

# **Enbridge's feedback on proposed amendments to Ontario's *Oil, Gas and Salt Resources Act* to remove the prohibition on carbon sequestration**

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## Introduction

Enbridge Inc. and its affiliated companies (Enbridge) appreciate the opportunity to provide comments on the Minister of Natural Resources and Forestry's (MNRF) proposed amendments to Ontario's *Oil, Gas and Salt Resources Act*, R.S.O. 1990, c. P.12 (OGSRA).

In the fight against climate change, experts like the International Energy Agency and the Canadian Energy Regulator agree that carbon dioxide (CO<sub>2</sub>) capture and storage/sequestration (CCS) solutions are among the most critical decarbonization technologies.<sup>1</sup> In Ontario, Enbridge believes CCS will play a key role in decarbonizing local industry, including steel and cement manufacturing, petrochemicals, and refining and power generation, among others. CCS will also unlock and facilitate production and adoption of "blue hydrogen" or low-carbon hydrogen to transition.

Enbridge is very pleased to see the MNRF proposing important steps to unlock Ontario's CCS potential, including through the proposed amendments to the OGSRA. Enbridge has reviewed and commends the Government of Ontario (Government) on [Ontario's Roadmap towards Regulating Geological Storage](#) (Roadmap) and we support a "phased approach" that provides clarity for businesses that plan to invest in the province, while ensuring safe and responsible development.

With its extensive and growing experience with CCS projects in other jurisdictions and with gas storage and other related projects in Ontario, Enbridge has an informed perspective of how CCS projects are best enabled to address public interest considerations. Through this lens, Enbridge is providing preliminary comments and suggestions on the Roadmap, to enable successful deployment of each phase.

These submissions are complementary to comments made by Enbridge on March 14, 2022 (ERO Number: 019-4770) (March Submission) in response to the MNRF's January 2022 Discussion Paper on Geologic Carbon Storage in Ontario (Discussion Paper).<sup>2</sup> Subject to some updated perspectives set out below, many of the detailed recommendations that Enbridge provided in its March Submission remain relevant and we have therefore referenced throughout where applicable.

## About Enbridge

Enbridge is a leading North American energy infrastructure company. We safely and reliably deliver the energy people need and want to fuel quality of life. Our core businesses include Liquids Pipelines, which transports approximately 25% of the crude oil produced in North America; Gas Transmission and Midstream, which transports about 19% of the natural gas consumed in the U.S.; Gas Distribution and Storage, which serves approximately 3.8 million retail customers in Ontario and Quebec; and Power Operations. Together, our renewable energy projects (either operating or under construction) have the capacity to generate 2,075 megawatts of net renewable power in North America and Europe. Enbridge is committed to reducing the carbon footprint of the energy we deliver, and to achieving net zero greenhouse gas emissions by 2050. As a pathway to this goal Enbridge recently announced a new energy as a service line of business called Enbridge Sustain. This service offers dependable and convenient energy solutions to help homeowners, developers and commercial customers in Ontario reduce their greenhouse gas (GHG) emissions and energy costs. The currently offered technologies include geothermal heating, solar photovoltaic, hybrid heating and electric vehicle chargers.

Our regulated utility Enbridge Gas Inc. (Enbridge Gas) is Canada's largest natural gas storage, transmission, and distribution company based in Ontario with a more than 170-year history of providing safe and reliable service to customers and heats over 75% of Ontario homes.

## Importance of CCS for future energy pathways

As the first recommendation in our March Submission, we urged the Government to expedite the consultation and amendments necessary to fully enable and support CCS in Ontario to maximize the value of Ontario's unique geology, the environmental imperative and business case for CCS and the growing regulatory momentum in this space. The urgency of these statements has only increased since March, as highlighted in the [Pathways to Net-Zero Emissions for Ontario Study](#) (Study), prepared by Guidehouse Inc. for Enbridge Gas and published in September 2022.

The Study evaluates two energy pathways, a diversified pathway and an electrification pathway, to meet Ontario's 2030 emissions reduction target of 30% below 2005 levels and net-zero by 2050. For both pathways, the associated investments that would be needed in electricity, hydrogen, and methane supply capacity and storage were evaluated, as well as what infrastructure would be required for each. It also quantified the end-user costs, combined, providing the total cost for Ontario to reach net-zero emissions via a diversified pathway and via an electrification pathway. It is important to note that the diversified pathway was found to be the more practical pathway for Ontario, because it has several advantages over the electrification pathway such as:

1. **Affordability** – the diversified pathway is more cost-effective. The report shows that the electrification pathway is 27% (over \$200B) more expensive.
2. **Reliability** – In addition to being a lower cost pathway, utilizing both the gas and electric systems means that consumers continue to have reliable energy when they need it, including on the hottest and coldest days of year.
3. **Resiliency** – Having multiple systems provides more protection against extreme events such as severe weather. Enbridge's system is largely underground and provides this resiliency to our customers at a low cost (approximately \$50/month).
4. **Consumer Choice** – Diversification allows Ontario energy consumers to transition to the energy solution that best meets their needs. A wider range of options enables choice, which will support a more achievable pathway, as customers will more willingly make choices that reduce their GHG emissions if they can choose which solution is best for them.
5. **Competitiveness** – Diversification allows the costs of operating and maintaining the gas system in Ontario, a system that is shown to be required in both pathways, to be spread among millions of users as opposed to concentrating the costs across those in hard-to-abate sectors of industry that have no alternative.

The Study concludes that regardless of the pathway chosen, there are certain "safe bet" actions that should be taken immediately to support Ontario's 2030 emissions reductions goals and to set Ontario on a path to net-zero. One safe bet is the investment in and use of CCS. This is a safe bet as using CCS to produce low-carbon hydrogen for industrial customers and to decarbonize hard-to-abate industrial processes is required in both pathways. It is important to note that in the diversified pathway CCS is used to produce low-carbon hydrogen for more widespread use, including building heat. Therefore, CCS is critical to enabling the diversified pathway in Ontario, a pathway that provides greater consumer choice, resiliency, competitiveness and affordability.

Our March Submission sets out several other important environmental, economic and safety considerations that position CCS as a significant opportunity and necessity to help Ontario achieve GHG reduction targets and remain competitive in North America. The main points are summarized below and details and references are provided in the March Submission:

- CCS represents a significant opportunity to help Ontario achieve GHG reduction targets;



- CCS is safe as a secure, resilient and feasible option for climate mitigation and in thoroughly screened sites, is safe over geological timescales and leakage is unlikely;
- Large CCS projects have been safely developed and operated for decades; and
- Ontario must develop a viable CCS framework in the near term in order to provide large emitters and heavy industry, especially the emissions intense, trade exposed (EITE) industry, with a viable option to mitigate GHG emissions and remain competitive. Ontario depends on these industries for its economic prosperity and for employment of thousands of Ontarians.

## Enbridge's leadership on CCS and gas storage

Enbridge is a leading North American project developer in the CCS space, with a particular focus on CO<sub>2</sub> transportation and storage. We have CCS projects under development across North America, including Ontario, Alberta, Saskatchewan, the U.S. Gulf Coast, and the U.S Midwest.

One particularly exciting CCS project under development is our Open Access Wabamun Carbon Hub (the Wabamun Hub) located north and west of Edmonton, Alberta. The Wabamun Hub will support recently announced world-class CO<sub>2</sub> capture projects by [Capital Power](#) and [Lehigh Cement](#), which represents an opportunity to avoid nearly 4 million tonnes of atmospheric CO<sub>2</sub> emissions annually (Mtpa)—the equivalent of taking more than 1.2 million cars off the road every year.

Once built, the Wabamun Hub will be one of the world's largest integrated CO<sub>2</sub> transportation and storage complexes, effectively doubling the amount of CO<sub>2</sub> captured and stored in Canada today.

Enbridge is developing the Wabamun Hub in partnership with local Indigenous communities (Alexander First Nation, Alexis Nakota Sioux Nation, Enoch Cree Nation, Paul First Nation, and the Lac Ste. Anne Métis Community) who will have the opportunity to co-own (up to 50%) the Wabamun Hub's CO<sub>2</sub> transportation and storage assets.

With the support of Indigenous partners, Capital Power, and Lehigh Cement, Enbridge applied to develop the Wabamun Hub through the Government of Alberta's competitive carbon hub selection process. In late March 2022, the Government of Alberta announced that Enbridge was awarded the right to pursue development of the Wabamun Hub. In September 2022, Enbridge signed a carbon sequestration evaluation agreement with the Government of Alberta, an important step that allows Enbridge to advance evaluation of the geology underlying the Wabamun area. We plan to drill two evaluation wells in 2023, with the first as early as Q1.

Other active, public CCS initiatives involving Enbridge include:

- [Enbridge and Oxy Low Carbon Ventures exploring development of a CO<sub>2</sub> transportation and sequestration hub near Corpus Christi, Texas.](#)
- Collaboration with the [Petroleum Technology Research Centre \(PTRC\)](#), including in the development of the Wabamun Hub. Enbridge was also a founding member of the Aquistore Project led by the PTRC, a commercial-scale project tied to real injection considerations, taking industrial CO<sub>2</sub> at variable and intermittent rates between 250 and 500 tonnes per day from SaskPower's CO<sub>2</sub> capture facility at Boundary Dam near Estevan, Saskatchewan and injecting it to a depth of 3,400 metres into the Deadwood formation.
- [Enbridge, Svante Inc., Cross River Infrastructure Partners LLC, and OTS Ltd. establishing Cross Carbon Ventures to explore commercial opportunities across North America to develop, build, own, and operate CO<sub>2</sub> capture projects for CO<sub>2</sub>-intensive industries](#)

Enbridge has also been involved in CO<sub>2</sub> transportation and storage initiatives for years. For example:

- **Alberta Saline Aquifer Project** – Enbridge and Capital Power (then EPCOR) co-launched the Alberta Saline Aquifer Project (ASAP) in 2007. Led by Enbridge, ASAP was a broad-based initiative to advance CO<sub>2</sub> sequestration technology and capacity in Alberta. Initially comprising a group of 19 private sector companies, the number of ASAP participants eventually grew to 36 industry participants, one academic institute, and one research institute. This project was aimed at gaining a better understanding of the potential costs, procurement constraints, and technological considerations of the various components required for successful CO<sub>2</sub> sequestration projects in Alberta.
- **Project Pioneer** – Enbridge and Capital Power partnered with TransAlta for Project Pioneer, which aimed to capture 1 Mtpa of CO<sub>2</sub> from the Keephills 3 power plant, located west of Edmonton, Alberta. Project Pioneer assessed CO<sub>2</sub> storage in a deep saline aquifer (the Nisku formation) in the Wabamun area west of Edmonton, Alberta through a drilling program that included an extensive characterization program. The Pioneer well (Highvale 08-17-51-3W5M) was drilled, cased, and tested between October and December 2011. The purpose of this evaluation well was to confirm the reservoir quality of the saline aquifer.
- **Wabamun Area Sequestration Project** – The Wabamun Area Sequestration Project (WASP) was a University of Calgary-led project with industry partners including Project Pioneer partners Enbridge and TransAlta. The project involved a comprehensive characterization study of large-scale CO<sub>2</sub> sequestration opportunities in the Wabamun area. It examined the feasibility of storing 20 Mtpa of CO<sub>2</sub> per year within a 60 km by 90 km area extending south of the Wabamun Lake area. The Nisku formation (a deep saline aquifer) was selected as the primary target for CO<sub>2</sub> sequestration.
- **Fort Nelson Carbon Storage Project** – In 2012, Spectra Energy (which combined with Enbridge in 2017) explored the technical and economic feasibility of sequestering CO<sub>2</sub> from a commercial natural gas processing facility in Fort Nelson, British Columbia in a deep carbonate saline formation in northeast British Columbia.

Ultimately, these CCS initiatives did not proceed because the policy landscape at the time did not support the projects' economics. We are very encouraged to see this changing in Canada and Ontario, specifically.

Finally, Enbridge has substantial and relevant experience developing and operating natural gas underground storage facilities. Enbridge owns or operates eight natural gas storage facilities in the United States and 36 natural gas storage fields at the Dawn Hub storage facility in Ontario, with a net working storage of about 438 billion cubic feet. The "Dawn Hub" got its name because it is connected to most of North America's major natural gas supplies, as well as to major demand markets. Like the spokes of a wheel, more than half a dozen major pipelines connect at the Dawn Hub. Enbridge sees this experience as directly relevant to developing, building, and operating CO<sub>2</sub> transportation and storage hubs.

## Certainty for industry and responsible CCS development

Enbridge appreciates the MNRF's efforts to develop the initial Roadmap as it demonstrates the Government's intentions to enable CCS projects, starting with testing and demonstration and designing a regulatory framework for commercial scale CCS projects on both Crown and private lands. Enbridge is supportive of these elements of the Roadmap and urges the Government to advance next steps and act quickly to enact enabling legislation and regulations. Enbridge is also supportive of a "phased approach" that both provides clarity for businesses that plan to invest in Ontario and ensures safe and responsible CCS development.

While it is a positive signal that the Government has proposed removal of section 11(1.1) from the OGSRA, thereby removing the prohibition on the use of wells for CO<sub>2</sub> injection in underground formations generally or for enhanced oil and gas recovery, this lone amendment does not serve to advance development of Ontario CCS projects effectively. In our March Submission, we promoted this, at least as a first step. Since making the March Submission, Enbridge has learned more about industry needs and timelines and the limitations on Ontario geology. We have also learned lessons advancing CCS projects in other North American jurisdictions. It is through this lens that Enbridge is advocating for an adjusted CCS roadmap for Ontario that sets out a more efficient and effective pathway to successful project development and implementation.

***Recommendation 1: Revise the Roadmap to prioritize the enactment of Crown vesting legislation and state definitive timelines for development of a comprehensive legislative and regulatory framework for Ontario CCS projects, targeting completion by the end of 2023.***

As detailed above, Enbridge has considerable experience with the technical and commercial expertise and financial viability required to implement CCS projects. The need for broad provincial coordination amongst stakeholders and participants is abundantly clear. Against this background, Enbridge is recommending an enhanced CCS Roadmap as follows:

### **Enhanced CCS Roadmap**

1. Crown vesting of pore space for the purposes of CO<sub>2</sub> sequestration in saline aquifers
  - a. Enact legislation (e.g., that amends the *Mining Act* or other applicable legislation) to declare that all pore space for the purposes of carbon dioxide sequestration is vested in the Crown (especially in saline aquifers) and the responsible ministry can enter agreements with respect to the use of such pore space.
2. Removal of legislative barriers (coincident with step 1)
  - a. Amend the OGSRA to revoke section 11(1.1) in its entirety, thereby removing the prohibition on the use of wells for CO<sub>2</sub> injection in underground formations generally or for enhanced oil and gas recovery and leverage and replicate the recent compressed air energy storage (CAES) amendments to also include CCS; and
  - b. Amend the *Mining Act* to allow for storage leases that authorize the permanent storage of CO<sub>2</sub> on Crown lands, while ensuring that such leases can cover broad geographic areas and be applicable to specific stratigraphic zones.
3. Establish a permitting and licensing regulatory framework for various types of CCS projects (including in saline aquifers and other geological formations), commencing with evaluation/pilot projects leading to larger commercial-scale implementation if successful (coincident with or shortly following steps 1 and 2)
  - a. Enact a permitting regime for CO<sub>2</sub> wells, injection activities and related surface facilities such as CO<sub>2</sub> pipelines, which is modelled after the existing regime for compressed air energy storage (CAES) projects under the OGSRA or other applicable regime (such as in Alberta);
  - b. Ensure this regime is flexible and avoids any limits on the types of storage applications that proponents might submit and the application review process is expedited and subject to regulatory review timelines;
  - c. Adopt the relevant aspects of CSA Z-741 and Z-341 Codes, as appropriate for CCS in Ontario; and
  - d. Ensure there is an appropriate transfer of long-term responsibilities for stored CO<sub>2</sub>, following the model established in Alberta.

4. Develop utility-like regulatory framework, through Government agreements or under the OEB's jurisdiction similar to other utility models, for open access CCS facilities
5. Refine and adapt CCS regulatory framework for new activities and emerging technologies, as required

In our March Submission, Enbridge emphasized the importance of creating a regulatory framework through companion mechanisms to encourage commercial CCS projects (by amending the Emissions Performance Standards (EPS) and creating a carbon offset system) and ensuring scalable and cost-effective infrastructure development. The CCS Roadmap need not address all of these elements directly, recognizing that coordination with external agencies and jurisdictions may be necessary. However, the Roadmap should at a minimum provide a clear path for the critical elements of pore space acquisition, resource protection and scaling of CCS projects.

We therefore recommend that the Roadmap be revised to clearly acknowledge that Government leadership and coordination are required to enable and facilitate the initial most critical CCS projects in saline aquifers. This foundational regulatory framework can then be leveraged to develop new and various types of CCS technology, infrastructure and regulatory models at the appropriate time. This is similar to what Alberta is doing under its *Mines and Minerals Act* (MMA) and related legislation and regulations. This approach is particularly critical in light of the timing considerations and geological limitations for large-scale CCS in Ontario, as further discussed below.

***Recommendation 2:*** *As the first steps in the CCS Roadmap, targeting the first half of 2023, enact legislation declaring that pore space in deep saline aquifers for CO<sub>2</sub> storage purposes is and always has been vested in the Crown in right of Ontario (with exceptions for any federal lands, including First Nations reserves). For clarity, distinguish between geological CO<sub>2</sub> storage in deep saline aquifers and CO<sub>2</sub> storage in other formations (e.g., depleted oil and gas formations) and prioritize developing legislation for CO<sub>2</sub> storage in deep saline aquifers. Coincidentally, remove the current legislative barriers in the Mining Act, to provide access to Crown lands, and the OGSRA, to legalize CCS.*

It is important that the Government undertake the first two steps of the revised Roadmap at the same time, as one legislative package. This is because removing one or both of the legislative barriers to CCS (in step 2) on their own will only serve to legalize CCS in concept, without any insight into the enabling mechanism that will allow project proponents to acquire the necessary pore space. Without legislative Crown vesting of pore space, the default position at common law is that the surface rights landowner will own that pore space. The Government should clarify its intentions for Crown vesting of pore space at the outset so that private landowners and project proponents have certainty about project development values and trajectories.

## Ontario geology – saline aquifers and Crown lands

In Ontario, deep saline aquifers include the Cambrian formation, approximately 1000 m in depth.<sup>3</sup> These formations are isolated from the surface and potable water reservoirs by several hundreds of metres of rock formations. The overlying rock formations consist of several layers of impervious rock that form a series of primary, secondary and final seals which provides multi-layer CO<sub>2</sub> containment. Saline aquifers are comprised of porous rock and brine (with very high salt content) with layers of cap rock above. These formations are ideally suited for CO<sub>2</sub> storage and the regional Cambrian aquifer does not contain commercially exploitable minerals or oil and gas. To date, producible oil and gas has only been discovered in structural and stratigraphic traps in the Cambrian formation.

As noted above, saline aquifers are also a finite resource (especially in southern Ontario, proximate to major industrial activity and emissions) requiring careful management through appropriate regulations. Important public interest considerations in this regard are public safety, environmental protection, long-term climate implications and the encouragement of business investment through fair, affordable, and timely provision of CO<sub>2</sub> storage services.

The Roadmap and prior MNR Discussion Paper make only a brief reference to the geologic limitations to CCS opportunities in Ontario. The Discussion Paper states, at page 3:

It is expected that pilot or demonstration projects would occur in southwestern Ontario in areas that are already generally associated with oil, gas and salt production, and the underground storage of other substances. Some early studies have looked at saline aquifers in southwestern Ontario and it is thought that there is potential for carbon storage in these locations, although more detailed investigation and data collection are required.

Under the right conditions, carbon dioxide might also be stored in other geologic settings such as former hydrocarbon reservoirs where the resource has been depleted. However, the long legacy of drilling for oil and gas in Ontario has affected the suitability of many of these reservoirs for the storage of carbon dioxide. Careful site selection and extensive study would be required to ensure that the carbon dioxide could be stored safely by proponents.

As detailed in its March Submission, Enbridge agrees with findings of prior studies and reports<sup>4</sup> that saline aquifers in southwestern Ontario have by far the most promise and potential for commercial-scale CCS in Ontario, especially given their proximity to the hard-to-abate EITE industries that, in the public interest, will benefit most readily from CCS opportunities.

The Roadmap as currently presented does not serve to facilitate saline aquifer development specifically. Because saline aquifers are continuous in nature and cover the subsurface areas of very large tracts of land with multiple landowners, both private and Crown, it is not practical or feasible for project proponents to acquire the necessary pore space for CCS projects in saline aquifers without Government intervention, especially given the multiple uncertainties associated with CCS project developments in Ontario. It is also imperative that the Government provide access to Crown land coincident with private land access to provide an opportunity to project proponents to acquire interests in a sufficiently large and continuous CCS project area.

Further, Crown lands appear to comprise the majority of the land and waters under which suitable saline aquifers are located, thereby increasing the importance of access to Crown lands for CCS projects. Amending the *Mining Act*, as proposed in the Discussion Paper and recommended in our March Submission, is a necessary first step in this regard. As set out in our revised CCS Roadmap, the Government should make this amendment at the same time as it makes the proposed amendment to the OGSRA legalizing CCS, to signal the Government's intention to make Crown lands available for CCS development purposes sooner rather than later. As noted above, Enbridge recommends against removing the legislative barriers to CCS in the OGSRA (and/or the *Mining Act*) without Crown vesting of pore space in saline aquifers because this will effectively be putting the cart before the horse and will lead to confusion about Government intentions, CCS project viability and pore space valuation for these critical geological resources.

## Crown vesting of CCS pore space in saline aquifers

In order for the Government to manage Ontario's saline aquifer resources most efficiently for CCS opportunities, Enbridge suggests that there are two primary options for acquiring the necessary pore space and land rights:

1. **Crown vesting of pore space:** Similar to Alberta, declare Crown ownership of the pore space within Ontario saline aquifers for the purposes of CO<sub>2</sub> storage.



2. **Leverage existing mechanisms for gas storage and oil & gas production:** Provide a legislative mechanism pursuant to which project proponents can seek declaration of a designated project area for CCS purposes (similar to a designated gas storage area or a spacing unit for oil & gas production) that includes Crown lands.

While Enbridge appreciates that Crown vesting of pore space is not currently a familiar concept in Ontario legislation,<sup>5</sup> we strongly recommend its adoption as the most sound and efficient approach to successful and timely CCS project development in saline aquifers. This is because it is best suited to Ontario's geologic potential and geographic location of its largest emitters and it has already been applied successfully in Alberta, Canada's leading jurisdiction for development and implementation of CCS projects. More specifically, the Crown vesting option is preferred for the following reasons:

- **Prudent management of a scarce resource for the public good** – Saline aquifers in Ontario that are extensive and accessible enough for CCS projects are a finite resource and they must be developed in an efficient and effective manner to preserve their full potential for Ontario residents and businesses. Title to pore space is a critical element of the CCS Roadmap for the Government to “get right” and manage closely to enable successful CCS project development, especially given the large tracts of pore space that will be required for CCS projects. Project proponents need title certainty and Crown vesting as proposed will enable dealings with a single, responsible pore space owner who can then establish consistent conditions for access in the public interest.
- **Ensuring public safety and environmental protection** – Because CCS projects have not yet been developed in Ontario, there will inevitably be a period of testing and evaluation that the Crown will be able to closely manage and monitor through agreements with project proponents, as noted above. In addition, the existence of a single owner will more effectively facilitate the development of a prudent long-term liability regime (further discussed below) to ensure the integrity and safety of CCS sites post-closure. The Government can also adjust its arrangements with project proponents to help achieve Government objectives for emissions abatement in a controlled manner.
- **Certainty for CO<sub>2</sub> storage project developers, stimulating investment** – With clear Government sponsorship and leadership and the ability for project proponents to access all necessary pore space for a CCS project, investment related to CCS projects and solutions will be stimulated in Ontario. The proposed Crown vesting approach avoids the need to create or adapt a compulsory acquisition regime which would otherwise be required to address pore space ownership uncertainties/opposition. It also avoids potentially challenging valuation problems.
- **Unlocking timely, lowest-cost CO<sub>2</sub> storage solutions** – Deep saline aquifers in Ontario are the most extensive, useable, well-situated and logical geological formations to target for Ontario CCS projects and Crown vesting of these formations does not result in significant interference with existing property rights because these formations are not currently used to any significant degree for commercial activities and CCS is currently illegal in Ontario. Enbridge proposes that surface landowners will be entitled to market-based compensation and fair land access terms where surface rights are required for CCS project facilities and the public will benefit through reasonable payments to the Government for use of the pore space.

Enbridge suggests modelling the required Ontario legislative amendments after section 15.1 of Alberta's *Mines and Minerals Act* (see Attachment 2). The primary elements of this vesting legislation would be:

- A declaration that the pore space contained in saline aquifers below the surface of all land in Ontario is vested in and is the property of the Ontario Crown despite any existing grants to the contrary;
- The responsible Government ministry can enter into agreements with respect to the use of the pore space; and
- Deeming that no expropriation occurs and no person has a right of action to claim damages or compensation from the Crown as a result of this enactment.

Because vesting of pore space would be defined as limited to saline aquifers, this sort of Crown vesting provision would not interfere with existing rights in any significant way as saline aquifers are only used for some brine disposal in Ontario today. Existing rights of this nature could be grandfathered as part of the legislative package. If the Crown vesting were extended to any pore space beyond saline aquifers, the Government would need to address any interference with existing rights, such as mining and mineral rights, oil & gas production rights and gas storage rights, more extensively. In any event, Enbridge generally favours preservation of all existing rights, given Ontario's well-established history of private ownership for many of its subsurface resources. Crown vesting for geologic formations other than saline aquifers is not as critical because to the extent they may be used for CCS, their geographic scope will be more limited and definable.

The Government may choose to enact a Crown vesting provision such as this in the *Mining Act*, *Conveyancing and Law of Property Act* or as a stand-alone statute. Upon request, Enbridge would be pleased to provide further examples of how other jurisdictions have addressed Crown vesting and similar requirements in the CCS and other contexts. Similar to the oil, gas and salt resource provisions of the *Mining Act* and the OGSRA, the Ontario Land Tribunal (OLT) could be authorized to determine disputes over surface land compensation or other elements of CCS project arrangements, as required. This is similar to the role of the Surface Rights Board in Alberta. Note that Alberta legislation ensures that existing rights related to oil & gas production, conservation or storage are preserved at the permitting stage for a CCS project.

The second option noted above of leveraging existing regimes for gas storage and oil & gas production is not desirable for CCS projects in saline aquifers because it involves much more uncertainty for the Government and project proponents, engages many more landowners and other stakeholders and potentially results in multiple public proceedings before various tribunals, depending upon the legislative scheme adopted. This alternative will not only take much more time to develop and implement and add years to project schedules; it lacks a coordinated and systematic approach to development of limited geological resources, potentially squandering their full capabilities.

## Alternative approaches

Enbridge encourages the Government to consider the lessons learned from the other Canadian provinces with CCS and CCS-like regulations (Alberta, BC and Saskatchewan). Of these, Alberta's model has stimulated the largest and most significant CCS developments largely because of their strategic vesting decisions many years ago.

Ontario has a longer history of oil and gas development (much of which is on private lands) than western Canada and therefore has to reconcile past practices with how best to move forward today. As noted above, the second option to address the critical elements of pore space, access to Crown lands and scalability for CCS projects in Ontario is to provide a legislative mechanism pursuant to which project proponents can seek declaration of a designated project area for CCS purposes (similar to existing regimes for a designated gas storage area or a spacing unit for oil & gas production) that includes private and/or Crown lands. While this may work for smaller scale

CCS projects in geological formations other than saline aquifers, this approach has several disadvantages for saline aquifer CCS projects, the most apparent of which are:

- **Lack of title certainty** – Without title certainty, there would be significant uncertainty for project proponents about whether they will be able to acquire the large tracts of land necessary to develop CCS projects and what agency or agencies will make these determinations. Uncertainty about the regulatory process required and value attributable to CCS resources makes it difficult for project proponents to make commercial arrangements to advance projects.
- **Unique nature of saline aquifers** – CCS projects in saline aquifers cannot be treated in the same manner as oil and gas production projects. By their very nature, oil and gas reservoirs have defined boundaries that are contained within small geographical areas, while CCS will occupy areas comprising very large geographical areas – potentially up to hundreds of kilometers versus tens of kilometers. For CCS projects in saline aquifers to be successful, project proponents must have access to larger tracts of land than were ever contemplated for oil & gas projects. Further, it will be difficult for agencies such as the MNR to determine a precise spacing unit or project area for testing and development purposes, making it more difficult to determine what landowners may be impacted. With this uncertainty, existing regimes and regulatory processes are not well-suited to CCS projects in saline aquifers.
- **Role of the OLT** – The OLT does not currently have any authority to make compulsory vesting orders. While the OLT may be well-suited to determine landowner compensation for land that has been designated for use as part of a CCS project, the designation of land for such purposes is best managed and determined by the Crown in the early stages of CCS development in saline aquifers.

## Comprehensive regulatory framework development

As recommended in our March Submission, we believe a CCS framework regime modelled after the existing regime for CAES under the OGSRA may be most appropriate, leveraging the existing CSA Z-741 (Geological storage of carbon dioxide) and CSA Z-341 (Storage of Hydrocarbons in Underground Formations). Further, the Alberta regime provides a useful model for CO<sub>2</sub> storage in saline aquifers. Enbridge also supports development of a Government-led approval process that can accommodate an expedited review of either demonstration/pilot projects, or commercial-scale projects, at the outset, as was done in Alberta. It is also very important to ensure project proponents are pre-screened for technical, commercial and financial suitability.

In Alberta, a comprehensive regulatory scheme has been developed for CCS and CCUS, including:

- *Mines and Minerals Act* (pore space ownership and long term accountability) and Carbon Sequestration Tenure Regulation (issuance of evaluation permits, agreements, and leases for carbon sequestration);
- *Oil and Gas Conservation Act* (approval of CO<sub>2</sub> schemes);
- Directive 020: Well Abandonment;
- Directive 051: Injection and Disposal Wells – Classifications, Completions, Logging, and Testing Requirements;
- Directive 056: Energy Development Applications and Schedules;
- Directive 065: Resource Applications for Oil and Gas Reservoirs;



- Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry; and
- Directive 087: Well Integrity Management.

An enabling regulatory regime must be developed quickly, before the end of 2023, to allow the timely development of CCS projects in Ontario. Because EITE industry participants are looking for GHG emissions abatement solutions now to be ready for service in 2026 - 27, Ontario must be responsive to these needs to prevent industry participants seeking solutions outside of Ontario.

As a point of comparison, Enbridge Gas operates and maintains tens of thousands of kilometers of natural gas pipelines in Ontario today and the Company routinely utilizes existing legislation and the current regulatory approvals framework to seek leave to construct to build new pipelines and drill new wells for integrity management and system growth purposes. These are very well-established processes that provide Enbridge Gas with certainty when evaluating its systems for replacement requirements and new investment opportunities.

To develop a new traditional pipeline project in today's environment can take up to four years (or more) from project inception, through regulatory approvals, permitting, lands acquisition and construction, to reach the project in-service date. As such, a project commenced in early 2023 will not likely be placed into service until 2027 or later.

The timelines required from initial development to CCS hub scale development will take approximately the same length of time (4-5 years) or longer from the time that legislation changes are fully enacted, a clear and transparent regulatory framework is developed and pore space allocation is determined and approved. The opportunity for CCS to play a key role in the path to net-zero by 2030 means that these CCS project elements need to be addressed and solutioned in 2023. While these timelines may appear aggressive, Alberta was able to develop and enact its CCS legislative package in less than a year.

In order to attract capital at reasonable rates of return, the approval and licensing process for CCS projects need to be well understood and transparent. Enbridge generally supports a simpler approach for test wells and demonstration/pilot projects, but the new approval and licensing process must be available for commercial-scale projects at the outset. As noted, the approval process must provide a clear path for a demonstration/pilot project or test well to be "converted" into a commercial scale operation. The cost of pilot projects is estimated to be between \$5 to \$10 million and if these investments are subject to a secondary approval risk, or if a third party could acquire the pore space around the test well and shut out the test well proponent from converting the test well to a commercial project, this will discourage and hamper investment in Ontario.

As we noted in our March Submission, it is also critical that a mechanism to establish the transfer of long-term responsibility for stored CO<sub>2</sub> to the Crown be developed. This will assure the public that there will be a responsible entity even if the operator becomes insolvent or disappears over the long period of time that the CO<sub>2</sub> will be stored. Having the Crown involved early in the evaluation and development process, ensuring the technical competence of project developers, will best facilitate the transfer at the closure phase.

The CSA Z741 Standard contemplates that, at the end of CO<sub>2</sub> injection, the project operator will use the post-injection period to prepare the site for the transfer of responsibility, including the abandonment of the well(s) and facilities and the restoration of the site. At the end of the post-injection period, all rights, obligations, and responsibilities associated with the site will be transferred to a designated authority. When this occurs, the site is said to achieve "closure", with a site achieving "regulatory or permitted" closure status at the point of transfer of responsibility. Alberta has adopted a post-closure transfer of liability approach like that described in the CSA Code and further details about appropriate long-term liability mechanisms are provided in our March Submission.

**Recommendation 3:** Coincident with steps 1 and 2 of the revised CCS Roadmap or shortly thereafter, targeting completion by the end of 2023, develop a comprehensive regulatory framework for full lifecycle CCS project approval, from demonstration/pilot to commercial-scale development that is modelled after the existing regime for CAES or the Alberta model for CO<sub>2</sub> storage. Ensure appropriate flexibility in the regime for various types of storage applications, an expedited and timely approval process, rigorous pre-screening process for eligible project proponents and an appropriate transfer of long-term responsibilities for stored CO<sub>2</sub> following the Alberta model.

## Complementary enabling regulatory mechanisms

In our March Submission, we also made recommendations about the critical complementary regulatory mechanisms that must be developed in parallel with the CCS Roadmap steps to enable a comprehensive framework for CCS projects in Ontario, such as:

- Amending the EPS to allow CO<sub>2</sub> that is captured from a covered facility and appropriately sequestered to be deducted from a covered facility's verified emissions. The Government's amendments proposed on December 13, 2022 via ERO#019-5769 are a positive step in achieving this;
- Creating a carbon offset system in connection with the EPS and develop a project methodology for CO<sub>2</sub> sequestration that would allow offset credits to be issued to voluntary CCS projects that take place outside the covered sectors; and
- Designing the regulatory regime for CCS projects to minimize costs, maximize efficiencies and ensure public safety, in part by adopting open access policies and non-discriminatory rates for CCS facilities where appropriate.

The points made in the March Submission about amending the EPS and creating carbon offsets are still valid and relevant and should be actioned by the Government as part of the full CCS value proposition. Otherwise, industry participants and project proponents will not be incented to invest in CCS projects. This is essential to unlock the value proposition in the evolving CCS industry for Ontario residents and businesses, and it is especially true in the light of limited credit generation opportunities for Ontario emitters under the federal Clean Fuel Regulation (CFR). The CFR credit market is nascent, subject to fluctuations and policy risks. Because of the scale of investments required for CCS projects, long-term value certainty is essential both for an emitter to install capture equipment and for a CO<sub>2</sub> storage operator to develop a CCS project. In its current form, the CFR cannot currently provide this level of certainty.

Under the CFR, CO<sub>2</sub> storage can generate CFR credits. However, only emissions captured from liquid fuel producers are eligible, leading to unequal financial and regulatory incentives among large emitting sectors within Ontario. Industry participants from other large emitting sectors (e.g., power, steel, cement, chemical) are not eligible to create CFR credits for CO<sub>2</sub> collected. Even where the EPS is amended to recognize captured carbon as a means of reducing emissions, meeting compliance through paying on emissions is likely to be a more cost-effective compliance option. While emitters who deploy carbon capture may create performance credits that can be purchased by other EPS participants and therefore monetized, the ability to meet compliance through payment of the carbon charge will limit value of these performance credits. In addition to the investment in capture technology and direct operating costs, the emitter will also likely be required to pay a fee to support CO<sub>2</sub> storage and transportation operations, as these activities cannot be monetized under the CFR for these sectors. Also, only one entity can claim a CFR credit. As such, the CFR credit value must be shared between transacting entities.

For the power sector, it is important to recognize and acknowledge that currently, there is no like

for like replacement for natural gas fired generation due to its unique operating characteristics. A reliable electrical grid cannot be achieved where natural gas power is phased out by 2030<sup>6</sup> or by 2035. The review conducted by Ontario's Independent Electricity System Operator (IESO) of a moratorium on new gas generation clearly indicates that natural gas fired generation is required in 2035.<sup>7</sup> To maintain optionality and to maintain competitiveness, CCS should be enabled as a compliance option for power producers that would have to comply with the federal net-zero electricity sector target by 2035. Looking forward to 2050, the IESO indicates in their decarbonization scenario that natural gas generation could be phased out by 2045; however, further assessment is needed to determine the feasibility of this target<sup>8</sup>. In addition the IESO report does not look at nor represent a fully decarbonized economy, and therefore does not contemplate CCS use in industry or the negative emissions potential for CCS paired with biomass in power production. However, the IESO report does indicate on page 37:

...the Pathways scenario points to a step change in how we grow and manage our electricity system. In order to meet a projected 60,000 MW of customer demand, Ontario will need all of the resources available to it to simultaneously expand and decarbonize. While many options are already available and understood (wind, solar, hydroelectric and large nuclear), others options such as SMRs and low-carbon fuels will require support, and their availability is not guaranteed.

Enabling CCS in Ontario means supporting the continued operation of the reliable electricity system that exists today and into the future.

The Government of Canada has designed its investment tax credit for CCS (ITC) to incentivize permanent CO<sub>2</sub> storage solutions using saline aquifers. The Government of Canada has made clear that the ITC will only be available for projects "in jurisdictions where there are sufficient regulations to ensure that the CO<sub>2</sub> is permanently stored as determined by Environment and Climate Change Canada."<sup>9</sup> Accordingly, "initially, the [ITC] will only be available to CCUS projects that store the CO<sub>2</sub> in Saskatchewan or Alberta."<sup>10</sup>

As such, Alberta and Saskatchewan are well positioned to attract near-term (as early as 2023) investment in CCS with CO<sub>2</sub> storage solutions using saline aquifers. Ontario could catch up, but only if it has appropriate regulations for CO<sub>2</sub> storage in saline aquifers. Enbridge strongly recommends that the Government make the development of the required regulatory scheme a top priority.

***Recommendation 4:*** *Develop complementary regulatory mechanisms related to EPS, offsets and attracting ITC incentives in parallel with implementing the proposed steps in the revised CCS Roadmap in order to provide much-needed certainty for the full value proposition of CCS in Ontario.*

## Affordability and economic development

Enbridge recommends that strong consideration be given to taking steps that ensure CCS will be affordable for Ontario businesses. Ontario is competing with other jurisdictions in Canada and North America and CCS in Ontario needs to be competitive to attract and retain investment and jobs in Ontario. The following aspects of the CCS value chain, discussed above and in our March Submission in more detail, will help in this goal:

1. Crown vesting of pore space in saline aquifers for the purposes of carbon sequestration and implementing an orderly and efficient manner of allocating large tracts of regional reservoirs will optimize the resource and allow development at economies of scale. This will be especially supportive in dealing with projects that target CO<sub>2</sub> injection sites near or along the area where private land abuts Crown land.

2. Maximizing the business case for CCS will stimulate development. For example, supportive EPS amendments, offsets and allowances for non-covered emitters will help project proponents determine the value proposition, drive the demand, support CCS development and ultimately drive the costs down for CCS projects.
3. Light-handed rate regulation with a utility like model for CO2 pipelines and related facilities will enable larger scale development and ultimately provide access at reasonable costs to the maximum number of CO2 emitters. It is not necessary to develop a utility regulatory regime for CCS projects at the outset, however. As set out in the modified Roadmap, this enhancement can be considered at a later stage of development, similar to the approach that has been taken in Alberta.
4. Demonstrating Government leadership and driving CCS forward with a sense of urgency will provide certainty to project proponents and emitters seeking to continue and establish businesses in Ontario. Regulatory certainty is needed to unlock private investment and get us moving forward. Without bold legislative and regulatory leadership, Ontario will fall further behind other jurisdictions in Canada like Alberta and our neighbours to the south. Industry, government and other stakeholders can work together to make this happen.

## Conclusions

The proposed OGSRA is a good first step to signal that the Government intends to move ahead with facilitating CCS. However, this step should only be taken as part of a more comprehensive set of legislative amendments that include Crown vesting of pore space in saline aquifers, empowering the Crown to enter into agreements to use the pore space for CCS projects and amending the *Mining Act* to provide access to Crown lands for sequestration leases.

Much more needs to be done on an urgent basis to fully enable and support the development of the CCS industry in Ontario. Enbridge urges the Government to adopt the revised Roadmap set out above and follow the four recommendations to implement the steps necessary to enable CCS in Ontario in 2023. Enbridge would be pleased to provide further insights and assistance to the Government, informed by its extensive expertise with CCS projects in other jurisdictions, to meet these objectives.

If you have any questions or require additional information, please do not hesitate to contact Nicole Gruythuyzen, Government Affairs Senior Advisor ([nicole.gruythuyzen@enbridge.com](mailto:nicole.gruythuyzen@enbridge.com)) or Bradley Lattanzi, Strategist Government Affairs ([bradley.lattanzi@enbridge.com](mailto:bradley.lattanzi@enbridge.com)).

## References

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<sup>1</sup> International Energy Agency, *Net Zero by 2050: a Roadmap for the Global Energy Sector* (October 2021, 4<sup>th</sup> rev.), pp. 47, 60, 79-80; Canadian Energy Regulator, *Canada's Energy Future 2021* (2021), pp. 10, 16, 60, 76-78.

<sup>2</sup> Enbridge's comments are available on the ERO here: <https://ero.ontario.ca/comment/60191>

<sup>3</sup> These depths are for the southern Ontario area near Nanticoke and the northern shore of Lake Erie.

<sup>4</sup> See CO<sub>2</sub> sequestration in Ontario, Canada. Part I: Storage evaluation of potential reservoirs, *Energy Conversion and Management*, 45(17):2645-2659 (October 2004) and Ontario Ministry of Natural Resources, [Geological Sequestration of Carbon Dioxide: A Technology Review and Analysis of Opportunities in Ontario](#) (2007).

<sup>5</sup> An exception to this is Ontario's *Bed of Navigable Waters Act*, section 1, which provides that a grant is deemed to exclude the waterbed of a navigable body of water or stream for nearby lands.

<sup>6</sup> Independent Electricity System Operator, *Decarbonization and Ontario's Electricity System: Assessing the impacts of phasing out natural gas generation by 2030* (October 7, 2021), p. 15.

<sup>7</sup> Independent Electricity System Operator, *Pathways to Decarbonization* (December 15, 2022), p. 24.

<sup>8</sup> *Ibid.*, p. 37.

<sup>9</sup> EY's "[Proposed federal investment tax credit for CCUS](#)" (Tax Alert 2022 No. 31, 17 May 2022)

<sup>10</sup> *Ibid*