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Chair

Mr. James Maloney

Standing Committee on Natural Resources

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● (1535)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): I will call the meeting to order.

I'd like to welcome everybody back from our constituency week. I hope it was very productive and that you got a lot done back in your home ridings.

I'd like to thank Mr. Kmiec for substituting today and joining us for the meeting.

I'd like to thank and introduce our witness today. We're very fortunate to be joined by Mr. Dan Wicklum, who is the chief executive of Canada's Oil Sands Innovation Alliance, an organization that needs no introduction around this table.

I want to thank you very much for taking the time today and making yourself available to speak with us and answer some questions. You're joining us from Calgary, I understand.

Mr. Dan Wicklum (Chief Executive, Canada's Oil Sands Innovation Alliance): I am, Mr. Chair. Thank you.

The Chair: I welcome you to provide some introductory remarks, and then we can open the floor to questions.

[*Translation*]

Mr. Dan Wicklum: Thank you very much.

Good afternoon.

As you said, I have the privilege of being the chief executive of Canada's Oil Sands Innovation Alliance, or COSIA.

We were deliberate in choosing our organization's name because we wanted it to reflect the fact that oil sands are a national resource that can be developed sustainably, from coast to coast to coast.

[*English*]

I'd just like to point out that by testifying in front of the committee today, we are saving almost 500 kilograms of carbon from being liberated into the atmosphere. As we enter a carbon-constrained world, we all need to be willing and able to step up and communicate and interact differently.

I have about 10 minutes of presentation that's going to be centred on about eight slides, but I would very much like to preserve most of my time with you for questions at the end.

The slide in front of you now should appear as a circle, or a ring of logos; it's slide 2. At the top of the slide is the vision of our alliance. Simply put, the vision of these 13 oil sands companies, which joined together four years ago inside a new legal structure, is to accelerate the pace of their environmental performance improvement in Canada's oil sands. That's why we're here. That's what we do. We accelerate the pace of environmental performance improvement. We do it through two concepts. One is collaboration; the other is innovation.

I'll unpack a little bit more detail in terms of what that means in the COSIA context. These 13 companies collectively account for about 90% of the daily production of Canada's oil sands. Before COSIA they competed on environmental performance. Through COSIA they collaborate. What that means, to put a point on it, is that they share with each other the knowledge, practices, and technologies that they know and own, all to accelerate their performance improvement. Inside of COSIA, we think that this collaboration is pushed as deeply as in any alliance or industry association we know of anywhere on the planet.

Let me give you an example. All of these companies own proprietary technology. Inside of COSIA, for the first time they give each other patent use rights, royalty free, in perpetuity, and irrevocably if it's going to help them accelerate their performance improvement in the oil sands. Essentially what they've decided is that when it comes to environmental performance, collaboration is a better model than competition. They're still in full compliance with competition law, but when it comes to environmental performance, they collaborate.

The first thing they do is share their technologies. So far they've shared almost 820 technologies that cost about $1.3 billion to develop.

The second thing the 13 companies inside COSIA do, along with 39 formal partners that have been made partners inside of an associate membership program by signing a memorandum of understanding with COSIA, is they develop a planning framework so that they codify and articulate the highest innovation priorities for new knowledge, new practices, and new technologies.

The third thing that they do collectively, themselves, and with a global network of partners is launch new projects to develop and test new technologies. Our current project portfolio is about 250 projects with a price tag of about $450 million.

Let's go to the next slide. I'm going to give you a little bit more detail in each of those areas where the companies share, plan, and deliver. The slide in front of you is a bit complex. I won't go into the details. It's a cascade of rectangles. In the upper left-hand corner is the COSIA charter and vision. The charter is essentially a document that the CEOs of each of these 13 oil sands companies has signed, committing to themselves and to each other that they would do things differently. They would push collaboration to depths that large companies have not done previously in the world.

The bottom right-hand rectangle talks about a project portfolio. This is really a list of our 250 projects. We needed to develop a series of more detailed and technical concepts that would link the ability to make sure we're launching exactly the right projects in the bottom right-hand box with the ability to deliver on the vision of responsible development in the upper left-hand box.

Without going into detail, I'll just say that these companies have defined the technical concepts. We call them opportunity areas or gaps or challenges. They are exceedingly refined articulations of an innovation need, that is, exactly what type of technology we need in order to reduce greenhouse gas emissions or use less water, for example. This is the planning framework that we've made fit for purpose and we have populated since COSIA was launched.

On the next slide we have four concepts, all of which we call aspirations. Now that we have these 13 companies working together, we have to define what success is, what they are trying to accomplish. We do that through two main concepts. One is called an aspiration and the other is called a goal. They're similar but different.

An aspiration is what you see in front of you. I won't go into the details, but I'll draw your attention to the bottom box where the companies collectively say that their aspiration in terms of greenhouse gas emissions is to produce their oil with lower greenhouse gas emissions than other sources do. Said otherwise, they want to be the best. They want to be the best in class at what they do.

On the next slide, we have the concept of a goal, which is similar to an aspiration. This is quantitative. We have three goals. I'll give you an example of one right now. This is public and we do report publicly on progress towards this goal. For in situ water performance, the companies have said collectively that they want to reduce their freshwater use intensity by 50% by 2022. Setting this kind of aspiration and this kind of goal allows both technical people inside of these companies and their partners to understand what new technologies they need to develop and test in order to deliver on these goals.

I'm happy to say that we reported for the first time against this goal in the fall of 2015. Between 2012 and 2014, which is within the life history of COSIA, the companies reduced their freshwater use intensity by 36%. We have a similar goal for mining companies, which is to reduce freshwater use by 30%. Again, I'm pleased to say that we're almost at that goal.

Next we have a very busy slide full of logos. This tells you the level of partnership that these companies are at with COSIA. These are our 39 associate members. We have really two major types of associate members. One type is organizations that have innovation capacity internally, which have staff and budgets. In many cases these are some of the most innovative and technologically intense organizations in the world. I'm looking at General Electric, IBM, and Veolia. The second type of associate member is what we call a hub organization. There are just too many companies, organizations, universities, and governments around the world that we need to link into to have a direct relationship with each one of them. We've therefore launched a series of partner hubs, shown in the middle band with a white background on the slide in front of you. We develop a very intense relationship with these organizations. They really rarely understand the opportunity areas, the gaps, and the challenges that the COSIA companies have. They take those innovation priorities and they use them in their existing network. We may not touch partners of these hub organizations, but through those hubs we extend our reach and our touch to literally hundreds and hundreds more people and organizations around the planet. Essentially our goal is to have a very detailed technological innovation ecosystem in which the best minds and the best organizations in the world understand the technological needs of the oil sands sector, and they accelerate solutions that come back to the companies.

● (1540)

On the next slide, labelled “Innovation in Action - E-TAP”, I wanted to flag that there are two real ways for third parties to plug into COSIA. One is very formal, very structured, and frankly, quite intensive, through our associate membership program. E-TAP, on the slide in front of you, is exactly the opposite. Any party in the world, ranging from a large company to a garage entrepreneur, can go to the COSIA website and submit an idea very quickly and very safely by filling out a very simple template. We put those ideas in front of the oil sands companies immediately.

You don't have to be an associate member; you can be an individual, an organization, a student, or anyone to get your innovation idea in front of the COSIA companies very quickly. What the companies do through COSIA is send back direct feedback, again quickly, to the innovation entrepreneur, either with an affirmative “yes, we like your idea and we'd like to advance it” or potentially with feedback such as “your idea may not be pertinent at this time, but here are the types of things you could work on to make it more attractive to the companies”. So far, we have almost 600 ideas coming in through E-TAP.

On the next slide, I'm going to give about six project examples, to give you an idea of what some of the 250 projects we have inside our COSIA project portfolio are like.

The first one on the list is an XPRIZE. The concept of an XPRIZE, you may remember, came into popularity when a prize was offered to the first team that could take a manned space vehicle into orbit, return it to Earth safely, then return it to orbit and again safely to Earth within two weeks. You may remember that a team won that competition and was awarded $20 million. That technology has now been licensed and is the start of a burgeoning space tourism industry with Richard Branson and others.

COSIA has partnered with an American energy company called NRG to offer a $20-million prize to any team in the world that can take carbon dioxide and change it into a valuable product. What we feel we're doing with this is reconceptualizing or reimagining carbon. Right now, it's a waste. What would happen if we could make it into a valuable resource? It would fundamentally change the way we look at carbon and fundamentally change the climate change game.

That's not to say that many of the COSIA projects are not developing technology that would decrease emissions in the first place, but we believe in developing as many tools in the tool box as we can, and the COSIA carbon XPRIZE and the $20-million prize to reimagine carbon is one of them.

The second project on the list is the SkyStrat, a flying rig. It's essentially a new type of oil drilling platform that can be lifted by helicopter into an area, negating the need for any type of connecting road and dramatically and markedly decreasing the fragmentation of the landscape and the amount of disturbance of it.

The third is a fuel cell. There are fuel cells that use a compound called molten carbonate for electron transfer. They're now being used commercially in the Orient. We have taken that technology and are in the middle of testing it in the oil sands context. If initial modelling is correct, it could decrease GHG emissions, even using existing technology, by up to 30%.

The fourth project is rifle tubes. Many of the technologies that we work on are transformative; they will fundamentally change the technological landscape of the oil sands and other adjacent sectors. Sometimes lots of small innovations can add up to big things as well. This is the rifle tubes. Right now, in order to produce oil in the oil sands, you usually need to produce steam. The way that—

[*Technical difficulty—Editor*]

We're back. I'm just going to assume that I can keep going, in the interest of time.

● (1545)

The Chair: Yes, we lost you. You were discussing rifle tubes.

Mr. Dan Wicklum: To produce oil from the oil sands, usually you need steam. The way most companies make steam is they have a pipe through which they put water, and then they heat the outside of the pipe to make the water steam inside the pipe. As it turns out, if you put spiralled lines inside the pipe and you spiral the water, it heats much more evenly. This uses less water and up to 6% less energy, which of course would be up to 6% less in GHGs emitted. This is not a huge technological breakthrough. It has been used in other areas, such as the rifling inside the barrel of a gun, but it is the type of thing that our engineers think about every day.

I have two more examples, Mr. Chair. One is the water technology development centre. This is a $160-million dedicated facility that we are building to test technology. What we are finding is that even if we have good ideas about how to test technology, our testing infrastructure has to keep up with the demand. There is enough motivation among these companies for the infrastructure not to be a bottleneck to progress that we are developing a dedicated, fit-for-purpose water technology development centre.

The last example is an eye-in-the-sky satellite. There is a Montreal company called GHGSat, which is about to launch a satellite that could dramatically increase the resolution of monitoring greenhouse gas emissions. Several of our companies are teaming up with this Montreal company in order to improve the information collection in the Canadian oil sands.

Mr. Chair, my last slide is a sum-up of results to date of COSIA. We were launched about four years ago. We have completed and populated a planning framework. We have 104 written articulations of priority needs that we and our 39 associate members are distributing around the globe to key partners to accelerate the development of solutions. The total number of active projects in our portfolio right now is 252, with a $480-million price tag. The number of technologies actually shared is 819, which cost about $1.3 billion to develop. Those technologies are now being implemented, and the actual environmental impacts are being realized, such as, for example, our 36% decrease in freshwater use intensity.

We have developed an associate member program, now with 39 associate members, to increase our leverage and reach literally around the world. We have associate members from Israel and the U. K., and our hub members reach every continent.

We have been actually quite quiet since we were launched. We really felt that we needed substance in delivery before we started to talk about COSIA. We feel that that's there now, so 2016 is a year when we will be speaking a little more to key partners and key opinion leaders about what we are doing.

My last point is about our E-TAP, where not just associate members can plug into COSIA, but anyone—including anyone on this committee—who has a good environmental innovation idea. You can propose it to these oil sands companies for direct and immediate follow-up. Of course, as always, third party intellectual property is protected. These companies are willing to test third party technologies. We are not asking third parties to share. That is not the way the world works. Third party intellectual property is completely protected.

That is my presentation, Mr. Chair. I would be happy to answer questions to the best of my ability.

● (1550)

The Chair: Thank you very much.

I am going to open the floor to questions now. The first segment of the questions will come in seven-minute installments, Mr. Wicklum.

Mr. Lemieux, you are up first.

[*Translation*]

Mr. Denis Lemieux (Chicoutimi—Le Fjord, Lib.): Thank you, Mr. Chair.

Mr. Wicklum, thank you for that great presentation.

Our committee is currently studying innovation, sustainable solutions, and economic opportunities in the oil and gas industry. What your alliance is trying to do, in other words, speed up the discovery and development of environmental technologies and close the gap between an idea's inception and implementation, is precisely what we are concerned about.

My first question is this, Mr. Wicklum. How can your alliance help the oil sands industry improve its reputation around the world when it comes to sound environmental practices?

[*English*]

Mr. Dan Wicklum: I'd say there are two elements to that question. I'll touch on this notion of accelerating implementation which is a core part of COSIA's mandate.

One of the benefits when COSIA companies share is that they can share test results. We have many situations where one company tests one piece of technology and then shares the test results with all the others. The understanding and the expectation is that other companies test as well and also share their results. Before COSIA, each company had to test every technology. With COSIA now, for example, each company could test one water technology, share the results, and each company would have the results of 13 tests. That's the acceleration and it's much more cost-effective.

In terms of how our organization can be used to influence our reputation, I feel that reputation is a function of substance and communications. We are the one organization in the Canadian oil sands that deals with substance collectively. Each of these companies holds the burden and responsibility to improve their performance, but we are the only organization within which they come, work together, do things quicker, do things more effectively, and do things cheaper. We are about substance.

In terms of communication, there are many organizations that have roles to play in international communication. The Government of Canada has a strong role, as do the provincial governments, individual companies, and individual commentators. That space is actually quite packed. There are many organizations that have a role in communication.

We're the organization that has the role to actually deliver on substance, to help companies improve their performance more quickly. Because of that, I don't want to get pushed out of our strategic space, so I want to ensure that we concentrate on substance.

Having said that, the companies have said, in 2016, they would like our organization to play an increasing role in communications as well.

● (1555)

[*Translation*]

Mr. Denis Lemieux: Thank you.

I'm also quite interested in the progress the oil sands industry is making around water savings and reduction. You're doing a lot of work involving accelerated dewatering, waste, and centrifugal action.

How do you manage to integrate your dynamic flocculation ideas and principles into the dewatering and centrifugation processes?

[*English*]

Mr. Dan Wicklum: In COSIA, we have four environmental priority areas. One is water. One is tailings, which of course is mining waste. One is greenhouse gas emissions. The last one we call land. You can think of that as landscape. It's decreasing disturbance to begin with, and when the land is disturbed, to speeding its reclamation.

As it turns out, in many cases, a technology that's developed by our water group, for example, has implications and ramifications for the other three. We have very formal structures and planning processes to ensure that the planning that happens by each of these four groups is integrated. I'll give you an example.

Many companies are working on ways to use the water that's contained in tailing ponds as a source feed of water for their production capacity. It's actually taking a waste, again, and turning it into a resource. In this case it's tailings ponds water.

For another example, I'll go back to my rifled tubes example. This is a piece of work that was done by our GHG group that was looking for ways to use less energy and emit fewer greenhouse gases. The group came up with the rifled tubes. As it turns out, it has a co-benefit of using much less water as well.

When we take a look at almost every technology, almost everything that were working on is linked to at least one, if not all, of the other EPAs. It's very important to take an integrated view, and we have the structures and processes to ensure that happens.

[*Translation*]

Mr. Denis Lemieux: I care a lot about Canada's energy sector and the oil sands. I do what I can to promote them, in fact.

As far as oil sands research is concerned, what are the success stories that you think should be shared with the public, to show Canadians that the industry wants to take the appropriate action to overcome the environmental challenges facing this generation as well as future generations?

[*English*]

Mr. Dan Wicklum: One of the challenges that we have with 13 very large companies working together is that there are an awful lot of what I call moving parts. Our planning framework and the work that we help the companies with cannot be an added layer of bureaucracy to slow them down. We have structures and tools that allow the companies to share. Projects are constantly coming online; new projects are being launched, and projects are closing down. On our website, we have about 30 to 40 examples of either active or concluded projects that people can go to. We have a communications department that is at people's disposal if they want more information. We have just come to an agreement with select federal departments that will provide them with quarterly update sheets of active projects, completed projects, breakthroughs, and outcomes, so that the Government of Canada can use that in their day-to-day business however that may be.

● (1600)

The Chair: Thank you, Mr. Wicklum.

Mr. Barlow, over to you.

Mr. John Barlow (Foothills, CPC): Thank you, Mr. Chair.

Dan, thank you very much for being with us today. I appreciate it. My riding is Foothills, in the southwest corner of Alberta. It's great to have an Albertan with us today to talk about this industry.

One of the things you talked about at the end of your presentation was communication and substance. One of the things that our committee has to do, which we've heard so much about, is get the message out about some of the extraordinary innovations and partnerships that are developing in the private sector.

We've heard over the last couple of weeks, certainly not from the members of this committee—we have a great group here—but from some other members of government, that we will not be able to explore our fossil fuels, specifically the oil sands, without increasing greenhouse gases. Our best solution to this is to leave up to two-thirds of our energy resources in the ground.

I look at some of the things that your group and your partnership have been able to do. Over the course of the weekend, I read over some of the projects you've done. For example, 90% of the water is already recycled. Today you talked about direct hot water production. One that really caught my eye was a CNRL, Canadian Natural Resources Limited, project to convert algae and reduce greenhouse gas emissions. I'm wondering if you could talk a little bit about it, if you have some more detail. They were talking about the potential to reduce their greenhouse gas emissions by 30%, or the equivalent of taking 300,000 vehicles off the road. It's projects like these that will make a huge difference. Can you talk about that project a little bit and how far along it is?

Mr. Dan Wicklum: Yes, I sure can.

One of the things that COSIA does is it brings an overarching collaboration hub to all the individual companies' projects. Current innovation theory suggests that you don't want to put all your eggs in one basket. It's sort of like investing. Frankly, you want to take a portfolio approach and invest in many different types of projects, some big, some small, some quite expensive, some not, some absolutely transformative but probably higher risk, and some, frankly, not as transformative but very meaningfully incremental, with a high degree of success. I'll tell you about a couple of examples of projects in our portfolio.

The Canadian Natural Resources one essentially takes waste heat, waste carbon dioxide, and puts it into a bioreactor with designer types of algae. Through a series of processes, refinements, and fermentations what you get is a product that could be used for anything from a solvent to synthetic jet fuel. Fundamentally, it's the concept of taking waste and turning it into a resource, turning the paradigm upside down. That's one that we have.

Another one that just came to mind is something called solvents. Right now, in our in situ practice, much of it is injecting steam deep into the ground, melting the bitumen away from the sand, and then bringing the water, steam, and bitumen to the surface. Some companies are working on solvents so they would never have to use water, and because of that, they wouldn't have to use energy to turn it into steam. They would inject solvents deep into the ground, dissolve the bitumen away from the sand, then bring it all to the surface, extract the bitumen and recycle the solvent. That is the type of fundamentally disruptive technology or transformational technology that companies are working on in many cases.

Mr. John Barlow: In your opinion, Dan, and certainly from speaking with your partners I know this is the reason that you've been brought together as a group, with the technology and the innovation of groups like COSIA, do you see any reason why, from today into the future, we cannot continue to explore our energy sector and extraction projects like the oil sands, and at the same time be able to reduce greenhouse gas emissions?

Mr. Dan Wicklum: I don't see any reason.... I mean, here's what I know. I'm a scientist, and I know that when you create a framework that focuses what you're trying to accomplish, you harness all the capacity of smart people and smart organizations and you solve problems.

As for what we're doing inside of COSIA, I'm quite proud of it, but the companies deserve all the accolades. I don't know of any other sector anywhere in the world with companies of this size, historically competitive, that are focusing as quickly and as sharply and are creating this global innovation ecosystem as quickly and in as focused a way as they are. We are seeing results now after, frankly, in innovation scale timelines, what is a rather small length of time. We're very excited about the projects pipeline.

● (1605)

Mr. John Barlow: Speaking for my colleagues on this committee, I think, you talked about starting to market yourselves, for a lack of a better description, in 2016, and I hope that one thing we can do is help to bring about some awareness of some of the projects you're doing. I can't say enough about how impressive it is to see a group like the one you've been able to put together in COSIA. Hopefully, it can be a template for other industries such as mining, for example, which would be able to do something like you're doing to share those patents and share your research.

Quickly, there's a last question I have. You talked about reducing GHG emissions and a low environmental footprint. Is there anything COSIA is doing in terms of preferring to transport bitumen and oil sands through pipelines rather than rail and in terms of the advantages of pipelines over rail, trucking, or any other transportation?

Mr. Dan Wicklum: We actually don't do that. One of the things that I think makes COSIA special—but legal, frankly—is that we've signed a series of joint venture agreements among these companies, one for each of our four priority areas. Those joint venture agreements define the technological scope within which the companies operate on COSIA terms—shared patents—and outside of that scope, the companies don't deal with it at this point.

It's always a trade-off between focus and impact. At this point, the companies have decided to focus on the upstream environmental performance of water, land, tailings, and greenhouse gases. At some point in the future, they may expand that, but at this point that's legally outside of our mandate.

The Chair: That's perfect timing again.

Mr. Cannings, it's over to you.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you.

Thank you for the presentation. It's an impressive concept that you're heading up there, and I appreciate that.

You've mentioned that you're looking primarily at environmental areas. Considering that the reason we're here today and talking about all of this is the effect that the economic downturn has had on this industry and the world with the global price of oil, I want to know if there's anything in COSIA's innovations, taken altogether, that will help bring companies closer to profitability. Are there some limits to the technological innovation, especially in the short to medium term, when we have such a miserable outlook for the price of oil?

Mr. Dan Wicklum: I'll approach the answer to that question in two ways.

One is that the model itself is designed to leverage. What that means, of course, going back to my water technology testing example, is that companies don't have to do everything. They don't have to test every technology. They can count on their collaborators inside of COSIA to do an awful lot of work, because they know they're going to get those results back. Just the concept of leverage itself, by definition, is about 13:1, all things being equal. It's a little more complex than that, more complex than you might have expected, but basically, a company can get the same amount of innovation done—discovery, development, demonstration, and deployment—much more cheaply and quickly because they're actually in the alliance itself. That's one thing I would say.

The second thing is that much of the environmental performance improvement that these companies are relentlessly pursuing, frankly, is about waste. It is about how we could use less energy and how we could waste less energy. How could we use less water? How could we take the waste of tailings and turn it into a resource, or not produce it in the first place?

Fundamentally, the concept of producing waste is not good for these companies, just like it's not good for any company, any individual, or any sector. Fundamentally, if they produce less waste, it's almost always an economic advantage to those companies, because it reduces their operating costs in a co-benefit way. If we find them a way to decrease GHG emissions, it really means that they're not using as much energy and they're lowering the cost base. It's the same for water. It's the same for not disturbing wetlands to begin with. It's the same for not producing as much tailings to begin with. Fundamentally, at the environmental nexus is an issue of cost and environmental performance.

● (1610)

Mr. Richard Cannings: Thanks.

You talked about one of your aspirations as being the lowest greenhouse gas producers in the oil industry of all types of oil. I wonder how realistic that aspiration is, and how close you are. Related to that, what would a price on carbon do to drive faster adoption and incentives for further innovation?

Mr. Dan Wicklum: On the first question relative to our aspiration, it's basically to be the best in class. On how that is going or where are we, I can tell you about many of the new production projects that are coming online. I'm thinking of one by Imperial. The major shareholder of Imperial Canada is ExxonMobil. They have a new project they call the Kearl project. They use a series of interrelated technologies. Basically, they are there already. They are as good as anything out there in the baskets of crudes.

I'm thinking of other new technologies like the solid technology I've talked about. Suncor has a project they call ESEIEH, which is an acronym. They heat the bitumen deep in the ground by using radio waves instead of solvents. In that type of technology the promise is also the fact that they are already there.

Many of these operations came into existence many years ago using existing technology, and they have a certain type of performance. The new oil sands with the new technology is basically there in many cases. I think the future is quite bright and promising for this.

Mr. Richard Cannings: Okay, and perhaps in referring to the old oil sands, how broadly are these technologies adopted when they are made available, or is it more the new projects that are coming online?

Mr. Dan Wicklum: I think it's both. With many of the new technologies, it's not straightforward to use them to retrofit older production facilities. We have two general types of technologies we're working on for our portfolio. One is retrofittable, meaning it might be new technology, but you can use it in existing facilities. The reality is that with some of the more striking technologies, it's not that straightforward to retrofit.

We work on both in that idea of a portfolio approach to make sure we're going to be successful. We're not putting all our eggs in one basket, or counting on one, or two, or three technologies. That's why we have 252 projects.

Mr. Richard Cannings: Getting back to the lowering greenhouse gases goal, I wonder what role renewable and green energy sources might play in reaching that goal, and if you're investigating those.

Mr. Dan Wicklum: We have projects to do with renewables right from the algae project, and we have other companies that are taking a look at wind projects.

I think the reality is that the current state of the technology associated with renewables is not there in order to produce the dense energy we need in many cases for mobile transportation.

These are energy companies. In many cases they have this concept of a renewable in their portfolio even outside of COSIA, but we definitely have renewable projects in our portfolio. That's the notion of a portfolio approach where you hedge your bets and you take deliberate investment decisions on what proportion of your investment collectively across the sector would go to different types of opportunity areas, as we define them.

Renewables are definitely something the companies are interested in and actively pursuing.

The Chair: Thank you. That's time.

Over to you, Mr. Tan, for seven minutes.

Mr. Geng Tan (Don Valley North, Lib.): Thanks for your presentation.

In your presentation you showed us some major projects, I think six projects that are being conducted. You also mentioned there are 819 technologies being shared.

Can you give us some successful examples which the sector has innovated in the past?

● (1615)

Mr. Dan Wicklum: I'll go through each of our project portfolios.

In tailings, what the companies are working on and have already implemented are essentially industrial steel centrifuges. The problem with the oil sands tailings is that they end up being almost a yogourt. It's very difficult to get the solids separated from the water quickly and easily so that those solids can then be reclaimed into a natural landscape. The companies are spending an awful lot of money on developing new technologies on how to deal with these oil sands tailings, or it's called the fines.

One of the things that Syncrude has done is they have developed a very large industrial-scale centrifuge concept where the tailings are literally put into a centrifuge, spun, and the centrifugal force forces out the water. They have those operating right now. They show great promise, and they've shared all the technology with the other companies as well.

I know Shell is also pursuing a centrifuge solution. They saved millions and millions and sped up their operation by years just by taking all the good legwork that Syncrude has done rather than starting from scratch. There's one example.

Another example on land is that companies are coming together inside COSIA, and often they do things at a scale that's not possible outside an organization like COSIA.

I'm thinking of one issue, which is the boreal caribou issue. Boreal caribou are a species that live in northern Alberta, and they require large tracts of land in order to have viable populations. Pre COSIA, companies were doing reclamation on the landscape. Inside COSIA, they have the structure and the culture so that they can collaborate so that the reclamation plans mesh together inside a complete range and scale that is required for the caribou. That's the kind of thing they can do inside COSIA that they can't do individually.

I've talked about the rifled tubes, so maybe I'll leave that one.

With greenhouse gases, our molten carbonate fuel cell definitely is a flagship.

We have other things that range from what I call meaningful incremental to transformational. Meaningful incremental could be something that we call vacuum-insulated tubing. When you produce oil sands, you have to transport heat an awfully long distance, and what the companies are doing is putting tubes inside tubes and then creating a vacuum between the two of them that amounts to basically a thermos so that when you put your heated solution through the inside of the thermos, you lose less heat.

Another thing that we've done, just by way of example, is we've tried to find ways that could lead the world in using low-grade heat. Heat that's about 60°C often just gets wasted; it just flows into the atmosphere. We partnered with General Electric, where we offered a $1-million challenge to anyone in the world who can come up with new ideas of how to capture low-grade heat. We've identified a couple of solutions in Italy, the U.K., India, and the United States of America, and now those are being tested inside the oil sands context.

That's an example of how our global network is really starting to bear fruit in developing this ecosystem. With companies there's just not enough people to have individual, face-to-face interactions, so we use our partners to search the world for us as well.

Mr. Geng Tan: Are there specific areas that you think could be improved the most or the fastest? In other words, do you think there are any—

The Clerk of the Committee (Mr. Michel Marcotte): Just so you know, when the picture is frozen, they can still hear, but when it goes blue we lose them for a few seconds.

They're reconnecting. Sorry.

● (1620)

Mr. Geng Tan: Are there specific areas that you think could be improved? Do you think there's going to be any major technology breakthrough in the next few years?

Mr. Dan Wicklum: Are there any areas that need to be improved? I'll answer that from a scientific perspective, and one that I hope you don't think is trite, and that is, every area can be improved. In COSIA and these oil sands companies, we take very much a continuous improvement model. Just because things are going well doesn't mean they can't go better, quicker, more inexpensively. That's the philosophy we embrace every day at COSIA.

Having said that, we have these opportunity areas and these gaps, and when we take a look at those gaps, we map them towards our current project portfolio, our 252 projects, and technically we make an assessment as to whether there is sufficient effort in our project portfolio to close the gap. If there's not, then what we'll do the next year is launch more projects.

I'll use this as an opportunity to draw attention to another concept. In some cases we have a gap, an innovation need, and the companies think that gap is particularly amenable to telling the whole world about it. We take some of the gaps and we write them up in a three-page document, including technical specifications, into what we call a challenge. That challenge is written in a way that you don't really have to understand oil sands to understand the innovation need. Then we ship that challenge basically through a series of channels around the world so that we can have, very literally, a water engineer in Israel working on a Canadian oil sands innovation challenge. So that's one thing.

The second part of your question is whether there are technological breakthroughs. What I'd say, and again, this is a bit tongue in cheek, is that as scientists and engineers, we have a hard time scheduling our breakthroughs. If it were that easy, we'd do it. Having said that, what we have done, we believe, is created the conditions to absolutely maximize the chance of success. Innovation theory shows that when you focus, when you articulate a very specific innovation need that you have, and when you put sufficient resources against it, and attract the best minds in the world to work on those challenges and problems, you get great progress. That's where we are. By taking a portfolio approach, you can actually manage a pipeline of projects, and we have a very robust innovation pipeline of projects.

The Chair: Excellent. Thank you.

Now we're moving into the five-minute round.

I understand, Ms. Stubbs, you're next on the list.

Mrs. Shannon Stubbs (Lakeland, CPC): Yes, thanks, Mr. Chair.

Thank you for joining us today. Suffice to say that we can all be proud of the rapid innovation and the world-class development of oil sands, so thanks for putting that on the record here today for all of the committee members.

You've alluded to this, but I just want to note for the committee that the chief economist at the International Energy Agency, who is one of the world's foremost energy economists, recently confirmed that GHG emissions from Canada's oil sands are, in fact, quite low, especially in the global context. I'll just note that he said, “There is a lot of discussion on oil sands projects in Canada and the United States and other parts of the world, but to be frank, the additional CO2 emissions coming from the oil sands is extremely low.”

Given that emissions are quite low, and per-barrel emissions have actually been decreasing as innovation has advanced, could you expand on how innovation will further enhance the already strong carbon competitiveness of Canada's world-leading oil sands?

Mr. Dan Wicklum: GHGs, greenhouse gas emissions, are one of our top four priority areas. Many of the projects, not only in what we call that environmental priority area, or EPA, but also the ones in the other EPAs, have a direct reduction of energy or reduction of GHG emissions potential. Again, that's one of the company's highest priorities.

One of the things we're doing is we take what we call a directed innovation approach. You can think of innovation in two ways. One is essentially just asking anyone if they have a good idea, and then seeing if it maps to oil sands or whether it could be used in an oil sands context. That's one approach, and that can yield good results. What we try to do is exactly the opposite. We try to get the smartest, most informed, most motivated people, figuratively, in a room, and then articulate exactly what we're trying to accomplish. Then we tell that to the world. We call it very directed. It's actually creating your own future. One of the best examples of directed innovation was when President Kennedy stood up and said, “Watch us, We're going to put a person on the moon by the end of the decade.” That's the type of thing we do at COSIA: we define the future and then make it through a top-down, directed innovation approach, as opposed to a bottom-up or passive innovation approach.

● (1625)

Mrs. Shannon Stubbs: Thank you.

We know Canada has a credible and world-renowned regulatory system, although the current transitional approach does create uncertainty for an industry that needs stability and predictability now more than ever.

In light of the massive investments required and the timelines for innovation, I wonder if you have any comments on how increasing the complexity of regulations, the costs, perhaps duplicating what is already being done provincially, and expanding lengthy approval processes impact the innovative implementation and growth of Canada's oil sands.

Mr. Dan Wicklum: I'm going to invoke one small luxury I have, and that is the fact that we are a group of scientists and engineers helping the companies collaborate and innovate, and for this reason, we don't take positions on policy and regulation.

What I do know is that in many cases, testing new technologies or new practices requires co-operation from the regulator. We have seen that here in Alberta, where the regulator is very amenable to keeping a high standard of environmental performance but is willing, in one-off and controlled and prescribed examples, to allow the companies to test technology that may not have been permitted under a previous regulatory regime. You've touched on a very real thing, the concept of the regulator allowing innovation to happen.

Mrs. Shannon Stubbs: Given Canada's position globally, and that the oil sands drive Canada's position in energy development in the world, do you know of any other examples like your organization in other energy-producing nations?

Mr. Dan Wicklum: Most sectors have some type of organization within which they co-operate. As far as we know, we are the only organization that pushes collaboration to the depths that we do. I'll make a quick distinction. “Co-operation” means organizations coming to the table to learn, but frankly, they are doing it for the purposes of their own company. That's the way we define it. “Collaboration” as we define it means organizations coming to a table like COSIA for the benefit of all and the regional acceleration of environmental performance improvement. They take off their competitive hat and put on a collaboration hat, and they do it for the right reasons.

To answer your question, we don't know of any other organization globally that does this like COSIA does it.

The Chair: Mr. Harvey.

Mr. T.J. Harvey (Tobique—Mactaquac, Lib.): First of all, I'd like to thank you for giving us your presentation today. I have the utmost respect for what you do in your organization.

I wonder if you could elaborate on what COSIA's priorities are for the coming year. Even more extensively, does COSIA develop a long-term framework within the pipeline structure of innovation to target what the priorities are and where you'd like to see the innovation go over 1, 5, 10, or 20 years? If so, how does this help drive innovation in environmental change, particularly in respect of climate change and greenhouse gas emissions?

Mr. Dan Wicklum: First of all, thank you for your kind words in describing what we're doing here at COSIA. Personally, I play some minor catalysis or leadership role. It's really the companies that deserve all the credit for doing this, especially from the top down. It's the CEOs who are making it happen. They deserve the credit for sure.

To the substance of your question, regarding the type of planning framework we can use and the timelines, that really goes fundamentally to what COSIA does as an organization. In many cases, some of these 13 companies are very sophisticated parts of global organizations that have been around for decades and decades. Imperial Oil has been around for over 100 years as part of Exxon Mobil.

Over that time, they've developed very sophisticated planning structures, dated decision-making and risk models, and so on. Each company makes its own decisions within its own company structure. We provide that overarching framework that allows them to leverage and to share, but with that we have a series of about five key tools that we use to map things like project impact versus cost, or project impact versus probability of success. We use something called a technology funnel. If you want to have good ideas and be ready for commercial implementation every year coming out one end of the funnel, you have to have lots of ideas coming in the other end of the funnel, because not all of them are going to work. We just know that. There's attrition along the way. We have a very formal funnel model whereby we take a look at each of our priority areas, with regard to what proportion of investment and projects are at what we call discover, develop, demonstrate and deploy stages. That's the latest innovation theory for project portfolio management.

With regard to the last part of your question, we have a formal five-year strategic plan. That being said, many of the projects have a longer time horizon than that. Normally, just by rule of thumb, in this type of sector, people think about a 10-year time horizon from ideation, meaning discovery or the twinkle in someone's eye, to commercial deployment. Our job is to push that down, and we have a five-year strategic plan to that end.

● (1630)

Mr. T.J. Harvey: Okay. I have another quick question.

You have 39 associate members and you identified three key hubs earlier in your presentation. I want to touch on two of them.

Sustainable Development Technology Canada is an organization I have a lot of respect for. I've watched the work they've done in the past. The other organization is Carbon Management Canada.

With regard to those two companies and the role they play within COSIA in helping to foster development technology, could you touch on what their role is currently and how they could play a greater role in the future?

Mr. Dan Wicklum: For Sustainable Development Technology Canada, SDTC, I'm privileged to sit on their member council, so we do have a structural linkage there between that organization and ours.

Carbon Management Canada morphed out of a network centre of excellence that had been funded by NSERC, and they are sort of recreating themselves, but we do have a connection with those folks there as well.

I guess the trick and the art in all of this is to focus as much as you can on what you're trying to accomplish but not necessarily on how. In some cases, we take a portfolio approach. In some cases we do take a bottom-up, more passive approach. We essentially ask if anyone has a good idea about how to make a certain kind of valve.

The other end of the spectrum is to be very directed and deliberate and to say that this is the exact piece of technology that we need. We're exploring something with both SDTC and a fund in Alberta called Climate Change and Emissions Management Corporation, CCEMC, which is a multi-hundred-million dollar fund that is populated by a carbon charge that the Alberta government levies on what we call large final emitters. I sit on that board, and along with many of our partners, we're exploring the concept of directed innovation.

Instead of just asking innovators what their good ideas are, we take the time to sit back and we plan and [*Technical difficulty—Editor*].

The Chair: Could you finish your answer quickly?

Mr. Dan Wicklum: This concept of directed innovation is at a strategic level and, at the risk of sounding heavy-handed, it's almost from a top-down perspective, saying that these are innovation priorities and then asking the innovation community to self-organize, as opposed to a more bottom-up approach. That's something I think we're certainly exploring at CCEMC and SDTC as well.

● (1635)

The Chair: Thank you.

I'm going to dispense with formalities.

Tom, you're next.

Mr. Tom Kmiec (Calgary Shepard, CPC): Thank you, Mr. Chair.

Thank you, Dan. It's great to see another Calgarian here telling us the good story of what the industry is doing. It's a pretty progressive approach. Your companies have given up a competitive advantage. You gave us the ratio of 13:1 as the leverage you're getting out of this.

I'm going to build on the question of my colleague.

You said there is no comparable COSIA in another sector of the economy in Canada. What about internationally, such as Saudi Arabia or Nigeria or one of these places with a sole state-owned company that runs the entire operation from A to Z? How do they compare in innovation, entrepreneurship, and innovating from the top down? It's probably different over there from here.

Can you talk more about that?

Mr. Dan Wicklum: Yes, when you talk about the range of innovation models or approaches used by countries or individual companies in a state-owned model, it really is a whole continuum.

I think we have the best of both worlds here, because we have the structure within which companies can collaborate, yet we have the individual entrepreneurship of individuals and teams and companies. The trick and the art is to bring that together in a way that yields results.

One of the criticisms, frankly, that some of the company staff had when we launched COSIA four years ago was around where the incentive was for the individual or the company to innovate, and whether that was really at the scale of the company.

When you think about what COSIA is, it's a recognition that these companies are all in it together, and they will succeed together. They're still in competition, but they're in competition with other energy sources and other geographies. What we've done inside of COSIA is we've characterized and formalized the scale of competition as being different from what it was four years ago, because it is different. This is a made-in-Canada model for the companies to be able to deliver.

All that said, we keep finding out about different types of alliances and so on across sectors, but when you poke in and scratch underneath the surface, to date we still don't know of anyone that pushes it as deeply as COSIA does.

Mr. Tom Kmiec: I can always tell when I'm talking to an Albertan; it's the “can do” attitude. I can just hear it in your voice: “There's no challenge we can't surmount, nothing that can defeat us; there's always a solution to a problem.”

You talked about some of these technologies like the SkyStrat flying rig, the rifle tubing, the eye-in-the-sky satellite. What do you do to highlight the contributions of the individual? A lot of these people are living in my riding. Some of them are unemployed right now. What do you do for those technical specialists, the actual innovators of the technology? How do you recognize their success? How do you recognize what they're doing, not just for the particular company, but also for their field? These are some of the best people in the world at what they do. I meet these people. My neighbours are some of the best people in the world in LNG development, for example. How do we praise their craftsmanship? How does COSIA do that, and how does the industry do that in Calgary, in Alberta, and in Canada?

Mr. Dan Wicklum: Yes, it's a great point.

One of the things we do have is a newsletter, and in every newsletter we focus on individuals as leaders. In some cases it's strategic leaders, and in some cases it's more technical leaders. That's the way we can draw attention to the fact that innovation really is about a collision of ideas. Those ideas are usually in someone's mind or in some organization, and you want to make these collisions as constructive and productive as possible.

In 2016 we were asked by the companies to take more of a communications role, and part of that communications role is communicating even into the companies themselves, so they can fully wring the value out of COSIA.

It's a great point, and it's something we've done, but we're going to stress that more in the future.

The Chair: You have 30 seconds.

Mr. Tom Kmiec: I'm going to take 30 seconds.

The Chair: That includes the answer.

Mr. Tom Kmiec: It will be very short then.

Can anyone join as a core member outside of the ones you have elaborated? Are you open to taking new members to form part of a core group? MEG Energy comes to mind.

Mr. Dan Wicklum: Yes, absolutely. We're completely open.

As you might expect, we have legal documents to make this real. There is a lot of money at play. There is a competition law. Oil sands companies can join. We have some membership criteria.

More importantly, any organization or individual in the world can be part of a project that COSIA has, and they get to keep their intellectual property rights. We have a completely open door policy with, as you might expect, some prescriptions in terms of criteria.

● (1640)

The Chair: That's excellent. Thank you.

Mr. Serré, we go over to you.

[*Translation*]

Mr. Marc Serré (Nickel Belt, Lib.): Thank you, Mr. Chair.

Thank you for telling us about the activities COSIA has been working on. It's fascinating stuff. Your alliance is doing some wonderful work.

You said the alliance was quiet in the years prior to 2016. I think it's high time that we take a more proactive approach in talking about the innovative work the industry is doing. I think that's really important.

Drawing a parallel with something that was mentioned earlier, I would point to the Centre for Excellence in Mining Innovation, known as CEMI, and Laurentian Mining Innovation and Technology. Those organizations have done more or less the same thing your alliance is doing, but for the mining industry, in terms of creating hubs and university partnerships. Keep up the good work.

You're involved in a lot of R and D and you've established partnerships with universities, which you mentioned. Once the research phase is complete, you begin working with companies on the implementation phase. It's very expensive for a company to pursue R and D activities.

I have a question about the third step in the process, so the implementation of the technology once the R and D is complete. What can the government do to help companies adopt these new technologies? Traditionally, companies, like workers, are slow to adopt change. It takes a certain amount of time. What can we do to help you in that regard and ensure that companies have the resources they need to put your innovations in place?

[*English*]

Mr. Dan Wicklum: I'd answer that question by saying that you're absolutely right when you talk about a sequence of events going from research and development to implementation.

The best way to implement technologies is to be working on the right technologies to begin with. A poorly tuned and poorly structured innovation system creates many technologies or products or services and then tries to find an application for them. I must admit, we have hundreds of people or organizations coming to us as COSIA, trying, and this is a figure of speech, to sell the companies a hammer. They're saying, “Could we test your hammer?” when frankly what the companies need is a certain type of screwdriver.

I think a properly tuned innovation system starts with the end in mind. It is a directed innovation: what specific types of technologies do we need, and how would we develop them in ways that allow their implementation to be easy? It's difficult, but we spend a lot of time planning that, but then it's set up so that when people start to work on earlier stages of innovation—ideation, discovery, development, demonstration—they actually don't have to work at implementation. There are companies pulling it; you have companies demanding those types of products.

One thing I would say is that for the government to be part of, first of all, a directed innovation ecosystem that does not just rely on bottom-up good ideas but relies on very clear contact with industry about the commercial application before we start working.... To the extent that the government can be part of that fine-tuned innovation system, it would be very welcome.

There are good examples, but I believe there are opportunities for improvement in this area.

Mr. Marc Serré: Thank you so much for that.

What do you in COSIA see as the most important, significant environmental concern in the oil sands and their development?

Mr. Dan Wicklum: I respect your question, but it's getting dangerously close to my non-policy and non-regulatory position. What I would say is this. The companies have a priori defined four key areas: water, land, tailings, and greenhouse gases. From a purely technical perspective, those are the areas. They're definitely intertwined.

Speaking as a citizen of Canada, I would say that most of the international discourse, of course, is around greenhouse gases, and I'm happy to say that's one of our four priority areas.

Mr. Marc Serré: With respect to R and D and research for COSIA, how has the oil pricing around the world right now affected your ability to do more R and D and research?

Mr. Dan Wicklum: What I can say is that COSIA is about leverage. It's about companies working together and having synergies: merging properties and doing projects that are too large for each individual company to do, so they have to do them together.

If that comment about leverage made sense four years ago when oil was at a high price, it makes as much or more sense now. All the evidence I have—I'm a scientist, so I deal with data—is that the companies are absolutely committed to COSIA and to environmental performance improvement. Our project count went up in 2015, not down, and the dollar value of our project portfolio was essentially constant.

Having said that, these are extremely difficult economic conditions for those companies. For many of them, they are just not sustainable. That provides a very large caveat to my notion of the level of commitment the companies have.

● (1645)

The Chair: Thank you.

Mr. Cannings, over to you for the last round of questions. You have three minutes.

Mr. Richard Cannings: You mentioned that you're a biologist. I know you're an aquatic biologist. As a biologist myself, I thought I'd throw a last biology question at you. It's not about aquatic biology; it's about caribou.

You mentioned caribou before and the work that COSIA has been doing. I know caribou are notoriously sensitive to changes in the landscape, to changes to old-growth forests. I'm wondering what your sense is of the future of caribou in this landscape, given how long it takes for these habitat enhancements you talked about to really take hold.

Mr. Dan Wicklum: [*Technical difficulty—Editor*] to a positive future. Let me give you an example of some of the ways companies are working towards that.

Right now it's a difficult operating environment up in northern Alberta to reclaim the land. Much of it is essentially muskeg. It's very difficult or impossible to get a mechanical vehicle on the landscape for eight months of the year. If you go on it in the summer, you put these huge ruts in the landscape. If you go on it in the winter, it's difficult, for example, to plant trees.

Two projects come to mind.

One is something we call faster forests. We found that, actually, you can go on the landscape when the muskeg is frozen. You can get on there with mechanical machines, but there's no impact or very little impact on the landscape, and you can plant spruce trees. You will notice as a biologist that this may be odd, but as it turns out you have very high survivorship for trees planted in the dead of winter. Companies, again through a COSIA project, are figuring out how to accelerate reclamation.

The second thing we have is a new piece of technology that is a way of reclaiming linear disturbance, and by that I mean a road or seismic line. Essentially you have what amounts to a backhoe on a series of big floats. You can take that backhoe to help reclaim these linear disturbances. You can take it on the landscape in the middle of summer when historically that backhoe would quite literally sink into the muskeg. With these series of large floats and a series of implements, you can actually now plant in the summer as well.

This is the kind of thing whereby we think we can speed reclamation by hundreds of percentage points, and frankly, at the same time save costs.

Mr. Richard Cannings: What do you think about the future of caribou? You mentioned those things, but I'm wondering how those timelines can work to help caribou.

Mr. Dan Wicklum: I apologize. I thought I spoke to that right off the bat.

I think the future of caribou can actually be managed to a good future. We have endangered species legislation in Alberta. Of course, the Species at Risk Act is overarching federal legislation that gives the Government of Canada certain responsibilities. I know both the federal government and the provincial government [*Technical difficulty—Editor*].

The Chair: I'll let you wrap up quickly. We lost you there for a few seconds.

Mr. Dan Wicklum: I would just say that the planning processes are unfolding now with all the necessary stakeholders. With these new technologies, I believe there's again a viable future for boreal caribou in Canada.

● (1650)

The Chair: Excellent.

Mr. Wicklum, thank you very much. We appreciate your taking the time out of your schedule to prepare and especially to present to this group. It was very informative, and it's going to be very helpful in what we're doing here. We all appreciate it.

Mr. Dan Wicklum: Thank you very much to the committee and to you, Mr. Chair.

The Chair: We're going to suspend the meeting, and then come back and go in camera.

[*Proceedings continue in camera*]