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**National Coal Council Releases New Report for U.S. Secretary of Energy:
“CO₂ Building Blocks: Assessing CO₂ Utilization Options”**

WASHINGTON, D.C. – The National Coal Council (NCC) today released a new report – “CO₂ Building Blocks: Assessing CO₂ Utilization Options” – that calls for support for RD&D and adoption of incentives to advanced carbon dioxide (CO₂) utilization technologies. The report identifies CO₂ for enhanced oil recovery (CO₂-EOR) as the most immediate, highest value opportunity to utilize the greatest volumes of anthropogenic CO₂ and thereby incentivize the more rapid deployment of carbon capture utilization and storage (CCUS) technologies to control emissions of CO₂ from fossil generation and industrial sources.

“There is a growing consensus among industry, the environmental community and governments that future CO₂ reduction goals cannot be met by renewable energy sources alone,” said NCC Chair Mike Durham, founder of Soap Creek Energy. “CCUS technologies will have to be deployed to achieve climate objectives in the U.S. and globally and to insure a reliable power grid.”

The report assesses various geologic and non-geologic CO₂ utilization options in the context of their economic opportunity and potential to incentivize deployment of CCUS technologies. In addition to CO₂-EOR, geologic options include utilization of CO₂ in natural gas shale formations, enhanced coal bed methane (ECBM), enhanced water recovery (EWR) and geothermal energy storage.

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Non-geologic markets include production of inorganic carbonates and bicarbonates; plastics and polymers; organic and specialty chemicals; and agricultural fertilizers. These uses of CO₂ are in the early stages of RD&D and represent smaller, more niche-based markets. They do have the potential, however, to “fix” CO₂ molecules intact, akin to geologic storage. Utilization of CO₂ for transportation fuels represents a significant opportunity in terms of market share and economic incentive.

The extent to which CO₂ utilization technologies may incentivize CCUS deployment is dependent on numerous policy and market factors. Current U.S. policy favors geologic-based utilization pathways for Clean Air Act (CAA) compliance. U.S. law recognizes CO₂-EOR and other geologic storage technologies as CAA compliance options; non-geologic technologies may be used only if EPA determines they are as effective as geologic storage. U.S. and international greenhouse gas (GHG) reduction objectives and timeframes further dictate the need to employ those CO₂ utilization technologies that can be quickly commercialized at significant scale.

The Council recommended that monetary, regulatory and policy investments in CO₂ utilization be roughly prioritized from geologic to non-geologic, with exceptions made for any non-geologic technologies that are found to be as effective as geologic storage. The recommendation is based on the potential for advancing those utilization technologies that can be commercially available in the near- to intermediate-term at a scale that will help ensure compliance with U.S. and international climate goals.

Despite the barriers to the near and intermediate-term employment of non-geologic CO₂ utilization technologies, NCC recommends that further investments in these applications should be undertaken. On a case-by-case basis, deployment of a CO₂ utilization technology may hold promise for turning an uneconomic project into an economic one.

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“A broadly deployed mix of CO₂ utilization technologies may also help to advance CCUS even incrementally,” noted report chair, Kipp Coddington with the School of Energy Resources at the University of Wyoming. “CO₂ utilization technologies do not need to provide full-scale carbon management solutions – although that would be ideal, of course. They only need to provide sufficient incentive to keep CCUS technologies moving forward.”

The report was requested by U.S. Secretary of Energy Ernest Moniz, following on the Council’s recent report offering recommendations to create “policy parity” for CCS to achieve diverse energy policy objectives. The latest “CO₂ Building Blocks” report re-emphasizes the Council’s support for policies and incentives that commit the U.S. to the rapid deployment of CCUS technologies. Employing policy measures and financial incentives that level the playing field for CCUS technologies serves as a foundation upon which to construct the building blocks of CO₂ utilization markets.

“Nearly every major energy forecast projects that fossil fuels will remain the world’s dominant primary energy source through mid-century and beyond,” said NCC Coal Policy Committee Chair Deck Slone, Arch Coal. “Given that fact, CCUS is an absolutely essential tool for addressing the climate challenge, as well as a means to ensure that the United States can make the most of its remarkable fossil fuel endowment in the future.”

Principle report recommendations include:

- 1. Prioritize CO₂ Utilization Technology Deployment:** Monetary, regulatory and policy investments in CO₂ 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.
- 2. Establish a Technology Review Process:** There is benefit to establishing a technology review process that is as objective as possible to assess the benefits and challenges of different CO₂ utilization technologies and products. Evaluation criteria fall into three broad categories: 1) environmental considerations; 2) technology/product status; and 3) market considerations.

- 3. Employ Thresholds to Assess Scale and Speed:** To identify the most expeditious and impactful technology options, NCC recommends applying a reasonable market potential threshold of 35 MTPY, which is roughly equivalent to the annual CO₂ emissions from about 6 GWe or a dozen 500 MWe coal-based power plants.

- 4. Align Needs of Power Sector with CO₂ Markets:** CO₂ utilization markets may not be well aligned with the regulatory or investment requirements of the power and industrial sectors. For example, an owner of a CO₂-emitting facility must consider whether a CO₂ user may discontinue the project due to market changes or other reasons, leaving the facility owner without a viable regulatory compliance strategy. Aligning CO₂ production and utilization markets may require temporal relaxing terms of compliance for CO₂-emitting utilities and industrial facilities, as well as providing for establishment of an inventory of unused CO₂ in geologic storage.

NCC Chief Executive Officer Janet Gellici noted that the NCC has prepared an expansive body of reports supporting deployment of CCS technologies to achieve the world's ambitious environmental goals. The NCC's "CO₂ Building Blocks" report is the 11th report the Council has prepared for the U.S. Secretary of Energy on carbon management policy and technologies since 2000.

The NCC was chartered in 1984 under the Federal Advisory Committee Act (FACA) to advise, inform and make recommendations to the U.S. Secretary of Energy on matters related to coal policy and technology. Council members are appointed by the U.S. Secretary of Energy and serve at no compensation. A list of Council members is available on the NCC website at www.nationalcoalcouncil.org.

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MEDIA NOTE: The report was approved by the NCC membership on Tuesday, August 30th, 2016 and will be finalized with supplemental comments by September 9th, 2016.

A DRAFT copy of the NCC report can be accessed at

<http://www.nationalcoalcouncil.org/Documents/CO2-Building-Blocks-2016.pdf>.

Please contact the NCC office for questions pertaining to citing information from the DRAFT report that is posted.