

# Methane Hydrate Advisory Chair Report

1. **Summary of Meeting with Under Secretary Orr**
2. **Discussion**
3. **Are there other steps we should take?**

**Peter Flemings**, Chair MHAC, Professor of Geosciences, University of Texas

**Miriam Kastner**, Vice Chair MHAC, Professor, Scripps Institution of Oceanography

# Methane Hydrate Advisory Committee Recommendations to the Secretary of Energy\*

- 1. Introduction and MHAC Charge**
- 2. Main issues of importance**
- 3. Technical Recommendations**
- 4. Recommended Budget**

**Peter Flemings**, Chair MHAC, Professor of Geosciences, University of Texas

**Miriam Kastner**, Vice Chair MHAC, Professor, Scripps Institution of Oceanography

**Mark Myers**, Commissioner Alaska Department of Natural Resources

\*Summary of MHAC letter to the Secretary of Energy (May 21, 2014).

(April 10, 2015)

# Methane Hydrates: Opportunity on the scale of today's gas and oil shale

## 1. Resource

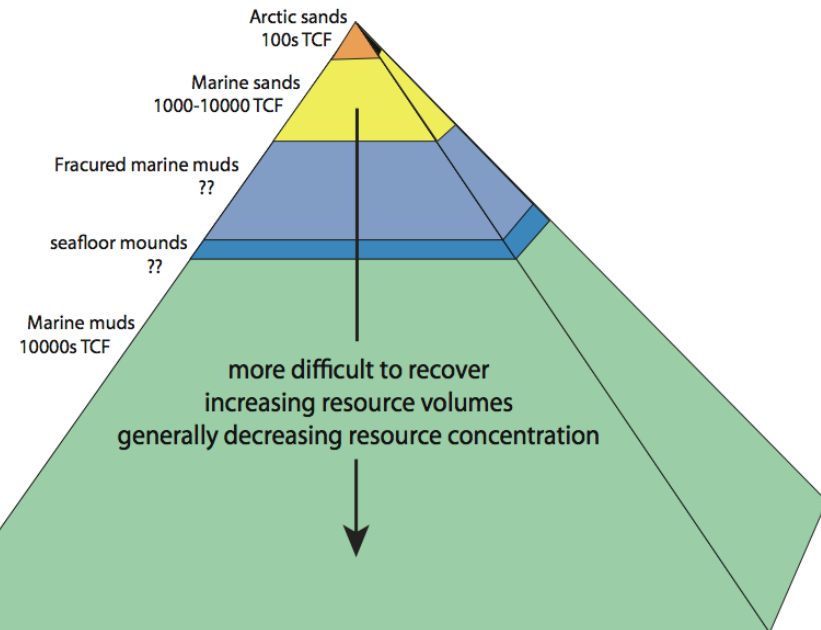
~85 TCF: onshore Alaska

~13,000 TCF Offshore Gulf of Mexico and Atlantic Margin

## 2. A clean and efficient bridge fuel

## 3. Energy Security: U.S. and abroad

- Japan, India, China, South Korea
  - limited fossil fuels,
  - Significant hydrate deposits
  - Enormous/growing energy demands

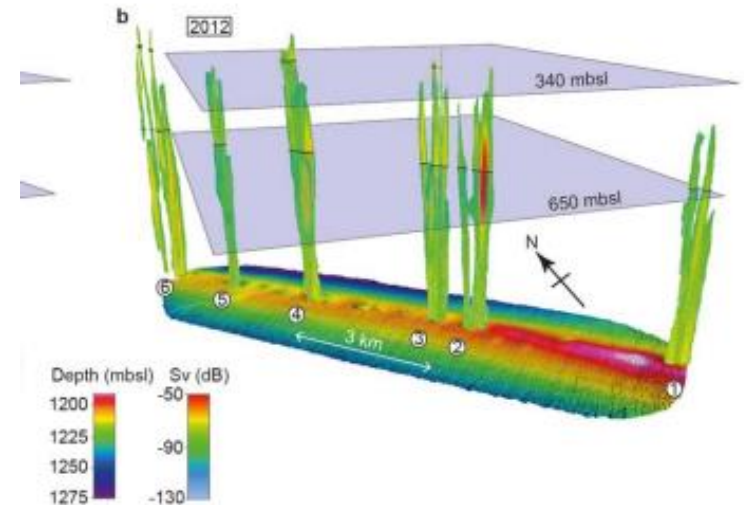
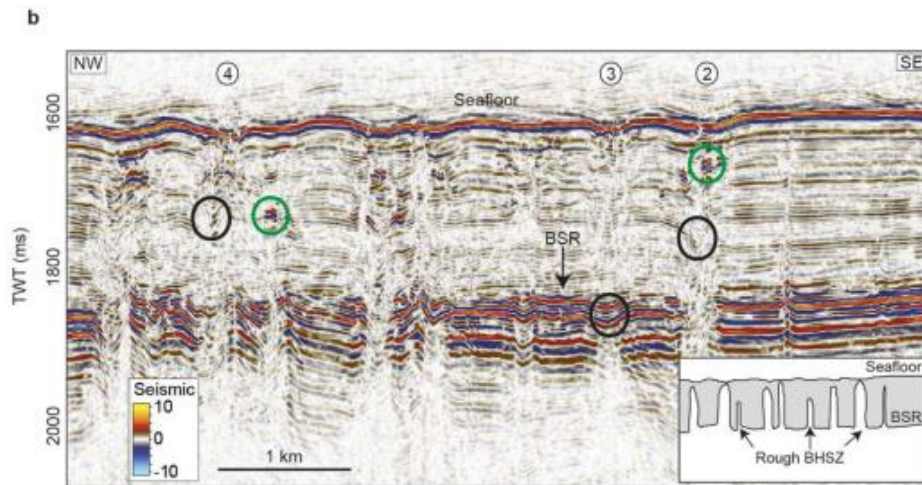


(April 10, 2015)

# Environmental Considerations

## 1. Warming and destabilization of primarily near surface methane hydrates

- a) increased amount of methane to the water column and atmosphere, ocean acidification
- b) Most pronounced in Arctic & mid-latitudes



Smith, 2014a

(April 10, 2015)

# U.S. Technical Leadership at Risk

- 1. U.S. Investment Since 2000: ~\$152 Million**
  - a) Two short-term Arctic Production tests
  - b) one offshore drilling program
- 2. Japanese and India investment has far outpaced U.S. investment**
- 3. This year alone:**
  - a) India marine field program
  - b) Korean marine field program
  - c) Japanese marine field program

An Energy Coup for Japan: 'Flammable Ice'



(April 10, 2015)

# Recommendations

## **1. Perform Arctic land production test within 4 years**

The state of Alaska has temporarily set aside unleased onshore state lands just north of the Prudhoe Bay Unit for a potential methane hydrate test. Limited time opportunity to for long term production test.

**Estimated Cost: \$40-60 million.**

# Recommendations

## 2. Characterize hydrate concentration at sea within 4 years.

High concentration methane-hydrate in sand-rich reservoirs have been inferred from logging. Need to sample to confirm concentration, the petrophysics, and to estimate ability to produce methane hydrates from sand reservoirs in the Gulf of Mexico and Atlantic margin.

**Estimated Cost: \$30-\$50 million.**

## 3. Perform production test at sea within 10 years

The major hydrate resource is in offshore marine sands. A production test can determine whether these resources are technologically recoverable and identify the optimal production technology.

**Estimated Cost: \$100-\$200 million.**

# Recommendations

## 4. Methane U.S. leadership position in methane hydrates research.

Continue the DOE laboratory and University partnerships that focus on technological developments, experimental analysis, model analysis, analysis of field data, and analysis of the role of hydrates in climate change. Increase outreach and education (e.g. post-doctoral scholar program).

**Estimated Cost: \$10-\$20 million/year.**



# DOE Investment

4. **Current \$15 million per year should be incremented by \$10 million in each of the next 4 years to achieve these goals**
  - Would allow land-based production test to be completed while continuing progress on the other goals above.
  - If land-based production test demonstrates viability of the resource, we will be poised to pruse a production test at sea.

# General Response

We met with Dr. Orr for 30 minutes and then we had a longer discussion with Guido and Lou afterwards.

The Under Secretary is clearly well informed of this effort and in support of it.

A concern for us is that no funding is requested in the Administration's FY16 budget and that this issue will be revisited in FY17.

I want to thank Mark Myers and Miriam Kastner for their willingness to cross the continent for this meeting. As Mark said 'this is important and it's worth it.'

# General Discussion

- 1) Should MHAC be making any further immediate steps?
- 2) The Department of Energy (DOE) is conducting assessment of science and energy technology research, development, demonstration, and deployment opportunities to address our nation's energy-linked economic, environmental, and security challenges.

We are invited to individually participate in a peer review by conducting a detailed written review of the Gas Hydrates Science and Technology Assessment. A coordinated Committee review is not being sought. The technology assessment borrows freely from the draft gas hydrate roadmap that the Committee reviewed in early 2014.