxyalkanoate, which is a home-compostable polymer. As long as you do not throw that into the improper environment, it will stay intact. Even a biodegradable plastic, for example, is still intact in the bathrooms of many people after several years.

The second part you are talking about is nanotechnology. Yes, nanotechnology has a big future. Recently, you might be hearing of a scientific advancement. Even microplastics were taken and by microwave treatment were converted to graphene. Graphene is a wonder material. Graphene got a Nobel Prize, and now a bio-graphene is coming up.

Suppose you make nanoplastics. Let's say you take your microplastics and, by scientific innovation, they can become a nano type of structure. Once you take nano structure things and mix them with the plastics, it is considered as an upcycling or upgradation of the plastics. That can give a lot of enhanced properties for structural applications, such as automotive applications and others in which we need a lot of strength and modulus of the final product.

Mr. Lloyd Longfield: Thank you so much.

Dr. Bali, when we talk about the cost of all of this, what has your experience been? Is this costing a lot more?

We heard in our last meeting that bioplastics are cost-prohibitive. In your business, are you finding that the cost to weight is better with bioplastics or worse?

Mr. Atul Bali: Thank you very much for this question.

In our business, we find that there has been a 55% to 65% reduction in the landed cost of what I would call compostable. I don't like the word “bioplastics”. These are compostable-certified resins that can substitute for fossil polymers with absolute apples-to-apples performance application functionality.

This cost reduction—I hate to admit this—has largely come from the capacity increases in Southeast Asia and in the Far East. Today, we are benefiting from that by being able to create the composites in our country using these raw materials to substitute for fossil polymers. They're getting very competitive. There's one bioresin now that is actually lower than the price of polyethylene, which was four times the price only six years ago.

Mr. Lloyd Longfield: Great.

Just for our report, what's the technical label for a bioresin substitute like that?

Mr. Atul Bali: The technical word we use is biocomposite resin. It is certified for zero microplastics. It is certified for compostability at different levels, which could be home, industrial, soil or marine degradation.

Above all, it's certified for food contact, if the application is for food contact, with zero migration from the resin to the food.

Mr. Lloyd Longfield: Thank you.

Investing in this science will help us solve the microplastics problem.

Mr. Atul Bali: Yes, it will, 100%.

The Chair: I'll turn to MP Blanchette-Joncas for five minutes.

● (1730)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

My first questions are for Ms. Seaman.

I am trying to understand your remarks. You suggested that the government should remain technologically neutral.

What do you mean by that?

[*English*]

Ms. Christa Seaman: When we talk about technology-neutral, we mean putting regulations in place that are outcome-based; it's not dictating whether or not only mechanical recycling, only compostables or only advanced recycling can take place.

To be honest, to get to where we need to be, we're going to need all of the solutions in the basket. It's creating the end point, but not defining how we get there or what technology we use to deliver it.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Can you give me some concrete examples of how the government has not remained technologically neutral?

[*English*]

Ms. Christa Seaman: Thank you for the question.

Madam Chair, when we are looking at examples with the proposed recycle—

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Seaman, I would like an example. We don't need the whole list.

Could you give me an example, please?

[*English*]

Ms. Christa Seaman: The recycled content minimums regulation that's proposed right now allows for advanced recycling, but the method by which you calculate the recycled content—what is considered recycled—is not technology-neutral. It is creating a bias that is impacting circularity.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Okay, I understand.

Based on your expertise, when a government invests $34 billion in hydrocarbon development, is that technologically neutral?

[*English*]

Ms. Christa Seaman: Technology neutrality means supporting all forms of technology and not picking winners and losers. Whether it be from a hydrocarbon perspective or a bioresin perspective, we need investment and supports in investment.

[*Translation*]

Mr. Maxime Blanchette-Joncas: From your point of view as a scientist, is it a good thing to invest $34 billion in a pipeline known as Trans Mountain?

[*English*]

Ms. Christa Seaman: I'm sorry. I'm here to speak to plastics. That's my area of expertise.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Okay.

As a representative of the Chemistry Industry Association of Canada, do you suggest technological advances or new technologies to the government in any way?

[*English*]

Ms. Christa Seaman: In fact, you can look to Quebec for some examples of significant technological advancement. Polystyvert is a company recycling polystyrene and doing it at significantly lower greenhouse gas emissions. We have Loop Industries as well—

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Seaman, I am not sure the sense of my question is getting across.

I want to know whether you, as a representative of your association, propose that the government use certain types of technology to the detriment of others or promote other ones?

[*English*]

Ms. Christa Seaman: No. As an industry association, we don't support one technology over another.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Great.

Ms. Seaman, I'm going to quote from a brief that your association submitted to the Standing Committee on Finance in August 2011. Its conclusion was as follows:

> New sources of feedstock such as shale gas promise a once in a generation opportunity for growth. We need to seize this with new investment to create wealth and jobs and strengthen and grow our manufacturing base.

This is the brief you submitted to the Standing Committee on Finance in August 2011.

You mentioned Quebec, and I thank you for that. Since August 2022, Quebec has banned hydrocarbon research and production, including for shale gas, for the first time in 10 years.

I would like you to explain how it is that you told me a few seconds ago that your association makes no recommendations on the development of new technologies.

I just quoted a report that you tabled. The report says the exact opposite and runs completely counter to the will of the Government of Quebec.

I would like to hear your comments on that.

[*English*]

Ms. Christa Seaman: Thank you for your question—

The Chair: Give a very short answer, please.

Ms. Christa Seaman: I was not with the association in 2011. I'm sorry. I cannot respond to that, but I can look into it for you.

● (1735)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Yes. I would appreciate it if you could send me a written answer. That would be good.

Thank you, Ms. Seaman.

[*English*]

The Chair: Thank you.

Now we will have MP Blaney for five minutes, please.

Ms. Rachel Blaney: Thank you so much, Chair, and thank you to all the folks who are here testifying today.

I would like to as well speak to the University of Guelph. I really appreciated your interventions today.

I'm just wondering what the biggest scientific and engineering challenges are in creating biodegradable materials that can compete with traditional plastics in terms of cost, durability and functionality.

Dr. Amar Mohanty: That's an excellent question.

Many people think that biodegradable plastic is more costly than petroleum-based plastic. That is true, but in my opinion, or scientifically, we must consider the end product. Suppose we make a product, and the product is costlier than a petroleum-based product, so nobody is going to take that. That's not going to be accepted by society. In my opening remarks, I told you that currently, in order to support the circular economy, some agro-residues or food waste residues and some of the waste residues can be incorporated into the plastic so that the final cost of the product will be cost competitive and will still be green, and that is accepted.

Whatever research we do in the centre, anything we commercialize today, there is no cost penalty. This is supporting a circular economy, because we are incorporating agro-residues or some food residues into our biodegradable, costly plastic and making the final product cost competitive, and it is going to the market.

One of the biodegradable plastics, as told, has PBAT, which is polybutylene adipate-co-terephthalate. It costs four times more than the petroleum-based plastic. That cost has reduced currently. Why is that happening? There is a demand for biodegradable plastic around the world. For example, if biodegradable materials will be produced on a large scale, you can have cost competitiveness. It's good news that currently growth in biodegradable plastic is about 22.6% versus 5% for non-biodegradable petroleum-based plastics.

Biodegradable plastic is like a small child, while petroleum plastic is like a mature person, so we must take how old that technology is in the current scenario of climate change and the circular economy. There is a big demand for biodegradable plastic going on, so the final cost is going to reduce with the increase in capacity and with the incorporation of innovation by combining some biocomposite materials, taking some residues and putting that inside the bioplastic, making it cost competitive at the end.

That is one answer I can give you.

Ms. Rachel Blaney: Thank you for that.

I heard earlier, from a member's question, this concern that all of a sudden there'll be a piece of legislation and all plastic will be turned off immediately. In the scientific world that you're talking about, is there any concern that this will happen?

Dr. Amar Mohanty: Truly speaking, scientific research tells me that with urbanization and the population explosion, we'll certainly need more plastics. We have to make plastic.

As I said in my opening remarks, current plastic production is 400 million metric tons. It will be one billion metric tons by 2050. It's not whether plastic production will go up; it's how to manage the plastic in this world. That is the biggest issue.

Everybody talks about recycling and the properties degrading, but in another way, we must talk about the final product, as I talked about. Suppose you take recycled plastic, which is a low-value product, incorporate about 20% or 30% of that, and make composite materials by adding some fillers into that. Your final composite will be much higher in cost than even your virgin plastic. That is why this type of innovation is taking place. People are moving in that direction. That is how the world will move on.

Every product has some positive points and negative points, but fundamentally, based on science, plastic production will go on. During the Second World War there was a plastics boom. This was because of the scarcity of natural materials. People had earlier been using natural resources for all their packaging; the Second World War was the mother of invention for plastics. Since then, people have not moved back. It made life so comfortable. The problem that's happening now is around the greenhouse effect and the non-degradability.

Having said that, science is moving in really a tremendous way. Recycling technology is modifying it—

● (1740)

The Chair: Thank you.

Dr. Amar Mohanty: —and upcycling is going on.

The Chair: That's our time.

Dr. Amar Mohanty: Chemical recycling is an another area we're moving in.

The Chair: Thank you.

We will now go to our second round, also shortened by a minute.

MP Viersen, you have four minutes, please.

Mr. Arnold Viersen (Peace River—Westlock, CPC): Thank you, Madam Chair.

I want to thank the witnesses for being here.

Earlier, Mr. Bali, when my colleague from the Bloc mentioned picking technologies rather than goals, you stuck up your hand as though you wanted to respond. I was hoping you could give us an example of one of these, of the government picking a technology rather than an end goal.

Mr. Atul Bali: I think the government should not be technology-neutral. I think the government should base its decisions on science. Science will decide which technologies to choose, based on complete transparency, in terms of only two metrics: What are the greenhouse gas emissions in making that plastic, and what are the end-of-life emissions at the time of disposal of that plastic? Are there any more smart ways in science to deal with both these metrics? There are international standards—they don't have to be reinvented—that can actually speak to this.

I think the government should follow science, and follow science based on internationally acknowledged standards like ISO 14044 or the carbon-14 carbon dating system. These are long-established standards.

That's my view.

Mr. Arnold Viersen: Ms. Seaman, do you want to add anything to that? You were nodding along.

Ms. Christa Seaman: Thank you.

I just want to add that I agree. Technology neutrality goes hand in hand with a life-cycle approach. When you look at the waste hierarchy as well, you should reduce first. Not everything should be plastic, so don't make it plastic, but use a life-cycle approach so that you are using the lowest-impact material for that application. Let science basically drive the technology forward.

Mr. Arnold Viersen: Thank you.

Mr. Bali, I'm just trying to get clear on some of the definitions. Does “bioplastic” mean that it's biodegradable, or does it mean that it comes from, like, a fava bean or a chickpea or some source? That's kind of confusing to me. I've talked to farmers who've told me that their product is being used for bioplastic, which is different from what I was necessarily thinking about.

Mr. Atul Bali: That is a good question, and you're very right. There is a lot of confusion around the terminology.

To be perfectly clear, there are examples of fossil-based plastics—100% fossil-based—that are fully biodegradable, completely compostable. PBAT is one example. On the contrary, there is an example of a completely bio-based plastic that is not going to ever biodegrade, like biopolyethylene made by Braskem, so the word “bioplastic” should be avoided.

Plastic should be categorized into any of two categories. One, are these plastics certified compostable as a composite or as a plastic? This means zero microplastics and complete material circularity going into compost. Two, are they not degradable, meaning that they will pollute the environment unless there is effective recycling and reuse of those plastics?

I think “bioplastics” is terminology that should be avoided. We should call them either “compostable biocomposites” or “non-degradable plastics”.

Mr. Arnold Viersen: We can get methane gas from a whole number of sources, and that doesn't change what methane gas is.

Mr. Atul Bali: That is exactly right. That is such a good analogy.

Mr. Arnold Viersen: Thank you very much.

The Chair: We will now turn to MP Jaczek for four minutes.

Hon. Helena Jaczek (Markham—Stouffville, Lib.): Thank you so much, Madam Chair.

Thank you to all the witnesses for appearing.

Ms. Seaman, in the brief that the Chemistry Industry Association of Canada submitted to our committee, you suggest a recommendation that the federal government incentivize the increase in recycling capacity. After that, you have a whole description of advanced recycling.

At the same time, we've also received a brief from Environmental Defence. What they have said about advanced chemical recycling is that it “is an especially false solution”, that it “creates a new mix of chemicals, not plastic”, that it's “energy intensive and inefficient”, that it “produces toxic substances”, etc.

Could you perhaps respond to that criticism to give your position that advanced recycling is something that the Government of Canada should pursue through incentives?

● (1745)

Ms. Christa Seaman: Think of advanced recycling like LEGO. I have LEGO. I build it into a car. I have different colours of bricks as I'm putting it together.

There are multiple different technologies that will do advanced recycling. Some of them are very energy intensive but are still of lower energy intensity than virgin plastic. What chemical recycling or advanced recycling does is use indirect heat and pressure to break those bricks apart so that you can pile your red bricks, your green bricks and your blue LEGO® blocks together. At the other end, you can then take those bricks and make a flower or a house instead of a car.

While there is a breakdown of the material, we are able to say what materials are being produced, what plastics are being produced, and we manage it the same way we do any of our other chemical manufacturing processes.

Hon. Helena Jaczek: Thank you.

Dr. Bali, do you have any comments on the two sides of what our advice is here?

Mr. Atul Bali: I'm not sure that I have advice. I just have an observation, and I think it's about transparency.

I think there has been so much greenwashing, both in the area of recycling and in the area of biodegradation, that the government needs to step up now and, with science, ask for transparency from every brand owner. There is no reinventing the wheel in this.

If you have a recycled plastics stream, there is a certain amount of energy being used to either mechanically or chemically recycle. There is a certain global warming potential being created. There is a certain amount of GHG being emitted. Talk about it. Publish it. That should decide whether that should really be part of a solution or part of a problem. It really is very simple.

There are two very commonly used standards in Europe. We go to Europe pretty often because the European Union has some very strong regulatory frameworks around this, as you're surely aware. It has the PPWR, for example. There they just talk about two things. They talk about the ISO 14000 standard, specifically the ISO 14044, and they talk about the carbon-14 standard. These are two globally acknowledged ways of identifying the renewable content in any product, any plastic you're putting in the market, and of identifying the global warming potential of it.

To conclude this point, I will just say one thing to you: The automotive sector, in my experience in the last 30-odd years in industry, never asked for the global warming potential of any solution being offered. Now, every automotive company in their RFQ demands that.

The Chair: Now we will have MP Blanchette-Joncas for two minutes, please.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I will continue with the scientific aspect.

Mr. Bali, we need to have this discussion. I think we will agree.

You said that science-based decisions had to be made, and you mentioned one criterion, the increase in greenhouse gases. Earlier, I gave examples of technological neutrality. The government purchased a $34-billion piece of infrastructure, the Trans Mountain pipeline. Through it, we will produce 300,000 barrels a day, and that number will increase to 890,000 barrels. That's a 200% increase. Greenhouse gas emissions will go from 21 million to 26 million tonnes a year. Personally, I have rarely seen environmental activists driving a Hummer. However, I get the impression that this is what the government is trying to make us believe.

As a scientist, do you think it makes sense to increase greenhouse gas emissions from 21 million to 26 million tonnes a year while paying lip service to plastics recycling?

● (1750)

Mr. Atul Bali: You are right, Mr. Blanchette-Joncas, but if I may, I will answer the question in English, even though I understood it in French.

[*English*]

I will say the following to you. The government has made a decision—for whatever good reasons, I'm sure—but to be very clear, has it examined every other science-based alternative solution? If the answer is yes, through proper due diligence based on science and science alone, then yes, it's a good decision. However, if it is not based on science and it hasn't examined the alternatives to give our country global leadership in the area of GHG reduction, it's a poor decision.

Personally—and this is entirely my personal opinion—I lean towards it being a poor decision, but that is my opinion. However, if the decision was made based on good, solid science, using internationally acknowledged standards, that's good.

The Chair: For our final questions, we will go to MP Blaney for two minutes, please.

Ms. Rachel Blaney: Thank you.

I'm going to come back to my new friend, Dr. Mohanty.

I wonder if you could share with the committee some examples of the most promising sustainable materials your team has developed at the Bioproducts Discovery and Development Centre.

How do they differ from traditional materials in their environmental impact?

Dr. Amar Mohanty: Thank you very much for the question.

I already talked about it in my opening remarks, but I want to give one example of how the University of Guelph has made a breakthrough in composite materials, and especially biocomposite materials. We pyrolyzed all the waste coming out, whether municipal solid waste, biomass waste or waste plastics, etc. The first time, we invented the terminology “biocarbon”. Biocarbon is a filler material.

In the automotive industry, for example, most of the parts are black in colour. When an automotive part is made, whether it's the bumper of a car, the seat of a car or the handle of a car, it's all mostly made from polypropylene-based materials mixed with talc or glass fibre. The talc and glass fibre are very energy-intensive and very high density. For example, they're 2.6 grams per centimetre cubed. With our invention of those biocarbons, whose density is one-half that, we converted the waste into the materials and we supported the circular economy and used filler materials.

We invented that technology, and it is now being used as a new biocomposite, biocarbon-based material by the Ford Motor Company in its headlamp housing in the Lincoln model. It is 20% lighter than the talc-filled polypropylene composites, and it is sustainable.

That's one of the innovations we made from waste resources to support the circular economy. That's one example.

The Chair: Unfortunately, that's the end of our time today.

Thank you so much, witnesses. If you have any additional comments you'd like to submit, you can submit them through the clerk.

Before we adjourn today's meeting, this is a reminder that the witness lists for the committee's study of new capstone research funding are due at 5 p.m. on Friday, September 27.

The meeting is adjourned.