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News

- IFPEN
- CO2 capture, utilization and storage

As COP 30 approaches, where each country will present its new climate roadmap, one thing is clear: carbon capture and storage (CCS) is essential to achieving carbon neutrality.

This technological solution does not replace other decarbonization levers but rather complements them. Reducing emissions at source, massive electrification, deployment of renewable energy, energy efficiency, circular economy, sobriety, and behavioral change—given the climate emergency, all these levers must be mobilized massively and jointly to meet the “Net Zero” ambition set for 2050. Increasingly, countries and companies are now incorporating CCS into their decarbonization plans, in line with the scenarios of the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), which consider it essential for achieving global climate goals.

CCS is indeed a key solution for reducing residual atmospheric emissions from the industrial sectors that are most difficult to decarbonize, such as cement, steel, and heavy chemicals. Its appeal lies in its ability to address a specific need: to sustainably reduce emissions where technological alternatives for reducing CO? emissions remain limited. Scientific research confirms that the subsoil offers significant potential for CO? storage,

sufficient to enable industrial activities to commit to long-term decarbonization. It is therefore a strategic resource that should be prioritized for sectors where capture remains the only viable path to carbon neutrality.

The principle of CCS is well known: capturing CO? emitted by industrial facilities and then storing it sustainably in deep geological formations. This technology is already a reality. For nearly 30 years, the Sleipner site in Norway has demonstrated its reliability, storing one million tons of CO? annually in deep underground formations beneath the North Sea. Canada, the United States, and Brazil are also operating large-scale sites, while Europe is intensifying its efforts with major projects such as Northern Lights and Porthos, which pool transport and storage infrastructure. In France, the first complete chain, from capture to storage, is expected to be operational by 2030, targeting 4 to 8 million tons of CO? captured and stored annually, particularly in Le Havre, Dunkirk, and Fos-sur-Mer.

Momentum for deploying this technology is accelerating: more than 600 projects are currently under development worldwide, signaling significant progress. However, these efforts still fall short of what is required. In 2024, global capture and storage capacity exceeded 55 million tons per year, while the IEA estimates that 1.2 billion tons will be necessary by 2030 to stay on track for Net Zero.

Faced with the challenge of climate change, decision-makers have a dual responsibility: to significantly accelerate investment in all CO2 emission reduction technologies and to direct their deployment where their impact will be greatest. CCS perfectly illustrates this logic: it must be targeted primarily at industrial sectors where emissions cannot otherwise be reduced.

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