

The business of business is no longer business

Carbon capture, utilization and storage

June 2023



EY had the opportunity to sponsor [Energy Disruptors: UNITE](#) in Calgary, moderating a panel on carbon capture, usage and storage (CCUS) and carbon innovation. We were joined by decarbonization experts Lindsay MacKay, VP Non-Regulated Canada Gas Commercial and Business Development, TC Energy; Fabrizio Chiaccia, VP New Ventures, Pembina Pipeline Corporation; Mina Zarabian, Co-founder and CEO, Carbonova Corp.; and Patrick Elliott, Co-Founder and COO, Carbon Alph.

In the context of reaching our net-zero ambitions, as we contemplate the panel dialogue, several vital insights emerged regarding the opportunities and challenges ahead. While our future energy mix will continue to include fossil fuels, energy companies must address how to capture and reduce methane and CO₂ emissions to lower carbon intensity. Moreover, it needs to occur at a scale we've never seen.

Demystifying carbon capture, usage and storage

CCUS is a technology that can capture and make effective use of the high concentrations of CO emitted by industrial activities. Furthermore, according to [Natural Resources Canada](#), CCUS plays a critical role in Canada's economic and environmental future as we strive to meet our net-zero ambition by 2050 objective.

CCUS can take any one of the following forms:

- ① **Carbon capture and storage (CCS), which includes technologies that capture CO₂ and permanently store it**
- ② **Carbon capture and utilization (CCU), where CO₂ is used for other industrial activities such as the production of chemicals**
- ③ **Carbon capture, utilization and storage (CCUS), where CO₂ is captured and then stored and potentially later used for industrial processes**

Patrick Elliot explains, "In the Canadian context, we have two leading global facilities, including Boundary Dam in Estevan, Saskatchewan and Quest near Fort Saskatchewan, Alberta." The successful operation of CCUS facilities in Alberta and Saskatchewan demonstrates that the oil and gas industry has the technological resources and geological advantage to build and operate a thriving CCUS industry.

According to the International Energy Agency, 21 CCUS projects each year capture 40 Mt of CO₂ globally. Most CCUS projects operate in the US, Canada and Europe. Over 140 CCUS projects could be operational globally by 2025, capturing at least 145 million tonnes per annum (mtpa) of carbon dioxide emissions.

The business of business is no longer just business

As Alberto Lopez-Valenzuela points out in his book, [The Connecting Leader](#), in these times of hyper-transparency, and consumer and employee engagement and activism, companies must consider how they create value for stakeholders beyond shareholders. Essential concepts like environmental justice, health equity or just transitions are increasingly discussed as part of a broader business plan. But this value creation can be elusive and difficult to quantify.

The Canadian energy sector is on the cusp of a consumer-led, technology-enabled transition, pushing companies to rethink their energy mix to meet new stakeholder demands and pressures, including the use and storage of carbon. While the costs of energy transition and renewables are falling and government subsidies provide enhanced incentives, Canadian companies are still tight for cash – with existing liquidity challenges only being heightened by the impacts of COVID-19. The Canadian economy is also likely on the path towards a recession. We have an energy crisis and stubbornly high inflation, which the [Bank of Canada](#) is trying to cool with higher interest rates. In addition, geopolitical uncertainty is contributing to the slowing of the economy. Most pressing issue of our time. And it helps organizations stand out from their competitors aiming to win in the sustainability space.

Despite these challenges, as [Steve Varley](#), EY Global Vice Chair Sustainability, said, value-led sustainability is everybody's business. Business can and should play a role alongside government, society and individuals to solve the most pressing issue of our time. And it helps organizations stand out from their competitors aiming to win in the sustainability space.

As companies look to shift to growth, they'll have to be strategic about where to deploy capital. Whether through buy or build, the flexibility and value-based decision-making companies display in responding to today's dynamic market conditions will determine their future strategic success.

CCUS is a vital component of the sustainability journey for any company in the future. The Government of Canada is undertaking measures to reduce methane emissions from [Canada's oil and gas sector by 40% to 45% by 2025](#), pushing companies to adjust their strategies. Remaining competitive will require the Canadian oil and gas sector to use CCUS to meet the 2030 emission-reduction targets.

“Geopolitical instability has many around the world more conscious of where the energy they need comes from. We're focused on helping Canada meet its climate goals with an aggressive plan to reduce emissions, while ensuring we play an increasing role in meeting the world's energy security needs. We know of no other oil-producing jurisdiction where competitors have come together and done the work required to advance such an ambitious plan.”

KENDALL DILLING
President, Pathways Alliance

Scaling for impact is going to require innovative collaboration

According to Lindsay MacKay, “We need to be competitive, and to do this, we need to collaborate.” The Canadian oil and gas sector is not sitting on its hands but coming together strategically through a highly innovative alliance to collaborate on a lower-carbon future. The [Pathways Alliance](#) comprises Canada's largest oil sands producers working together to address climate change. The six companies operate about 95% of Canada's oil sands production. The Pathways Alliance estimates a net reduction of 10 Mt of CO₂ annually by 2030 via CCUS from oil sands facilities and an additional 30 Mt per year by 2050. It's a crucial part of the Pathways Alliance's plan to achieve net-zero greenhouse gas emissions by 2050.

The group's foundational project features a 400-kilometre CO₂ transportation line that will initially connect 11 oil sands facilities to an underground storage hub in Cold Lake, Alberta. Furthermore, a significant component of the plan is carbon capture, utilization and storage technology.

Further to collaboration between companies, engaging First Nations, Inuit and Métis Peoples in new ways is another vital component of success. Cultural awareness, community involvement and business collaboration are table stakes, and increasingly financial participation is another aspect that requires careful consideration.

These cross-company and external collaboration and engagement efforts are essential to scaling the future of CCUS in Canada. Fabrizio Chiacchia said, “I'm really excited about the open innovation that's happening around this, with government and companies big and small.” Mina Zarabian adds, “Canada is a great place for innovation, but to scale up, we need to do more. If Canada does not do more immediately, startup companies will move to the US.”



From an engineering and technical standpoint, Canada has much going for it

According to global law firm [Norton Rose Fullbright](#), Canada is particularly well suited to developing CCUS technologies. The country has seven large sedimentary basins for permanent geological sequestration of captured CO₂ and an oil and gas industry with extensive expertise in drilling wells and injecting substances into geological formations for storage or disposal. Chiacchia adds, “We have some of the best geology in the world, and when you look at reservoirs around the world, we are definitely top five.”

[Alberta Innovates](#) indicates that Canada is enabled by robust existing infrastructure and is well positioned to drive the CCUS innovation agenda forward. Those with a strong track record in the oil and gas sector have an advantage, with the potential to identify and repurpose suitable assets, capitalize on transferable skills and develop reliable supply chains. Still, they will need to move quickly to gain a competitive advantage.

New projects are also in the funnel for future development. [Pembina Pipeline Corporation and TC Energy](#) have announced plans to develop a carbon transportation and sequestration system to serve industrial emitters in the Alberta Industrial Heartland region. In addition, oil sands producers [Suncor Energy and ATCO](#) are partnering on a hydrogen project incorporating CCUS technology.

Despite announced projects, according to the [Canadian Energy Centre](#), one of the main issues currently impeding on growth is that CO₂ infrastructure is often inaccessible. That is combined with a lack of nearby infrastructure with available capacity to transport and store additional volumes of CO₂ that will be tied into the carbon capture unit. On top of that, investment in a capture plant requires assurance of transporting the CO₂ to geological storage (deep porous rock formations covered by a solid “cap rock”). Unfortunately, the source of CO₂ emissions is not always in a location with suitable storage.

There are some significant policy and regulatory hurdles that need to be overcome

From a policy and regulatory standpoint, some progress has been made. For example, the federal and provincial governments continue to support Canada’s CCUS industry. The [Strategic Innovation Fund](#) is set to accelerate the development and adoption innovative technologies and processes to lower the oil and gas industry’s environmental impacts.

However, it’s not just about hard incentive dollars. According to the [Pembina Institute](#), it’s still necessary to establish a credible regulatory framework to ensure that all carbon captured is permanently sequestered. Addressing nonfinancial challenges preventing the accelerated implementation of CCUS remains challenging.

What’s more, assessing if public funding for new industrial applications of CCUS is needed given the 2030 carbon price and the emergence of other market-based incentives. Many experts say the key to unlocking significant carbon capture investments will require governments to assure the future value of carbon credits.

In any province, it’s clear that to secure private investment; governments need to give out the right signals and underpin them with a suitable policy landscape, clarity on business models and financial incentives. MacKay adds, “We need certainty to regulation and policy in Canada.”

The US incentives model has something to teach us

The US has a track record of getting things done on a massive scale. According to a recent article in the [Financial Post](#) and a report by [BMO Capital Markets](#), Canada will be left behind by the US, with incentives for carbon capture luring investment south. The Biden administration's new climate package has been celebrated worldwide as a game changer in the fight to reverse climate change. According to Chiaccia, "US policy is very friendly to industry and decarbonization." Furthermore, he adds, "They've made the policy framework simple, made projects economic, and people understand how it works with not a lot of change."

The US production credit is considered superior to Canada's incentives for CCUS. The biggest problem with Canada's investment tax credit isn't necessarily its size but that it doesn't shield investors from potential changes in future carbon prices. The new policy increases the US government's tax credit for such initiatives to \$85 for each tonne of stored CO2, up from \$50.

The US approach questions whether the carrot (tax incentive) vs. stick (carbon price) approach is best to drive the impact needed in Canada.

Defining a path forward that unites the energy vs. environment divide will take time

The global demand for oil and gas will increase in the coming decades. With the third-largest proven oil reserves and fifth-largest natural gas reserves in the world, the Canadian oil and gas sector is vital in responsibly supplying the world's energy needs. CCUS will be the bridging mechanism enabling Canada's oil and gas industry to enhance energy security while significantly lowering carbon emissions.

As we chart our path forward, it will be necessary to consider our approach to:



COLLABORATION Government, industry and Indigenous communities work together to advance Canada's economic interests while creating the sustainable future we all desire. Collaboration, innovation and co-creation among groups with divergent views are vital to producing meaningful and lasting solutions that align Canadians.



REGULATION Maximizing Canada's energy opportunity will require creating an effective and efficient regulatory system, one that clarifies the rules on foreign investment and project approval and demonstrates to the world that we can deliver on capital projects.



INCENTIVES Incentivizing CCUS investment through an effective tax credit program could help propel Canadian solutions onto the world stage and support the global push toward carbon neutrality.

We have **proven the technology works**, the natural geology that supports storage, and the engineering and technical knowhow. **Canada is uniquely positioned** to make a **meaningful mark** in the CCUS space. **So let's seize it and become world leaders.**

Authors



Dr. Lance Mortlock

EY Canada Energy Managing Partner,
Energy & Resources & Haskayne
School of Business Adjunct
Associate Professor
lance.mortlock@ca.ey.com



Brittany Keenan

EY Canada Energy & Resources
Assurance Leader
brittany.keenan@ca.ey.com



Greg Boone

EY Canada Energy & Resources
Tax Leader
greg.boone@ca.ey.com

EY | Building a better working world

EY exists to build a better working world, helping to create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.

Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via ey.com/privacy. EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit ey.com.

© 2023 Ernst & Young LLP. All Rights Reserved.
A member firm of Ernst & Young Global Limited.

4222202
ED None

This material has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice. Please refer to your advisors for specific advice.

ey.com