



# Carbon Capture and Storage is Safe and Proven

Carbon capture and storage (CCS) is one of the most effective, reliable technologies available for reducing emissions on a large-scale from industries like power generation, petrochemical and manufacturing. CCS was developed in Texas about 50 years ago and today, companies around the world are implementing CCS to create new products, protect jobs and improve the environment.

## So, what makes CCS safe?



**CCS has been rigorously studied** by experts in academia, industry and government, including leading researchers at the University of Texas and University of Houston, among others. Time and time again, it's proven to be safe and effective.



Advanced modeling and monitoring equipment provides detailed maps of the subsurface which allows companies to **assess, measure, monitor, and verify injected CO<sub>2</sub>** in real time throughout a project's lifetime—from pre-injection to post-injection.



**Texas has some of the best geological formations for safely and permanently storing carbon deep underground** – often 1-2 miles below the surface and well below groundwater resources. CO<sub>2</sub> is injected in locations where it can be structurally trapped beneath impermeable cap rock that prevents it from escaping.



**Regulatory agencies like the Environmental Protection Agency (EPA) and Texas Railroad Commission** are involved extensively in the development and monitoring of CO<sub>2</sub> injection, requiring detailed assessments and inspections before approving permits for CCS projects, which ensure that injected CO<sub>2</sub> stays put and doesn't affect groundwater.



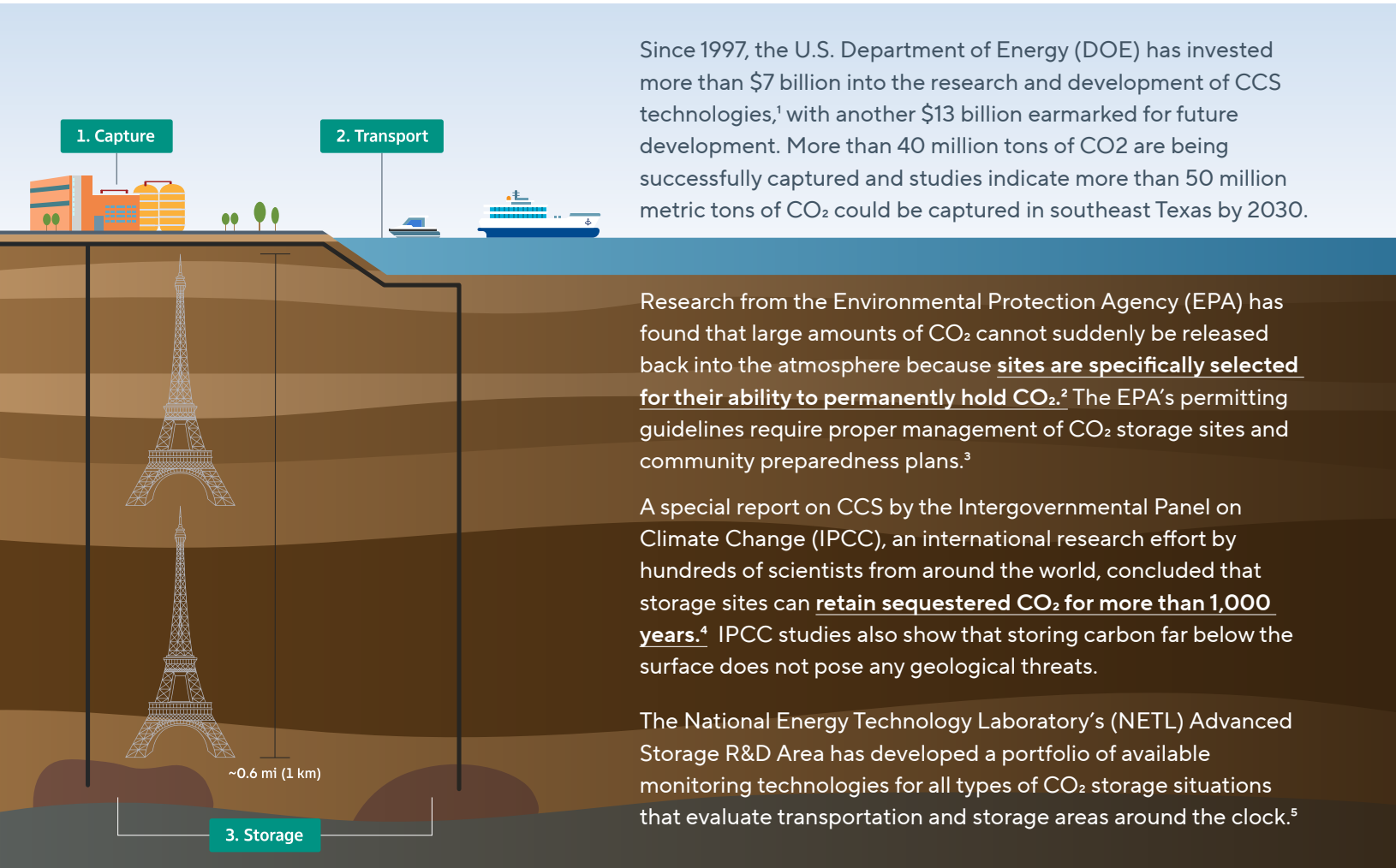
History shows that carbon capture and storage is safe and permanent. Fossil fuels were trapped for thousands of years in the same geologic formations used to store CO<sub>2</sub>.

For more, visit [HoustonCCS.com](https://HoustonCCS.com)



## HOW DO WE KNOW CCS IS SAFE?

Carbon capture and storage may sound new, but CCS is actively being used to reduce greenhouse emissions at industrial sites around the world. Federal agencies and international research organizations have worked extensively on testing and developing CCS in every condition and found that there are no negative impacts to either human health or the environment.



Since 1997, the U.S. Department of Energy (DOE) has invested more than \$7 billion into the research and development of CCS technologies,<sup>1</sup> with another \$13 billion earmarked for future development. More than 40 million tons of CO<sub>2</sub> are being successfully captured and studies indicate more than 50 million metric tons of CO<sub>2</sub> could be captured in southeast Texas by 2030.

Research from the Environmental Protection Agency (EPA) has found that large amounts of CO<sub>2</sub> cannot suddenly be released back into the atmosphere because sites are specifically selected for their ability to permanently hold CO<sub>2</sub>.<sup>2</sup> The EPA's permitting guidelines require proper management of CO<sub>2</sub> storage sites and community preparedness plans.<sup>3</sup>

A special report on CCS by the Intergovernmental Panel on Climate Change (IPCC), an international research effort by hundreds of scientists from around the world, concluded that storage sites can retain sequestered CO<sub>2</sub> for more than 1,000 years.<sup>4</sup> IPCC studies also show that storing carbon far below the surface does not pose any geological threats.

The National Energy Technology Laboratory's (NETL) Advanced Storage R&D Area has developed a portfolio of available monitoring technologies for all types of CO<sub>2</sub> storage situations that evaluate transportation and storage areas around the clock.<sup>5</sup>

By safely capturing and storing CO<sub>2</sub>, we can significantly reduce emissions, helping to put us on a pathway to **achieving a net-zero future.**

1. Congressional Research Service. "Carbon Capture and Sequestration in the United States." October 5, 2022.

2. US Environmental Protection Agency. "Carbon Dioxide Capture and Sequestration: Storage Safety and Security." January 19, 2017.

3. US Environmental Protection Agency. "Class VI - Wells used for Geologic Sequestration of CO<sub>2</sub>." January 19, 2017.

4. Intergovernmental Panel on Climate Change. "Special Report on Carbon Capture and Storage." 2005.

5. National Energy Technology Laboratory. "Permanence and Safety of CCS." August 2024.

Houston CCS Alliance is a coordinated effort among some of the world's most innovative energy, petrochemical, and power generation companies to advance the development of CCS in the greater Houston industrial area and support the southeast Texas community.