

HANSARD

NOVA SCOTIA HOUSE OF ASSEMBLY

COMMITTEE

ON

ECONOMIC DEVELOPMENT

Thursday, February 25, 2016

COMMITTEE ROOM

Ocean Technology Sector in Nova Scotia

Printed and Published by Nova Scotia Hansard Reporting Services

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In Attendance:

Ms. Monica Morrison
Legislative Committee Clerk

WITNESSES

Mr. Tony Goode,
Associate - CFN Consultants (Atlantic) Inc.

Mr. Mark Regular,
Director of Business Development - Partner International



House of Assembly
Nova Scotia

HALIFAX, THURSDAY, FEBRUARY 25, 2016

STANDING COMMITTEE ON ECONOMIC DEVELOPMENT

9:00 A.M.

CHAIRMAN
Mr. Joachim Stroink

MR. CHAIRMAN: Good morning everybody. This is the Standing Committee on Economic Development. My name is Joachim Stroink, MLA for Halifax Chebucto, I am the Chair for this meeting.

This meeting will have a presentation from CFN Consultants (Atlantic) Inc. on the ocean technology sector in Nova Scotia.

I'll ask the committee members to do introductions and I'll start with Mr. MacLeod.

[The committee members introduced themselves.]

MR. CHAIRMAN: I'll ask the witnesses to introduce themselves and then you may start with your presentation. I ask that before you speak during the question period that you get recognized by the Chair, in order for Hansard to be sure they have the right people associated with the questions and comments.

Mr. Goode, I will now turn it over to you.

MR. TONY GOODE: We are delighted to be here. This is sort of a follow-up to a presentation we made to this committee about two years ago when I was here with Jim Hanlon, who is now the chairman of IORE. I am accompanied by my colleague, Mark Regular who is a consultant with Partner International - we're both consultants.

I've been working in the aerospace, defence, and ocean tech sector for virtually my entire life, so that goes back 50 or 60 years or so. I've been around for a while but have been working in the consulting field for 10 years, focusing in this area. I am delighted to have this opportunity to talk to you today about a subject near and dear to my heart. My aim is to sort of just give you an update on the technology sector since 2014, a little introduction of sector overview, things that are happening at this stage in the game, a report that we did for the Government of Nova Scotia that we submitted in the Spring of last year and some conclusions and recommendations.

I think the key message that we want to get across, and I think that this committee certainly understands it, that the ocean tech sector is, indeed - and this is out of the Ivany report - one of the strengths of the Nova Scotia economy and it offers a possibility of playing a transformative role. We absolutely feel strongly that ocean tech, writ large, offers the opportunity to significantly transform the economy of Nova Scotia if it is placed at the centrepiece of government policy, government actions, the economy, et cetera, because it is so broad it impacts on so many areas of the province, both rural and urban, and looks at large numbers of resources, so we will go further forward and mention that as we go forth.

Right now, it generates about 7 per cent of the overall economy and if you take it to the spinoffs, it's 12 per cent of the overall economy - significant, one of the largest sectors in the economy at this stage of the game. This just shows you how that's broken down. I think this was as of 2014, but this is something that we took out of the Ivany report. It just shows you where the actual activities within the ocean tech sector take place, including defence security obviously, shipbuilding, marine transportation, fisheries and aquaculture, but the point I'm making in this thing is it shows the breadth and the depth of the sector in Nova Scotia.

I'm just going to go over a few critical events that have taken place in the last couple of years. The Centre for Ocean Ventures and Entrepreneurship (COVE) in which the government funded WDC to purchase the former Coast Guard lands in Dartmouth, and I understand that the work of this committee was very influential in the government's decision to go ahead with that purchase. For that, I think the entire sector thanks you for your interest and for your stimulus of this particular incentive.

We think COVE does have the prospect of being a stimulus for ocean sector technology research and innovation, but it's not the be-all and the end-all. There is more to it than just COVE, and it does need key private sector tenants to make it a success.

The Institute for Ocean Research Enterprise, they've been doing great work under the leadership of Jim Hanlon, renamed to this Ocean Research Enterprise, which probably better focuses on what it's actually doing at this stage of the game. They've done several things - the smart buoy initiative, which there is a new data collection buoy at the approach of the Halifax Harbour at the moment; another one at the Port of Saint John. There are a lot of other projects that these guys are involved in in terms of bringing the innovation

that's available within the research community and that is available within the industry itself.

The Ocean Frontier Institute at Dalhousie is their initiative at the moment. As I understand it, they've been invited to submit a full proposal by March 29th to the Government of Canada. This offers a huge boost to the research community in the local area if, indeed, it does go ahead with the kind of money that they're looking for. The potential, again, for truly transformative research, building on the significant number of researchers that are already at Dalhousie University.

They've got continued support for their ocean tracking network that has been around since 2008. This is a global network for tracking what's going on in the oceans of the world from the point of view of species. Most of the equipment that these guys use is designed, developed and manufactured in Halifax by a company called Vemco. They are the leaders in the world in tracking marine mammals, fish, you name it - anything that swims in the ocean. Indeed they've now moved it into the fresh water area as well. So Vemco is a key example of the kind of things that are taking place within the ocean technology cluster in Nova Scotia - and they're unsung. Nobody knows who Vemco is, or very few people know. It's the same with most of the other 200 companies that work in this area across Nova Scotia. I'll talk more about that as we go forward.

If you have any questions, by the way, don't hesitate to put it right there. We can always go with the interruptions - no problem.

The Ocean Technology Council of Nova Scotia, which is an industry council under the auspices of the Aerospace Defence Industries Association, has a membership of close to 100 companies at this stage in the game. It has a lot of large companies like Irving, IMP and smaller ones like JouBeh and Jasco - again, locally developed companies that are out there selling their wares around the world.

In late 2014, our company team was selected to develop a technology road map for the ocean tech sector. Mark and I have done a number of studies in the ocean tech sector over the space of the last six or seven years and that helped us to basically be successful in going forward. What we were supposed to do is to develop a technology road map to identify research and development priorities and skills.

There is a list of the objectives of the study at this stage in the game: what is the state of the sector at this point; how do we compare with other jurisdictions; and what are the opportunities for collaboration and co-operation. Then the key thing is, what are the future technology thrusts? In other words, what are the technology drivers that are going to help businesses to grow, prosper and survive in the future? We were able to do that for the government.

Unfortunately, we submitted our report - at least we were supposed to submit our report - just as the government reorganized our customer, the Department of Economic and Rural Development and Tourism, and all of a sudden our customer disappeared. We managed to deliver it anyway, but the problem is that there has been little follow-up on the recommendations we had made in this study. I'm going to talk to you about some of those things as we go forward.

As I say, we submitted the report in May and we do understand that a lot of the recommendations have not yet been taken for action. In terms of our findings, and this is where we're going now, the government support in the sector compared to other sectors in the economy is very limited, there are very few dedicated bureaucrats working on this sector or its related adjacent sectors - aerospace and defence, et cetera. Mr. Matthew Thompson, who's in the room, I think - yes - is one of the key officials working in this sector at this stage of the game. He has been in it for a very, very long time and is very supportive of what we do but has relatively few - he may contradict me - from our perspective we don't see a whole pile of people working in it at this stage of the game. It needs a more stable, larger source of funds than has been the case in the past. There has been and we choose now a recommendation of ocean tech fund, we fully support that recommendation.

A few years ago in a previous government, there was a document published about the sea and the ocean tech sector and all the rest of it. It was great, very descriptive. It indicated how valuable the sector was to the economy of Nova Scotia, the breadth of it and all the rest of it. It was not a strategy, it did not have a plan, nor did it have a request for dedicated funding.

What we think is, if this sector is to live up to its potential, there is a need for a vision for the ocean tech sector; you need to have objectives or goals. You need to have an ocean tech strategy because all the elements of a successful sector are in place right now. We've got researchers at BIO, we've got them at the DRDC, we've got them at the universities. We're got a significant body of successful companies that derive 85 per cent or more of their revenues from exports, exactly the kind of companies that this province needs in order to be on the cutting edge, et cetera and we've got a physical infrastructure second to none across.

What we haven't got, in our view - and by the way when we did this work, we went out and talked to a lot of companies, a lot of officials, a lot of industry people and they all say exactly the same thing. If you go to Ottawa and you talk ocean tech in Atlantic Canada, they don't think of Nova Scotia - they think of Newfoundland. We need to change that. We need to change that paradigm because we have a larger sector, a more capable sector, a much broader research capability. They specialize in certain areas, we specialize in others but we have that. It's all in place. What we need to do is bring it all together with a strategy and a plan and a vision. That was one of the things that we recommended and we have not been able to move ahead with that at this stage of the game.

Having said that, I know that Matthew and his team are working in this area. Obviously they have their own plan but I'm talking about something that is going to bring everybody into it. That's one of the things that we have recommended we would do.

The strategy obviously needs to include the key elements of the sectors, et cetera, regulation, the management of ocean resources, the target of objectives or investment attraction. In other words, NSBI is working in this area, and we need to do more in terms of bringing more people into the sector.

We think that the government needs to act as a cheerleader for the sector. We'd like to see the Nova Scotia Government, every politician - as I say, if you go to Newfoundland, from the Premier to the mayor of every major community, they talk ocean tech and they know about it. I don't hear that within the ranks of the body politic in Nova Scotia, and yet we should be because we were founded as a result of our ocean location. So I think it's going back to the past in many ways.

We think that could be done through the development of a vision and strategy. There is a need for a stable source of funding. In Newfoundland - I know that we've got issues with regard to royalties at this stage in the game, but Newfoundland, when they put their strategy in place, they earmarked a revenue stream coming out of the royalties from the oil and gas sector to feed into the ocean tech sector. When they put their plan out - I can't remember how long ago it was, it was quite a few years - they came out with about \$25 million of identified, attached funding to the plan, that is available, has been available and it's being refreshed over time to support the sector in terms of companies, in terms of research, in terms of infrastructure, et cetera.

As I say, we've got oil and gas at the moment but there is hope because of all the work that's going on right now with Shell and BP off the south shore. I was just reading in news feed this morning about how bullish BP is on the sector at this stage in the game and the discoveries they hope to make in the very near future - very encouraging. So we need to look at also what we can do to support the research and development - longer time lines for execution, et cetera. That's obviously something that IORE could do and it's also something that the Government of Nova Scotia could support as well.

There are a lot of trends that are taking place within the sector. There is consolidation. People recognize there is a need to get larger so smaller firms are starting to band together. There is a convergence in integration of technology. There's not a thing that goes into the sea these days that doesn't include IT - information technology, data management and a digital approach to it. So things are converging like the growth of big data; I think we all know about that. How do you manage vast volumes of data? The global tracking network from Dalhousie generates vast amounts of data. How do you deal with it?

Automation, robotics - that's coming along. The changing economics of technology - because in the past, technology had been incredibly expensive. Customers these days are insisting that prices go down. So something you could have sold for \$20,000 a few years ago, they're now saying \$5,000, that's all I'm prepared to pay. Then with the implications of cheaper and cheaper memory from the point of view of integration, you're able to do that.

Also, systems integration - moving up the value chain. People just don't want you to provide a small component. They'd like you to provide a complete solution to something. That means in Nova Scotia, three or four firms, or one big firm leading, need to go further up the food chain. That's where the money really is.

Then of course there's the newly emerging technologies with green environmental policies that are going on right now.

So a lot of technology areas are being pursued. That was part of what we had to do and I'm not going to go through all of those at this stage in the game. Some will come to mark in the next few years; some will take many years after that and a lot of resources to do it. I think we identified well over 100 emerging technologies, something like that, and you can't fund them all. So there has to be a process put into place whereby - and it's hard to say, the 10 best, the 15 best, 20 or whatever the heck - those guys might be with a committee from industry, et cetera, the best ones for us to put money in in the near future. That entails a certain amount of picking winners, but I think with an informed group you can certainly look at what the prospect is of being successful.

I already talked about the lower prices, et cetera - and SRED credits have really been - the availability of the scientific research credits from the federal government - they've been shrunk significantly, which is rather unfortunate - in terms of the access to them. One of our clients found out that they thought they were going to get \$400,000 back - sorry guys, no, we've just tightened the rules and you're not getting it. That's huge for a small company in terms of cash flow because they put the money into the research, expecting to get it back.

What we need to do is look at ways we can improve the access to capital, commercialization investment. One of the key things is the non-recurring engineering. It's very difficult for companies to get support for that. In other words, you've got an idea, you brought it up to a certain technical readiness level - how do I get it from here to get it ready for market? That's a huge investment, a lot of non-recurring engineering is required to do that to commercialize it. So how we do that - as was recommended by the Ivany commission - is an ocean tech fund, which is relatively simple. I know there are other funds available right now within the government but we think something focused on ocean tech would be a very good idea.

Just coming to my conclusion recommendation is really a repetition of what I've already said. We think because it touches virtually every aspect: aquaculture, manufacturing, education, training, IT, research development, ship and boatbuilding. It goes everywhere. There's hardly a community in Nova Scotia, whether it's a rural community or whether it's an urban community, not touched in one way or the other by ocean technology, writ large, and we think it should be the defining paradigm for the future of the province. We should not be the province that says in its licence plate "Ocean Playground", we should be the ocean tech centre of this country and that's what should go on our licence plates. We've got all the elements of that sector in place at this stage of the game but as I said before, we lack this comprehensive vision, strategy and plan so that we can allow this sector to grow, support it in its growth so it can take its defining place in the economy of the province.

The sector right now is robust, it's export-oriented and it's focused on innovation. These guys innovate like crazy; they have to, in order to survive. I've talked about the fact that it has potential to transform the economy but it could offer us the opportunity to provide better, well-paying jobs for our young people to educate and keep them here in the province because we'll be able to employ them in such an interesting, dynamic sector. As I say, no other sector has this wide a reach across the economy.

We need the funding to develop the vision, the plan, the strategic framework and we think that the potential can be realized through the active involvement of government at both levels - federal and provincial - with academia and industry acting as partners to allow for more collaborative industry and university research and development relationships.

Companies complain about how difficult it is to work with the universities. They complain and we've got anecdotes to support that because university imperatives are different from those of industry. Industry wants an answer rapidly, and universities don't work under quite the same time pressure. I'm not being critical here, I'm just stating an observation that was passed on to us by a number of companies. There is some supplementary material which you can see.

In conclusion, thank you very much for listening. I'm open for questions at this stage of the game. My apologies for taking longer than I was supposed to.

MR. CHAIRMAN: Thank you very much, Mr. Goode. I will turn it over to Mr. Orrell for the first question.

MR. EDDIE ORRELL: Thank you, gentlemen, for your presentation. You are talking about an ocean tech fund and you are talking about a vision in the ocean technology sector that needs to be government-driven and supported. We have a government that says the Ivany goals say that they are not the ones that drive the economy - it's small business and businesses in the society. How do we bridge that gap? If you guys are going to pitch

that ocean tech fund and the vision, who do you pitch it now that the ERDT is gone? Is it Nova Scotia Business Inc.? Is there someone dedicated for that? If the ocean sectors are saying we need a vision and a fund and needs to be driven and supported by government and the government is saying it is small business that needs to drive that, where do we stand on that? Where does that new tech fund stand?

MR. GOODE: To go back, I think the government - the bureaucracy and the political side - needs to be the cheerleader of this sector. We are convinced that you cannot do this without the participation of industry, mostly small businesses, with academia and with government. So in order to develop this, we've already done a lot of the groundwork for developing a strategy and a vision, that's included in our report.

At this stage of the game, what we would envisage would be setting up a working group in which there would be representatives from industry, perhaps from the Ocean Technology Council, which has 100 members and represents a large breadth of it; perhaps from the offshore energy sector as well. In other words, bring more people into that. Somebody from the university sector - could be Nova Scotia Community College - and then somebody from government to work with us, as in giving us consultants - working to be the catalyst to develop this strategy, to develop the vision, et cetera. Then that would be submitted to government and be accepted by government as the way ahead for this sector, and we would propose that money would be associated with this in order to grow it and help it move ahead.

I recognize that there are huge demands on the government purse at this stage of the game, that there are very major issues there. But we feel very strongly that with a relatively small investment, compared to investments that have been made in other sectors with less promise, that this sector is poised for take-off. It's all there - you don't have to spend to create it. You don't have to support these companies because they're all making a living at this stage in the game, and they're growing - maybe not as fast as they would like to, but they are growing and the key is that they export. Whether you're Acadian Seaplants - they're exporting, that's where they have a market. Vemco exports all over the world. MetOcean exports all over the world. All these guys do this.

We think that putting this team together to make this happen - to articulate what we've already suggested - would be the right way to go and it would involve industry at its core.

MR. CHAIRMAN: Mr. Regular.

MR. MARK REGULAR: I think the key part of our recommendation is definitely that we see that government's involvement and role is as a player in the story as opposed to being led by government. We definitely see the feedback that we receive directed us to that it needs to be led by industry. There are government initiatives already happening, whether it's things that NSBI is doing, what the Department of Business is doing with

COVE and others. Those are all key parts of the puzzle, but it doesn't necessarily just have to be - let's create another project, another group to manage this. It needs to be led by industry and I think everyone that we spoke to would agree with that statement - that it's definitely an industry-led initiative, but bringing in the key pieces and the key activities that are already happening to move it in the same direction.

MR. ORRELL: I did hear you say that the university involvement - the post-secondary type of involvement - is a lot slower than the industry would like. How do we improve that? How do we get everybody together to make this work? It sounds like this could be a real big part of our future and that could be new money, new investments in the province. How do we as politicians of all stripes do that to make this happen, to make it move forward?

MR. GOODE: Going back to your previous point, the key is to make this industry-led. In Germany after World War II, the German Government, as it was at that stage in the game, recognized that if they were going to survive after their entire industrial base had been wiped out by bombing and by war, that they had to change the paradigm. So they instituted something called Fraunhofer Institutes, a partnership between industry and researchers - not universities but university-level researchers, Ph.Ds, and the rest of it who were employed by these institutes to answer questions set to them by industry. So they responded to industry requirements with university-level thinkers, but who were not driven by the imperatives of "publish or perish" or with teaching loads or any of those other kinds - and there's cross-pollination back and forth.

There are now 75 of these institutes. One opened at the University of Western Ontario recently - about two years ago - focused on the automotive industry. There are two in the United States now. We had proposed in several of our reports that we have one of those in Nova Scotia - industry-driven, industry-funded to a certain extent, funded by government as well. When a company comes to one of these institutes and says okay, I've got a problem, I need an answer to this particular technical problem in three months, I'm prepared to pay \$100,000 to get my answer in three months. Give that over to those guys and they come back. They don't get their money unless they solve the problem.

That's a different paradigm than what the university has at this stage of the game. Again, the university has its own imperatives - they have to, that's the way they are organized. They are not organized with industry considerations at the forefront of their priorities. Again, that's an observation, not a criticism.

MR. CHAIRMAN: Mr. Belliveau.

HON. STERLING BELLIVAU: I find this very interesting and I'm sure we don't have enough time to address the number of questions. I'm going to ask through you, Mr. Chairman, Tony, for your observations. You talked about - there's no question that the potential for the offshore sector, the ocean technology is there, to me it's unlimited but

there are some serious questions that need to be addressed. You alluded to this in your presentation about Shelburne Basin.

Today, as we sit, there are some serious questions talking about the offshore development in that particular parcel. I'm going to bring your attention to parcel 3 and 4, the northeast point of the Shelburne Basin. The fishing industry has posed serious questions about tidal drift and the influence of the Bay of Fundy. I'm asking the question because I raised this question in the House of Assembly last session and the Minister of Energy does not share the same views as myself or the fishing industry. I'll point you to the Clean Ocean Action Committee that has basically the endorsement of all the different fishing industries in southwestern Nova Scotia.

I'm just trying to summarize here, quickly, that there are some serious questions that came up and I want to say that there are some sensitive areas around there in close proximity to Browns, which has a protected lobster nursery. Anyway, you get the picture. To me there are some serious questions that need to be addressed in order to have offshore oil development. One of them is dealing with dispersants and the effect that the tidal range in the Bay of Fundy would have on that. Now the fishermen have one opinion, the Minister of Industry has another and the oil industry has another. I think this technology can address that.

The second part of this, and I'm going to ask you - like the earlier speaker here - to see how we can develop this technology and all benefit from it. At present there's no capping mechanism on North American soil. There's no heavy-lift vessel in North America to put a capping mechanism, in case of a spill.

Now I brought your attention to the effects of the Bay of Fundy and I'm sitting here saying we have the technology, how can we develop that and let that evolve so every coastal community and Nova Scotian can benefit from that and we can proceed with the development of the offshore?

MR. GOODE: I'm not an expert in the offshore although I am obviously aware of it and read about it so as I say, I'm not an expert and would be very hesitant to venture into that sector. I think there are a couple of observations I could make about your question. There are always competing interests no matter where you go, no matter what you're trying to propose, particularly when you're trying to introduce the potential for resource exploitation in an area which is also a key area for another sector, so there has to be a balance.

Going back to the point I made earlier on, my feeling is that if there were an institute of the type I described, then the two sectors with their funding could go to these guys and say I want you to do some work in this area, I want you to come up with a plan to develop the kind of technology that addresses the kind of concerns that you have at this stage of the game, particularly when it comes to what kind of capping mechanisms can be developed,

et cetera. There is a market for that stuff around the world because in my humble opinion, the demand for oil and gas is not going to disappear in the lifetime of anybody in this room. As a matter of fact, it's going to keep on going up. You've got to find it somewhere.

We in Nova Scotia who are desperate for new sources of revenue - in order to support an aging population, in order to support the youth that need education - need to look at how that could be exploited in an environmentally sensitive way that does not in any way damage a very key part of our sector, i.e. the ocean resources, the fishing - the guys that swim or crawl along the bottom.

I think that if you had a mechanism and something you could go to, a resource you could go to and say, I've got these problems; oil and gas - I want you guys to fund this study because you've got the money, but that it would be informed directly by the people who would be affected, i.e. the fishing industry, coastal communities, those kinds of things.

I can't comment on the no capping mechanism and no heavy lift. I guess the real issue is that we don't have a large sector at this stage in the game. There has been a lot of development off Newfoundland. There's a lot of development, we hope, pending off Nova Scotia, but it's all driven by the market. Where is the demand for these things? In the Arctic, off the Norwegian coast, off the Brazilian coast, to a lesser extent in the Gulf, et cetera. We're just not there yet. The only way you could do that is say, government has to fund it.

However, this offers a market opportunity for us. If there is any way that we utilize our really smart researchers to come up with a mechanism that might be cheaper, more efficient and easier to use than they've got right now. As I say, I'm not an expert.

MR. BELLIVEAU: If I could interject quickly here. You're basically saying that these ideas are somewhat on the money so the question is about funding. My observation is that our federal Prime Minister has suggested that they will go into deficit - identify some shovel-ready projects. Would you suggest what we're talking about here - the ocean technology - are shovel-ready?

MR. GOODE: I wouldn't say that - there are some shovel-ready projects because people are already doing research. Are they doing research in the areas that we've just discussed? I really don't know and I'm not in a position. You could certainly ask the guys in the oil and gas sector whether or not there is, but this could be something that could be identified to go ahead, but then you can't - again, it's got to be industry-driven by the core constituents who are affected by this kind of thing. You can go and employ somebody from the university, but I think you'd be better off to go and get somebody - a young buck that's doing a post-doc and really understands this stuff, who is keen and eager and then goes working in an industry community-driven organization along the lines that I described.

MR. REGULAR: I think the other key part of when we talk about there being a strategy, our view of the ocean sector is a lot more than just aquaculture or just oil and gas

or just any given sector. The reality is we see this as really if you're involved in something that you throw into salt water - or fresh water, I suppose for that matter - there is an impact here. So creating a vision and a strategy where two different groups can have a conversation about a topic or create an environment where they can at least be at the same table, have the same conversation, understand what the organization, the province, the larger view of the sector and how we're going to use the oceans is the environment I think ultimately we're trying to create.

We had numerous conversations with companies that talked about things that were benefiting multiple sectors. We talked with one group about the idea of mapping the sea floor all around the province, the benefits that could have. They, in fact, were an aquaculture company, but they said that helps the folks that are doing tracking of marine life. It helps the oil and gas folks. It helps the folks who are doing aquaculture and those types of things. Some of these things have a lot of impact on a variety of areas, but having a strategy actually puts them all in the same place as opposed to pushing it off to the Department of Fisheries and Aquaculture or the Department of Energy - otherwise it creates an environment and a view that everyone can actually work towards and be part of. That's one of the things we're trying to suggest here.

MR. CHAIRMAN: Ms. Lohnes Croft.

MS. SUZANNE LOHNES-CROFT: It's wonderful to have you here because I must say I'm not as familiar with ocean technology as others in my caucus are. I'm still not clear on who you take your direction from. What department?

MR. GOODE: When we started this particular project it was the Department of Economic and Rural Development and Tourism, and it was taken over by the Department of Business. At the moment our project is - we've delivered it and what we're trying to do is to socialize the idea around saying, let's implement the recommendations of these, at least go forward in terms of one of our key recommendations, which is the visioning, the plan, the objectives, strategy, et cetera.

At the moment we think it should be the Department of Business that would do that - it could be Nova Scotia Business Inc., we really don't know. We've talked to everybody about it at this stage in the game. One of the things that we're doing by being here is to socialize it and get the message out to a group of people who can indeed influence government in moving this thing forward because we think it does need to be done. We don't mind who we work for to make this happen. We've worked for ACOA, we've worked for Nova Scotia Economic and Rural Development and Tourism, we've worked for the industry association so we really do not mind. We would just like to ensure that the work we did in this sector in this latest report just doesn't sit on a shelf somewhere because we think it's so important to the future of this province.

I think it was identified as the only sector, if my memory serves me, that was identified within the Ivany report as being worthy as a sector of significant mention. That's what we're here for, and I wish I knew who my customer is going to be at the moment.

MR. REGULAR: I just wanted to clarify - as Tony said, as two consulting companies, we were engaged by the Department of Economic and Rural Development and Tourism to execute this study so we're not representative of the sector broadly, we're members of the sector, I would consider us. We were engaged by that department to do the study and we delivered that study to them. So much of Tony's comments around sort of the "we" was our opinion and our view and are results of the work that we submitted, so we're not sort of speaking on behalf of the aerospace association, the Ocean Technology Council or others.

MR. GOODE: Furthermore, all of our work in this particular study was informed by significant consultation within industry, within academia, within government, so it's not just our views. We obviously synthesized those views and then came to conclusions and recommendations as to where to go.

MS. LOHNES-CROFT: So you have no government liaison at all, no one that you talk to in government?

MR. REGULAR: No, so we submitted our report at the end of the fiscal year, the day before the changes happened in the Department of Business. Our report was submitted and the next day - that day, I suppose - all the changes happened within that department. We subsequently met with the person we had reported to at the time. He indicated he received the report, it had been received and that was it at that point. So the project was completed at that stage.

MS. LOHNES-CROFT: You received no feedback at all from any department?

MR. GOODE: We have not received any official feedback. We have talked to Mr. Johnson, we have talked to Laurel Broten, we've talked to the Ocean Technology Council on this, and we've talked to the head of IORE. We've talked to a lot of people about what was in this report but at the moment we have not received any official feedback, not that one always does from studies that the government commissions.

We haven't received official feedback, as I say. We've met with a number of people in terms of trying to get this thing moved ahead because we think it's such an important - and we're not the only people who could do this. It just happens we have done a lot of work in this sector. There are others out there as well, but we just feel that it would be - especially given what was in the Ivany report, it would be very disappointing if the next steps as we saw them, as we recommended, were not taken to move this to the next level. It's one of the reasons we're here.

MR. CHAIRMAN: Mr. MacLeod.

HON. ALFIE MACLEOD: Thank you for your presentation. I'm going to continue on where my colleague left off. My question is, who was it that asked for the report and what was the driving reason for having this report done to begin with? When the call for proposals was made, was there a timeline, who called for it, and what was the objective of it?

MR. GOODE: It was a senior bureaucrat within the Department of Economic and Rural Development and Tourism. We were commissioned to do this study, I think, in December 2014. We were told that it needed to be done before the end of the fiscal year, so a lot of work had to be done in a relatively short period of time.

The Department of Economic and Rural Development and Tourism at that time had identified the ocean tech sector as a priority sector. This was another in a series of studies in terms of defining - at first I think we did, what was the first one? We've done several studies for them. We did one on the voucher program for research and development. We did another one for them in sort of defining what the sector looked like, et cetera, writ large. This one was just another in a series of studies trying to define the potential and then the future direction of the sector in terms of a technology road map, and that it would be utilized as part of their ongoing thrust to recognize the high priority that the government accorded this sector at that stage in the game.

MR. MACLEOD: So government identified this sector as being a priority situation that we should be moving on, is my interpretation of your last answer.

MR. GOODE: That's our sense - at that stage in the game. It certainly had been articulated to us that this was a priority sector.

MR. MACLEOD: That being the case, according to slide 13, you gave the report, we're almost one year later and nobody has taken you up on the results of this very important subject, which was deemed that had to be done by the end of the fiscal year because it was a very important priority of the government, and nobody has talked to you or brought any results from that report since a year now?

MR. GOODE: Not officially.

MR. CHAIRMAN: Mr. Belliveau.

MR. BELLIVEAU: Tony, you made reference to the Ivany report several times during your discussion here today and I'm going to bring it to your attention, too, because the Ivany report suggested the doubling of fish exports that could be accomplished within one decade. As a backdrop I'm going to use today, February 25th, and the temperature

outside was 13 degrees when I left my vehicle. I'm bringing your attention now to the warming waters off our coast. I think we're in the process of climate change.

Something that has been documented as basically species are moving north because of the warming waters. Actually there was a study a couple of years ago in Maine; the high lobster population landing areas literally moved 75 miles to the north in the New England States lobster fishery. The fishermen have observed that in Nova Scotia on a daily basis.

My question is, through ocean technology, are there companies involved in trying to collect this data? Is there anything being done to address the needs of rural Nova Scotia, because the fishery is going to change, it's literally changing as we speak, especially over the last four or five years, as some of these - and I'll use the example of sector 33, the development of the lobster industry in that particular one sector has evolved tremendously in the last four or five years so again, there's great potential.

Are there small companies or is somebody collecting this data and making this information available for all the above?

MR. GOODE: In my comments I referred to the Ocean Tracking Network. The Ocean Tracking Network is a global organization basically run by Dalhousie to track biomass in the world's oceans, utilizing sensors provided by Nova Scotia companies. The priorities are set by the council that sort of manages the Ocean Tracking Network.

As I understand it, the Fisheries and Aquaculture Department does research on a regular basis in terms of tracking movements of biomass, et cetera, keeping an eye on particularly high-value species. If communities wanted to find out what was going on, I'm sure that if they went to Dalhousie - and again I'm not connected with Dalhousie or anything - they should be able to get results of the kind of things that you are looking at that might be able to inform them.

There are companies out there doing this kind of work - smaller companies in terms of the actual companies but there are companies here in Nova Scotia, either on behalf of the Ocean Tracking Network or for other customers and also for private sector companies that need to know this information. For example, Clearwater is a funder of research - other fishing companies are as well - because they absolutely have to have this information.

I think you are right, that as waters warm further south that there will be a migration. This is not the first time this has happened in the history of the earth, it has been going on for millions of years, species move back and forth depending on what is going on within the climate and changes in the oceans, et cetera. There are opportunities if one knows what is in that biomass. I think Dalhousie researchers are doing a great deal of work in that area.

MR. CHAIRMAN: Mr. Regular.

MR. REGULAR: Just to add onto the point as well, one of the key findings we had in the study itself, we talked a lot about sort of the convergence of technologies. There are a lot of companies that are really focused on, how I can take what I do and bring it part of a bigger picture.

One of the concepts that was discussed quite a bit, and is an active part of the sector, is the idea of sending out autonomous vehicles to collect data, weather. They can put amazing things on these vehicles, everything from testing the water column to temperatures, to any number of factors that they can collect data on using these pieces of equipment, have them rise to the surface of the ocean, send that data out to a satellite. That data gets all dumped back into - we talk about big data - put back into another system and into another technology for analyzing data.

The technologies the companies here are working on, there are companies here that are capable of those things. It's always a question of who pays for it, who does those things but definitely the technology is there, the companies have the capabilities to measure those types of things here now.

MR. CHAIRMAN: Mr. Irving.

MR. KEITH IRVING: Thank you for being such a strong advocate for a sector with tremendous potential and I think we all recognize that.

You referenced an understanding of the pressures on government with respect to finances, they are immense now but you are making a very strong case of investments needed in this sector that would - I think you basically implied they are going to return multi-fold returns. Can you give me a sense of what you're talking in terms of government funding first of all, for the vision and the framework portion of work that you're recommending.

Secondly, you alluded to Newfoundland with a \$25 million, I'm presuming annual fund. Is that the order of magnitude that you're talking about, your advice, that we need in this province?

MR. GOODE: In terms of completing the work that we had recommended that needed to be done, that's relatively inexpensive. We're talking maybe \$30,000, \$50,000 to be able to get that work done. Then because there will be more recommendations that come out of that and you've got to have ongoing funding to support those recommendations, the question is about the implementation of it.

I will betray self-interest here - we would love to do that work because we've been working in the sector. We really have a close relationship with it and, as I say, we had prepared the recommendations, which we think are very important going forward.

In terms of an ongoing fund, the Newfoundland and Labrador Government as I understand it - and again we don't live there - when they released their money, I think it was about \$23 million to \$25 million over a space of a four- or five-year period, and then it was topped up going forward. So we're not talking about large sums of money. Again, you hate to make invidious comparisons, but in the past, the province has put very large sums - hundreds of millions of dollars - into the forestry pulp and paper sector, et cetera, some of which went bankrupt shortly thereafter.

We're not talking about those sums of money. We're not talking about supporting an industry in terms of subsidies or anything else like that because it's existing at this stage in the game. It's getting along - exporting like crazy, as I say, innovating within it. What we want to do is to provide them with a fund that they can access to support their research, development and their innovation - commercialization of their technologies. That's not a huge amount of money for a province like Nova Scotia.

If there was \$25 million allocated to this, and that's real cash - I'm not talking about bureaucratic administration or anything else like that. I'm talking about money that would be available and accessible to companies or researchers or whatever in order to go forward. That's not a huge amount of money. The potential return on investment is significant because again we're not talking about a dying industry. We're talking about an industry of today, and an industry of tomorrow.

Ocean technology, writ large, is forecast to grow at an incredible rate around the world. We're talking a trillion dollar industry overall - if you include everything that's in it. You can narrow it down obviously, but it's a massive sector. Does that help?

MR. IRVING: It does help and I do want to just clarify what you've stated there because part of your presentation talked about access to capital and I was starting to feel from your presentation that you were looking at government returning to kind of the pickers of winners and losers and investing venture capital. Clearly I think what you're saying now - and you can expand on this - government isn't good at that. We've made some very bad choices - whether that's in the pulp and paper industry or most recently with wind. So obviously our focus is staying away from those kinds of major investments. So you're really focusing on research in terms of this technology fund?

MR. GOODE: Yes, in essence it would be. There are funds available right now, but not necessarily all the ocean tech - advanced technology et cetera. As I say, it does exist. It would be something that a company that has an idea based on previous research or based on customer demand says, okay, I need \$1 million, let's say - maybe it's not that much, maybe \$500,000, whatever it is - to act as the seed money to match up with the funds that I'm already going to invest anyway in this to move this piece of technology from where it is at this stage in the game - it may just be in the lab, it may be in the initial stages of development - to move it to commercialization so it can be out there in the market selling, making money. That's what you want to do.

The non-recurring engineering aspect of that can be quite significant for smaller companies because most of these companies are 20 to 50 people, they don't have huge financial resources. There's the Atlantic Innovation Fund which takes a huge amount of effort to get, there are other funds available at this stage of the game, all of which are very, very bureaucratically intensive in terms of getting it.

One of the joys of the voucher program that the previous Department of Economic and Rural Development and Tourism had was it was so easy to access. They could go and in less than two weeks get \$15,000 that they could spend with a researcher and in the recommendations we made it said you need to increase it and you need to allow them to go back twice, which were accepted. Those recommendations were accepted.

The reason it's so attractive is that it's so quick. It's two pages of paper, not a volume that you have to submit. That's what you need, quick access to this kind of thing.

Now some of that money may vanish, that's the nature of business, you're not going to win on every one of them, but it's not you, it's not the government picking - the guy already has a technology idea, so how do we develop that?

MR. REGULAR: If I could just add as well, one of the things that we found in the work that we did, the feedback from industry wasn't always that they wanted duplication of existing programs either. There are areas where they didn't feel like there was support - you know, non-recurring engineering wasn't one of those types of areas so it's not necessarily to duplicate the existing programs or even replace them, many of them are using them quite well.

Tony mentioned the voucher program, it was really interesting to see what these organizations could do with a small amount of funds. I mean at the time (Interruption) it was \$25,000, a very small amount of money that these guys were using. They went to this program, here's a problem that I have that I need to solve, they worked with academic institutions, either community colleges or the universities, solved the real business problem that they had and were able to benefit from it on the other side.

It's not always we need \$15 million of venture capital to grow a company. These are companies that say here's a real opportunity, my current client or customer has come to me and said I need this technology added to whatever it is that you're selling. It's like how do I get over that hurdle and that's really what a lot of these things, the interest from industry is solving those problems and to be able to do it in a timely fashion because as Tony said, they don't want to wait - I have a problem right now, I need you to solve this. Your competitor in Norway or in Asia or elsewhere, maybe they can but we need to do it with you, let's get this done. The companies are often challenged with that sort of question.

So it doesn't necessarily have to be hundreds of millions of dollars to dump into a sector to create a sector. As Tony said, it's here, it's really helping to solve some of those problems that they're coming across.

MR. CHAIRMAN: Mr. MacLeod.

MR. MACLEOD: I just want to go back, we talked earlier, in your slide 4 you said that this industry is worth somewhere between \$2.5 billion and \$4.4 billion, depending on what you take into it. You just discussed a minute ago about a potential fund over four or five years of somewhere between \$5 million and \$7 million a year for that period of time. You were engaged to deliver a report on a sector that was identified as a growing sector that was important to the economy of the Province of Nova Scotia and you said that nobody has officially acknowledged and/or taken that report and done anything with it. Is that correct?

MR. GOODE: As I say, officially we have talked to government officials. We've told them about it, we've tried to move ahead. There is a limitation of resources obviously in terms of taking these things and people are focused on other priorities, as we understand it. The COVE that we talked about that the government had invested in, et cetera, that is going to require funding going forward as well.

As I say, officially we have not received any notice of our findings or what the next steps are going to be at this stage in the game.

MR. MACLEOD: Please correct me if I'm wrong. You said we have a \$1 trillion business moving forward here as far as ocean technology, when you consider the world and what's happening, and there is nobody in the Province of Nova Scotia's government who has decided that this is important enough to sit down and officially have discussions about where the next step is and where we should go?

MR. GOODE: As I said, my understanding - and I'm obviously not in government - is that the focus at the moment is getting COVE up and running on the Coast Guard lands, getting the infrastructure in place and all the rest of it. That's the focus of effort. So obviously there is a business plan that has to be written. I don't know what's in that plan or anything else, I have no insight into it, but that is where the efforts are being focused, as I understand at the moment, but you'd have to get a government official to come back and talk to you about that. I'm not informed.

MR. MACLEOD: I certainly do appreciate that, but apparently somebody in government at one stage or the other thought that this was a priority when they gave you a purchase order to get a report done from December to the end of March - get it in and get it done, and then of course they destroyed a department.

I just wonder if you could tell me what the relationship with the offshore industry is with the Department of Energy, is there any kind of working relationship there?

MR. GOODE: I am really not aware of that. As I say, it's not the area that we work in. Obviously we had some insight into what was going on in the offshore technology industry, but we focus really on, what you might call, classic oceans technology in terms of the biomass, the instruments going into the ocean, the offshore energy sector, those kinds of things. We have not delved into the oil and gas sector in any great depth at this stage in the game, but we did recognize that it is a key area going forward.

MR. REGULAR: I would just add - as Tony said, we weren't involved with the Department of Energy. We did consult with some oil and gas companies as part of the process at a high level with respect to technologies. That was the focus of the mandate. So there was no evaluation of the existing relationship between the oil and gas sector and the Department of Energy as part of this mandate.

MR. CHAIRMAN: Mr. Belliveau.

MR. BELLIVEAU: I'm going to go in a bit of a different direction now, if I could. The last time you guys were in you talked about how Canada used to encourage the adoption of local technology, but then there was a shift whereby local companies had to prove themselves on the global market. My interest is if this is still the trend. The point I'm trying to make here is - to me, there is a potential for tidal power and wind power in Nova Scotia. It's almost you had a perfect place on our globe. To me, there is encouragement about local technology, and when I look at this, I look at the large projects like in the Minas Basin. I refer to it as the Wright brothers trying to fly a 747 on their very first flight.

The point I'm trying to make is that there is so much potential literally around Nova Scotia and particularly in southwestern Nova Scotia and the influence of the Bay of Fundy. There are a lot of local areas where small turbines - not the 747s in the Minas Basin, but the small turbines can supply energy hogs for municipalities from hospitals to skating rinks and so on - from Cape Sable Island to Petit Passage, the Schooner Passage. There are literally dozens of locations that can accommodate small turbines, yet we are focused as a region on this large project.

The second point I'll make, in December 2015, we had a Government of Newfoundland and Labrador company announce that they wanted to create a wind farm off of southwestern Nova Scotia, literally 13 kilometres from the southwest part of Nova Scotia and take all that power to the United States. Not one kilowatt comes ashore. There are a lot of opportunities there to develop and have some benefits off this technology, yet we're not implementing or putting these small turbines where municipal units or some of these large hospitals can benefit from that natural resource. We do not have a smart grid system that we can accommodate power that literally is going to be on our offshore and is going to be shipped to the United States.

I'm asking, am I the only one here thinking that way? What is your observation on the evolution as this industry moves forward, on those points?

MR. GOODE: One has to be very careful in terms of commenting critically on the past and government policy. I would agree with you that the opportunities for the kind of micro technologies that you suggested is probably almost infinite. But again, it all has to depend on what the market is. Is the market there for it? Is the return on the investment for people who are developing this kind of technology going to be there, et cetera? Again, I'm not an expert in this area but just being logical about it. How do you get the power company to start reacting to these kinds of things, given the fact that as with all large companies, they look on much larger investments, et cetera, going forward to get their return on investment.

Again I come back to what we have suggested, the kinds of things you're talking about - they should be included in a vision or strategy for this sector. An objective for this sector, in which we bring these disparate elements together in a perspective for the province on this particular sector and its potential impact. We know that it is going to be significant wherever you make these kinds of - I can't specify what the return on investment is going to be but as I say, when you look at aquaculture, what do we do in that area? That's part of it. You might say in the strategy that we can't include all of that. You say okay, we need to do - this is the objective, how do we do that? Then set up a plan to go and make that happen, that part of it, et cetera.

It needs to be done under a comprehensive vision and strategy. I think that is what we are missing at this stage in the game. Had we had that in place, then the kinds of things that you are talking about, say 10 years ago, we might have gone in a different direction. That's what has been lacking, it is being developed piecemeal with everybody's own sectoral interests coming to the fore without, as I say, a vision for the province. That's really what we're trying to suggest here.

Is that a huge goal? How can you reconcile all these competing interests? That's always difficult but you've got to start somewhere. Newfoundland and Labrador has done it and it has had an impact on there because they integrated in that strategy the offshore oil and gas, et cetera. They don't have the same kind of - they have some tidal power opportunities, but certainly not what we have. We have this unique resource, the Bay of Fundy, and all these small areas in between - southwestern Nova Scotia all the way up into the Minas Basin, which offer opportunities.

Again, you have to start with a vision, and that vision and strategy permeates and is disseminated through the body politic. I'm not saying it's going to be a panacea or anything else like that but it takes us back to our roots as a province. We lived by the sea, that's what we did for centuries - by the way, I'm not from here, I've become one, okay? (Laughter) That's what we need to do.

The kinds of things you're talking about get folded into that. You can't cover it all in one document, I recognize that, but you can put placeholders in it. More action is needed in that particular area to see how that is going to happen. As I said, if we had something 10 years ago, I venture to suggest that we would be in a different position today.

MR. REGULAR: If I could just speak to your first question around the idea of companies having to prove themselves outside. We are definitely an export-driven industry, but there are a couple of reasons for that. There are definitely some really good examples of companies working together now, selling products to each other and creating a local industry. Many of these companies are developing technologies that our government - I suppose it would be federal funding - just aren't purchasing those products and services at this stage.

There are companies out there that are almost exporters by force in terms of the things that they develop are being used by other markets that aren't here. There are many jurisdictions around the world - working right at the ocean who are more advanced in terms of how they map their sea floor, how they invest in their technology, how they grow sectors and how they use these technologies. So we're at some level catching up to that, but our companies are already ahead of that curve in that they're selling products around the world to these companies. Sometimes it's purely a question of local demand.

I think most of them would be happy if we spent more money from a federal government perspective on mapping the ocean and understanding sea life and all those kinds of things because that's where their technologies can be used, but many of them really are just forced to sell to export markets because that's where their customers are. When they come back to compete here - no doubt that they can - it's just there's not even the market existing here for them to compete in.

MR. GOODE: Back in the 1980s, the Canadian Department of National Defence had made significant investments in research and development - through what is now DRDC Atlantic - in a variety of areas in terms of acoustics, in terms of ship quietening, in terms of infrared suppression. They mandated in the development of the frigate contract that went to Irving back in 1985-86 or something like that, but those technologies would be incorporated in those ships. The technologies were commercialized by companies across Canada. A number of them are still doing well on the technology that they developed, but they mandated that that's what they wanted to have in the ships.

In the 1990s, for whatever reason, that connection between Canadian industry, Canadian research and the Department of National Defence, and the Coast Guard for that matter - their requirements were severed. My sense is that it was severed because of an insistence on competition. In competing, they said one of the things you had to do was (a) cost - and I understand that - but (b) that you've already proven the technology. Well, where are you going to prove it? You have to prove it overseas, and then you have to come back and compete.

It has been very difficult for Canadian companies to get their products at sea, in aircraft or in land vehicles within the Department of National Defence, whereas a lot of other countries - particularly the United States - say, guys, it has to be homegrown.

Our market is not all that large, but most countries do it a different way. As in the 1980s they say, we'll fund that, we'll help you and you've got to put money into it as well, but we're going to get that commercialized and we want it installed on our ships as we go forward if we think it's a winning technology - and then use that as a basis for exports around the world because you've adopted it.

One of the clients I work with - a small technology company here which is growing by leaps and bounds, doing fantastic work - their technology was first sold to Australia and New Zealand. These guys competed with those countries in a variety of arenas and it was in the maritime aircraft area and it took years for us to get that technology into Canadian aircraft, despite the fact that it's some of the best stuff around, as evidenced by the fact that other countries bought it. It's a real problem. I think we alluded to that in the study we did for ACOA in terms of technology and technology adoption. It applies to ocean tech, equally as it does to the aerospace and defence area.

MR. CHAIRMAN: Mr. Rankin.

MR. IAIN RANKIN: I had my question for a while so you were kind of skating around the answer, and I think with the question from Mr. Belliveau when you said you can't really specifically say what the return on investment was - that was kind of my general question because I was wondering how comprehensive the study was, if it included performers. When you answered the question from Mr. Irving, I think you did elucidate one example of a company that borrowed \$15,000 and they showed a positive return.

I'm wondering how many examples do we have? Was that in the study? Could you show - or not limited to even Newfoundland but there are many jurisdictions that I assume have programs that have access to capital because, no question, I think people understand that a big component to this is having that access to capital and that's where government ought to be a partner.

Given the competing interests that you know are there, that's very real; without having some kind of way of proving return on investment, how do you expect to garner those funds, I guess?

MR. GOODE: That's a very interesting and a very difficult question but the first part of it - no, we were not mandated to look into the return on investment or anything else like that. The main focus of what we were doing was to identify the technology areas that companies and researchers felt were coming down the pipe within the next five years, next 10 years, next 20 years, et cetera, identify all of those and, as I say, I think we came up

with 50, 75, a significant number of them anyway, and also put the timelines as to when those were.

Around that kind of technology road map, that's when we developed a lot of the other recommendations as a result of the consultation we made with industry. We were not mandated to get into that kind of level, we were not asked to look at the finances, per se, of the sector. A gut feel doesn't work when it comes to these kinds of things. A gut feel is that a small investment in these things, again you're not going to win on every one of them.

When we look at the export potential of these companies, as I say, between 75 per cent and 85 per cent of their revenues are export. In order to keep those revenues coming in they have to keep on innovating, either by developing their current products further or introducing new technologies. In order to get to those new technologies there is a requirement for capital, either from internally generated capital or whether they get venture capital, which they're not fond of, or if they get some government assistance, et cetera, to leverage their existing funds going forward. So if you are looking at a sector that is increasing about 10 per cent a year, year over year, then you can extrapolate what the return on investment might be.

The thing is the accessible market is significant around the world. I mentioned that in fact the figure we saw, the overall ocean tech sector around the world in one year is \$1 trillion, but again that's everything that goes into it. Even if you start to narrow that down, that's still a huge potential and we're already generating \$4 billion or \$5 billion a year within this sector so I think you could extrapolate it.

When you go looking for money, one of the things you've got to tell the funder is the return on his investment and then return on the investment would be increased sales, increased profitability, more capital being generated within the company so they will not need to go back, et cetera. You can look at that and you can generate that - I can't specifically say for the sector as a whole. My sense is that it's a good investment.

MR. RANKIN: I think that's the important part because I think that somebody needs to do that calculation. I know and I recognize that you had three or four months to do the study so I'm not trying to be critical of the study itself. I think it's a good macro-level look at what needs to be done.

I'm curious - the working group thing sounds like a pretty good idea. Would that be able to form as a catalyst to bring some of the big ocean tech companies to Nova Scotia, in terms of just saying, who are they, can we get them here and what are the inducements required to attract them?

MR. GOODE: Again, that's a very good and very interesting question. There are a number of large companies in existence in Nova Scotia at the moment that work in the sector. Lockheed Martin does a lot of work in that area. There's a company called Ultra.

There are companies such as Thales, which is one of the largest aerospace and defence companies in the world with a significant ocean tech sector, which is now looking to set up shop in Nova Scotia.

So there are larger companies and I think that one of the impediments perhaps to further growth in terms of bringing larger companies in - what we do here flies beneath the radar. I know that we've had people from NSBI out there looking for inward investment, et cetera, into the sector. Despite its impact in Nova Scotia and the fact that amongst the scientific community around the world we're well known, we don't sort of loom on everybody's horizon in terms of a potential for investment. But if we can grow the sector further, that then starts to attract interest in the sector - by bringing larger American companies in, European companies, et cetera.

There are Norwegian companies working here in the fisheries sector; Dutch companies working here. So it's not that we're totally off the map, but I think we need to grow in order to grow.

MR. CHAIRMAN: Mr. MacLeod.

MR. MACLEOD: I just have one question. I'm going to put this to you, Mark. I see that your title is Director of Business Development. Based on the recommendations in the report that you submitted to the former department that have not been moved on for almost a year, if this committee were to take the information that you've supplied to us, what would your request to this committee be to take back to government in lines of where we should be going - based on the recommendations you've already given to government, but nobody seems to be listening to you?

MR. REGULAR: I think the key finding and key recommendation that we made from this study was that we need to develop that strategy; develop the vision; work with the people involved. There is a series of recommendations, but the overarching one is to develop the strategy and required in that will be consultation with the industry, forming some sort of organization if required, some committee, whatever it happens to be to move it forward, but to put the foundation in place to get it done.

Again, as I said, it would be developing the strategy, developing the areas of focus, developing the group that's involved in this and having some structure around how to move it forward. I think pretty much everything in this report lends into that core recommendation: we know what's out there, we need to be able to push it forward in some way, this is how we think it needs to be done, this is our recommendation of that, which is to take it to a next level where you form some organization/body. It doesn't necessarily even have to be for a larger group, but something to move it forward and to actually define what that strategy is and get the buy-in from the stakeholders to move it forward. That's what we're recommending in the report at the end of the day.

MR. GOODE: This was a technology road map. In that technology road map there were a large number of potential technologies - ones that people are working on, thinking about, areas that we need to do.

One of the recommendations we did, because we didn't have time, was to go back to industry to validate on a group basis - a representative group of companies, let's say, working with the Ocean Technology Council, and say, did we get it right? Yes, you might have missed one, et cetera. So we revise that on the basis of direct feedback from the industry sector.

Then, the next part of the recommendation - and I think it's as critical in terms of future investment - is to set a priority, a list: 10 to 15 most promising technologies. With that list of most promising technologies, then that would inform government - when guys come knocking on the door to get access to this fund, are you one of those top 15? Sorry, guys, we really can't help you at this point. So if you want to get your stuff in, go back and lobby. But you have to have a structure - you can't fund everything. Fifty priorities is a priority of nothing; you need to narrow it down. That was one of the recommendations.

Again, we didn't have the time nor were we given the mandate to go off and do that because this is a relatively short study over a very busy period, namely the big Christmas holiday season in which nobody is responding to your phone calls. That's where we would want to go.

The timeline? You could do the first part of it probably in about three to six months without too much difficulty. The second part of it could be done in parallel because it's a matter of meeting with the right stakeholders.

MR. CHAIRMAN: Mr. Belliveau.

MR. BELLIVEAU: I certainly find this interesting. Mr. Chairman, through you to our presenters here. I talked earlier about the Clean Ocean Action Committee, which represents a number of fishing groups across Nova Scotia, particularly in southwestern Nova Scotia - they raised a question about the use of dispersants in the offshore oil industry. To me, this is something that the present government has not recognized the sensitivity around, and something that this committee and the fishing industry has raised.

My question is, are there any companies involved in this area about looking at the use of dispersants in the offshore oil industry as a management tool for oil spills? Can you elaborate on that?

MR. GOODE: I'm not sure if there's any company that specializes in this. I'm aware, I think just peripherally, that Dalhousie may be looking at this and I'm pretty certain that the Department of Fisheries and Aquaculture is. Are there companies that could do

this in Nova Scotia? I think there are. Again, they need to be commissioned, there needs to be a fund set up to make that kind of thing happen.

I think if you are going to develop the offshore from the point of view of oil and gas, then you've got to make sure that the risk mitigation strategies are in place before the first oil starts to flow. A lot of that stuff has already been done and I know that people around the world have been looking at dispersants and how you can improve the efficacy of dispersants without damaging the environment at the same time - in other words, what happens to those dispersants, et cetera, when it sinks to the bottom or whatever?

There are companies that do it. I can't remember them off the top of my head but we certainly can take that under advisement and see if we can identify a company that could do that kind of stuff. There's a company somewhere in the middle of the province, it strikes me, that does this kind of stuff and I can't remember the name at the moment. We'll take that under advisement.

MR. CHAIRMAN: Monica will reach back out to you for that information.

Ms. Lohnes-Croft.

MS. LOHNES-CROFT: I think you might have answered the question I was going to ask about the strategy and getting that going, how we go about getting it going, getting the vision. Does the vision come from the sectors and the subsectors?

MR. GOODE: Yes, we think that again we have had input in the course of this study and previous studies from people working in the sector, whether they are in government or whether they are in academia or in industry, et cetera, what their vision would be. What we would need, as I say, is a working group that would have representatives of the various key stakeholders in it that we would work with in order to synthesize this vision and then test it, go back and forth, because it takes a while to come to an agreement on this kind of thing that is going to satisfy all the stakeholders. Mr. Belliveau has been talking about some key stakeholders and certainly the fishing community is one of those key things as well.

I think we've got a starting point. We've put down some of the factors that need to go into the strategy, we've provided them in this report. That would sort of be the starting point. I know that other people have done some work in this area. The offshore technology council, they've got their view of it, IORE have its view of it, and I'm sure that people within government also have their view. What we want to do is synthesize these, bring them all together so there is an overarching vision that can inform government.

What we would like to see with this vision would be articulated by the government of this province. I'm talking from the political side, as it was in Newfoundland and Labrador where the Premier, if my memory serves me, along with his Minister of Energy,

announced the strategy. That's the kind of thing that we would like to see and that has a political impact, no matter what your political stripe might be - because this is for the province. This is not for the benefit of any one group of political Parties or anything else like that. This is for the province. That's why we're so passionate about this - because we think it has the opportunity to move this province in a different direction.

MS. LOHNES-CROFT: And you speak of the cheerleaders and you indicated the Premier would be key in that. We are a peninsula here in Nova Scotia - very few communities are not affected by the ocean, but I also find there is a fear of technology for a lot of people. I look from the Lunenburg area where there are a lot of skilled and unskilled workers who do work in ocean-related industries. I know fishers who have been injured on the job who can no longer work on a dragger or fishing boat. They're offered education to go back to school and they fear the technology. They're stuck.

I see this more as an industry to attract young people to Nova Scotia. Is there anywhere in your report which indicates education has to be a huge component? I mean, our education system has to lead in the technology. I think we are headed a lot in that direction but can you speak to education and getting our young people involved and interested in this field?

MR. GOODE: We certainly mentioned education as being a critical component - both starting in high school or perhaps even younger. Certainly the Nova Scotia Community College and the work that they're doing, and they are already starting to - they have an ocean technology technician now, which is a great leap forward in terms of satisfying the requirements and offering employment to people who perhaps don't want to go off to university to take a master's degree or master of science degree or something like that. So we've certainly mentioned education.

I understand where you're coming from. It's really interesting because - I'm trying to think back, but we had a high tech crash I think was in the 1990s or in the mid-1990s, early 2000s, and as a result of that - because everybody was going go, go, go. This was the era Microsoft was going and IBM and everything was going, and then bang, it dropped off the face of the planet. They had the stock market crash associated with that sector. As a result of that, parents stopped encouraging their children to work in that sector. Really not a very smart approach because technology is so pervasive in the society in which we live.

If you take a look at fishing, if you have not embraced technology as a way of understanding where the biomass is, you're not going to be successful or as successful as somebody who has. Take a look at a small fishing vessel, even a lobster fishing vessel - they are festooned with antennae and sonars and everything else. That's all technology, which has to be embraced.

I understand that it's not easy if you haven't had that exposure in your younger days, but again, you have to embrace it. I understand the fear of it, but technology is

liberating because it allows you to be much more productive per level of effort that you put into something. It leverages your brain to make your brain more productive - something we all need to embrace. Without that technology, which can be developed in Nova Scotia educational institutes - whether they are at the community college level or at the university, that then forms the basis for the expansion of what we're talking about. Then going back, say okay, if this then becomes the defining sector for Nova Scotia, then you get parents enthused about it so that they then encourage their children to take the courses they need in high school in order to get into science programs or engineering programs or technology programs at the community college, et cetera.

There are jobs out there, there's lots of them. We've got to find something to replace the oil and gas out in Alberta for employing our people. The ocean technician program at Nova Scotia Community College is a perfect example of that kind of thing but you've got to get people enthused about it and then that starts at the political level - leadership.

MR. REGULAR: If I can add to that point as well, the interesting situation we have right now and I think this is one of the biggest challenges that the ocean tech sector faces is we don't know enough about it in this province, we don't know.

The reality is our neighbours work in the sector, our friends and colleagues work in the sector. I know people that I went to two universities with in Halifax and I went to school with people who went to study computer science at Dalhousie and now work for companies like Vemco. I know people who did engineering at different institutions and now work for guys like JouBeh and others. We are already generating the people, it's just creating another opportunity for your engineers, your computer scientists, your science students, your biology and marine biologists to get out there.

A good friend of mine was doing his master's degree in research and he actually ended up working closely with a couple of different companies when he was doing his master's research about commercializing the technology he was developing. He went to Acadia and was working on his master's but he was able to get that technology. We just don't know about it, the reality is that we don't know enough about the sector to know who is active in it and what they are doing but we are already creating that environment where companies can thrive here. The more companies we have, the more opportunities for expansion, growth and development and overall knowledge.

The tools the companies need are already here because the companies are here and succeeding. I think that's the key part of it, we don't even necessarily need to recreate the wheel here, it's building upon what's there now.

MR. GOODE: I'm going to ask a question - did anybody know that there's over 200 companies active in the ocean tech sector in this province? That is a fact. If I go and ask somebody on the street if they know about that - not a clue. It's the same with the aerospace and defence sector, we have a large sector here. Nobody knows about it, there's

no government department associated with it, not a department of high tech or vast technology or whatever, nobody knows about these things.

They all know about agriculture because somebody down in the Valley starts complaining bitterly when somebody wants to move an airport to some other place, et cetera. With fisheries, Mr. Belliveau will make sure that the fishery sector is well represented in terms of the political clout. Nobody knows anything about what we do in this province from a high tech perspective and it's significant and flies beneath the radar, unfortunately. We're trying to raise the awareness of one part of that, oceans technology.

MR. CHAIRMAN: Mr. Irving, real quick.

MR. IRVING: Again I appreciate your passion. I don't think it's completely lost on politicians in this province. The Premier has spoken very strongly about ocean tech, unfortunately he has to speak about other topics as well in his job. You are focused on one, which I appreciate.

The *We Choose Now* report has really only identified two sectors to focus on and there are seven priorities. Unfortunately government doesn't move at the pace of business and that is a constant battle that frustrates politicians and people from outside government so we have that ongoing challenge.

My quick question for you, a major initiative for the ocean tech is COVE, can you tell me if you see that as maybe becoming that heart of that organization to lead this sector? Is it important to have a building there and a hub? Just comment on COVE - give us a bit of your thoughts on that.

MR. GOODE: These are my own personal views on it, and I think Mark probably shares them. I think COVE has the potential to be hugely important within the sector, but governance is part of its future that has to be determined.

I think from the point of view of potential, you've got a thousand feet of waterfront with a water lot that goes out a fair distance into the harbour, and that's very valuable. It means that a small company that needs to test its instruments in a water column can go and do that right off there without having to go talk to anybody else in the harbour or any level of government or anything else like that.

If you can get a larger anchor tenant - a significant company - to move in there, then you start to create the nucleus of a catalyst that's going to help the system, so people start feeding off each other. Get some research going on there, perhaps a research lab from one of the universities or BIO or DRDC or something like that. Get them involved in it.

The location is fantastic. You've got an infrastructure which obviously needs to be upgraded and I think that funding is being sought to make that happen at this stage in the

game, but there are a lot of moving parts to it. But it's not the total answer to the ocean tech sector. It could be a very important part of it.

My own view is it should be driven by a totally private sector board, with representatives from government obviously, because then it would respond to the industry. Now, that's me advocating on behalf of the industry. Other people might have other interests that they would want to see, but that's what I would like to see - a private sector board driving COVE, with representatives of the ocean tech industry and others.

MR. CHAIRMAN: You have a few minutes left to wrap up, if you have any closing comments that you or Mr. Regular would like to add.

MR. GOODE: Ladies and gentlemen, I very much appreciate the opportunity to have been able to speak to you this morning about a subject which I'm obviously very passionate about, but I wouldn't be here unless I thought that this sector, as you mentioned - one of which was singled out in the Ivany report and its follow-on document as being hugely important to the province.

We had the privilege of being asked to look at this sector. We came up with some serious recommendations, which we think if they were adopted would help to move us down a particular path, because it is a path. It's a voyage we have to go on, but it needs from the very top, as I say, this vision, strategy, in which we can do it. Somebody might be working on it at this stage of the game. We haven't been asked to participate in that, if it is indeed going on. Thank you again. I really appreciate it and would love to come back and continue the discussion sometime in the future.

MR. REGULAR: I'll just add one final comment and obviously it echoes Tony's comments about appreciating the opportunity to be here and speak about it. It's a unique opportunity for us. As consultants, we're not here to just give our own opinions on the world.

The interesting part about really any work we've done in this sector - and this study in particular - is that the real feeling of ownership that the companies in this sector have - they really want to see this succeed. They're buying into it. They're here plugging away on a daily basis to create companies and create these opportunities. They want to see it grow.

The things that we put in here aren't just our view of the world and our opinion. It's not an op-ed piece. This is what industry is saying. This is what industry would like to see happen and want to see move forward. It's energizing to talk to these companies to see what they've gone through, how they've got there and how they're plugging away to make something happen here.

Certainly this report, this study, as we saw it, is really a way to help move that in the right direction - to really help them build on the energy they've already created. As was said earlier, it's not re-creating the wheel, it's helping to maybe make that wheel spin a bit faster. The companies here are really passionate about what they can do and they're doing it quite well. This is a way to provide that level of support to get them to the next level.

MR. CHAIRMAN: Thank you very much Mr. Goode and Mr. Regular for sharing your thoughts today and your presentation was quite enjoyable I think for all of us.

We're just going to recess for a few minutes then we can do some committee business regarding our next meeting. So just a five-minute recess and I'll call you guys all back. Thank you.

[10:50 a.m. The committee recessed.]

[10:56 a.m. The committee reconvened.]

MR. CHAIRMAN: Just a little update - the witness is unavailable for our regular meeting date, which is the Department of Transportation and Infrastructure Renewal on the minister's Rail Advisory Committee, which is the next topic. So I ask that if we could please move the meeting to Tuesday, March 22nd from 1:00 p.m. to 3:00 p.m. If we could make that happen, then the witness would be available to do his presentation. If I can get a motion for that.

MR. MACLEOD: So moved.

MR. CHAIRMAN: Would all those in favour of the motion please say Aye. Contrary minded, Nay.

The motion is carried.

With that, the next meeting will be March 22nd. At this point, the meeting stands adjourned.

[The committee adjourned at 10:56 a.m.]