As North America’s largest energy infrastructure company, Enbridge is an industry leader in moving to a sustainable, lower-carbon future in which Carbon Capture and Storage (CCS) will be a key enabler. Collaborative solutions will be needed to kickstart this emerging industry and Enbridge is committed to working with industry, governments, and Indigenous communities to provide cost-competitive solutions that meet emissions reduction goals while supporting economic recovery and the long-term health of the Canadian energy sector.

As industry and governments work to reduce Canada’s carbon footprint and meet ambitious emissions reduction targets, Carbon Capture and Storage (CCS) infrastructure is emerging as a key decarbonization solution. CCS infrastructure technology will create jobs, lower emissions and support economic recovery and growth.

In fact, a recent International Energy Agency analysis says, globally, reaching net zero greenhouse gas emissions will be “virtually impossible” without CCS.

That’s why Enbridge is working with industry and governments to advance cost-efficient, customer-driven CCS solutions in Western Canada and across North America.

What is CCS?

Carbon-dioxide (CO₂) is emitted naturally and through human activities such as power generation and oil and natural gas production and refining. CO₂ accounts for approximately 80% of all greenhouse gases (GHG) emitted though human activities, so reducing its impact is critical.

CO₂ can be stored in geological formations like oil and gas reservoirs, unmineable coal seams, and deep saline reservoirs. These are structures that have stored crude oil, natural gas, brine and CO₂ over millions of years.

In an integrated CCS solution, instead of emitting carbon-dioxide into the atmosphere, it is captured as a gas at source and compressed into a liquid state. It is then transported via pipeline to a strategically located storage hub, where it is injected and safely and permanently sequestered within deep underground geological formations.

Carbon capture, transportation and storage has been in use for some 50 years in North America. Projects like Quest and the Alberta Carbon Trunk Line are among many other CCS projects operating around the world, from Australia to Norway.

Enbridge is actively seeking Indigenous partnerships to advance our CO₂ storage and transportation plans.
Advancing a carbon storage solution

Many regions in Alberta have subsurface geology suitable for permanent CO₂ storage. Generally, there are two subsurface geologic features needed to safely store CO₂. First is a thick reservoir with enough porosity to store large volumes of CO₂, with sufficient permeability to handle large-scale injections. Second is a strong rock layer above the storage reservoir with low permeability that caps the storage reservoir and prevents the CO₂ from returning to the surface.

Enbridge is advancing several carbon storage proposals in response to Alberta’s call for expressions of interest. Enbridge is uniquely positioned to operate new carbon storage hubs given our experience with open-carrier pipeline networks where we provide open-access and competitive rates to all shippers, while providing safe and reliable infrastructure solutions.

With assets spanning the North American energy system, Enbridge has the technical, financial, and operational capacity and expertise to develop and manage integrated CCS solutions that will help Canada meet its emissions reduction goals while minimizing infrastructure footprint on land, water and the environment.

Enbridge has a long history of building and operating underground natural gas and natural gas liquids and oil storage facilities. Throughout North America, we currently manage about 440 billion cubic feet of net natural gas storage capacity.

Collaborative solutions will be needed to kickstart the emerging CCS industry and Enbridge is committed to working with industry partners, federal and provincial governments, and Indigenous communities to provide cost-competitive solutions that meet climate goals while supporting economic recovery and the long-term health of the Canadian industrial and energy sectors.

Enbridge is also committed to sharing the benefits of, and maximizing Indigenous participation in, our projects and operations. We are actively seeking Indigenous partners to advance our CO₂ storage and transportation plans.

Developing an integrated CCS solution

Integrated capture, transportation and storage solutions will be critical to decarbonizing heavy industry in Alberta. Major carbon transmission or trunk lines will be needed to connect emissions sources to the nearest favorable underground carbon storage reservoirs, while smaller lateral infrastructure will connect various facilities and hubs.

We’re in the early stages of developing an integrated, multifaceted transportation solution to connect Alberta industrial facilities to new CO₂ storage opportunities.

In addition to facilitating emissions reductions, constructing new CCS infrastructure represents a multi-billion-dollar capital investment in Western Canada that would create thousands of direct and indirect jobs. It would also create new opportunities for strategic Indigenous partnerships and unlock emerging industries in CCS, blue hydrogen, clean power and low-carbon petrochemicals.

What is CO₂? Is it dangerous?

Carbon-dioxide is a naturally occurring greenhouse gas made up of carbon and oxygen. An increase in the amount of CO₂ in the earth’s atmosphere creates an overabundance of GHGs that trap additional heat, leading to climate change. CO₂ is emitted through natural carbon cycles and human activities, including oil and gas production and refining, power generation, transportation and other industrial means.

CO₂ accounts for approximately 80% of all greenhouse gases that result from human activity, which is why capturing and storing carbon is so important toward achieving the goal of net-zero GHG emissions by 2050.

Is it safe to inject CO₂ in the ground?

CO₂ can be stored in geological formations like oil and gas reservoirs, unmineable coal seams, and deep saline reservoirs. These are structures that have stored crude oil, natural gas, brine and CO₂ over millions of years.

The technology required for CCS infrastructure is well understood and has been in use for some 50 years in North America.

Projects like Quest and the Alberta Carbon Trunk Line are already operating and there are many other CCS projects around the world, from Australia to Norway.