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California Energy Commission
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12-EPIC-1
TN # 66788
AUG 17 2012

Via electronic mail

Re.: Electric Program Investment Charge First Triennial Investment Plan Development Workshop

Carbon Capture, Use, and Sequestration in California

The greenhouse gas emissions reduction goals for California, as required under AB32 and Executive Order S-3-05, are stringent and require exceptional compliance measures. Energy efficiency and renewable energy sources will make important contributions to meeting these goals, but CARB and many other entities such as the California Council on Science and Technology, recognize that there will remain a significant gap between projected emissions and the 2050 target emissions[1]. This gap can only be met by 2050 through fossil fuel electricity generation with emission capture and storage implementation as a bridging technology until non-fossil fuel based power proves sufficient in order to maintain the flexibility and reliability needs of the grid. Renewable energy sources alone will not achieve sustainable development of California's economy in the foreseeable future.

The PIER program co-funded important research in carbon capture, utilization and sequestration (CCUS)[2,3] and we urge that this continue under the EPIC program to permit commercial development of the component technologies to proceed. Research undertaken has provided an assessment of viable storage sites for carbon sequestration and has identified new capture technologies available in the state. The PIER program also supported a research roadmap for uses for CO2 as alternatives to geologic storage.

Additional characterization of suitable geological sites, capture technologies, and alternatives to sequestration are three areas that require continued research and support. CCUS involves a broad spectrum of technologies and baseline measures, too many to list here. Important focus areas are:

- Reducing the cost of CO2 capture through innovative technologies and processes,
- Identifying technologies and research measures to assure storage containment for both safety and emission accounting purposes,

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[1] Jeffrey Greenblat, Jane Long, & Bryan Hannegan. 2012. Electricity from Renewable Energy and Fossil Fuels with Carbon Capture and Sequestration. California Council on Science and Technology, California Energy Future: A View to 2050 project, 45 pp.

[2] Larry Myer. 2006. Sequestration Options for the West Coast States, Final Report for WESTCARB Phase I. 97 pp. + 22 appendices/

[3] Mike Gravely. 2012. West Coast Regional Carbon Sequestration Partnership, Final Report Phase II.112 pages + 36 appendices.

- Understanding of seismic impacts on geological containment and development of protocols of such potential impacts for site assessment,
- Public acceptance initiatives.
- Establish at or near commercial scale demonstration of CO2 capture to sequestration/alternate use in the state of California.
- Understanding deployment of CCUS in the context of the future portfolio of power sources in California, wherein emissions sources are rampable natural gas plants
- Development and testing of techniques and methodologies for accounting and verification of storage to meet AB32 and future compliance requirements

Policy and regulatory challenges to the development of CCUS in California have been identified by the California CCS Review Panel [4] (appointed by the California Energy Commission, the California Air Resources Board, and the California Public Utilities Commission). The Panel's report, which received international attention, recommended continued public investment in CCUS technologies and efforts to mitigate these challenges. The Panel also recommended a public outreach program to ensure that the risks and benefits of CCUS are effectively communicated.

The federal Department of Energy has aggressively supported CCUS research and development as a means to curtail the nation's GHG and has provided significant funding for studies and demonstrations across the country. Bringing these funds to California requires matching funds, and EPIC investment, along with cost share from utility partners, is critical to bring these significant federal funds to the state.

Carbon management technologies require substantial investment for the benefit of California's energy sustainability under a GHG reduction scheme, a level of investment that, for early developers of this industry, is huge. Support from the public sector, whom this industry will directly benefit, is required.

Thank you for this opportunity to provide these comments.

Sincerely,

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[4] Findings and Recommendations by the California Carbon Capture and Storage Review Panel. 2010. (http://www.climatechange.ca.gov/carbon_capture_review_panel/meetings/index.html)