The Methane Hydrate Advisory Committee

Advisory Committee to the Secretary of Energy

June 3, 2020

The Honorable Dan Brouillette
Secretary of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Secretary Brouillette:

Natural gas in the United States is increasing in importance, with consumption expected to rise from 27 trillion cubic feet (TCF) today to 40 TCF in 2040, and worldwide natural gas consumption is approximately 132 TCF/year today, rising to 185 TCF/year in 2040.

Biogenic conventional natural gas is a potentially huge future energy source that underlies the United States offshore waters. Because this poorly understood resource is often associated with gas hydrates, the Methane Hydrate Advisory Committee (MHAC) is recommending leveraging and expanding the currently planned Department of Energy research in the Gulf of Mexico in order to better understand the potential of this resource. The attached MHAC document, ***Stimulus funding for Petroleum Systems Exploration for Conventional Biogenic Methane Accumulations – Leveraging the Existing Deepwater Methane Hydrate Drilling & Coring Project***, provides a brief description of the proposed program expansion.

The MHAC believes that the proposed critical Gulf of Mexico field and scientific goals could advance commercialization of the massive untapped biogenic gas and gas hydrate clean resources throughout the U.S. continental margins.

Yours truly,

Carolyn A. Koh (Chair) Miriam Kastner (Vice-Chair) Mark Myers (Vice-Chair)

On behalf of the Methane Hydrate Advisory Committee

Stimulus Funding for Petroleum Systems Exploration for Conventional Biogenic Methane Accumulations – Leveraging the Existing Deepwater Methane Hydrate Drilling & Coring Project
Contact Name: Methane Hydrate Advisory Committee, MHAC
Stimulus Funding Requested: $40,000,000 for Shovel Ready and Economic Stimulus

Objective: Stimulus funding of $40 million is requested to augment existing DOE-funding to conduct:

(i) sampling, evaluation, and modeling of a known biogenic gas accumulation in the Gulf of Mexico (GoM) to develop an integrated biogenic petroleum systems program to understand the processes that lead to their formation, potential linkages to gas hydrate systems, and to assess the huge potential of the biogenic gas and associated gas hydrate resources throughout the U.S. continental margins.

(ii) short term reservoir flow tests designed to assess the origin, preservation, and response of a marine gas hydrate reservoir - these originally proposed and vetted science tests in the DOE GoM-UT (University of Texas at Austin) project were removed due to budget limitations.

The integrated biogenic petroleum systems multi-scale approach in (i) will involve marine drilling, modeling, and laboratory work at Universities, National Laboratories, and Industry. These marine drilling tests leverage the existing deepwater DOE GoM-UT gas hydrate drilling and coring project already planned/approved.

The GoM reservoir flow tests in (ii) were recommended in the DOE Methane Hydrate Advisory Committee (MHAC) Roadmap (2020-2035) – with these stimulus funds, the science tests (previously removed due to budget limitations) will be conducted to provide important new understanding of the origin, preservation and response of the marine gas hydrate reservoir, and also augment and leverage the DOE GoM-UT project.

The proposed new marine data and models from (i) and (ii) are critical for accurate assessment of the potentially massive U.S. resources of conventional biogenic gas and associated gas hydrates ***(Figure 1***), and to enhancing the long-term national energy security in the U.S. Biogenic methane gas accumulations have different generation, migration, and trapping conditions than thermogenic gas accumulations that provide most of the conventional and unconventional natural gas historically and currently produced. With the huge potential of the biogenic gas resource there is significant interest within industry in exploring for conventional biogenic gas accumulations, but there is not an adequate petroleum system understanding of the microbial processes that lead to their formation, trapping, and preservation.

Economic Impact: The GoM exploration for conventional biogenic gas and gas hydrate accumulations and reservoir flow tests will use a commercially contracted vessel, with ~120 people running operations 24/7 and ~5 people servicing the vessel/person. These marine field activities along with the modeling and laboratory work will support the equivalent of about 800 people from universities, small businesses, corporations, and federal labs to pursue the critical science goals that will lead to commercialization of the massive untapped biogenic gas and gas hydrate clean resources throughout the U.S. continental margins. Science, Technology, Engineering, and Math, STEM training and education will be extensively supported, thereby preserving the technical capabilities in the energy industry.

Shovel Ready: The integrated biogenic petroleum systems exploration project can be initiated immediately with petroleum systems modeling – refitting/developing existing commercial/academic models coupled to available academic/industry databases and will leverage the planned and permitted DOE GoM-UT project. The MHAC, in collaboration with DOE, USGS, NETL, BOEM will serve as technical expert advisors for this shovel ready program.

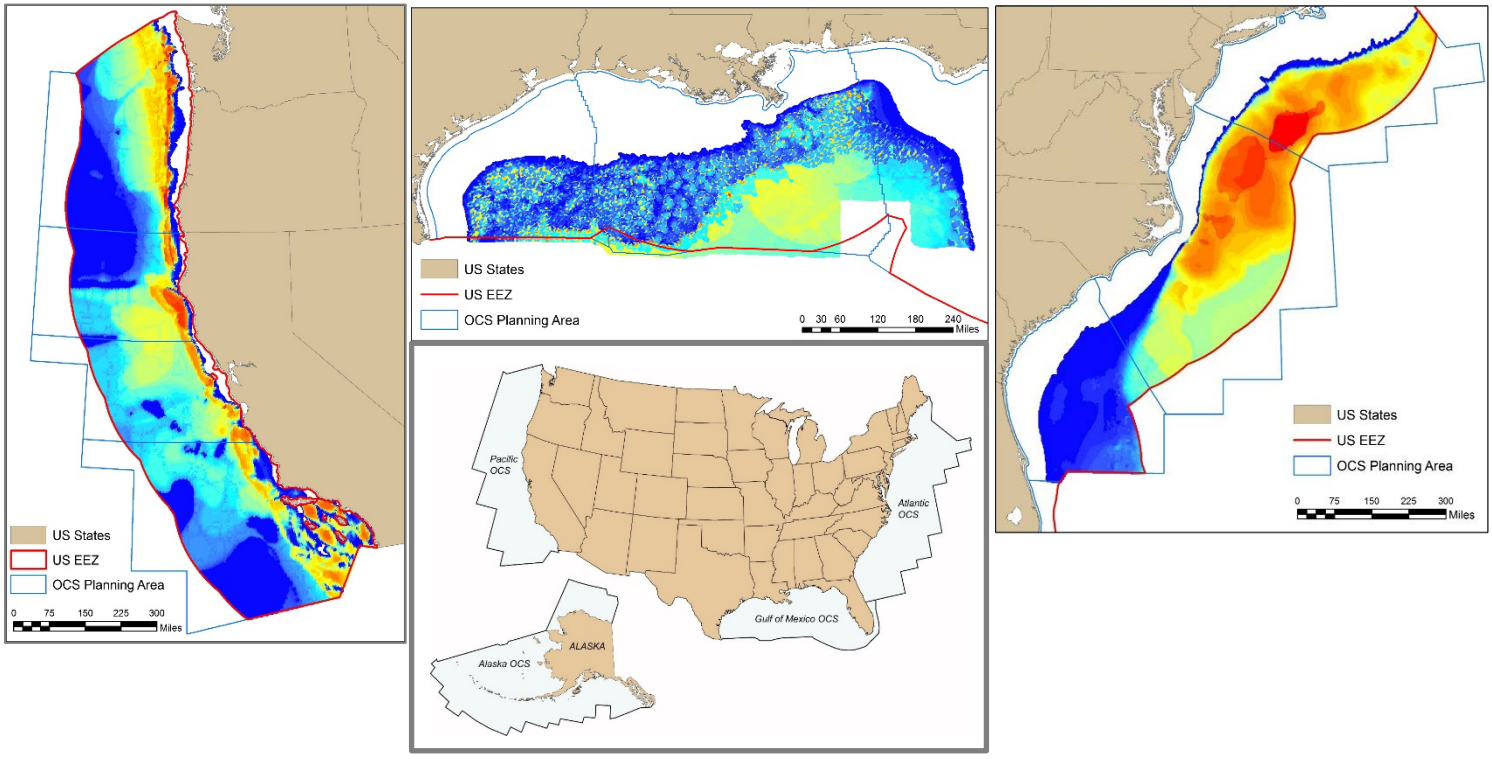

Fig. 1. Assessment of In-Place Gas Hydrate Resources: Maps depicting estimated in-place gas hydrate volume distributions for: Atlantic, Pacific, and Gulf of Mexico Offshore Continental Shelf. Red colors indicate maximum accumulations; blue colors indicate minimal accumulations [BOEM Fact Sheet RED-2012-01].
https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/Oil and Gas Energy Program/Resource Evaluation/Gas Hydrates/BOEM-

APPENDIX

The Methane Hydrate Advisory Committee (MHAC)

Chair: Carolyn A. Koh is the William K. Coors Distinguished Chair and Professor in the Chemical and Biological Engineering Department at the Colorado School of Mines (CSM). She studies the interfacial interactions of natural gas hydrate in multiphase flow and offshore conditions. She is the Director of the CSM Center for Hydrate Research, which involves a consortium of energy industries to develop and advance new flow assurance strategies to ensure uninterrupted production of oil and natural gas in subsea flowlines. She has served on several key national and international advisory committees, and has a prolific publication and mentorship record in gas hydrate research.

Vice Chair: Miriam Kastner is the Distinguished Professor of Geosciences at the University of California, San Diego, Scripps Institution of Oceanography. She is an oceanographer and geochemist who combines mineralogical and geochemical expertise to tackle a range of geoscience problems. She has sailed on countless marine science expeditions, many of them focused on hydrate research. She has served on dozens of key national and international advisory panels and editorial boards for prestigious journals, acting as an outspoken advocate for science of the highest quality.

Vice Chair: Mark Myers is the Principal of consulting firm Myenergies and works globally on energy research, evaluation, and policy development. He has been involved with various aspects of methane hydrate research for more than 30 years. Previously he served as the Director of the United States Geological Survey, the State of Alaska Commissioner of Natural Resources, Director of Oil and Gas, and State Geologist, and as the Vice Chancellor of Research for the University of Alaska Fairbanks. Early in his career he worked in exploration, development, and research for several major oil companies, and also was a pilot and intelligence officer with the USAFR.

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