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**COMMITTEE ON
NATURAL RESOURCES AND
ECONOMIC DEVELOPMENT**

Tuesday, December 20, 2022

Committee Room

Provincial Government Investment in the Verschuren Centre

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**NATURAL RESOURCES AND
ECONOMIC DEVELOPMENT COMMITTEE**

John White (Chair)
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Lisa Lachance

[John White was replaced by Danielle Barkhouse.]
[Dave Ritcey was replaced by Tom Taggart.]
[Chris Palmer was replaced by John A. MacDonald.]
[Carmen Kerr was replaced by Hon. Kelly Regan.]

In Attendance:

Tamer Nusseibeh
Legislative Committee Clerk

Gordon Hebb
Chief Legislative Counsel

WITNESSES

Department of Economic Development

Scott Farmer,
Deputy Minister

Verschuren Centre

Dr. Beth Mason,
President and CEO



House of Assembly
Nova Scotia

HALIFAX, TUESDAY, DECEMBER 20, 2022

**STANDING COMMITTEE ON
NATURAL RESOURCES AND ECONOMIC DEVELOPMENT**

10:00 A.M.

CHAIR

John White

VICE CHAIR

Dave Ritcey

TAMER NUSSEIBEH (Legislative Committee Clerk): Good morning. In light of the Chair and Vice-Chair's absence, the committee must elect an acting Chair for today's meeting from among the member's present.

The floor is now open for nominations. Mr. Smith.

KENT SMITH: I nominate MLA Taggart.

TAMER NUSSEIBEH: Are there any other nominations? With that, MLA Taggart.

[Tom Taggart assumed the Chair.]

THE CHAIR: Good morning, everyone. I'd like to call this meeting of the Natural Resources and Economic Development Committee to order for Tuesday, December 20th, 2022. I'm Tom Taggart, the MLA for Colchester North, and I'm the Chair for this committee today. I welcome our guests and look forward to our discussion.

Today we will hear from presenters regarding the provincial government investment in Verschuren Centre. Please everybody turn off their phones or put them on silent. In case of emergency, please use the Granville Street exit and walk up to Grand Parade.

I will now ask the committee members to introduce themselves for the record by stating their name and constituency. I'll start with Ms. Barkhouse.

[The committee members introduced themselves.]

THE CHAIR: If anyone arrives late, we'll introduce them at that time.

I would like to also note the presence of Chief Legislative Counsel Gordon Hebb and Legislative Clerk Tamer Nusseibeh.

MLA Burrill.

GARY BURRILL: I just want to say that Lisa Lachance is with the fiscal update meeting across the hall, and she'll be here shortly.

THE CHAIR: Awesome, thank you very much. Today's topic is provincial government's investment in the Verschuren Centre. I welcome our witnesses and ask them to introduce themselves.

[The witnesses introduced themselves.]

THE CHAIR: Do either of you folks have opening remarks? Deputy Minister Farmer.

SCOTT FARMER: Good morning, Mr. Chair, and committee members. Thank you for the opportunity to be here to contribute to today's discussion around the work of the Verschuren Centre for sustainability in energy and the environment. Nova Scotia has a great track record for innovation and is quickly becoming a hub for successful innovation-based start-ups.

As government, we work to create the conditions for business and industries to thrive, but our partners like the Verschuren Centre play the key role in our success. When we look at the minister's mandate for the Department of Economic Development, two key areas are focusing on innovation-driven, green, and sustainable businesses, and working with partners to enable entrepreneurs to start and scale their businesses across the province, and actively encouraging innovative, sustainable, and green businesses to establish or relocate to the province.

The Verschuren Centre is an excellent example of how we can advance these mandates. Dr. Mason and her team are true leaders in promoting sustainability and helping to accelerate growth for the clean tech sector. Many companies from across the globe have set their sights on Nova Scotia because of the extraordinary work happening at the Verschuren Centre.

The centre helps clean tech companies develop and commercialize innovative and sustainable technologies. These companies then help to diversify Nova Scotia's economy by providing new opportunities for clean tech jobs and increasing investment across the province, particularly in Cape Breton.

Dr. Mason and her team are constantly evolving and responding to the sector's needs while making connections for businesses through their living laboratory to develop new bio-economy and green energy solutions.

In addition to the wealth of expertise and talent the centre hosts, it is also an impressive facility. This past June, Minister Corkum-Greek announced \$2.5 million for the Verschuren Centre to support its expansion into a national bio-manufacturing centre - the first of its kind in Canada.

The Verschuren Centre is also home to a bio-reactor - one of only three in Canada - but its expansion into a national centre will increase its capacity by more than 10 times. The new facility will help companies accelerate and scale up their product development in ways that are not yet available elsewhere. The expansion will also help the Verschuren Centre attract top talent from across the globe.

One of the strengths of this partnership is that we have a shared goal to enhance environmental and economic sustainability here in Nova Scotia. The Province is proud to support the centre's expansion and we look forward to their continued growth and success.

Thank you for the opportunity to say a few words this morning. With the permission of the Chair, we'd like to show the short video that illustrates the experience of one company at the Verschuren Centre.

THE CHAIR: Please go ahead, yes.

[Video presentation begins:]

MARK MASOTTI: We're helping to reduce the cost and carbon footprint of concrete products using biologically derived nanomaterials - something we call bio-graphene. Graphene has shown a lot of promise as an additive for composite materials like concrete for quite some time. However, graphene is quite expensive and comes from mineral graphite normally, which is

mined from the ground. It's a complicated process and has a high carbon footprint. There's also large demand for graphene for other applications, like electric cars, et cetera.

We realized a few years ago that nature produces something that is very similar to graphene, and that comes from woody materials. We worked to take those woody materials to make basically a zero-carbon, or carbon-negative, alternative to mineral graphene for use in composites like concrete.

So we are in the product-development stage. We also just finished a big hiring cycle. We now have six very talented engineers and scientists working on our team, who are critical to finalize the development. We are currently operating a benchtop pilot unit at the Verschuren Centre. We just commissioned a larger commercial pilot in the industrial park here in Sydney alongside the Verschuren Centre, and we're now using those two facilities to finalize the development of our first products and get them into customers' hands.

The Innovacorp and Verschuren Centre teams have created quite an environment here for companies like ours to rapidly access capital and equipment that's really needed to develop complicated technical products. We find everybody easy to get along with out here, too. Things move quickly. People are really committed to the cause of this start-up ecosystem and we're really happy to be here.

I think it's a really unique opportunity that Cape Breton offers here in Nova Scotia in the AscendBio program for companies like AlterBiota.

My name is Mark Masotti, and I'm the CEO and cofounder of Alter Biota.

[Video presentation ends.]

THE CHAIR: Thank you very much. Dr. Mason, do you have some comments?

BETH MASON: I have a few slides, if that's all right, Mr. Chair.

THE CHAIR: Please.

BETH MASON: I just want to introduce the Verschuren Centre and what we do. I'd like to have a three-minute elevator pitch, but it doesn't work that way. We just seem to keep expanding and doing more.

It's a little bit of a unique entity, the Verschuren Centre. It's a not-for-profit pulled out of a university setting. It was built basically to be a bridge to the new economy on the back of the closure of traditional industries. To do that, we felt it was important to be an independent entity. Since we were independent three and a half years ago, we've grown exponentially, and that's because of our business model.

I just want to give a little bit of background as to what that business model is so that everybody kind of gets a grasp of what we do. It's very difficult to not be trying to solve everybody's problems, so we keep pulling that into what I call two backbones of what every large corporate, municipal, federal, provincial government needs - and that is greening our supply chain and reducing our carbon footprint. When you distill it like that, everything we do touches those pieces.

We have two sides of our business. One is focused around bio-manufacturing. That is everything that you currently make, wear, use that's petrochemical based. We can make from "bugs," as I call them - the non-technical term for synthetic biology - or we can extract from base resources.

On the other side, we basically help companies to model their net zero pathway and pull in technologies to do that on the thermal side. To do that - because we're in a clean tech space - that means investment in large capital equipment. It's not like the IT space where you can be a bench, I can send you a million beats of versions, poof, we're out there in the market. It needs big capital plan, and a lot of those SME companies are at a stage where they can't find that million for the first plant that they don't need when they need the \$5 million for the next plant.

That's really where we fit. We started three years ago building that capital infrastructure and, as we were talking earlier, building a pipeline of companies that need that - and we saw that need across North America. We're basically taking clients who exited and accelerated. They've gone through a university, they've gone through an incubator, they've gone through an accelerator, and they've been refined down to somewhat well de-risked and ready to scale.

That's where we step in. We surround them with partners in the Nova Scotia ecosystem that can pull non-diluted funding, venture funding to their journey through our technical platforms. I'd like to say that's all we do, but SME companies need a little bit more than that.

The key, I think, from a Nova Scotia perspective and from a national perspective - we set out to be nationally significant to address global problems, but from a Nova Scotia

perspective, all of our primary sectors need that upscaling, and all of our manufacturing needs that green supply chain. So we're the bridge. The technologies that we deploy are the bridge for upcycling the value of our primary industries and solving the path to net zero for our manufacturing sector. It crosses so many sectors. That's the nice thing about this - exciting thing about the companies that are coming in.

On the feedstock side, that might be anywhere from methanol to cellulosic sugars to pea starches. It's of national relevance because Canada has all of those resources, as well. On the deployment side, it's all kinds of things. It's functional food, green chemicals, smart materials. It's just phenomenal.

I just want to show a few pictures in terms of investment in the shared landscape of capital scale-up that we've deployed. We've done that by being quite good at stacking private investment, federal investment, programs, and more recently, our partnership with the Province.

Some years ago, we started with baseline fermentation, which was our marine extractions on the marine side. We also most recently got our sea cannons, which are for deploying oysters into the Bras d'Or Lakes to rejuvenate the oyster industry. A lot of those leases are First Nations leases. These are all housed up at Port of Sydney. We have that beautiful building as we showed at the beginning, but we also have the dirty bays, as I call them.

We moved from baseline fermentation into more sophisticated extraction, and then into our pilot facility through the middle of COVID-19. This was about a \$1.5 million investment, shared funding - again, with help from ACOA, and some of our provincial dollars, and some of our partner dollars. We built what looks like a crazy mess, but that is really the top end line or the Cadillac of industrial fermentation, which basically is where our SME clients work.

Our goal is not just to deploy technologies into partners in manufacturing - it's to deploy a team with them. We have a very challenging model whereby we actually let our clients in our space, and we try to train them alongside of our highly-qualified technical teams, which in and of itself presents lots of challenges.

On the biomanufacturing side, having thought that 1,000 litres would get people to deployment, we discovered that all of their investors at that more institutional and Series A-level weren't what we call 10X, conveniently. I guess they're all decimal or something. We then discovered we need 10,000 litres to get them to their ultimate 100,000 or 200,000 litre deployment, wherever in Canada that might be.

We set about building 10,000-litre capacity, and we did that with a stacked model of our own investment from the Verschuren Centre - federal program investment, and our

provincial partner investment. It's a great help on a journey of this size for what in effect - we are a small company ourselves.

[10:15 a.m.]

The important pieces of that; the impact that we generate, not just deploying technologies. We started a program called AscendBio with Innovacorp at the time, and that accounts for a group of those companies that come through that biomanufacturing platform largely. You saw the video with Mark with AlterBiota - he's one of those companies. We have about 40 different companies that we work with and we work also with large corp. This is a snapshot of a core dozen companies over the last two years. You can see their raise in terms of investment.

In the first year there was \$14 million. Now there's \$35 million invested in those few companies. Four of them are going on to Series A, which tends to be in the \$5 to \$10-million investment. Their valuations collectively are almost \$160 million. Also from a local impact, their employment is 38 people locally - top-end scientists and engineers - and their expectation is to double all of those figures in the coming year as they enter their Series A rounds.

The one thing that we want to track better is their Sustainable Development Goals impact, because every company we take in targets an SDG impact sector. Typically they would have impact and corporate investment. The next round, anticipated investment is \$58 million. In that time also, the Verschuren Centre doubled its number of employees to be able to service these companies. When you think that's over the last two to three years, the growth has really been exponential.

I just gave a couple of examples here because often the question is: Do these companies and their employees stay in Nova Scotia? As much as we always said that we would retain the technical capacity at our location, and they would recycle through there, building their technical teams, they're now starting to deploy with partners in Nova Scotia. You heard AlterBiota in there. They've been in conversations with Harry Freeman & Son Limited lumber, with Shaw Resources, to co-locate down on their pyrolysis piece down in the Valley, and then test deploy products through local companies on the concrete side.

Kraken Sense is another example who came in. We actually modified one of our labs to be what's called BSL-2, which is a high-level microbiology, and they have rapid pathogen detection, which was designed for the food industry. You'll all have heard of at one time or another E. coli outbreaks or salmonella outbreaks that cost food industry partners millions in recall. Theirs is an on-the-spot rapid detection that allows you to prevent that early on in the program. Interestingly enough, they've got pulled into public health testing because they have basically a lab on a chip. They've been engaged in COVID-19 testing through the water systems.

Again, they are deploying manufacturing with a local manufacturer, Protocase, up in Sydney, and also testing with TruLeaf in their Truro bay. We're starting to see that true resident-type impact, as well as their national deployment. CoteX is another example. They have seed coatings for fertilizer and seed. We've partnered them with Copol, who are a polypropylene manufacturer in North Sydney who we work with to basically test-deploy biopolymers. They have a large multinational, Nutrien, that they're partnered with. We're co-locating a pilot with them in North Sydney. It's examples of how we collectively deploy big-scale equipment to get them to market.

Just to touch briefly on our energy side, most of that is external to our nice little building. We were engaged in the rooftop solar installation at the university. We are partnered with New Dawn - which is the middle picture at what I call Radar Hill, being a *M*A*S*H* fan, but is actually the low-income housing area - to do a ground-mount solar which will sit in the middle of that area and basically take a low-income housing area to net zero. We're also involved in large corporate mapping to net zero with corporate partners, and now the harbour here in Halifax. So we have a lot of external projects as well.

What's the relationship between energy and biomanufacturing? We're actually going to merge them in our national biomanufacturing centre by adding in a microgrid once we're up and running, so that we can actually decarbonize our own biomanufacturing and then test deploy thermal technologies right there. It actually does all come together and make sense in the end.

We talk benefits - this was just something new we put together on the 10X and the deployment of companies after 10X across Canada. We're looking at potentially \$3 billion investment in those companies when they first deploy - 400 jobs locally and 4,000 when they've deployed across Canada. That's across a 10-year lifespan of our national biomanufacturing centre. Realistically, it would have a 20- to 25-year lifespan.

Probably just as important is the impact from manufacturing on being able to reduce their GHG and have a green supply chain, making Canada far more competitive than it would be if we didn't have this in Canada.

I think that's it. Thank you very much for your time and patience. I appreciate that.

THE CHAIR: Thank you very much. I just want to make a comment. It's unfortunate - I wish I weren't Chair today, because I could ask questions. It's very exciting stuff and I could ask questions for the two hours. I just want to note that before I got elected, I was on the board of Divert Nova Scotia, and I see where there are a couple of projects that have worked their way in through there - TruLeaf and I think another one.

Before we go to questioning, MLA Lachance has been away at a briefing across the street. If you want to introduce yourself?

LISA LACHANCE: Hi, I'm Lisa Lachance. I'm the MLA for Halifax Citadel-Sable Island.

THE CHAIR: Thank you very much. We're going to start with questions. In this committee, it's my understanding that we do questions individually and we don't do the 20-minute format. Am I right or wrong about that? That's correct? Okay. I will keep a list of names here and we'll go from there.

Before I do that, I'll just remind everybody to make sure their name is called before they speak into the microphone. That gives Legislative TV the opportunity to have the microphone turned on and get everything recorded.

I'll start with MLA Burrill.

GARY BURRILL: Thank you. I'm just thinking about this - you were talking about the upscaling of the value of primary industries. I'm thinking particularly about forestry. You were mentioning about the project working with Freeman's. I seem to remember that the Forestry Innovation Transition Trust has had some role with the centre, some funding role. I forget the details.

Could you say a little more about where the centre's work is, particularly relative to forestry?

BETH MASON: The Forestry Innovation Transition Trust was focused on finding additional value in businesses for biomass - not just forestry biomass but all sources of biomass in the province. We tapped into that fund to support some of the technology deployment and upscaling that would relate specifically to forestry.

One example would be AlterBiota, and that was to bring technical capacity around de-risking those so that instead of them deploying with a partner and trying to do all of that growth on site, that we would collectively do that with those companies. We looked at de-risking some key technologies that, basically, transforming biomass into bio-oils or biomaterials such as the AlterBiota one, or biochemicals.

There's a number of those, so part of the forestry trust fund is to support what we call the carbon transformation platform. It is all things thermochemical that will take biomass and make it into something of higher value.

GARY BURRILL: I think I probably need a more elementary response. (Laughter) I actually don't understand - and I think this would probably be true for a lot of the people - what de-risking actually looks like, in terms of the forestry transition. What are the kinds of investments that would lead to de-risking about this kind of transformation-oriented innovation?

BETH MASON: A lot of times as a large company, you get approached by people with a technology who say, I've got the answer to your problem. I can make X, I can make Y. A typical one would be carbon black. It's a big component of many things, and you have a range of companies coming from all over the world to say, hey, I make carbon black. How about you invest in our company? How about we deploy at your plant? Or how about you be the offtake partner in this investment?

Usually at that stage, looking for shared investment, it's hard when you're the primary producer to understand those technologies, and what's a safe bet and what's not, and how far are they down the true commercialization scale.

With the closing of the pulp mill, the forestry sector is looking for immediate solutions. Other than the biomass to energy, there are not very many immediate solutions, so our mission with funding was: let's see how we can de-risk by assessing technology viability. Like, is it real? Does it actually make - let's say, using a carbon black - is it really carbon black, or is it just a charred carbon, and how useful is it in an application that this industry partner may need? Does it match what they need, and how real is it in terms of, okay, if you're the forestry biomass provider, can you take everything I've got? Can you take chips? Can you take them wet? Can you take them dry? Can you take bark? All of those things - it's overwhelming as a primary producer to be able to know what's real.

That's what I mean by de-risking: our technical teams we would deploy would look at all of those things. What happens? Does it blow up when the feedstock changes? Does it actually make what you said it made? Does it make it consistently, and does it really, when you put it into application, do what you said it would do? That's kind of what we did with the funds.

THE CHAIR: MLA Regan, please.

HON. KELLY REGAN: My question is for the deputy minister. The Province invested \$2.5 million into the expansion of the Verschuren Centre. The Government of Canada, through ACOA, contributed \$2 million through the Canada Coal Transition Initiative - Infrastructure Fund. Another \$2.3 million came from Next Generation Manufacturing Canada, \$1.3 million from the Verschuren Centre, \$500,000 from DeNova, which is a clean-tech company in Halifax. So the Province is the largest investor in the expansion.

What was the department's rationale for this particular investment? I'm not in any way suggesting it wasn't a good rationale, but I would like to know what the department's rationale was for the investment, and how you came to decide that \$2.5 million was the correct investment.

SCOTT FARMER: We've spent some time at the Verschuren Centre and with Dr. Mason seeing things first-hand and hearing the stories about the companies there, and the

difference that they're making, and the real opportunity that exists in our province to build a cluster around this.

[10:30 a.m.]

One of three biomanufacturing sites like this - really very little opportunity for a start-up to have access to this kind of infrastructure anywhere else in the world. We've seen companies relocate from southern U.S., from Toronto, to be in Sydney. The Verschuren Centre has a brand and an international reputation. It's one of these gems that we have inside of our ecosystem that is a magnet. It's attracting these clean tech businesses.

Working closely with Dr. Mason and the Verschuren Centre, we've received a proposal for how the Province might support the scale-up to the national biomanufacturing centre with the 10X and the large-scale fermenters that you saw in the photos. We feel it's a very good investment. There are a lot of partners at the table who share the same view. When we look out five to ten years, it's a lot of jobs, it's a lot of good-paying jobs, and importantly, it's building a cluster.

Just to spend a minute on that. There's an American economist named Enrico Moretti. He wrote a book in 2013 called *The New Geography of Jobs*. It talks about the importance of building clusters to drive economies. If you think about Detroit, at one time it was the cluster around automotive. That's where the suppliers were, that's where the engineers were. That's no longer the case - they haven't evolved. If you think about Silicon Valley, it started with hardware and it became software, and now it's social media and AI. It continues to evolve, because there's a cluster. If you want to find engineers and software developers, that's the place.

We've got the opportunity to build a clean tech cluster in Sydney, and we're seeing the fruits of that now. Maybe a bit of a long answer, but it's an exciting proposition here, and all of that went into the decision-making around supporting this expansion.

KELLY REGAN: Dr. Mason had spoken about stacking, and we saw that in terms of the investments there. I'm wondering more specifically, how did you decide \$2.5 million was right, and how does this differ from other projects that the department is supporting? I'm thinking of the Buy Local project, where we have trucks going around the province with the logo emblazoned, but we haven't actually seen any announcements or anything.

I'm wondering, how does the decision-making around that differ from your decision to invest in this particular project? Again, how did you arrive at \$2.5 million as the correct amount for that? Could the Verschuren Centre have used \$5 million? I'm just wondering how you decided on that and how that differs from this other one? I'm trying to be very clear here, even if I wandered all over the place.

SCOTT FARMER: In this case, we responded to the requested amount. Had the requested amount been \$3 million, I think we would have looked at it and said there's a good return on investment on that as well. I know that even Dr. Mason has worked closely with all of the funding partners that were available. Sometimes there are thresholds you come up against in other programs, whether it's ACOA or otherwise. Sometimes there are some limitations on the amount, but we felt that was very good investment for the amount that was requested, and it becomes a long-term return on investment type of analysis.

As it relates to Nova Scotia Loyal, that's a platform commitment by the government that we're working to implement. We've gone through some stages of both prototyping and brand development to ensure that we have the program that's as effective as it can be in driving demand for local products - easy for consumers to participate in, and easy for retailers to participate in. They're sort of unlike things, I would say, aimed at different goals. Hard to compare, but we're giving effect to an item that's in the minister's mandate letter through that work on Nova Scotia Loyal.

THE CHAIR: MLA Barkhouse.

DANIELLE BARKHOUSE: Our government was pleased to support the recently announced expansion of the Verschuren Centre into a national bioprocessing centre. What type of competitive advantages will the Centre and Nova Scotia have over similar facilities and other research and development institutions across the country? That's what I would like to ask - either the deputy minister or Dr. Mason.

BETH MASON: There really isn't another national biomanufacturing centre. There is a 10,000-litre vessel - one in the country - available for SME companies to test. It's at InnoTech Alberta, which is provincial-government-owned and provincial-government-run, and so has a limit to how many clients it could put through, and it doesn't have what we're building in our 10X, which is all the downstream extraction technologies.

If you imagine a brewery, you can brew your beer, but after that vessel, you need to get the beer out, separate the yeast, and refine and pasteurize, et cetera. That's what we call downstream, and that's key. If your value molecule is a tiny piece of that beer, and you need to get that value molecule out to a key client, whether that's a - Lululemon is a bio-dye, or a chemical for a cosmetic. It needs the downstream. From a competitive landscape, there really isn't this capacity.

A lot of these SME companies had already moved to the States, which is why we're drawing a lot from California - IndieBio - because they would have to go to the U.S. to get this capacity, and then we would lose them. We would lose the IP, and we would lose the capacity for them to build here in Canada. The other option is to go to Europe, and I suspect we'll actually reverse that trend and attract European companies here once we've built and we make our next expansion.

From a competitive landscape viewpoint, I think there's a lot of documented evidence right now that globally there's a bottleneck for biotech companies to get to market, and it's going to become critical, which is really the foundation for why we started the build.

DANIELLE BARKHOUSE: That leads me to ask - especially where the last one was announcements - what role does the Verschuren Centre play in helping us reach our climate goals as we are trying to transition off of coal?

BETH MASON: From our path to net zero, we work with the federal government's ACE program, which is basically mapping their path out for Atlantic Canada to net zero and deployment of clean technologies to do so. We work with companies like Irving on the Green Harbour, mapping out a path to net zero for the Green Harbour. That's all emissions-based work, and we work with communities in terms of deployment of renewables in community, and large corporations.

All of that fits in to that mapping of the path to net zero - GHGs, emissions, Scope 1 being the biggest part of our challenge. Scope 2 and 3 are the procurement chain, and that's where biomanufacturing comes in. For example, as we talked about on the forestry example, if you want to reduce your carbon footprint of cement - a big component of concrete and which has got a pretty bad reputation - where are you going to source those ingredients from to be competitive in this landscape?

We have large cement manufacturers. We also have large carbon black users in this province. From a procurement side, it targets very much our existing manufacturing base and where they'll manage to green their supply chain, which again is classes Scope 2-3.

SCOTT FARMER: The other thing that I'll note is we're seeing more and more, because consumers are demanding that companies they buy from exhibit environmental responsibility - those companies are driven by market reasons to do that, and therefore the ability to access products, inputs to the products that they make, that have a lower carbon footprint is important to them as well.

We may talk about Ficus Pharmaceuticals as part of the discussion this morning, but they've got a plant-based alternative to fossil fuel-based inputs to cosmetics, as an example. Every industry is drawing on fossil fuels in some way, so indirectly as well, through some of the work that's happening, substituting carbon-based products for natural products as inputs in feed stocks, we're helping to reduce demand as well, and therefore carbon emissions.

THE CHAIR: MLA MacDonald.

JOHN A. MACDONALD: Just quickly before I ask - you're using terms, and I know some of them but I don't know some of them. You keep saying SME, SDG, SME,

and non-diluting. Just for the millions of people watching us, as I love to say, can you explain those three terms? Then I'll ask my question, if that's okay, Mr. Chair.

BETH MASON: Apologies. SME is small/medium enterprise. It actually, under most funding bodies, comprises companies anywhere up to 500 employees. It's not necessarily small. A lot of our client base on the incoming side tend to be small. A lot of our offtake partners are large and probably greater than the definition of SME.

Non-dilutive - on a company's journey to commercial scale, as you can well imagine, you need investment. It's good if you can start that journey in the early stages with what we call non-dilutive funds. That is, when you got to investment, an investor is going to require some equity in your company. Non-dilutive are those grants, loans - all of those pieces that a company needs to use to be able to get to a point where their valuation is sufficient that if you take a dilution, you don't end up with nothing.

What we try to do is map out a client's pathway to deployment in stages and milestones that meet non-dilutive funds and then angel investment and then venture capital and then institutional. Their path tends to travel along that, and that non-dilutive fund piece is significant to get those clients through that deployment from the bits that exist after bench scale to scale up.

SDGs are sustainable development goals. Globally, sustainable development goals have been established, as you know. There are something like 24. They basically address what are considered the key impacts on our planet in terms of sustainability. They refer to clean air, clean water, replacement of petrochemicals, all of those things.

We are really honestly only interested in companies that have a target of impacting globally some part of that SDG landscape.

JOHN A. MACDONALD: Thank you for that. I even wrote - I wrote "STG," so I'm glad I asked you to confirm it.

The Verschuren Centre is obviously based in Cape Breton. Can you elaborate on what other projects have been done elsewhere in the province?

BETH MASON: Most of our energy projects are external, so we work with large corporations outside of Cape Breton. We tend to work nationally with our network, so NGen was mentioned, which stands for Next Generation Manufacturing Canada. It's no wonder they give them acronyms, is it? (Laughter) We work with accelerators across the country. That's how we're drawing clients here.

Our clients are working with multinationals, so they may connect with local companies. We mentioned the forestry sector in the south end of the province. Obviously we work with large corporations that exist - Michelin, Shaw - that are also based throughout

the province, on the materials and energy side. That's where our externalities tend to be. Those would be the large partners in those sectors.

[10:45 a.m.]

From the small company perspective, again, like I said, they have investment generally that's, interestingly enough, tapping on local venture funds, so we're getting a lot of interest in Halifax and Nova Scotia from venture funds across the country that have a sustainability arm, whether they'd be institutional or whether they'd be private venture funds. You're seeing all of that circling around Nova Scotia generally. Yes, we are located in Cape Breton for our technical facilities, but I think we don't see ourselves as physically restricted to where we are. We need to be nationally significant, and that's why it is very much a Nova Scotia economy that's building.

There are companies from here, but I think if we continue this growth, it sets Nova Scotia apart in Canada as a whole. Some of these companies will deploy locally in Nova Scotia, and the technical capacity being built here will only grow the Nova Scotia economy and the Nova Scotia ecosystem. We're in Cape Breton, but we see ourselves as Nova Scotia and Canada.

THE CHAIR: MLA Smith.

KENT SMITH: I have said this in probably three or four other committees, how outside of committee I probably wouldn't have done any research on the Verschuren Centre. No offence, Dr. Mason, I just probably wouldn't have. Because of this committee, though, I've had the opportunity to read about it, learn about it, and understand how fascinating it is and how great the work that you folks are doing is for us and for our economy and for the global economy.

In your opening, with the video and the slide show, I didn't catch anything on a relationship with Cape Breton University. Forgive me if I missed it, but I don't think I did. I'm wondering if you can talk about the relationship with Cape Breton University and how important and vital that is to the future of the Verschuren Centre.

THE CHAIR: Dr. Mason - I've never seen a deputy minister get off so easy at one of these committees. (Laughter)

BETH MASON: Initially, the facility, the actual centre was built on the campus, as I said, with a mind to transition the local economy to something outside of primary industry. We did operate briefly under the university, and although it wasn't funded by the university, it was always anticipated to be a self-funded entity.

When you're in an academic setting, that's challenging, because it assumes - typically you'd go after Tri-Council funds, and those assume that your staff, your faculty

are already paid by the university. It wasn't a very sustainable model. We pulled away and separated so that we could then pursue other funding mechanisms to make ourselves self-sufficient. An increasing portion of what we do is service-based revenue from clients and from large corporations, and then our infrastructure bills tend to be capital.

CBU specifically, as a university in Nova Scotia, is undergrad. We tend to pull Masters and above. We tend to also pull nationally when we advertise for our staff, and when our companies advertise, they're attracting talent from all across Canada and internationally as well. We don't have a specific relationship with CBU anymore, but we do pull - and we have a lot of co-op programs with all of the universities in Nova Scotia, and with the colleges as well.

We are actually at a point, along with our clients, where we really need upskilling programs. We need to develop technical skills that are not necessarily existent in the ecosystem right now, because we're at the cutting edge. That's where we've reached back out to the colleges here to look at how we can create credentialling and upskilling with them in a more tailored basis.

That's really where, I think, our relationship locally will develop as we build those. But again, we're also looking at program funding through NGen, because federally there's a desire to add credentialling. That's where I think all of the universities and colleges could step up and support this ecosystem build in addressing what are those skills gaps and how do we fill them and how do we fill them fast. Right now that's becoming a critical limitation factor on ourselves and our companies.

I hope that answered your question.

KENT SMITH: That's perfectly logical and makes sense.

A quick follow-up - my line of questioning was on strategic partnership, starting with CBU. The next line goes to AscendBio. That was featured in the video and a little bit in the slides. Is there a relationship there with Invest Nova Scotia as well? If you can expand on that a little bit for us, that would be helpful.

BETH MASON: The AscendBio program was a partnership we started when it was Innovacorp, and now Invest N.S. It is a key part of our pipeline of companies. The investment arm of Invest N.S. has access to partnerships across the country, venture funds across the country, and early-stage investment, which often is key. When companies reach that stage of angel rounds, there really needs to be a solid foundation invested that steps up first, and then everybody else follows. The investment group plays that role for companies that have reached that goal and are worthy of it.

Because of that, there's that network - Paul Richards in particular, from Invest N.S., has those connections across North America. An example would be IndieBio - they have

right now a \$4 billion investment in companies. There's not one company under three years of age in their portfolio. They have a pitch day, and on that pitch day there are hundreds and hundreds of venture funds, and some of our clients are pitching on that. That's a connection that we got by that relationship with AscendBio.

Other partnerships or accelerators at U of T, U of Montreal, UBC - they're all coming together. I don't know if it was yourself, but someone mentioned that there often seem to be a disparate kind of arrangement of entities where you've got groups that do little pieces of the journey, but nobody pulling that together.

What we're seeing now here in Nova Scotia, which is basically our advantage in the country, is that we have a real ecosystem where those venture funds are coming, the partners in Invest Nova Scotia are at the table, the Innovation Hub is there, and it's what we call our supportive ecosystem. That's what's bringing companies here. You can't get that anywhere else. You can go to an accelerator and take a program, but can you get that full package of support? We can't deliver that ourselves as the Verschuren Centre. We do it through those partnerships.

They're growing, and they'll continue to grow the more companies come here.

THE CHAIR: Deputy Minister Farmer, please.

SCOTT FARMER: I'll just add this quickly, as it relates to Invest Nova Scotia. There's the former Innovacorp side, which is the venture capital side and has all of the connections and capabilities that Dr. Mason described. There's also the former NSBI side, which works with large and small customers in the province but has good relationships with all of our existing large companies in the province and is able to play a connector role to the start-ups that are there with the larger companies that exist in the province.

There was some discussion about work with Michelin, and work with Freeman's, work with Shaw. Invest is in a good position to help build those relationships, and we can often trade a little bit on what I would call our just-right size in Nova Scotia. In a lot of ways, we're a million people, we've got sophisticated assets, we've got some international companies here, but we're small enough that people know each other, and those relationships exist so we can connect the research firm that's in Sydney with the head office of - the North American office of Michelin, as an example, to explore opportunities.

THE CHAIR: Thank you. Before we move on to MLA Boudreau, I just want to say I have Lachance, Regan, and MacDonald after that.

MLA Boudreau, please.

TREVOR BOUDREAU: Thank you to the witnesses for coming. As a Cape Bretoner and MLA, I have to say how pleased we are, certainly, to have the Verschuren

Centre in Cape Breton. You answered some of my question right off the get-go because I wanted to talk about the unique assets that Cape Breton itself has for the Verschuren Centre and then in Nova Scotia in general.

You talked a little bit about it, but what are some assets that make it a great place for the Verschuren Centre to be located? What is it about Cape Breton or Nova Scotia - you did hit on some of it already.

BETH MASON: DM Farmer suggested it was like a little mini-petri dish. I always look at Cape Breton as having that ability to be a test bed because we have a lot of natural resources. We have all of the renewables - more than we can use on the Island, in fact. We also have the Bras d'Or lakes which I think a lot of people look at and think, oh, well, what is that? What does that mean when you have a biosphere? Does that mean we just protect everything, and you don't touch it? In actual fact, if you look into that, a biosphere is supposed to be an integrated ecosystem where communities around those lakes live and have a livelihood in the lakes. That's unique in Canada.

The oyster project that we have with AFF - and Rod Beresford is our lead on that, which is a relationship we have with CBU - is to basically redeploy an industry that existed in that Bras d'Or ecosystem and is a sustainable, self-sustaining industry with First Nations leaseholders and other leaseholders whereby you are actively working in that ecosystem. That's why I say Cape Breton actually is perfect in terms of the assets it has to develop those kinds of programs.

Low-income housing - unfortunately, we possess a lot of that. We possess a lot of people who are energy-poor, and deploying Grandmark Solar within that community is key to bringing those levels of poverty back up. Another one is our First Nations groups - interaction with First Nations on energy security as well whereby we can connect our larger grid scale activities with local communities. It's actually an incredible test bed to deploy those kinds of things, but there's no reason either why Cape Breton, for being where it is, can't be a technology deployment centre for the whole of Canada.

That's the amazing thing. It doesn't matter where we are. It matters how we deploy technology. That's, I think, the business model that we've got. That's why it's successful.

SCOTT FARMER: What I'll add to that is that there's this unique asset that exists and has been built at the Verschuren Centre. It could have been built elsewhere, but that's where it was built. You can never discount the impact that one individual can have, and Dr. Mason, as a leader and a visionary around this - we're grateful that she chose to launch this in Cape Breton. A lot of other places would be happy to have her, but we're going to keep her here.

[11:00 a.m.]

When we talk about batteries, people often talk about Dr. Jeff Dahn and the attractive force that he's been in that space. I think the same can be said for Dr. Mason and the work that's being done at the Verschuren Centre.

TREVOR BOUDREAU: I'm glad you brought up the Bras D'Or Lakes and certainly Richmond County. In fact, all of the counties are kind of hovering around the Bras D'Or Lakes, and it's such a crucial part of our way of life.

Certainly, with the investment in the oyster industry for the Bras D'Or Lakes that our government has put forward, it's kind of an exciting time for us there. Do you have any update on progress with that program, and what's going on, and how that looks? What can we expect when it's up and running?

BETH MASON: Sure, I can update - there are exciting updates. I had them in one of the pictures there; you can see those ocean-on-land containers. Part of the revitalization of the oyster industry was to be able to grow and hatch in land-based hatchery nursery, to deploy, then, into on-surface grow out.

One of the things that Dr. Rod Beresford discovered during his studies was a lot of the oysters - so, for anybody who's not familiar with the oyster industry in the Bras D'Or, it was decimated by MSX, which is a parasite, and nobody really understood what to do. So, all of those leases became empty and fallow. Dr. Beresford found that if you raise oysters on the surface instead of in the mud where presumably this parasite's lifecycle is a component, that they survive.

Now, you can actually grow out oysters again. The problem was, where are the baby oysters to repopulate those leases? We connected with a U.K. company that actually builds hatcheries and nurseries in a container, and they just arrived the other day. It'll be commissioned in January so that we can start creating baby oysters, basically, to put back into those leases for those leaseholders to grow.

Potlotek First Nation is an important partner in that because they have oyster-processing capacity that was built historically for oyster production in the Bras D'Or. We then complete the cycle. We can put baby oysters back on lease, they have the capacity now to grow out on surface without everything dying, and then a processing facility to start selling what were, according to our friends at Potlotek, some of the best-tasting oysters around.

It's a wonderful story, and we hope we see those grow-outs on leases next year. All of the technology has arrived.

THE CHAIR: MLA Lachance.

LISA LACHANCE: Thank you so much for being here. Certainly, really fascinating work that you're doing. I think it's really a great model in terms of trying to think past the issue of being based at a university and relying on tri-agency funding. I think that's a great story. I think both of my questions are probably more directed for Deputy Minister Farmer, but that's not to say that your input has not been appreciated and, certainly, really valuable.

I think, as you know, deputy minister, we've been concerned about the lack of an economic development plan that brings together great initiatives such as this with a couple of campaign promises that we haven't seen really implemented thus far. In the absence of an economic development strategy or regional economic development strategy for Nova Scotia, how do you make recommendations within the department, for instance, to support initiatives like the Verschuren Centre? Do you see any constraints or any benefits in that way?

SCOTT FARMER: There's not a document that has a title page that says, "economic plan", as you've mentioned. It's reflected, I would say, across a variety of mandate letters, things that you'll read in the platform.

When we talk about priorities, I would distill it down to four things that you can group most everything under. One of them is growing, high-paying, high-productivity sectors. When we talk about clean tech research and development, that's a part of it.

There's another part of it that's driving productivity across all sectors, helping them to become more profitable and prosperous. When we think about contributions to traditional industries - forestry, we've talked about, and fishing, and others - making use of waste from marine processes, for example. That's happening at the Verschuren Centre. That's going to help the productivity, getting more out of those traditional businesses.

There's a third part of it that is around planting the seeds for the economy that we want to have in five years, 10 years, 20 years down the road as things change. We know that clean tech is a growth area. It's growing way faster than the economy as a whole. It's growing way faster than almost every sector. By putting investments into clean tech, we're doing that around planting the seeds.

The other thing that we need to do is we need to make sure that prosperity is spread across the province, whether that's geographically or amongst cultural groups or otherwise. When we're creating new opportunities in Cape Breton, when those new opportunities are being experienced in other parts of the province, as Dr. Mason has described, it's an investment that's helping to spread those benefits of the clean-tech sector around the province.

Those are sort of four lenses that we often apply to things. Sometimes an initiative hits on one of those; sometimes it crosses all four. I think when we're talking about the

work at the Verschuren Centre, you can certainly apply all four lenses and see where the positive impact is.

LISA LACHANCE: For some of the priorities that we can distill from mandate letters and from the platform, I'm wondering if you can provide an update. Nova Scotia Loyal - if you can provide an update on that program and which of the four lenses it contributes to.

I'm also wondering if you can update on the transition to Invest Nova Scotia. Has a new CEO been found? Has the advisory council been appointed?

SCOTT FARMER: Starting with Nova Scotia Loyal, there's been a prototyping exercise that's taken place over several months, working with consumers and retailers to understand what really drives behaviour and what kinds of solutions will work well and be practical for them, all against the aim of driving a 10 per cent shift in consumption of local products.

There's been a coincident branding exercise as well that's been undertaken to ask people why they're motivated by buying local and what's important to them. Those two things have come together and will sort of inform the next steps in the design of that program.

As it relates to Invest Nova Scotia, of course it's the combination of the former Innovacorp and the former NSBI. That became effective December 1st of this year. As you can imagine, there are a lot of things that need to happen in the background. We closed off financial statements and we've got new email addresses. There's a refreshed website and all of those things. The CEO search is an ongoing process that is continuing. The period for applications closed mid-November, so that's proceeding along.

I will say that from an operational perspective, we've continued to see things move along at a normal pace. The work at Innovacorp and AscendBio that we've talked about this morning has continued. The work of the former NSBI has continued. You see the regular disclosures on Tuesdays of innovation rebate programs and payroll rebates that have issued, and of course they continue to work with clients around the province.

It's been fairly smooth and we continue to work through the implementation steps on Invest Nova Scotia.

THE CHAIR: It is 11:10 a.m., and I believe we're going to go to about 11:45 a.m. before we ask for closing statements. We'll start our second round. I think we'll still continue to have a follow-up until we start running out of time, if that's okay. I have MLAs Regan, MacDonald, Burrill, and Barkhouse on my list. MLA Regan.

KELLY REGAN: Thank you very much for the description of the value of clusters. I studied at the University of Waterloo, so that was familiar to me for the software. Even those of us who were not taking tech-related got drawn into it, and many of us got employed through that area, and it can really change a community in terms of employment and opportunities for young people who maybe often leave to go elsewhere. Thank you for sharing that with us.

In terms of the expansion of the Verschuren Centre, how far along are we? Are we on time, on budget? We are seeing soaring costs impacting other construction projects here in Nova Scotia. Has the Verschuren Centre been dealing with that particular situation too? It's probably a question for Dr. Mason.

BETH MASON: We're not immune from soaring costs, delays, labour issues, and supply chain issues. We are constrained by our funding and the timelines on that funding. Initially we were going to have a new build, which would have been wonderful, but the timeline on that is out of scope, so we are just today signing off on our lease of an existing build. We have a compressed timeline because all of that has taken some time - NGen are wonderful for cracking the whip on us for mapping and reporting and accountability, if we weren't already.

You have an assessment of risk. Every project has a risk register. We did identify some of these things, because we were in the middle of COVID-19 when we did it. Probably our biggest risk was COVID-19, which then actually just equals labour market and supply chain issues.

Did we expect it to continue and be as peculiar as it is right now? No. You'd have to have had a crystal ball, wouldn't you? We risk mitigated in a number of areas, so where we knew cost inflation, supply chain issues. We did a lot of our equipment procurement used, which we were able to do because there were a lot of dispersals as well. Someone else's misfortune is to our advantage. That was an interesting process, acquiring those pieces.

We suffered the same delays engineering-wise and all of those, but we've mitigated on supply side with used on building with an existing fit-up. We still have a very compressed timeline we have to meet, but we continue to try to mitigate for that. I think we're well on the way. We've mapped out our installation, commissioning, and deployment, and then Phase 2. We always had the capacity to mix and match, get the first line and then add pieces, so we shifted fairly quickly in the process at the beginning of this year to stage our installation and our add-ons.

We've actually applied for \$4 million in additional funding to do some automation that we would have loved to have done in Phase 1 but will be in Phase 2 - which speaks to that labour market issue. It wasn't number one on my radar to actually automate everything

on Day 1. We were interested more in training programs and upskilling, and now the focus is automation. You have to be adaptable.

[11:15 a.m.]

KELLY REGAN: I think this question is probably for Deputy Farmer. Part of the minister's mandate is to attract and grow innovative, sustainable, and green businesses across the province and support businesses in reducing emissions

Apart from this project, can you speak about some of the other things that the department is doing to meet the minister's mandate?

SCOTT FARMER: It spans across a number of different areas, but to give a couple of examples, one is the recently changed IRP. That has to do with existing businesses - the Innovation Rebate Program that exists in the province. It's a \$12 million annual program aimed at improving both productivity and sustainability. When we're receiving applications for the IRP, we're looking forward to touch on both of those things, and we've seen some significant results.

For example, Labatt was the recipient of an IRP grant that allowed them to offset the cost of their capital improvements where they were recycling CO₂. It was a situation where they had CO₂ leaving, and they were buying CO₂ to go into their processes and reformed the process to recycle the CO₂ that was used in their processes. We've had other examples where companies have reduced their water usage or their greenhouse gas emissions individually through the IRP, and they need to indicate and demonstrate those things.

When we talk about attracting innovative and green businesses, part of it is through the kind of capability that the Verschuren Centre has built and we've supported to become a magnet for those kinds of organizations. There's research and development that's happening in other places. We talked about batteries, and there's a growing battery cluster here which is supportive of greenhouse gas emission reductions over time. The former Innovacorp, the investment arm of Invest Nova Scotia, now really places an emphasis on clean tech companies.

Though not necessarily in the green tech space, when we've looked at investment attraction through things like payroll rebates, there's been a focus on financial services and ICT. While they might not be in the clean space, they're clean industries, essentially. I know you're talking about knowledge workers in most cases that don't come with a large carbon footprint, along with those efforts, so it's a way to grow the economy in a way that has a low carbon impact. The more remote work that's an option for some of these, the more it provides an opportunity for people to do their work from different parts of the provinces and reduce some of the commuting time as well. That's some of the ways, I would say.

THE CHAIR: MLA MacDonald.

JOHN A. MACONALD: This is for the deputy minister. We've set an important goal of 20 per cent of money being spent by Nova Scotians on locally grown and produced food by 2030. What initiatives have the Verschuren Centre currently engaged to help bolster food production and security in the province?

SCOTT FARMER: I'm just looking at some of the companies that are with AscendBio right now. I'll invite Dr. Mason to fill in. She's more familiar with the individual companies than I am. As I look at it, the primary focus there is around turning waste into something that's useful rather than necessarily driving demand. It's having a positive impact, but on the other side of the supply chain is the way that I would describe it. Dr. Mason may have some further comments that are helpful.

BETH MASON: There's a lot of aspects to the food chain, and some of the key pieces are food security and food safety. We know currently - the number ranges depending where you look, but potentially 40 per cent of food is wasted from farm to table. With the burgeoning population, one of the most obvious places to target is food waste. Unfortunately, plastics are a piece of that. When something lands in a grocery store, plastic is what gives it shelf life.

One of the things that the Verschuren Centre has worked on is bio-based plastics that enable us not to have to get rid of all things polymer-based but to actually substitute oil-based plastics for bio-based plastics. We have a nice marriage, actually, between our marine extractions, where we've taken chitosan, which is a natural biopolymer, and applied that to plastics applications. It gives us all the same types of strengths and breathability that we require to extend food shelf life without being a petrochemical base. That's one example on the food waste reduction side.

On the production side, as has been mentioned, a number of those companies look at how we can get the same or greater production with less resources. Our agricultural yield outputs have maximized over the last decade, and yet our population continues to grow. How can we get more for less? Having been on the primary production end of that in my lifetime, I know what that feels like, where you're asked as a producer to keep making more, but do it in a more environmentally friendly way and use less resources. It's a squeeze, and that's why we're seeing farms disappear, and the farm owners' age demographic is diabolical, I would say at this point.

To do that, we focus on things like inoculants that we can grow - microbial inoculants that will enhance the soil microbiome, which means that when the plant grows, it sucks up more nutrients or it's more efficient in that nutrient utilization. CoteX, as we've referred to earlier, is a seed and fertilizer protein, so when you apply the fertilizer to the land, less is leached out. Less environmental degradation, more efficient use of fertilizer.

Our focus is on those technologies that enhance the efficiency of utilization of our resources and reduce degradation that may occur inconsequentially from primary production. At the other end of the spectrum, in food waste reduction, and in the middle, on food security with companies like Kraken Sense, we're ensuring that we don't waste food from contamination. There's a whole load of touch points on the food security sector that we have.

JOHN A. MACDONALD: You touched on this - Hants East is basically a dairy capital. What are you doing for helping the cutting edge for agriculture?

BETH MASON: My background actually is the dairy industry. I worked for the big cheese in Canada (Laughter) - number three in North America. Interestingly enough, when I came here, my focus was on marine extractions, but we did that by making use of lactose, which is a co-product - we don't like to say waste - of cheese production. I actually used to work for the big dairy company. My job was to upvalue all of the lactose deriving from cheese production in Canada and the U.S.

From the dairy sector's perspective, whey is a massive volume - 90 per cent of the milk that goes into cheese production ends up in whey. From a dairy plant perspective, we fractionate it that way, and you've seen the same things in the pulse industry in Saskatchewan. We fractionate that into its sugar and its protein components. The protein is what all you bodybuilders will be consuming as whey protein isolate, and the sugar is lactose, and we use that for fermentation. On the production side of dairy, finding uses for those co-products is key to sustainability of the industry.

Another interesting aside is on the production side. You'll all be aware of the many companies that are hoping to grow seaweeds and of the magical stories of seaweed reducing methane production from dairy cattle. If you go to the U.K., you can't sell your milk into Tesco, one of the major retailers, without disclosing your carbon footprint, which they will then lay claim to. I have friends in the U.K. with large dairy herds, and they have to reduce their carbon footprint to enable themselves to get their milk on the shelf. It will come here. We're already seeing those ads for the dairy industry heading for net zero.

There are a lot of things we do with dairy production. One of the big areas that I used to work with - mostly in the States, because the operations are larger - is anaerobic digestors and recapture of methane for various other uses. There are companies that are looking at the waste side in terms of methane recapture, and also methane output, that dairy cattle and beef cattle are being blamed for, methane being a primary contributor to GHGs.

There is some reasonable science behind methane reduction from certain seaweed species. So from a nutrition perspective, we can impact the dairy industry from the end use, and then also from a co-product of cheese production. Our focus is on a circular economy, and it's not actually just a dream. It's a reality. It's a nice example.

THE CHAIR: MLA Burrill.

GARY BURRILL: Deputy Minister Farmer, you probably wouldn't be surprised that I would like to ask you a political question. We're talking here about the interface of government economic development support and private sector innovation. In the public discourse in Nova Scotia, one prominent issue recently has been this transition with the amalgamation of Innovacorp and NSBI from a governance board model to an advisory board model.

The Chamber of Commerce here in Halifax - Pat Sullivan has said that this is a concern because, as he has expressed it, advisory boards don't tend to have the same quality of oversight, and also, with the advisory board model, both government and also the private sector are exposed to potential criticisms about political involvement.

This sounds to me like a legitimate concern. Does this sound like a legitimate, reasonable concern to you?

SCOTT FARMER: I've been to enough committee meetings that I know my opinions on things are really not relevant to the discussion.

My sense of things is - and my experience has been also - that ultimately the minister is responsible for what happens in the organizations that she has responsibility for. Whether there's a governing board or not, ultimately it comes back to the minister. With this change, that responsibility of the minister is shortened. It's more clear.

One of the things that can happen with an external governing board is that you are able to leverage the benefits and the connections and knowledge that those folks have. The implementation of an advisory board is intended to maintain that value, but they don't necessarily need to concern themselves with approving the budget of the organization or approving the written version of the business plan. With an advisory board, the aim is really to engage those expert advisors in the most efficient way.

The minister has always been responsible, ultimately, for the decisions that get made, particularly on a large payroll rebate, for example. That goes to Cabinet over a certain threshold. There have always been certain mechanisms. The CEO has a fair degree of day-to-day decision-making that they're enabled to make as well. I don't think it changes the nature of the decision making. We're intending to retain the benefits of the external board through the advisory board.

The other part of this, of course, is bringing together the two organizations so that it's much simpler for one Nova Scotia business to know where they need to go to get support. I'll say, we're seeing some of those benefits today. The Verschuren Centre example is a good one where we have the former Innovacorp as partner, and AscendBio, and we have the former NSBI making introductions to clients and helping them solve

problems through the participants at the Verschuren Centre. I'm quite optimistic about what we're going to achieve with the new Invest Nova Scotia, would be my summation on it.

[11:30 a.m.]

GARY BURRILL: I might ask the same question to you, Dr. Mason. You have worked with the former model in the two predecessor organizations, and now with the current model with Invest Nova Scotia. This question of a governance board or an advisory board - is this of relevance to the working relationship from the point of view of the Centre?

BETH MASON: I think it's an advantage to have the combined entity. As I mentioned earlier, we have a large number - and other provinces have the same. We have an investment arm and we have an attraction arm, and to have those groups at the same table to me gives us a chance to complete the pipeline together. We're all working collectively to support the growth of those companies. It's an absolute plus. It's not desirable as an entity like ourselves to have a disparate number of entities that we can't collectively get together with.

From a governance perspective, I would say that's not really for me to comment on. We have our own - we're a not-for-profit, we had an advisory, now we have a solid board. Either way, from a CEO's perspective, one would look to the board, whether advisory or fiduciary, to provide those external connections, and skill sets, and feedback that one needs to create strategic approaches to a business plan.

THE CHAIR: MLA Smith.

KENT SMITH: I'm going to turn my attention to something future looking that I'm fascinated with. In my former life, I was a real estate developer - I built a few homes, and that's what I did before I got into this fantastic opportunity. Last month, I read an article about the University of Maine, and their Advanced Structures and Composites Center had just completed a prototype 3D-printed home using wood fibres and bioresins.

I'm curious to know if that's anywhere on the Verschuren Centre's radar, and, if so, can we talk about the possibility that we could see something like that coming to fruition here in our province?

BETH MASON: It's absolutely possible. We started a cluster with NGen on smart materials to look at - complementary, actually, to the battery energetics - to look at other energetic materials, but, also, smart materials for industrial applications.

The other side of that is our drive to net-zero housing as part of our energy program. It's absolutely possible today to make net-zero homes, and materials such as those composites only add to the capacity to achieve net zero faster - net zero being the effect of

GHG emission, but also materials. As we said, that supply chain needs to be green. If you want to build a net-zero home and you use concrete, then you've got a dirty carbon footprint, versus if you can use a compressed composite.

They come with added benefits in terms of functionality. I had an interesting conversation this morning, actually, about whether we could start to develop something like that in the south end of the province whereby we pull together some of those technologies and just expand what the Verschuren Centre does into some of those deployment centres.

That's what I would call a future vision. We need to deploy across the province what we do from our little home in Cape Breton.

KENT SMITH: Net zero homes, great. They certainly exist, and if people choose to do the work and spend the money, they can certainly build net zero homes.

Focusing more on the 3D printed aspect of it, is that something that would be part and parcel if we were going to advance that type of technology?

BETH MASON: We don't currently focus on 3D, although there are smaller entities like, I believe, the Nova Scotia Power Makerspace has some 3D print capacity. It's at industrial scale, so our focus is to get the composite to a stage where it could be 3D printed, and then that's an easy deployment because so many things are being manufactured with 3D printing right now. So yes, absolutely a possibility, and an easy play.

THE CHAIR: MLA Boudreau.

TREVOR BOUDREAU: We've heard the term "cluster" a couple of times from a number of different people today, and it got me thinking about what this cluster would look like. What's the possibility of what could happen at the Verschuren Centre, and for the CBRM area? What is your vision of what that would look like in five to 10 years?

SCOTT FARMER: These are forward-looking questions. We're optimistic that when you look five years out that we could be talking about 20 to 30 new resident companies, 200 to 300 employees, and all the investment and spinoff that goes along with that.

One of the advantages that we have with the model that exists at the Verschuren Centre is that we're getting companies that have moved through the funnel. If you think about what goes in the top of the funnel in the start-up ecosystem and what comes out at the bottom as a healthy, thriving company, it's a narrowing funnel as you go along. There's a lot at the top - somebody who's got an idea in a lab somewhere, or somebody who's got an idea and hasn't made it to a lab. Then there's somebody who's got an idea that's been tested and not proven out.

Everybody who's arriving at the Verschuren Centre has been through the initial steps, so they're well along. They've got a technology, and there's a market for it. They've received some investment; they've got a business plan. They stand a much greater chance of success than the ones who are at the very top of the funnel.

Because that's happening, because we've got this significant demand and pipeline for organizations to come through, there's every reason, and the examples that we've seen - Shaw, Michelin, Copol, a variety of ones just in the early stages of this that are getting traction in Nova Scotia - there's every reason to think that five to 10 years out, we could be talking about hundreds of jobs and significant investment spread around the province.

The Moretti reference that I made earlier - it talks about a Moretti multiplier and the significant impact of a cluster in a particular area. It's not an overnight thing, and there's not a formula that every single job has so many spinoff jobs. But if you look over a long period of time in an area where there's a technology cluster, not only do you see disproportionately high growth within that cluster, you also see disproportionately high growth in all of the things that serve that directly and indirectly.

If we've got more high-tech businesses located in a particular area, that's good for the caterer, that's good for the accounting firm, that's good for the people who provide personal services. The benefit spreads out quite wide.

TREVOR BOUDREAU: I'm fascinated with the whole idea - it's an exciting time to be in Nova Scotia and in Cape Breton. I'll leave it at that.

THE CHAIR: Do we have any additional questions? We have five minutes left.

MLA Regan.

KELLY REGAN: If a company has an idea and they need some funding for that - I'm hearing from people and they're not clear on how things get funded these days. Dr. Mason, this has nothing to do with you. We have a shipyard that suddenly was sold to the Province, and folks are wondering: How does this happen? Does someone approach the Province and say, I've got this opportunity and we need help? How do you get in the door?

SCOTT FARMER: I'm happy to answer generally, as it relates to how you get in the door. We've got an organization in Invest Nova Scotia that's 130 employees who are connected around the province. We've got regional business development advisors who are situated around the province. We've got staff of Invest Nova Scotia who are here. We've got representation in Cape Breton.

The multitude of opportunities that exist out there come in in different ways. It might be through a regional business development advisor if it's business that's looking to expand and they're consulting on how they can do that. It might be conversation about how

they can access a new market. On the investment side, it might be a company that's pitching to the investment side of Invest Nova Scotia, the former Innovacorp. They've got a new widget and they're requiring some investment.

There are also lots of other partners in the environment as well - whether it's BDC or ACOA, or on the smaller end it could be the credit unions or the banks. There's a whole variety of them. All that to say there are many entry points through Invest Nova Scotia, depending on the nature of the client.

THE CHAIR: We have two minutes. MLA Regan.

KELLY REGAN: I have a pretty good idea how the Verschuren Centre reached out: They already had a relationship with the government, et cetera, to get funding. Casting zero aspersions on funding Verschuren Centre or anything like that, but I think people don't understand how it is that we ended up buying a shipyard when that has clearly not been a direction that the government has taken over the past number of years.

Could the deputy minister speak to how we have great entities like the Verschuren Centre being funded through a formalized process, and then something that just seems to be a one-off?

THE CHAIR: I'm not going to allow the question. I think it's too far off our subject.

You've got 45 seconds, if you want to go ahead, MLA Lachance.

LISA LACHANCE: Earlier, deputy minister, you outlined the four lenses that guide economic development strategy, policy, and investment in the province. I'm wondering: Could you provide for the committee at a later date the analysis that was undertaken to buy the Lunenburg shipyard and particularly highlight which lens it was seen as a priority investment under?

THE CHAIR: Order. We're not going down that - we're just too far off from Verschuren Centre.

We are out of time for questions. Dr. Mason, do you have closing comments?

BETH MASON: Thank you, everybody, for the opportunity to appear here and spread a little of our joy and excitement at what we're doing. I think there's lots of growth still to come, and I appreciate all the help that the provincial and federal governments do to support our private investments towards that end.

THE CHAIR: Deputy Minister Farmer.

[11:45 a.m.]

SCOTT FARMER: I'd just like to thank the committee for the opportunity to join you today on the Verschuren Centre.

THE CHAIR: Thank you all very much. Really, it's been a great topic. Very interesting and informative.

Typically we take a quick break here while the panelists leave, but before we do, because we may be done, do we have any other business for this committee?

The next meeting date, for the record, is January 24, 2023, on the success and future of the Nova Scotia Climate Change Fund. Our witnesses will be the Department of Environment and Climate Change, EfficiencyOne, and the Clean Foundation.

I adjourn the meeting.

[The committee adjourned at 11:47 a.m.]