FACTSHEET

CCS101

Understanding CO_2 Storage

Site selection and project development are central to the secure long-term storage of CO_2.

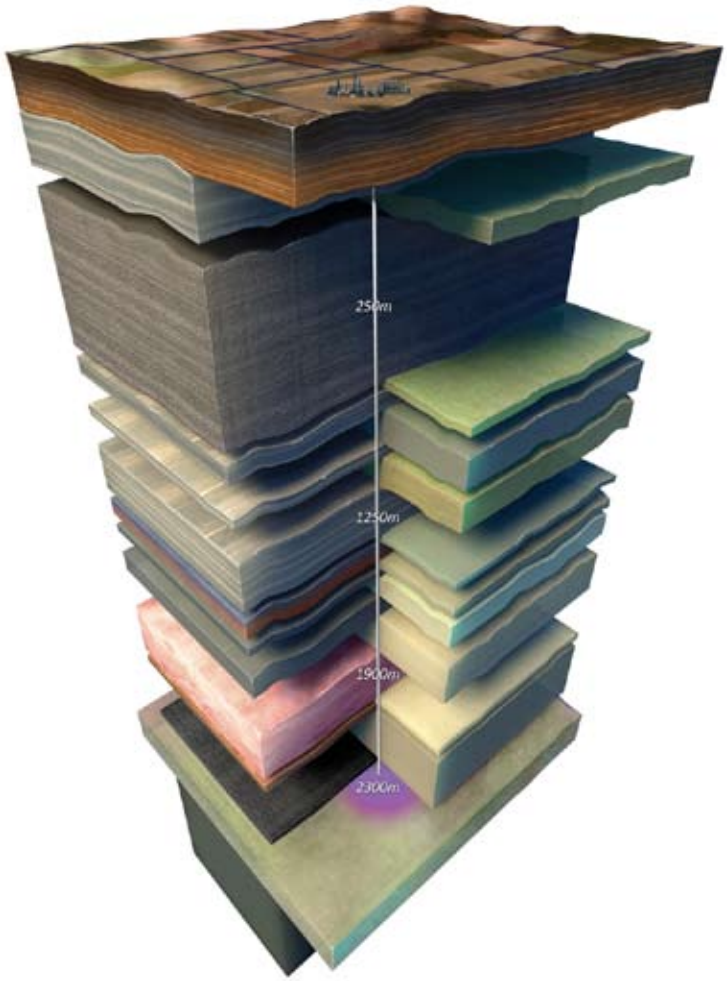
Geological layers that contain clays, rock, fluids, and gases make up the earth beneath our feet and CO_2 is one of the naturally occurring gases present in large volumes below the surface. In fact, many different gases (methane, SO_2 which is present in sour gas) and fluids (oil, saline water) have been safely and naturally contained underground for millions of years.

We more commonly think about carbon dioxide as part of the natural carbon cycle, where CO_2 is absorbed by green plants and converted to oxygen through photosynthesis; however, human activity has increased levels of CO_2 in our atmosphere, which is a growing concern and seen as a major contributor to climate change.

Growing economies around the world increase CO_2 emissions through industrialized growth. Having a plan to deal with CO_2 emissions makes sense and carbon capture and storage (CCS) has the potential to reduce those emissions until we find better ways to create and use energy.

Using storage sites underground that have naturally secured oil and gas for millions of years is a logical starting point because so much is known about the geological make-up of oil and gas reservoirs through decades of intense study.

As well, deep saline aquifers (rock formations that contain highly salty water at extreme depths of over one kilometre) are major potential storage points, since water is miscible (mixes) with CO_2. Globally, deep saline geological formations may offer the most storage potential.



Domes covering CO_2 injection sites can be seen blending in with the Canadian prairie landscape

CCS is a process that stores CO_2 emissions deep underground, where other gases have been stored for millions of years, but how do we know it will stay underground?

Site selection and project development are central to making sure CO_2 storage is safe and secure. In Canada, the Western Canadian Sedimentary Basin has features that hold promise for the development of safe storage technologies, because it is large, tectonically stable, and offers many different options for storage in the sub-surface.

Monitoring CO_2 is also very important in understanding what happens thousands of metres below the surface at the selected sites and it provides the strongest indications of what that CO_2 is doing in the sub-surface. CO_2 is injected and stored as a liquid, and this fact makes it easier to monitor and measure underground. Through pressure tests, 3D seismic arrays, soil and water testing, as well as a host of other monitoring techniques, scientists, researchers and engineers are confident that the geological traps that have held gases and saline brines in place for millions of years are suitable to keep CO_2 deep underground into the future.

For more specific information about how CO_2 is injected and stored, and the different trapping mechanisms that will keep CO_2 underground in the future, please visit www.ccs101.ca