CO_2 BUILDING BLOCKS
ASSESSING CO_2 UTILIZATION OPTIONS

NATIONAL COAL COUNCIL

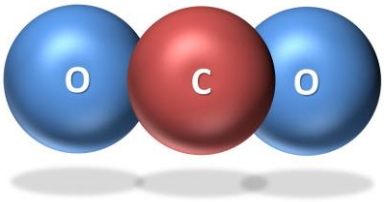
Extent to Which CO_2 Utilization Technologies May Incentivize CCUS Deployment

At the request of the U.S. Secretary of Energy, Ernest Moniz, the National Coal Council examined how EOR and other CO_2 utilization opportunities could incentivize the deployment of carbon capture, utilization and storage (CCUS) technologies. The main findings included

- U.S. law currently favors geologic storage/utilization technologies; non-geologic CO_2 uses must demonstrate that they are as effective as geologic storage.
- Timing of U.S. and international climate goals point towards the use of CO_2 utilization technologies that are either already commercialized or near commercialization.
- There is a misalignment of needs between industries who would utilize CO_2 and the power sector.
- CCUS technology deployments face a host of unresolved impediments that are unlikely to be mitigated by market demand for CO_2 alone in any near- to intermediate-term scenario.
- With the exception of geological utilization under appropriate circumstances, CO_2 utilization is unlikely by itself to incentivize CCUS technologies.
- CO_2-EOR – including production and storage activities in residual oil zones (ROZ) – remains the CO_2 utilization technology with the greatest potential to incentivize CCUS.

The key recommendations included:

- A regulatory based, incentive and tax compliant framework that provides a well-defined no-regrets economic calculus that limits the loss-of-capital to the investment community in FOAK (first-of-a-kind) CCUS projects should be developed.
- Monetary, regulatory and policy investments in CO_2 utilization technologies should be roughly prioritized from geologic to non-geologic, with exceptions made if non-geologic technologies are found to be as effective as geologic storage. Assessments should include in all CO_2-dependent products a full life-cycle CO_2 accounting of the displacement of current fossil sources of captured CO_2 by those that utilize CO_2 capture from fossil resources.



- Coordinate State and Federal regulations to provide flexibility to accommodate an acceptable and broad range of potential commercial constructs (among CO_2 producers, intermediaries, investors and ultimate users of the users of CO_2). Each party should be responsible in a well-defined chain-of-custody, with clearly defined MRV requirements and shared and definitive ultimate economic responsibilities for subsequent CO_2 releases.

http://www.nationalcoalcouncil.org/studies/2016/NCC-CO2-Building-Block-FINAL-Report.pdf

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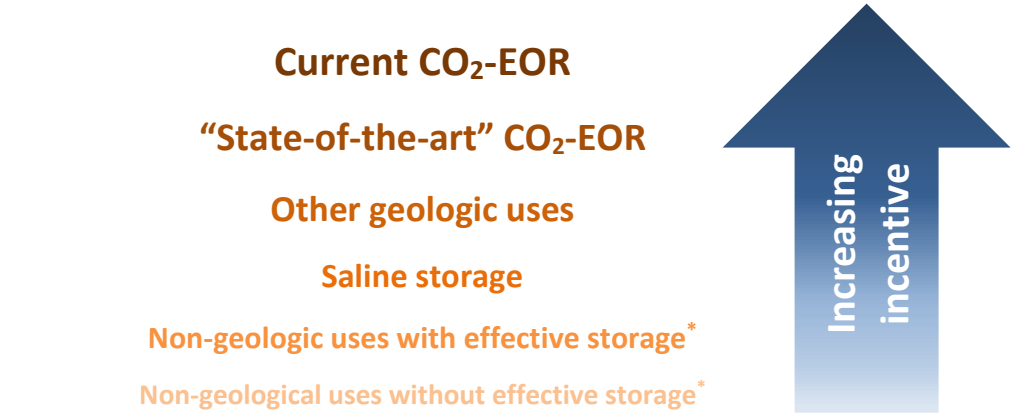
"On a case-by-case basis, deployment of a CO_2 utilization technology may hold promise for turning an uneconomic project into an economic one."

Monetary, regulatory and policy investments in the following CO_2 utilization and storage technologies, in descending order, are most likely to incentivize the deployment of CCUS technologies:



*"Effective" storage is defined as being deemed to be as effective as geological storage

While often mentioned as an opportunity, applying CO_2 utilization through conversion – i.e., non-geologic options – would be challenging, especially in the power sector where potential CO_2 users may not be ideally aligned with the regulatory compliance requirements of the power industry. This is because technology developers focused on CO_2 utilization through conversion are likely to require a return on investment in a time frame considered relatively short by the power industry. An owner of a CO_2-emitting facility must consider whether a CO_2 user may discontinue the project due to bankruptcy, market changes or other reasons, leaving the facility owner without a viable regulatory compliance strategy. Thus, even if CO_2 utilization is an option, a backup plan for storage may also be necessary.

With the exception of CO_2-EOR, the following hurdles must be overcome for CO_2 utilization to incentivize CCUS:

- Cost of capture is too high for many large-scale utilization options
- The market and/or raw material are often insufficient compared to CO_2 emissions
- Nearly all non-geologic CO_2 utilization technologies are not yet commercial
- The required geographic subsurface and/or infrastructure are often not available
- Legal and regulatory framework around CO_2 storage presents challenges

Despite these barriers, further investments in CO_2 utilization technologies should be undertaken. On a case-by-case basis deployment of a CO_2 utilization technology may hold promise for turning an uneconomic project into an economic one.

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