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CHECK AGAINST DELIVERY

I want to thank the Chemical Institute of Canada for inviting me to be here today.

And a special thank you to the Canadian Society for Chemical Engineering…and to this year's conference executive committee from the University of Calgary's Chemical and Petroleum Engineering Department – my alma mater. You've put together such an interesting program for all of us. There are some excellent speakers on the roster that are bringing a wealth of experience and different perspectives.

The theme of this conference is "Shaping Energy Technology for the Future." I'm excited to be speaking to you today on this subject because it's one that holds a lot of relevance for me, for Cenovus, for Alberta and for Canada.

We often talk about clean energy as a dichotomy between carbon-based fuels, like oil and gas, and alternative energy, like solar or wind. I firmly believe that oil and clean energy are not mutually exclusive. When it comes to fossil fuels, the opportunity for clean energy technology is significant. And that technology will come from many sources – from within the oil industry, from other industries, from technology hubs, academia and through collaboration.

In May of this year, the Council of Canadian Academies published an important report on how technology could reduce the environmental impact of oil sands production. The authors wrote that "changing the pace of technology deployment will not occur without strong leadership, [PAUSE] continued investment and risk-taking by all." They also said, "we really need to create the innovation environment to move these things forward."

In my view, the innovation environment we need is centred on sharing – taking down the barriers that silo us. Sharing - an idea that's becoming more and more prevalent.

Matt Clifford, co-founder of a European technology investment firm, recently wrote that "…innovation is increasingly distributed; there is no central authority whose ability to assess innovation is the bottleneck."

In the energy industry, the innovation environment of collaboration and sharing is growing and offering many opportunities. You may be surprised to hear that because, right now, our industry is facing tough times. Oil prices have dropped substantially, pipelines aren't getting approved and there's been a reduction in employment.

We are not going to compromise on developing Canada's resources safely and environmentally responsibly.

And R&D spending is not negotiable either. Deborah Yedlin, a Canadian reporter, recently wrote about this. She challenged the sector to commit capital on R&D, where the payoff is sometimes years away even though the impact could be transformational.

She noted that innovation is changing in the oil industry. While there are some concerns with respect to the impact on existing intellectual property, we realize that the past philosophy is somewhat out of sync with a newer generation of engineers and entrepreneurs. That's many of you here today. You look at the world much differently — valuing transparency and the benefits of solving problems together, not in silos.

Cenovus agrees. We need to solve problems together.

That's why I want to challenge you today to think about how you can contribute to clean energy technologies.

Let's consider how you can contribute to clean energy technologies by looking at it through three lenses:

- First, shared challenges. The big challenge that Canada's oil sands industry is facing as responsible energy developers is GHG emissions from natural gas combustion. It's a challenge we share with other industries.

- Second, shared solutions. Embracing open innovation, because the best solution could come from the unlikeliest source. Canada's oil sands industry is innovating how we innovate to significantly speed up the pace of improvement.
- And finally, a shared future. At Cenovus, we know that climate change is the elephant in the room. We can be the cleanest energy developer, but we know that people ultimately don't like our product – oil. We need to fix that. We need to transform the product, which will lead to transforming the way people feel about using oil. That's why focussing on technology and innovation is absolutely key to a clean, affordable energy future.

Before I elaborate on my first point, let me tell you a bit about myself and where I work.

Innovation and strategic research and development are topics that are of great interest to me. I've been involved with one aspect or another throughout my career, from leading oil sands technology development, to innovation policy while working in the federal government, to my current executive position at Cenovus Energy. I was also the inaugural Chair and part of the team that initially formed Canada's Oil Sands Innovation Alliance, or COSIA, which is working to improve environmental performance in Canada's oil sands by collaborating on technology.

Most recently, I joined Alberta Innovates Technology Futures as Chair of its Board of Directors. This entity is a prime Alberta government engine to accelerate commercialization through applied research labs and entrepreneur support. A staff of about 600 looks after several sectors, including energy, environment, agriculture, forestry and information technology.

At Cenovus, we're focused on the growth of our oil sands assets, where we've pioneered specialized methods to bring oil to the surface with minimal land and fresh water disturbance. We also jointly own two U.S. refineries and operate conventional oil and gas operations - including the world's largest CO_2 enhanced oil recovery and storage project. This project uses CO_2 emissions that otherwise would have been vented to the air. The International Energy Agency is also operating a world-scale research initiative there to study the storage of CO2 in an oil reservoir.

Cenovus is very passionate about what we do as a Canadian company.

We produce oil. Oil is the world's primary transportation fuel…for a combination of reasons.

It's available, it's transportable, it's affordable and it's reliable.

But what we're most passionate about is doing our utmost to live up to the expectation that goes with being a responsible developer of the oil sands.

Cenovus operates what's called in-situ projects. That means the oil we produce is buried too deep to be surface mined. We drill for it and then use pumps to get it to the surface.

I find that most people don't know what a drilling project in the oil sands looks like … so I'd like to show you.

This is an aerial photo of central facilities for our Foster Creek oil sands project, located in northern Alberta. It's named Foster Creek in honour of the creek nearby, but we don't use that water for our production. Rather, we use non-potable water from a deep underground aquifer. Cenovus is one of the largest thermal in-situ operators in Canada, and Foster Creek was a pioneering project.

Drilling represents the future of oil sands production in Canada. Eighty percent of the oil in the oil sands is so deep underground that it can only be accessed by drilling. Right now, about half the oil produced from the oil sands is drilled. But, every year, the amount of oil produced this way is on the rise.

This is a picture of a well pad at our Christina Lake facility. I'll quickly explain the technology that allows us to access bitumen through drilling. With incredible accuracy, we drill two horizontal wells, one directly above the other, deep under the ground.

We inject steam into the top well to melt the rock-hard oil and separate it from the sand. With the help of gravity, the melted oil then flows into the bottom well where it's pumped to the surface.

To further limit our impact on the land, we drill several of those well pairs close together from pads as shown on the photo. They reach out beneath the ground for about a mile. That allows us to keep our surface disturbance to 5 - 10 percent of the total underground area that we're accessing. So, equivalent to about the size of a stamp on an envelope.

Cenovus has promised to unlock challenging resources in a way that makes Canadians proud. We've put a lot of effort into improving. Status quo is not an option. We all know there are challenges.

As an engineer, like many of you, I'm a strong believer that the first place to start on tough problems is by stating the challenge well…a problem well defined is 75 percent solved.

Which brings me back to my first point, the big challenge that Canada's oil sands industry is facing as responsible energy developers is GHG produced from natural gas combustion – a shared challenge with natural gas power plants around the world

Our challenge is to dramatically and economically reduce the CO_2 emissions from natural gas combustion. We use natural gas in our oil sands production process to generate the steam used to melt the oil. People are often surprised that it's actually natural gas combustion that's our biggest GHG challenge. It's not from bitumen!

Technology has already helped the broader oil sands sector reduce per barrel CO_2 emissions by 26 percent since 1990. CO_2 emissions from Cenovus's oil sands operations are comparable to the average barrel of oil that's processed at US refineries. And yet we have to improve even more – perhaps a "moonshot" of zero, yes zero emissions one day.

Eliminating greenhouse gas emissions is a complex problem, one that many sectors around the world are tackling. Again, natural gas power plants face a shared challenge with emissions. So we, along with many firms in our sector, are now opening up and looking externally…to leverage more smart minds and dollars beyond our firms towards a solution.

Which brings me to my second point – shared solutions.

The idea of shared solutions is leading us to new thinking, and to innovate how we're innovating. It's leading us to open innovation – a term that's relatively new to the oil sands industry. Simply put, open innovation is moving from relying solely on internal ideas, to exploring external ideas, to encouraging opportunities that cross sectors, industries and borders.

I've got some stories about collaboration and open innovation.

COSIA … Collaboration and learning from each other, within and external to our industry, is a great way to bring more smart minds and funding to advance technology and innovation. Canada's Oil Sands Innovation Alliance (COSIA) is a fantastic example of how companies are already sharing solutions, as well as collaborating to address technology gaps. It's made up of thirteen companies, representing about ninety percent of production from the Canadian oil sands. Member companies, like Cenovus, Suncor, Shell, ConocoPhillips and others, understand that we can improve the environmental performance of the industry faster and more effectively together than by working alone. COSIA is truly driven by its members – a "COSIA is us" mentality – that helps set priorities and joint projects.

It's an unprecedented level of collaboration for the oil sands industry and an unprecedented model in the global oil and gas sector. In fact, it's drawing attention as a model for innovation.

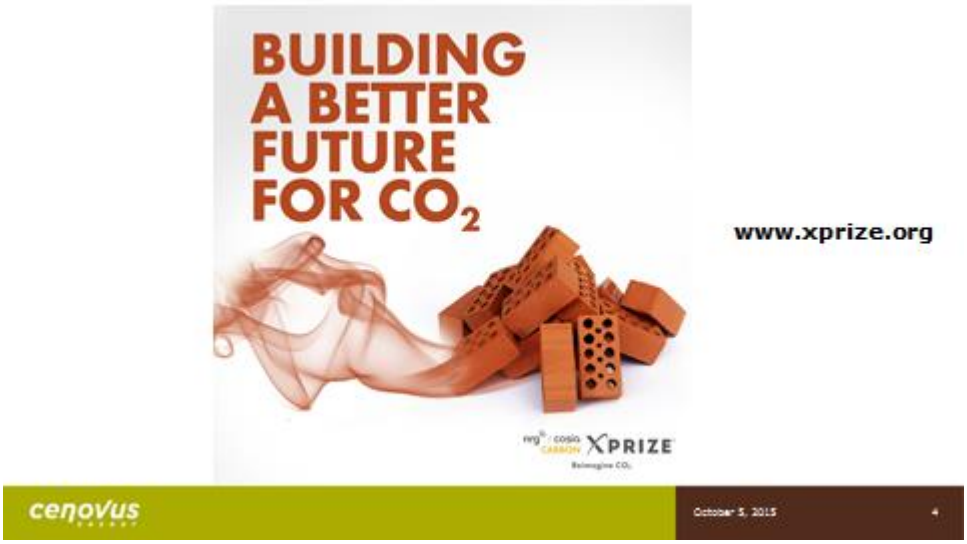
To date, COSIA member companies have shared 777 technologies and innovations that cost almost a billion dollars to develop.

COSIA members understand we don't have all the solutions to the environmental challenges facing the oil sands industry. So we've created an Associate Member Program to bring additional knowledge, experience and perspectives together to attain common goals.

The COSIA Associate Member Program allows companies, government agencies, academic bodies and other stakeholders who share the COSIA vision, but aren't oil sands producers themselves, to work closely with COSIA members. There are currently about 40 Associate Members, ranging from small and medium enterprises and academic institutes, to multinational corporations and government agencies…around the world.

The Associate Members include innovation hubs that serve as a gateway between COSIA and other groups of innovators. One example is the Canada-Israel Industrial R&D Foundation that represents all research institutes and companies in Israel.

I'm very excited about the latest news from COSIA. Just announced is the $20 million NRG COSIA Carbon XPRIZE to great fanfare at the end of September. We had global media coverage - even Sir Richard Branson tweeted about it! – and a reception in New York City with people like the Consul General of Canada and representatives from Google. I was pleased to have been there just last week.



COSIA is a co-sponsor of this global competition to reimagine CO_2. NRG, the other sponsor, is a progressive U.S. power utility. The competition is a cross-border, cross-industry effort, operated by the XPRIZE Foundation, which will run for four and a half years. The competition is designed to accelerate new technologies to manage carbon emissions by converting waste CO_2 emissions into valuable and usable products – a very important and tough goal.

Prize competitions have an impressive past. The $10 million Ansari XPRIZE, awarded in 2004, kick started the commercial space industry. More recently, the Wendy Schmidt Oil Cleanup XPRIZE, which was designed in the wake of the Deepwater Horizon crisis, inspired solutions to speed the pace of seawater surface oil recovery. The winning team quadrupled the previous industry rate of recovery.

For the NRG COSIA Carbon XPRIZE, competitors can focus on CO_2 emissions from natural gas or coal combustion, with prizes of $10 million for each of natural gas and coal. It's an opportunity for smart minds from around the globe to develop technologies that could launch an entirely new commercial industry – converting carbon from emissions into valuable products – while contributing to a cleaner energy future.

I'd like to play you a short video.

http://www.cenovus.com/operations/technology/cosia-nrg-carbon-xprize.html

I encourage you to check out this prize competition – register if you have an idea, or spread the word through your networks.

On collaboration & open innovation, Cenovus in particular believes solutions from outside our industry can make a difference. A few years ago, we decided to invest in promising entrepreneurs who are developing technologies aimed at minimizing the environmental impact of producing and consuming energy.

One of these is Vancouver-based Saltworks Technologies, which has developed solutions to convert seawater and non-potable saline groundwater into freshwater through energy-efficient desalination.

NASA – NASA! – selected Saltworks to develop a pilot unit to test the water recovery systems and processes for potential future use on board the International Space Station.

And we believe the technology could be used in oil sands operations to desalinate both water produced along with oil, and saline process water produced from aquifers (like we use at our oil sands operations). Talk about cross-sector innovation! Space… Oil Sands!

One more company we've invested in is General Fusion. Based in Burnaby, B.C., they're developing nuclear fusion technology – in essence harnessing the power of the sun – to generate cheap, safe and plentiful energy without greenhouse gas emissions, pollution or radioactive waste. It's a long shot and at an early stage, but the impact could be massive. This is an example of a transformative, long-term technology that we've invested in because we see it having the potential to significantly change energy production.

Cenovus does not have all the answers, so we're engaging smart people from around the country, including outside the energy sector, to help us solve our problems. Shared solutions!

We are working with several universities and looking at ways to engage with more entrepreneurs to come up with solutions to most critical environmental and cost challenges – in our operations, pipeline and marine transportation…perhaps right through to consumer use…by "innovating innovation."

My third and perhaps most important point is on our shared future.

I've talked about how innovating innovation means collaborating globally with our peers, entrepreneurs, students, academics, large corporations and governments to progress technology solutions to continue to reduce our impact on the environment, so that we get better…faster.

Tesla Motors is a prime example of an organization that's created a transformative, engaging innovation environment by applying an open source philosophy to its patents. Elon Musk realized that patents were stifling progress and that sharing Tesla's technology would accelerate the electric vehicle market far more quickly. By creating that innovation environment, he's helping attract smart minds and investment to the sustainable vehicle industry.

We need to take inspiration from the Tesla's of this world.

So the question is, how do we make oil part of a clean energy future?

A shared future means that, for energy companies to succeed in the 21st century, we must recognize that the opportunity presented by a clean energy mindset is enormous. We must think

differently, anticipating and creating the necessary change towards the end goal of clean and affordable energy for the growing world.

I stated earlier that our challenge on the oil production side is to dramatically and economically reduce the CO_2 emissions from natural gas combustion.

But Canadians also have concerns about their use of oil.

About its contribution to climate change.

Today, oil makes up 92 percent of the world's transportation fuel. Transportation is one of the biggest causes of greenhouse gas emissions. That's something we as the oil industry needs to address…to be part of the solution to resolve the carbon concerns associated with the consumption of our products.

Cenovus shares the public's concern that climate change is one of the greatest global challenges of our times. Our product is part of the problem. We will be part of the solution.

Rather than let oil be dismissed and given up on, we must find solutions to eliminate the carbon impacts of using this excellent source of energy. We need to create a product people want to use. To do that, we need to address carbon emissions along the entire value chain – from how we produce oil to how we all use oil, as in cars. We need to do this as an industry and as a country. This is transformational… eliminating the carbon impacts of using oil.

Innovation unlocked the resource potential of the oil sands. And innovation will help solve the challenges we still face!

Mega-collaboration is essential,

- With other industries,
- With entrepreneurs,
- With Government,
- With academia, and
- With other countries.

It's time for bold action.

When I started speaking today, I said I wanted to challenge you to think about how you can contribute to clean energy technologies. I want you to think about how you can be part of that shared future. We need bright minds, like all of you, with the passion to fuel world progress through affordable and cleaner energy. Look into ways you can be involved. For example, take advantage of competitions like the XPRIZE. Or send your ideas to. Share your solutions.

We need focus.

We need bold action.

And, we need to believe that we can.
When we encounter challenges, like greenhouse gas emissions, we can't throw up our hands and give up. One of the best pieces of advice I have gotten in my career is to find opportunity where there are big challenges.

The oil sands industry has shifted its mindset and is beginning to be innovative in how it innovates.

I hope I've sparked some ideas.

It's an opportunity for all of us.
Thank you.