CCU ABTRACT

Reducing greenhouse gas emissions is no longer just a political obligation; it has become a core business reality—one that requires substantial investments, entails technological risks, and depends on reliable regulatory frameworks. Against this backdrop, Carbon Capture and Utilization (CCU) is gaining strategic importance and moving to the center of political debate. CCU offers the possibility of treating hard-to-abate CO_2 emissions not as waste, but as a valuable feedstock for material use. In doing so, it contributes both to reducing industrial emissions and to gradually substituting fossil carbon sources—an essential lever for the industrial transformation.

Yet many companies remain skeptical of CCU technologies: too much green hydrogen required, too complex an infrastructure, too high an energy demand. Our new study deliberately takes a different perspective. It examines decentralized CCU processes, particularly hydrogen-free approaches capable of handling contaminated exhaust streams. These technologies can open realistic and economically viable entry pathways for small and medium-sized enterprises.

The study focuses on three groups that stand to benefit early:

- First movers willing to accept higher prices for sustainable products.
- Technology providers aiming to offer CCU solutions to their customers at an early stage.
- Companies with smaller, local CO_2 streams seeking to put them to productive use.

By doing so, the study closes an important gap in the current debate. While many analyses are either heavily regulatory in nature or focus on large-scale flagship projects, this work provides a systematic, technology-oriented assessment of CCU options from the perspective of medium-sized industry. It highlights which pathways are already close to market, where short-term applications are emerging, and how regional value chains can develop.

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