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Methane Hydrate Advisory Committee Meeting
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U.S. DEPARTMENT OF
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DOE PROGRAM IN GAS HYDRATES

IMPLEMENTING THE MHR&D ACT OF 2000 (AS EXTENDED IN 2005)

- Seven collaborating federal agencies
 - DOE-NETL led (National Labs)
 - DOI (BLM, USGS)
 - DOC (NOAA)
 - DOD (Naval Research Lab)
 - National Science Foundation
- Broad set of goals, with focus on
 - realizing methane hydrates resource potential, and
 - understanding hydrate's role in the natural environment
 - education
 - international collaboration

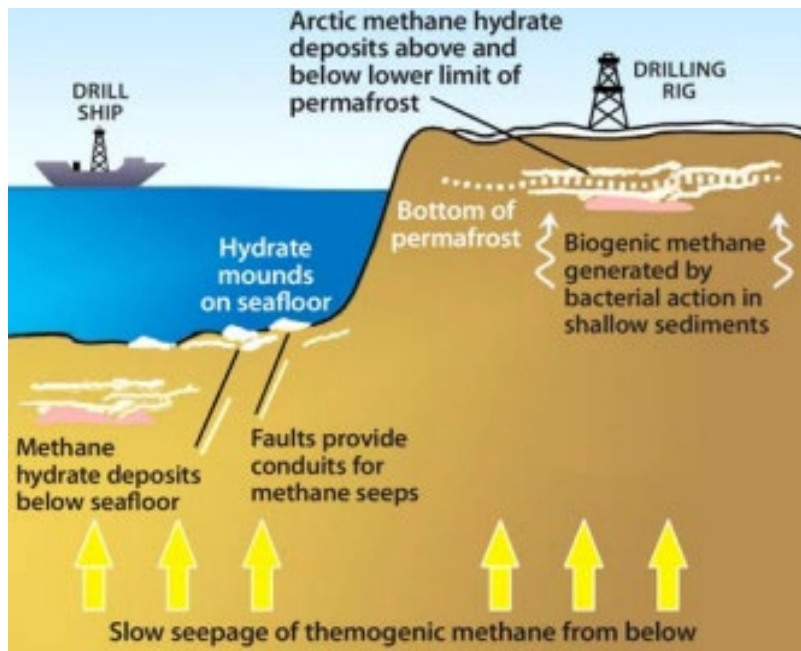
PUBLIC LAW 106-193—MAY 2, 2000

METHANE HYDRATE RESEARCH AND DEVELOPMENT ACT OF 2000



GAS HYDRATES RESEARCH

The world's supply of gas hydrates may contain more organic carbon than coal, oil, and other natural gas combined.



- Global resource estimates range from 250,000 to 700,000 trillion cubic feet
- DOE research program includes:
 - Production feasibility
 - Resource characterization and modeling
 - International collaboration

Types of methane hydrate deposits

Source: U.S. Department of Energy, National Energy Technology Laboratory



- R&D has the potential to impact gas hydrates just as it did for shale and unconventional resource development over the past 30 years.



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GAS HYDRATE PROGRAM

Alaska Field Test:

- Insight into the scale and recoverability of gas hydrate
- Insight into the general viability of gas hydrate recoverability
- Science is technically-relevant to Marine GH evaluation

GOM Resource Characterization:

- Determine the nature of hydrate reservoirs through pressure-core sampling
- Explore new hydrate system
- Insight into the nature, formation, occurrence, and physical properties of methane hydrate-bearing sediments for methane hydrate resource appraisal

DOE Hydrate Program

Laboratory Study for Basic Science:

- Hydrological/Geomechanical Property
- Pore-Scale observations and Modeling
- Fundamental Knowledge

Numerical Simulations:

- Gas Production Prediction
- Solid Production
- Basin and Petroleum System Modeling
- New Production Technology
- Laboratory test validation

System Analysis

- Long-Term Analysis of US Gas Supply and Demand

Tool Development:

- Pressure Core Characterization
- Pore-Scale Visualization

THCM Code Development:

- Fully Coupled THCM Code
- Constitutive Models

International and Domestic Collaboration:

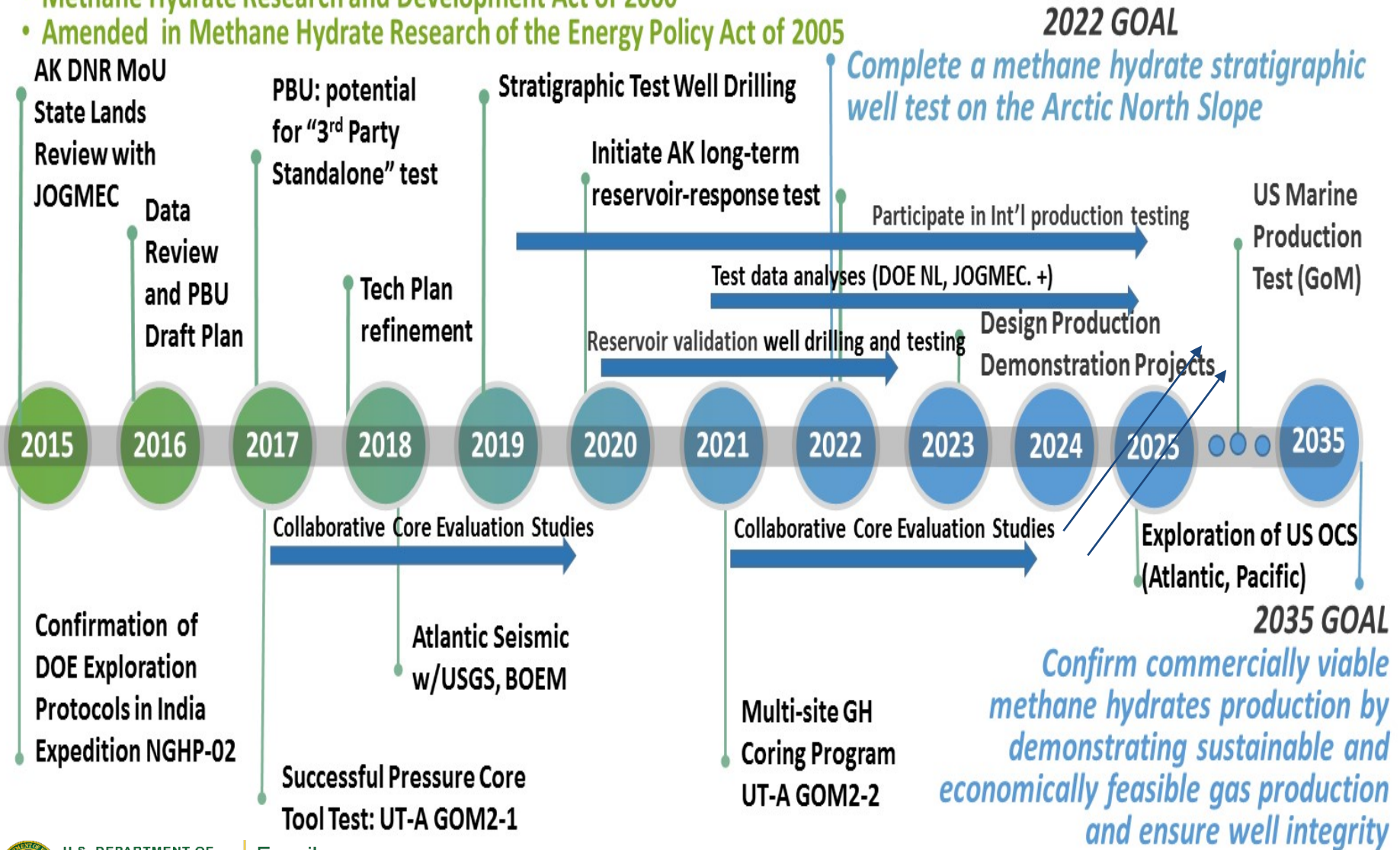
- 2nd International Code Comparison Study
- Modeling supports: NGHP



GAS HYDRATES PROGRAM PATHWAY

Key Drivers

- Methane Hydrate Research and Development Act of 2000
- Amended in Methane Hydrate Research of the Energy Policy Act of 2005



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Back-up Slides

Overview of FY 2018, 2019, and 2020 Budget In the FY 2019 Budget Structure

Program	FY 2018 Omnibus	FY 2019 Request	FY 2019 Enacted	FY 2020 Request
Natural Gas Technologies	\$50,000	\$5,500	\$51,000	\$10,700
Environmentally Prudent Development	\$15,000	\$0	\$16,000	
Emissions Mitigation	\$10,000	\$0	\$10,000	
Emissions Quantification	\$5,000	\$0	\$5,000	
Gas Hydrates	\$20,000	\$3,500	\$20,000	\$8,700
Natural Gas Infrastructure	\$0	\$2,000	\$0	\$2,000
Unconventional Fossil Energy	\$40,000	\$14,000	\$46,000	\$19,000
Total	\$90,000	\$19,500	\$97,000	\$29,700



GAS HYDRATE PROGRAM

FY 2019 SPEND PLAN - \$20.0M

Major Field Projects	\$M	Description
Alaska	15.9	Begin funding DOE portion of geo-data well and production test well (\$15,869K)
Gulf of Mexico	0.0	Deepwater GOM gas hydrate characterization led by UT-Austin via drilling, pressure coring, laboratory experimentation and modeling (\$0K)
Smaller Field Projects, Experimental, and Numerical Simulation		
Funding for FY16 FOA Projects	0.05	Final project funding for 2 projects (\$46K)
NETL Research & Innovation Center (RIC)	1.5	Gas hydrate development and production predictions for planning, performing, and/or analyzing field-scale test scenarios in both Alaska and the GOM that employ improved numerical modeling codes (\$1,500K)
National Labs	0.73	FWP's (PNNL, LBNL) primarily supporting international collaboration (India/Japan/Korea); collaboration with NETL RIC; support FOA work (\$725K)
Interagency Support	0.5	USGS (\$500K)
Program Support		
HQ Taxes/Other Expenses	0.23	HQ tax (\$0K); HQ TCF Fund tax (\$180K); audits (\$50K)
NETL Support, SBIR/STTR, Outreach	1.1	Program implementation (\$390K); SBIR/STTR (\$720K)
Total Appropriation	20.0	

DOE OFFICE OF OIL AND NATURAL GAS

Mission -- Maximize the value of U.S. oil and gas resources to the public and ensure responsible development and delivery through policy, research, innovation, and outreach

CORE PROGRAM AREAS

Unconventional Oil and Gas	<ul style="list-style-type: none">• <i>Develop basin-specific technologies to maximize resource recovery, operational efficiency with prudent environmental stewardship.</i>• <i>Accelerate the potential of emerging and untapped oil and gas resources</i>
Offshore	<ul style="list-style-type: none">• <i>Innovative solutions from topside through the reservoir that prevent loss of well control, predict geologic hazards, and prevent oil spills</i>
Gas Hydrates	<ul style="list-style-type: none">• <i>Develop commercially viable ways to tap gas hydrates massive energy potential</i>• <i>Advancing the potential for gas hydrates as a future energy resource</i>
Natural Gas Infrastructure	<ul style="list-style-type: none">• <i>Develop tools and technologies to reduce losses of natural gas in delivery infrastructure</i>• <i>Increase the efficiency, integrity and reliability of natural gas delivery infrastructure</i>
Crude By Rail	<ul style="list-style-type: none">• <i>Mitigate the risks associated with the transport of crude oil by rail</i>
Natural Gas Exports	<ul style="list-style-type: none">• <i>Process applications for authority to import/export natural gas, including liquefied natural gas (LNG)</i>