



# U.S. Department of Energy Categorical Exclusion Determination Form



Program or Field Office: Office of Energy Efficiency and Renewable Energy:  
Phase III Xlerator Program

Funding Opportunity Number DE-FOA-0000397

Applicant Name: Membrane Technology and Research, Inc

Location: Menlo Park, CA

Project Title Field Demonstration of CO2 Capture from Coal-Derived Syngas

Proposed Action or Project Description American Recovery and Reinvestment Act: ☐

Integrated Gasification Combined-Cycle (IGCC) power plants with carbon capture and sequestration are an environmentally friendly approach to electricity generation. The key to this approach is technology that can separate carbon dioxide from process gases cost effectively, allowing it to be sequestered without radically increasing energy costs. The goal of this project is to develop a low-cost and energy efficient membrane process for carbon dioxide capture. The proposed process captures 97% carbon dioxide in syngas with energy consumption of less than 10% of the electricity produced. Membrane Technology and Research, Inc., in the Phase I/II project, brought the technology to the laboratory pilot-plant scale. Membranes and membrane modules were developed for carbon dioxide and hydrogen separation, and a small test system with semi-commercial modules was tested at a coal-fired syngas plant showing the separation performance and stability of the membrane modules. In the Phase III program, Membrane Technology and Research, Inc., proposes to bring the technology to the commercial stage by demonstration of a complete pilot-scale membrane system for producing hydrogen and high-pressure liquid carbon dioxide (ready for sequestration) at a coal-fired syngas plant. In the Phase III program, production of the membrane and membrane modules will be optimized and brought to the industrial scale. A complete pilot-scale membrane system will be constructed and operated using a real syngas stream, to demonstrate the production of hydrogen ready for delivery to a turbine and high-pressure liquid carbon dioxide ready for sequestration; successful operation will confirm process reliability and efficiency.

Conditions: None

Categorical Exclusion(s) Applied: B3.6, B5.1

\*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR 10 21

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

ORO NEPA Compliance Officer

**James L. Elmore**

Date Determined:

9/17/2010