105TH CONGRESS
2d Session

SENATE

REPORT
105–248

METHANE HYDRATE RESEARCH AND DEVELOPMENT ACT OF 1997

JULY 13, 1998.—Ordered to be printed

Mr. MURKOWSKI, from the Committee on Energy and Natural Resources, submitted the following

REPORT

[To accompany S. 1418]

The Committee on Energy and Natural Resources, to which was referred the bill (S. 1418) to promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes, having considered the same, reports favorable thereon with amendments and recommends that the bill, as amended, do pass.

The amendments are as follows:

1. On page 2, after line 25, add the following:

(8) DIRECTOR.—The term "Director" means the Director of the National Science Foundation.

2. On page 3, strike lines 4 through 12 and insert the following:

(1) COMMENCEMENT OF PROGRAM.—Not later than 180 days after the date of enactment of this Act, the Secretary, in consultation with the Secretary of Defense, the Secretary of the Interior, and the Director, shall commence a program of methane hydrate research and development.

(2) DESIGNATIONS.—The Secretary, the Secretary of Defense, the Secretary of the Interior, and the Director shall designate individuals to implement this Act.

3. On page 6, after line 2, insert the following new section 4 and renumber the subsequent section accordingly:

SEC. 4. AMENDMENT TO THE MINING AND MINERALS POLICY ACT OF 1970.

Section 201 of the Mining and Minerals Policy Act of 1970 (30 U.S.C. 1901) is amended—

(1) by redesignating paragraphs (6) and (7) as paragraphs (7) and (8), respectively;

(2) by inserting after paragraph (5) the following:

"(6) the term 'methane hydrate' means a methane clathrate that—

"(A) is in the form of a methane-water ice-like crystalline material; and

"(B) is stable and occurs naturally in deep-ocean and permafrost areas."; and

(3) in paragraph (7) (as redesignated by paragraph (1)—

(A) in subparagraph (F), by striking "and";

(B) by redesignating subparagraph (G) as subparagraph (H); and

(C) by inserting after subparagraph (F) the following:

"(G) methane hydrate; and".

4. On page 5, line 3, insert "under" after the world "program".

PURPOSE OF THE MEASURE

The purpose of S. 1418, as ordered reported, is to direct the Secretary of Energy, in consultation with the Secretaries of Defense and the Interior, and the Director of the National Science Foundation, to commence a program of methane hydrate research and development.

BACKGROUND AND NEED

Methane hydrates are molecules of natural gas trapped inside the crystalline cages formed by frozen water molecules. They exist where low temperatures and high pressures squeeze water and methane into a solid form. Methane hydrates are found in many areas throughout the world. Preliminary studies by the U.S. Geological Survey indicate the presence of enormous quantities of methane hydrates along the eastern seaboard of the United States, under the permafrost and off the coast of Alaska, and in the Gulf of Mexico. It is estimated that methane hydrates located in the United States contain about 300,000 trillion cubic feet of natural gas. By comparison, the U.S. annually consumes about 22 trillion cubic feet of natural gas.

Given the great potential for energy and scientific benefits from methane hydrate research, S. 1418 authorizes the establishment of a methane hydrate research and development program within the Department of Energy, to be carried out in consultation with the Departments of Defense and the Interior, and the Direct of the National Science Foundation.

LEGISLATIVE HISTORY

S. 1418 was introduced by Senators Akaka, Craig and Landrieu on November 7, 1997. Senator Graham was added as a cosponsor on November 13, 1997. Senator Lott was added as a cosponsor on April 21, 1998. The Subcommittee on Energy Research, Develop-

ment, Production and Regulation held a hearing on this bill on May 21, 1998.

On June 24, 1998, the Committee on Energy and Natural Resources ordered S. 1418, as amended, favorably reported.

COMMITTEE RECOMMENDATIONS AND TABULATION OF VOTES

The Committee on Energy and Natural Resources, in open business session on June 24, 1998, by a unanimous vote of a quorum present, recommends that the Senate pass S. 1418, if amended as described herein.

The roll call vote on reporting the measure was 20 yeas, 0 nays, as follows:

YEAS	NAYS
Mr. Murkowski	
Mr. Domenici[1]	
Mr. Nickles[1]	
Mr. Craig	
Mr. Campbell	
Mr. Thomas	
Mr. Kyl[1]	
Mr. Grams	
Mr. Smith	
Mr. Gorton	
Mr. Burns	
Mr. Bumpers[1]	
Mr. Ford	
Mr. Bingaman[1]	
Mr. Akaka[1]	
Mr. Dorgan	
Mr. Graham[1]	
Mr. Wyden[1]	
Mr. Johnson	
Ms. Landrieu	

[1] Indicates voted by proxy.

COMMITTEE AMENDMENTS

During the consideration of S. 1418, the Committee adopted three amendments. The first amendment defines "Director" to mean the Director of the National Science Foundation. The second amendment adds the National Science Foundation to the agencies which will design and implement the methane hydrate research and development program established by S. 1418. The third amendment expands the definition of "marine mineral resource" in the Mining and Mineral Policy Act of 1970 (as added by the Marine Mineral Resources Research Act of 1996) to include methane hydrates.

SECTION-BY-SECTION ANALYSIS

Section 1 gives the short title of S. 1418.

Section 2 provides definitions of terms used in S. 1418.

Section 3 directs the establishment of the methane hydrate research and development program. Paragraph (a) states that the

Secretary of Energy shall commence a methane hydrate research and development program no later than 180 days after the date of enactment of S. 1418. The Secretary of Energy shall consult with the Secretaries of Defense and the Interior, and the Director of the National Science Foundation. These individuals, or their designees, are directed to meet not less frequently than every 120 days to review the progress of the program and to make recommendations on future activities.

Paragraph (b) permits the Secretary of Energy to award grants or contracts to, or enter into cooperative agreements with, universities and industrial enterprises for purposes of implementing the methane hydrate research and development program. The Secretary of Energy may also establish an advisory panel of experts from industry, academia, and Federal agencies to provide advice on implementing the methane hydrate program.

Paragraph (c) provides limitations on the use of funds made available to carry out the methane hydrate research and development program.

Paragraph (d) lists the responsibilities of the Secretary of Energy in implementing the methane hydrate research and development program.

Section 4 amends the definition of "marine mineral resource" in the Mining and Mineral Policy Act of 1970 (as added by the Marine Mineral Resources Research Act of 1996) to include methane hydrates.

Section 5 authorizes the appropriation of such funds as are necessary to carry out the methane hydrate research and development program.

COST AND BUDGETARY CONSIDERATIONS

The following estimate of the cost of this measure has been provided by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, June 29, 1998.

Hon. FRANK H. MURKOWSKI,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for S. 1418, the Methane Hydrate Research and Development Act of 1997.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Kim Cawley.

Sincerely,

JUNE E. O'NEILL, *Director.*

Enclosure.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

S. 1418—Methane Hydrate Research and Development Act of 1997

Summary: S. 1418 would authorize the Department of Energy (DOE) to begin a program of research and development in the use of methane hydrate as a source of energy, through grants, con-

tracts, and cooperative agreements with universities and industrial enterprises. Deposits of methane hydrate occur in deep ocean and permafrost areas of the world, and consist of methane-water ice-like crystalline material. Based on information from DOE, CBO estimates that the proposed research program would cost about $35 million over the next five years, assuming appropriation of the necessary amounts. S. 1418 would not affect direct spending or receipts; therefore, pay-as-you-go procedures would not apply. The bill contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

Estimated cost to the Federal Government: The estimated budgetary impact of S. 1418 is shown in the following table. The costs of this legislation fall within budget function 270 (energy).

	By fiscal years, in millions of dollars—				
	1999	2000	2001	2002	2003
SPENDING SUBJECT TO APPROPRIATION					
Estimated Authorization Level	5	5	11	12	12
Estimated Outlays	2	4	7	10	12

Basis of estimate: For purposes of this estimate, we assume that S. 1418 will be enacted before the end of fiscal year 1998 and that outlays from the new program would occur at the same rate as observed for similar existing programs. The bill would authorize the appropriation of such sums as are necessary to conduct a research and development program. Based on information in DOE's 1998 program plan for methane hydrate, CBO estimates this activity would require appropriations totaling about $45 million over the next five years.

Pay-as-you-go considerations: None.

Intergovernmental and private-sector impact: S. 1418 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose no costs on state, local, or tribal governments. Publicly owned universities would be eligible to receive research funds authorized by the bill.

Estimate prepared by: Kim Cawley.

Estimate approved by: Robert A. Sunshine, Deputy Assistant Director for Budget Analysis.

Regulatory Impact Evaluation

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee makes the following evaluation impact which would be incurred in carrying out S. 1418. The bill of the regulatory is not a regulatory measure in the sense of imposing Government-established standards or significant economic responsibilities on private individuals and businesses.

No personal information would be collected in administering the program. Therefore, there would be no impact on personal privacy.

Little, if any, additional paperwork would result from the enactment of S. 1418, as ordered reported.

EXECUTIVE COMMUNICATIONS

The pertinent communication received by the Committee from the Department of Energy setting forth Executive agency policy relating to this measure is set forth below:

STATEMENT OF ROBERT S. KRIPOWICZ, PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY

Mr. Chairman and members of the subcommittee, I am pleased to represent the Department of Energy and to present our views on the potential for methane hydrates as a future source of natural gas and more specifically, to review the progress we are making in preparing a multi-agency coordinated research plan for this potentially vast energy resource. I will also discuss our position on S. 1418, the Methane Hydrate Research and Development Act of 1997.

The Department's views on S. 1418, the Methane Hydrate Research and Development Act

S. 1418 would promote the research, identification, assessment, exploration, and development of methane hydrate resources. This legislation provides a clear endorsement from Congress of federal research efforts to better understand the true energy potential of methane hydrates. S. 1418 is consistent with the goals we have established for the federal hydrates R&D program; therefore, the Department can support this legislation.

We are particularly pleased to see the Congress emphasize in Sec. 3(d)(1), the need to facilitate and develop partnerships among government, industry and academia in future hydrate R&D. This concept of a public-private partnership, with shared responsibilities and resources, is fundamental to our fossil energy R&D program. It is particularly important that the private sector, which will ultimately be responsible for converting R&D results into commercially-viable production methods, be part of the project team early in the R&D process. We expect to see substantial industry cost-sharing in those activities that have significance for current drilling practices, such as the studies of hydrate mechanical properties and ocean engineering that I mentioned in Goal 4 above. As other longer-term technologies mature, we expect the proportion of industry cost-sharing in these areas increase to significant levels. We also will seek a wide range of private sector and academic partners. This will expedite significantly the transfer of technology that evolves from this effort.

We also applaud the Congressional direction to "ensure that data and information developed through the program are accessible and widely disseminated. * * *" Working with the Natural Gas Supply Association and the International Centre for Gas Technology Information, we are proposing to develop a methane hydrates Internet site that

will be used to enhance information dissemination among the world's community of hydrate researchers and technology users, as well as to obtain stakeholder input.

We are also pleased that the Congress has recognized the importance of cooperation among Federal agencies in developing potentially promising hydrate technologies. We would not be nearly as well positioned to begin a new, intensified examination of the hydrate potential had it not been for the excellent work of the USGS and the Naval Research Laboratory. The coordinated involvement of these organizations, along with others such as the National Science Foundation, the Minerals Management Service, the Interstate Oil and Gas Compact Commission, and the Gas Research Institute, will be essential in carrying out of productive and effectively managed R&D program.

This concludes my prepared statement. I will be pleased to answer any questions you or Members of the Subcommittee may have.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill S. 1418, as ordered reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

PUBLIC LAW 104–325 104TH CONGRESS

AN ACT To promote the research, identification, assessment, and exploration of marine mineral resources, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Marine Mineral Resources Research Act of 1996".

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"SEC. 201. DEFINITIONS.

"In this title:

"(1) The term 'contract' has the same meaning as 'procurement contract' in section 6303 of title 31, United States Code.

"(2) The term 'cooperative agreement' has the same meaning as in section 6305 of title 31, United States Code.

"(3) The term 'eligible entity' means—

"(A) a research or educational entity chartered or incorporated under Federal or State law;

"(B) an individual who is a United States citizen; or

"(C) a State or regional agency.

"(4) The term 'grant' has the same meaning as 'grant agreement' in section 6304 of title 31, United States Code.

"(5) The term 'in-kind contribution' means a noncash contribution provided by a non-Federal entity that directly benefits and is related to a specific project or program. An in-kind

contribution may include real property, equipment, supplies, other expendable property, goods, and services.

"(6) the term 'methane hydrate' means a methane clathrate that—

"(A) is in the form of a methane-water ice-like crystalline material; and

"(B) is stable and occurs naturally in deep-ocean and permafrost areas.

"**[**(6)**]** *(7)* The term 'marine mineral resource' means—

"(A) sand and aggregates;

"(B) placers;

"(C) phosphates;

"(D) manganese nodules;

"(E) cobalt crusts;

"(F) metal sulfides;

"*(G) methane hydrate; and*

"**[**(G)**]** *(H)* other marine resources that are not—

"(i) oil and gas;

"(ii) fisheries; or

"(iii) marine mammals.

"**[**(7)**]** *(8)* The term 'Secretary' means the Secretary of the Interior.

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