Building Back Better by Greening Industry
Roundtable #4 Transcript:
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DIANA FOX CARNEY: Thank you for joining us today. For those of you who've been at our events before, welcome back. For anyone who's joining for the first time today, welcome. The aim of this series is to think creatively about how we can build back better in the face of the pandemic and with the huge amounts of federal money into supporting the economy, how can we get a better outcome out of that for the longer term. So today we're going to be talking about industry and greening industry. We have a fantastic group of people with us today. As usual, we'll hear people's suggestions and we'll have a conversation. We've got slightly fewer panelists today so we're hoping we can answer your questions and get your input. That is a very important reason why we're doing this event so we would encourage you to ask questions in the chat and we will answer them online and we certainly collect them but we also encourage you to send in any thoughts afterwards so that we can develop a proposal together and we put out all our minds to work on this really important topic. So with that I'm going to pass over today to Toby whom you all know who will introduce today's proceedings.

TOBY HEAPS: Thanks Diana and thanks everybody for making time to join today. I just have three brief points. The first one is last week we saw more gathering momentum for green recovery globally with leaders from the economics, labor and business community across the world and in our G7 peer countries coming out strong in support of a green recovery, including 80 business leaders from France who signed on to a letter calling for the green recovery to be at the center of the economic recovery package. So that's one thing. In Canada just yesterday the federal government linked one of its core essential programs as part of the dealing with the pandemic, providing relief to large employers to climate disclosure. So seeing the climate lens be inserted in the central government program occurs well for the thinking that's going on right now in Ottawa. I think that that hasn't been enough to stop some of the more erstwhile commentators in the likes of the National Post from calling out the notion of a green recovery as a dangerous mission creep. I think nothing could be further from the truth when you look at the numbers and let sober analysis be your guide it's clear that a green recovery isn't mission creep, it's mission critical because it's the source of where we're gonna find a lot of our near-term jobs and it's also the source of where we're gonna have the best prospects for growth markets and a more resilient economy.

What we're gonna speak about today on the industry side is more related to the recovery. There's there's a little bit of stimulus potentially in the electrification of light industry which is a big opportunity, something that's already gathering steam and we could accelerate and could be part of a stimulus potentially.As well, there's the longer term play of decarbonizing heavy industry specifically looking at industries that are responsible for huge amounts of carbon like steel and cement and there's an interesting policy mechanism where if you pay those folks with a long lead price for example hundred dollars per ton of reduced emissions, you can really

incent some some scale investments to get not rapid but dramatic carbon reduction over time.Then the last one is boosting the circular economy looking specifically at how do we fix Canada's broken recycling industry by looking what the federal government can do not just with bands or certain types of substances and minimum recycled content, which was under the purview of the federal government, but also using the sort of the pedestal of the federal government and the financial resources of the federal government to create carrots to help to bring and harmonize provinces alongside extended producer responsibility, covering 100 percent of the cost above what is economic for the recyclers. As a reward for provinces that want to play ball on that, providing businesses in those provinces with tax credits to make investments to scale up and consolidate the recycling industry which is a growth market for us and it's been an essential part of the circular economy. So with that I'll pass it back to Diana and thanks everyone for joining today.

DIANA FOX CARNEY: Fantastic Toby, thank you so much. I think what's interesting about this space is that there's obviously been a renewed emphasis on domestic capacity for producing things during the pandemic whether it's producing ventilators or producing personal protective equipment etc. Many people for a long time have felt uncomfortable about the hollowing out of manufacturing in the move to the service economy in advanced countries. I think now they are looking even more specifically at what's happening. I think Canada is well-placed to move forward in this area. Manufacturing accounts for 10% of GDP and that's not including things like construction and the oil and gas industry, that's pure heavy and light manufacturing. It's reasonably small but it has some very advanced companies working. So let me pass over now to Ralph Torire who is our resident analyser of what might happen and he will share these ideas about how we might move forward to create a greener and thriving industrial sector in Canada. Thank you Ralph.

RALPH TORRIE: Thank you Diana, Good day everybody. There's been quite a few people who have been putting their heads together on this, so I just wanted that clear that it's been a collective effort as we have been thinking through these different [...] is the focus of the corporate night's green recovery webinars over the last few weeks. This focus on manufacturing this week is particularly interesting but also particularly challenging. It's interesting as Diana mentioned to see the extent to which industry can quickly pivot when there's an urgent need or a high motivation. We've seen a number of Canadian industries redeploy and refocus their know-how and their production technologies to make the things and provide the services that we need right now to respond to this pandemic. It's somewhat reminiscent of how quickly the Canadian auto industry pivoted to production during World War II and we tend to forget that in a business-as-usual environment just how capable we are of changing when we need to and innovating in response to motivation. That's important I think because things have been put on pause here a little bit and we're all thinking about how we can have the clean production systems that we know we have to move toward if we're going to have a healthier and more sustainable society.

Diana's mentioned some of the numbers about our manufacturing sector in Canada.The heavy industry in particular - sometimes we call them the smokestack industry - steel, cement, paper, industrial chemicals... They totally dominate the energy use and the greenhouse gas emissions from manufacturing in this country. These are the industries that take things like trees and rocks and gravel and turn them into useful materials for other manufacturers to work with and so they very often are using technologies and processes that are very energy-intensive, very often involving high temperatures and furnaces and kilns. They're important industries in this country - the contribution they make to GDP belies how significant they are as cotter pins in our industrial and productive culture. They are the mainstays of employment and economic activity in the communities where they're located and their multiplier and spin-off effects ripple out throughout the economy and throughout the country. So we need to think hard about how they will make this transition to clean production, because it is a gamechanger for them maybe in a way that it's not for other sectors of the economy, because it does go directly to their production technologies and processes. The transition to sustainable production also proceeds on many fronts: dematerialization - things are getting lighter -, the services as substitutes for commodities is becoming a very important trend - we talked about that in the mobility panel -, the need to eliminate toxic byproducts and waste to accelerate recycling. All of these different elements of the move towards a clean production system are operating on many different fronts, and ultimately what we're trying to get to is a production system which emulates the elegance and the circularity of natural systems.

What we're going to focus on today, as Toby has already indicated, are three different elements in this transition. One is these heavy industries themselves - we've grown accustomed to thinking about them as these big primary processors, just being necessarily energy and carbon intensive and maybe necessarily dirty. It's not true - and Chris and I will expand on this - there are a lot of options and a tremendous amount of innovation going on in that primary processing sector right now, which has and must continue to be so important in the Canadian economy. One of our proposals is specifically targeting steel and cement and how we can accelerate the move towards zero-carbon and low-carbon production strategies in those two sectors. With respect to the circular economy and zero-waste elements of a clean production system, here we think the government procurement for example, not only in steel and cement but in general, can be a powerful lever for increasing the circularity of our economy and reducing the waste that it generates. The waste industries have been the fastest-growing segment of the Canadian economy for the past 20 years. I don't know if that's something to be proud of or not, but it's quite phenomenal growing three times faster than the rest of the economy and this is going to be a permanent fixture in the circular economy - the industries that support the recycling of materials. Then finally with respect to the general manufacturing industries, which make a much larger contribution to manufacturing GDP than their energy and emissions might suggest , here again it's important to continue the trends we already see there towards electrification and cleaner energy. That forms the sort of third focus of where we are developing our proposals for the green recovery in the Canadian manufacturing sector. These are all important sources of employment and technological innovation and economic development and in the post-COVID recovery period, it's going to be particularly important that we renew and green our

manufacturing sector. I'm looking forward to the inputs from the other panelists so I'll stop now with those words of introduction.

DIANA FOX CARNEY: Thank you so much Ralph that was a great introduction. I think it will be useful in the discussion to keep those three pieces slightly separate, but then we'll bring them all together in the document. Again, I'd like to reiterate that we have a Q&A panel open so please do type any questions in there. First of all, I'm going to now delve deep into that heavy industry side. I think until recently they would have been called hard-to-abate sectors, steel and cement, they really felt like something we can't do much about in terms of emissions. They both account for about 8 percent of global emissions and use is increasing as urbanization increases. So it's really exciting now that there are technologies and power sources on the table that can make both of those much more carbon efficient, possibly even carbon neutral. In the case of cement I'm told there is a promise of carbon-negative cement with carbon curing technology. Someone who knows a lot about that is Chris Bataille who's an energy economist. He served as a lead author on the Intergovernmental Panel on Climate Change, works at IDDRI and he focuses on heavy industries, so I'd like to bring Chris in now to comment on what Ralph said and perhaps a few more details about how we can make progress in this area.

CHRIS BATAILLE (IPCC, IDDRI): Thank you very much Diana, it's an absolute pleasure to be here today. As some might be aware both cement and steel are two of the most used materials and commodities in the world. Basic civilization as it is is not possible without them. We can probably make do without fossil fuels, in the long run it's gonna be a while. Now as Diana was saying, these have been treated as hard-to-abate sectors for decades since we've been talking about climate change up until up about five years ago, we were shooting at climate targets of -80% and the assumption was that steel and cement would just carry on emitting, though they would always fit under that last 20%. But with the move to 1.5 to 2 C, holding our temperatures 1.5 to 2 C, it means we have to go net zero somewhere between 2050 to 2070 and that means all sectors have to go to zero. Steel and cement are no longer exempt and as are none of the heavy industries. Now the industrialization in these sectors is technically possible. We know at least six ways to completely eliminate emissions in steel and there's a whole sequence series of things that we can do in cement. Some of them are actually quite easy and cheap, getting down to minus 30-40 percent and then we get into deeper more transformative things, including carbon capture and storage for the process emissions, alternative fuels... but eventually as Diane said we need to change the chemistry that were using to make cement an [unintelligible] but that's going to take probably 20, 30, 40 years in order to make that commercial. But in the meantime we have to bring emissions down.

Now, we know how to do this and if anybody out there, you want a 15-45 minute presentation I'll talk all about that at some other time. For the industries as they exist today, industrial decarbonization - one of the reasons they were called hard to abate is that we've made very little progress in the past and it's really risky. These sectors are very low profit margin, they're very competitive, stock turns over really slowly - a steel plant can last 50 to 75 years, these plants can literally last forever with retrofitting and repair -, they're very capital intensive. The

most fundamental problem with both them is that there is no market for low GHG goods. We have one of the cleanest primary steel plants in Canada, in Quebec and they don't get a dollar extra for the steel they sell. There is absolutely no valuation of the varying GHG intensity of steel, cement, chemicals, what have you. That has to change.

So one of the first things we have to do is we've got to start measuring the GHG intensity in these products. They vary wildly - steel, cement and chemicals can vary wildly in terms of their intensity today. We have to start valuing these variations and so we have to come up with internationally agreed methods for doing that. Everyone can put a stamp on their steel and cementum and away we go. Now some R&D is needed but really we know what the technologies are to really drive deep reductions in these sectors. The trick is we've got to get them out of engineers' back laboratories and out of the small lab into a pilot state, up to a sort of small-scale pilot and up to a commercial pilot. Now this whole transition is what's called the valley of death in the innovation industry - it's extremely expensive, extremely risky and companies only do it if they've got some hope of making money back in the long haul. So one of the things we have to do and the reason we have very low-cst wind and solar today is that we created markets for those generation technologies. We had targeted niche markets for solar PV for satellites and on remote locations and then sort of pocketed areas far off the grid and they were paid the value of their service there, So the trick is we've got to create niche markets for green steel and cement that values that contribution. So one other thing - this can be done both from a government point of view and a private sector point of view - the government component value lower GHG steel and cement, put a dynamic falling premium on that and effectively [unintelligible] subsidy. For steel you probably have to put [unintelligible] when you start probably a hundred - two hundred dollars a tonne on top and it's gonna be prorated to the GHG intensity against a benchmark and then you get full subsidy if you're zero, half if you're half of whatever the benchmark is. But those subsidies would not go on forever and they could be calculated, we could budget for them going forward in time and they would fall off as the technology becomes commercial. It's not something that becomes an infinite sink out of our financial resources but what it critically does is lowers risk for steel and cement companies as they make investments going forward. So part of making that commitment is that governments do have to commit to net zero industry.

We develop both demand and circularity policies as Ralph was talking about, we need to get into a conversation with our steel and cement manufacturers right now. If you told them that they have to invest billions in highly risky technology with possibly no return, they're gonna say no, we can't tell our shareholders. You have to get into a conversation with them and tell them yes we're gonna help you with the R&D, we're gonna help you, there will be markets for you when you've got this process done. But for all that help, come 2035 we're gonna require that that new technology becomes the baseline that we operate against. In the long haul, you can only do this sort of subsidization for so long, eventually internal GHG pricing has got to catch up. We've got to put a price on the GHG content of the materials we use and if only some jurisdictions are applying that. You're gonna have to [unintelligible] and put some sort of border protections on there, but that's not for today, that's probably you know 5-10-15 years down the

road. The final problem is that there's a huge already built stock of steel and cement plants out there that are really high GHG intensity. They are partially retrofittable with advanced technologies but some of them simply probably will have to be retired early and that's going to have very large political, economical, and just transition issues attached to it. What do we do with the steel and cement plants that we have to shut down so that we can replace them with fully clean ones going forward. That's a very complicated and serious question. So that's all I wanted to say right now and happy to take questions.

DIANA FOX CARNEY: Thank you, thanks so much Chris. I'd like to call up now the first of our two people: we always try and include [polls] so if you could get that up that would be fantastic, I will come back to the results shortly. [unintelligible] We have people who are experts in both sectors, so first of all I wanted to turn to Kent Stuehmer who is vice president of operations at the Lehigh Hanson Canada. Can you tell us how this feels from your side, what do you think you can contribute to a zero carbon cement sector in the medium term?

KENT STUEHMER (LEHIGH HANSON): First, thank you for the opportunity to share industry perspectives. We're really pleased to see growing attention to the opportunities in our sector. You know as Chris mentioned, concrete is globally after oil the most suited material in the world and cement is a fundamental component of concrete. Its manufacturing counts for five to seven percent of global co2 emissions, as chris noted in his article and just in his comments, there's a ton of opportunities to reduce a emissions on demand, which are technologically and commercially viable today and can be accelerated with relative modest strategic investments done in parallel with smart regulatory policies. For example, banded use of low carbon fuels, alternative fuels as well as low carbon blended cements could reduce the overall carbon intensity of cement by thirty to forty percent, effective more or less immediately. Yes, there are some capital costs, the orders of tens of millions per facility and government programs in addition to carbon pricing can help defray these.

In fact, short-term support for low-carbon investment will be essential to keeping our sector competitive in the face of increasingly stringent climate policy. The major obstacles are actually regulatory. For example in just about every province in Canada it's surprisingly difficult to get permits for [unintelligible] traditional fuel or alternative fuel. It's hard to get government that consumes about fifty percent of all building materials, to buy low carbon products including low carbon cement. Our low carbon transition is going to hinge on a significant degree on government procurement, as has been mentioned. Success in these areas still leaves us far short of our goal of carbon neutrality. Our parent company Heidelberg Cements vision is carbon neutral concrete by 2050 and to do this we are investing heavily in carbon capture technologies. The economics of running a full-scale carbon capture system in Canada are improving with pricing but the capital investment required to build a large-scale CCS system is in the order of 500 million [unintelligible]. A CCS feasibility study is currently underway at [unintelligible] facility. We are aiming to make Canada home to the first carbon neutral cement facility in North America and possibly the world if we move fast enough. It will need hundreds of millions of support to become reality but we believe will be a critical

leap forward in making CCS more accessible to other cement facilities in Canada, the world and other high-emitting sectors. Our Edmonton facility with CCS, low-carbon fuels and low-carbon blended cement produce a carbon negative cement. I think this could be the first to many in our industry. The elephant in the room is what you do with the carbon once captured. Geologic storage, it's only available in certain areas outside of using enhanced oil recovery. Capture doesn't do anything, our storage doesn't do anything to improve the economic drivers for CCS. [unintelligible] will play a keystone role using our carbon capture [unintelligible], looking at life cycles and bringing it back into our system to produce negative aggregates and use again in the production of cement. These are medium to long term technologies that will take time to refine and scale. They can also face the same hurdles in terms of conservative codes and the need to reorient government procurement processes towards early adoption of low-carbon solutions. There are many activities underway to utilize CO2 and we want to expand the list of potential users. Thanks.

DIANA FOX CARNEY: Thank you so much Kent. We have a number of questions coming in which are specifically about cement and about the aggregate and the processes around cement which I think we probably won't be able to answer online now, but we will get to and some of them concern regulation and other things like that. I think you raised the issue of procurement and particularly that the government is a major customer for a lot of your product. Before we get to that and we have just the right person to answer those questions I wanted to switch and move over now to Mark Rowlison who's with the United Steelworkers and chair of Bluegreen Canada to talk a little bit about the steel industry. We have a question in which is about why we wouldn't do more in terms of domestic steel production particularly given the emissions associated with transported steel. So there's a clear advantage to making it at home, which I'm sure you'd agree with. Can you talk about what you think the prospects are for decarbonize steel and what you need to happen for that to take place?

MARK ROWLINSON (BLUE-GREEN CANADA, UNITED STEELWORKERS): Thank you for having me. It's a great pleasure to be here. Let me just first say I think we need to start by at least acknowledging that Canada has not been especially good at promoting the growth of manufacturing over the last number of decades. I've mentioned at the outset that currently manufacturing is about 10% of GDP. That is down from 16% of GDP a mere 20 years ago in 2000. We've seen a similar loss in the number of jobs connected to manufacturing in Canada from about 15% of the total workforce 20 years ago to about 9% today. That doesn't have to be that way. if you compare us to Germany where in fact manufacturing's part of GDP rose by [unintelligible] over a similar time period. However I think one of the things that people have become aware of as a result of the pandemic is that there are limitations to not having a domestic manufacturing facility as Diana mentioned that it has become apparent that how quickly we can spin manufacturing around to manufacture medical equipment and also in Canada, observed [unintelligible] an inability to have a sufficient domestic manufacturing capacity manufacturing medical equipment. So that has at least brought the issue to light and I do think that in the way forward, Canada is actually a place to develop an advanced manufacturing sector, but it will only do so if we have a plan in both government and the private

sector to actually do so. So let me talk a little bit about steel as an example. The Canadian steel industry is amongst the most low-carbon steel industries in the world as Chris mentioned. The Canadian Steel Producer Association has in fact [unintelligible]. We have a couple of advantages, one is we have a relatively low carbon sourced electricity grid in most parts of the country. We also have a substantial component of the Canadian steel industry operates on the basis of electric arc furnaces - just by way of background, there are basically two ways of making steel, one is by melting scrap using electric arc furnace, the other is by making basic steel by combining essentially iron ore and carbon in a blast furnace and a lot of the Canadians steel [unintelligible] use electric arc furnaces.

But going forward we will need to make substantial investments in our steel industry if we're gonna actually be able to decarbonize it. But technology, that I know the steel industry globally is very interested in, is replacing the carbon that is currently sourced from metallurgical coal with hydrogen - and there are already pilot projects in Germany and Sweden that are being built [unintelligible]. What concerns me is that I don't see similar investments being made in Canada and I think the Canadian government needs to actually look seriously at doing everything it can to [unintelligible] because while our steel industry is low-carbon, it's also relatively old. We haven't had a new steel mill built in this country since the late 70s and they can be retrofitted - and they have been retrofitted - but over time, there is concern. If you compare steel to, for example aluminum, I won't talk a great deal about aluminum but just to say - on the aluminum front, we also have by the lowest carbon aluminum industry in the world, again almost entirely due to low carbon electricity in Quebec and British Columbia. You're already seeing in Quebec a Rio Tinto project to develop zero carbon aluminum so we get on the aluminum front [unintelligible] the steel industry in terms of developing a low carbon heavy industry.

So lastly I just want to talk about what are some of the barriers that we face in steel and in aluminum to developing a true low-carbon economy of the future. The first area I just want to identify is that both steel and actually aluminum continue to be plagued by enormous overcapacity in the global market and that global overcapacity largely comes from China - it is an extremely high carbon producer of both steel and aluminum. As Chris mentioned, unless we figure out some way to price carbon emissions into the global price of steel and aluminum, it is gonna continue to not be economic for large steel companies to make investments in a jurisdiction like Canada. The second barrier we face in this phase - I think we need to talk seriously about our domestic stimulus and specifically government procurement- we do not do well when it comes to ensuring that Canadian government procurement, whether that's in bridges or transit all of which use a lot of steel and aluminum, we need to make sure and do everything we can to ensure that those markets are created for domestic steel aluminum using government procurement and that may mean revisiting some of the provisions we have in current trade agreements and some of the provisions in the WTO general agreement or procurement. We need to grow our domestic market and we need to ensure that our domestic market is fairly protected from unfair trading practices as a result of global overcapacity. Looking forward to discussions and questions.

DIANA FOX CARNEY: Thank you so much. Just to report back on that poll we had 73 percent in support, 12 percent disagreed which actually is fairly consistent across some of the polls that we've been doing. I think one of the questions that I see in the panel today is how do we build public support for the type of measures that are being proposed in this series and that's always an issue. I mean those who tune in are obviously generally reasonably well disposed, this it's not a representative audience, but I think one of the issues that we'll get to perhaps in our final webinar in this series is how we take this further, how we can build up that support as Toby mentioned. It's not universal even in the media right now so we have to think carefully about that. I'm going to turn now to the procurement side among other things to Nick Xenos, the executive director of Greening Government at the Treasury Board. He can talk about the role of government as a purchaser and how the government is thinking about greening its own operations.

NICK XENOS (CENTRE FOR GREENING GOVERNMENT, TREASURY BOARD OF CANADA SECRETARIAT): Thank you, I'm listening with all ears to what all our panel members are saying. So the government of Canada has something called the Greening Government strategy, it's got targets to reduce our emissions, reduce our waste, and be resilient to a changing climate in our operations, [unintelligible]. So we also have a policy on the green procurement side [unintelligible] environmental categories or criteria that we are caring about that we want to protect and so lowering carbon emission is obviously how we get to net zero basically in all of our government operations. So lowering carbon emissions, lowering waste, looking at circular economy [unintelligible] the different categories of things we buy. So the Government of Canada is the biggest public buyer in the country and we buy stuff across the country from Ontario to Quebec to Newfoundland to Nunavut to Southern Canada and we buy stuff for buildings or infrastructure for labs, bases etc. so it's a really diversified portfolio.

Obviously we have worked and we want to continue working on [unintelligible] green categories of things we buy and look at developing what is right for [unintelligible] each of those things and so one of the things that we need to do is look at setting mandatory requirements in each of those areas. So we have already started, okay we want to reduce our carbon emissions in government offices and so we've already got many requirements, like new buildings built with government money should be zero carbon in terms of operational then we want to look at embodied CO2, attack that.In terms of our fleet, light duty fleet, 75% of vehicles have to be green what we buy and 100% of our electricity should be zero carbon electricity by 2022. Then we want to go into the next categories, looking at construction materials in buildings for example is the classic. Bottom line, I think generally, not just for the government of Canada, but for all governments, businesses, and individuals we all have to ask for greener goods and services and that starts from being vigilant at home when we buy stuff to big organisations like the Government of Canada. The challenge is now how do I know what to buy, right, who do I talk to, how do I get the expertise I need to buy the greenest thing available. Well that's where we've been working with industry and think category by category, what's the greenest thing we can buy. Industry is already often saying we can offer this, how come you're not buying this. How do we encourage that, so how do we find the best that industry can offer and that's what we're

gonna do in the categories we want to buy. In other areas, governments or big buyers can pull together, right? Let's say the 20 biggest buyers of cement in the country or the 20 biggest buyers of steel, who are the 20 biggest buyers of fleets in the country or who build buildings. So getting those guys together and matching with industry and saying okay we should all ask for this, right? Then we can collectively move the market much faster or those networks could at least learn from each other, so if somebody's got a higher bar and we disseminate that higher bar quickly to everybody else so that it's not an infinite slow process where you know one jurisdiction does something and it takes 10 years for someone else to do so.

As mentioned on the panel today I also really believe that this goes hand-in-hand with Canadian competitiveness, because I agree with the panel members, I think we probably provide the greenest stuff there is or some of the greenest stuff there is, so this is hand in hand with increasing the domestic demand and the domestic market. Other ways we can look at greening procurement that we're looking at, ask your suppliers for certain requirements, for example disclose their carbon or have science-based targets etc. and get extra points for that. So if we're buying something smaller like pens or something, we don't need to look at the carbon content, but we know the suppliers are heading to zero so then that's good. We shouldn't underestimate the sort of the data knowledge information gap we have in each of the categories of things we buy. A procurement process is relatively conservative and so how do we make sure we address those data gaps and information gaps and create connections to ensure the procurement folks have exactly the knowledge they need. One example is working with construction materials, it's a big gap, a big area where we as governments and businesses can ask for better. So we're coming to a National Research Council just [unintelligible] the low-carbon assets for lifecycle assessments, we're working with industry, cement, steel, forestry, etc to build a Canadian base of carbon [unintelligible] containing these construction materials as best be related to buildings for example. So that we know if we [unintelligible] a low-carbon embodied building, we can compare bids, we can compare on a fair platform what people are applying and we can give points and credit. So there are some data and information gaps there that we need to roll up our sleeves and we're happy to do[unintelligible] to get to the best requirements and how we set those. If we get the big buyers together all asking for those and we're accelerating that body so… I'll leave it there, happy to take comments and questions.

DIANA FOX CARNEY: Thank you so much Nick, it's great to know that you're working on a lot of those areas and commenting about regulations and the government role, so thank you for being with us today. I'm gonna turn now to Terri Lynn Morrison who's been with us on a couple of these events before and she is director of strategic partnerships Indigenous Clean Energy. I'm not talking specifically about clean energy today Terri Lynn, but what is your take on how this might affect the communities with which you deal.

TERRI LYNN MORRISON (INDIGENOUS CLEAN ENERGY): Thank You Diana. So we've been listening to a couple of the comments and you know just going back and reflecting on what Ralph mentioned at the beginning that it's interesting to see how industry has changed and was

able to adapt you know in light of the COVID situation in terms of what services they're providing and I think that this also shows that you know we are resilient and that there's opportunity that lies and what's to come as we're moving forward and greening the economy. I think that as an indigenous person and having done a lot of work in this field before, having one of the biggest cement plants in the province of Quebec in my home territory, there's opportunity there for innovation in terms of carbon capture. being able to use different ways to reduce the emissions and the environmental footprint that these companies are leaving you know when they're producing things in the heavy industry such as steel or concrete. I think that there's a role for industry to know what area they're operating in and who the indigenous communities are. There's opportunities to partner to be able to reduce some of the output that's there and that indigenous communities are capable of being partners. I think that there's also a role of government I would think through their programs that they offer would be to support those partnerships that are zero carbon, that are sustainable partnerships but to actually enhance that relationship between Indigenous communities and industries so that they can go ahead and and support the reduction of greenhouse gases and whatnot. We're talking about zero carbon buildings behind the meter having indigenous communities be there to provide those services to the government or to industry. I think that those are really things that we need to start thinking a little bit outside the box and that would help advance Indigenous position and an Indigenous partnership in this field.

DIANA FOX CARNEY: Thank you so much. I'd like to move on now to issues around circularity that Ralph mentioned at the outset and we have exactly the right person to talk about this, Jo-Anne St. Godard, the executive director of the Recycling Council of Ontario. Do we do a good enough job in this space [unintelligible] Jo-Anne so what would you recommend to really kick the circularity off and in the future one.

JO-ANNE ST.GODARD (RECYCLING COUNCIL OF ONTARIO): Thanks to Corporate Knights for the opportunity to participate this afternoon. It's really interesting to hear the broad attention and support for the advancement of the circular economy, it's happening globally obviously. In the last I would say two years we're really seeing a fervor around these discussions in the Canadian context. We were poised to host the World Circular Economy Forum here in the fall of 2020, unfortunately that's when he pushed into 2021 given them pandemic but certainly that's an indicator that we see the advantages, the benefits in the triple bottom line areas around the circular economy and how important it is for us to stop living in this linear take-make-and-dispose kind of economy that we've been used to. It's interesting you know, in terms of Ralph's comments about the waste industry being the fastest growing of all of the industries in Canada, three times as I think the statistic that he offered us. And that's probably due to the fact that disposal in Canada is relatively inexpensive, in fact some of the cheapest disposal in the world happens here because we are such a vast nation with so much empty space and unfortunately that causes us to have a discrepancy between the cost of disposal over recycling. So we're starting the situation with economic disparity from the get-go. Over the last number of years we've really been reliant upon offshore recycling solutions so we do a lot of collection and we did a lot of staging, we'd have a lot of material recycling facilities here that sort

materials to almost perfection and then we go ahead and sell them to offshore buyers where most of the manufacturing around in globe is happening and unfortunately what that has done has basically depleted any of our true recycling processors here. We don't support them in the way that we should and really the resources for some recovery industries need sustainable and quality supplies and demand conditions for them to thrive. So really those are the bedrock conditions for a thriving domestic recycling industry and we just haven't had the support that we've needed.

So in order for us to really improve the economics of recycling we're really talking about three distinct measures. The first that we want to put forward is this opportunity that's been talked about already in this webinar which is procurement not just as it relates to government procurement, of course 200 billion dollars annually in all governments, not just feds, but 80 percent of that coming in from the municipal level means that we have incredible buying power government levels to connect the broader public policy objectives (environment social and economic) and we can be driving that through procurement decisions. We haven't obviously been doing that with low-carbon economies or transitioning to a circular economy so there is a direct and untapped opportunity that's been recognized and I have to echo the support of others in that and I guess not just drafting the policies but actually seeing it through with proper scoring and evaluations and follow through. In fact verification that the kinds of businesses that we are defining green and trying to pull green results or products from, we're actually verifying that and very little of that is actually happening in the Canadian context. I think governments are poised to lead the way and lead by example quite frankly.

Then on the policy front really requiring our supply chains, our manufacturers, our packagers of goods and services right here in Canada to require circular innovation solutions through supply chain requirements and so really trickling those requirements right through supply chains as well. So we'd like to see a bolstering of recycled content, we'd like to see that mandated starting with the government and then through to the private sector as well. That's really going to stimulate their domestic recycling processing community right here in Canada.

Then I would say, Toby mentioned it in the opening, but to supplement and support that we'd want to see bands from disposal, we've got this inequity in the cost of disposal over recycling in Canada so it is cheaper to dispose at the moment so we need supplemental policies like harmonized EPR across the country and bands of materials that we have capacity to recycle here in Canada so that we are again looping right back to providing our recycling industries with that sustainable and quality supply of materials that we require. [unintelligible] if they've got that with strong demand through procurement, we are setting them up for success.

DIANA FOX CARNEY: Thank you so much Jo-Anne. I think one of the points that you alluded to that is that procurement, government is a huge procurer but also Chris has noted in the chat column here that there's lots of other big companies and and some of the name-brand companies like Apple and Tesla who could be important purchasers or these low carbon products that we're producing, so working with them is important. One of those - Apple - is

buying an aluminium project in Quebec. So at this point I'm going to turn back and bring in Denis Leclerc who's the CEO of Ecotech-Quebec and ask him what Quebec is thinking about all these possibilities and opportunities.

DENIS LECLERC (ECO-TECH CANADA): Thank you, bonjour a tous. What Quebec is thinking about, what the clean tech ecosystem is thinking about all this. We just talked about issues and challenges and I would like to focus on opportunities and solutions. You know that Canadian cleantech is probably the best-kept secret and in Canada, so we need to find ways to increase the adoption of those green innovations throughout Canada. Innovation means not only to reduce our footprint but also to give those manufacturing a competitive edge so as to improve their competitiveness. We are apart of Canadian Cleantech Alliance and over the last two years we're doing a what we call the connect so Canada Connect with international buyers looking for solutions. They're looking for solutions from Canada and they are pleased to see the scope of solutions that we have to help them reduce their footprint. I think that we should do the same thing but domestically. We need to find a way to increase those matchmaking between 1 Canadian manufacturing and our clean technology ecosystem and SMEs and innovators. We need to be creative, we need to find - I don't want to say crazy ideas but original might. Here is a suggestion why don't we… first of all you know that we have great trade commissioners throughout the globe and those great commissioners are promoting Canada. They helped us do these matchmaking with the international buyers. Why don't we have trade commissioners in each province and their task will be to help facilitate those matchmaking between Canadian manufacturers and our clean tech companies in Canada. Can you imagine that we can help manufacturing reduce their footprint and at the same time creating jobs and opportunity for our innovative companies.

I think that we need to find those ways, not only to stimulate private funding by leveraging public money - of course money is important - but I think it's our way of thinking and team working that is important for the recovery. We're talking about climate change, okay. But we have a great opportunity to change the climate and to change the climate positively,yes. And I can see it's going that way. We can change the climate, I mean the business climate, we can change the financial climate, government climate to make sure that we have and we will be able to build a strong, innovative and sustainable recovery. But we need to be creative and one way of being creative is to find a way to increase the adoption of cleantech that needs to be, because it's going to be very difficult to export our clean technology over the next two years. So we have a great opportunity to increase the adoption of cleantech within Canada.

DIANA FOX CARNEY: Thank you. I think it's great to talk about opportunities in Canada, Canada certainly does have lots of opportunities and we've heard today that it's ahead in a number of these important areas. Yes, there may not be so much exporting going on for the next couple of years but let's be ready when that does open up again and make best use of that. I'd like to bring in Dave Sawyer now, Dave is the chief economist at the Canadian Institute for Climate Choices. Dave, you think about these issues daily, how do the things that we've been talking about today fit into your vision and the Commission's vision of the future for Canada.

DAVE SAWYER (CANADIAN INSTITUTE FOR CLIMATE CHOICES): Thanks Diana, I'm gonna just wrap it up really quick. So I think one of the things lots of folks are thinking about is conditionality around putting conditions on some of the recovery spending. If we think about long term transitions in climate policy, we think about flexible opportunities that don't necessarily require governments to pick winners. So flexible policy instruments like flexible regulations that allow industry to choose or their path on compliance forward, carbon pricing, broad-based signal that innovation pays and it puts diffuse decision-making into the system. So when we think about COVID recovery we should be really careful about picking winners because as the panelists today have said there are technology winners that aren't so certain. There's all kinds of forks in the road about which technologies you're going to emerge and where they're going to apply within the country and within sectors etc. And then the COVID lens by extension has very different impacts on non-GHG intensive sectors on the manufacturing facilities and they may not necessarily need certain types of GHG reductions and they may want to basically chart their own path forward. So when you think of a conditionality like under the large employer emergency financing facility you can think about these plans that are going to be developed, Net Zero plans that might happen, but then you can think about a broad-based sort of incentive structure to perhaps forgiving loans behind those loans that are tailor-made and picked by the facilities to do what they think they need to do. So we're not saying okay you should use this product or you should do this it's a more broad-based approach to not crowd out these ideas and these decisions. So we have to think really carefully around conditionality and basically think of it in broad-based terms and not crowd out the broad spectrum of opportunities that exist so I'll stop there.

DIANA FOX CARNEY: Thanks, thank you so much. We had our last poll but it's on electrification and we haven't really talked about the electrification of industry which was the third leg of this proposal. It is important and it does provide the facilitation of making a green economy if we are using all that lovely renewable power that we're going to increase if you listen to one of our previous webinars. I think today we've heard a lot about opportunities again, we've heard a lot about procurement we heard about regulations and incentives and those incentives obviously around prices on carbon or or paying additional premium for low carbon products. But I think really what's been a part of our discussion is acceleration of things that we know have to happen, that we've already sown the seeds for these things but whether it's recycling or the greening of heavy industry or the electrification of industry more broadly, how can we really accelerate these things so that we are well positioned and really can meet those zero targets by 2050 but also competitively positioned vis-a-vis the rest of the world as we shake off the COVID malaise which we hope is coming before too long. I just want to make one point, which was one of the questions was about the gendered aspects of this area. I think it's wrong to think of the industry as just a male area. I'm sure Kent could give us some statistics on the participation of women in heavy industry but from what I understand it is increasing and I do think that this is not just jobs for the boys. Perhaps Kent you could just give us one second on that before we close. I'd like to thank you all for being here again today and hope that you'll join us next week and in the coming weeks and thanks to all our panelists for a great conversation. But Ken, last word to

you today, oh sorry Ken, I meant Mark sorry apologies my error, Mark from the United Steelworkers but Ken could also comment.

MARK ROWLINSON: Hi everybody um yeah I mean there's no doubt as well as was pointed out in one of the questions that manufacturing has traditionally been a male-dominated workplace. I think I mean one of the things we've seen in Canada of course is that as jobs in manufacturing has declined, they've largely been replaced by jobs in the service sector and I think we need to think long and hard about whether or not we can have an economy going forward that is going to be overwhelmingly reliant on service sector jobs or whether we need to both promote manufacturing and promote more diverse hiring practices in the manufacturing sector. Because I think one of the things you're seeing of course as a result of the pandemic as many people have pointed out it was at least the initial wave of job losses have been unfortunately focused on women - the word “she-session” for example I know that has now hit the New York Times. So there are clearly gendered issues around this as there are in all workplaces and you know there are a whole whole number of issues but no doubt we're hopefully going to see more and more women entering manufacturing work in the coming decades.

DIANA FOX CARNEY: Thanks for that. I do think it's an important point to raise. Sorry we've gone over by a couple of minutes but great to have everyone here today, thank you so much. Goodbye.