

GAS HYDRATE RESEARCH AND DEVELOPMENT ACT OF 1999

OCTOBER 13, 1999.—Ordered to be printed

Mr. SENSENBRENNER, from the Committee on Science,
submitted the following

R E P O R T

[To accompany H.R. 1753]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 1753) to promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes, having considered the same, report favorably thereon with amendments and recommend that the bill as amended do pass.

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I. AMENDMENT

The amendments are as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the “Gas Hydrate Research and Development Act of 1999”.

SEC. 2. DEFINITIONS.

In this Act:

(1) **CONTRACT.**—The term “contract” means a procurement contract within the meaning of section 6303 of title 31, United States Code.

(2) **COOPERATIVE AGREEMENT.**—The term “cooperative agreement” means a cooperative agreement within the meaning of section 6305 of title 31, United States Code.

(3) **DIRECTOR.**—The term “Director” means the Director of the National Science Foundation.

(4) **GRANT.**—The term “grant” means a grant awarded under a grant agreement, within the meaning of section 6304 of title 31, United States Code.

(5) **INSTITUTION OF HIGHER EDUCATION.**—The term “institution of higher education” means an institution of higher education, within the meaning of section 1201(a) of the Higher Education Act of 1965 (20 U.S.C. 1141(a)).

(6) **SECRETARY.**—The term “Secretary” means the Secretary of Energy, acting through the Assistant Secretary for Fossil Energy.

(7) **SECRETARY OF DEFENSE.**—The term “Secretary of Defense” means the Secretary of Defense, acting through the Secretary of the Navy.

(8) **SECRETARY OF THE INTERIOR.**—The term “Secretary of the Interior” means the Secretary of the Interior, acting through the Director of the United States Geological Survey.

SEC. 3. GAS HYDRATE RESEARCH AND DEVELOPMENT PROGRAM.

(a) **IN GENERAL.**—

(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 gas hydrate research and development.

(2) **DESIGNATIONS.**—The Secretary, the Secretary of Defense, the Secretary of the Interior, and the Director shall designate individuals to carry out this section.

(3) **MEETINGS.**—The individuals designated under paragraph (2) shall meet not later than 120 days after the date on which all such individuals are designated and not less frequently than every 120 days thereafter to—

(A) review the progress of the program under paragraph (1); and

(B) make recommendations on future activities to occur subsequent to the meeting.

(b) **GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS, AND FIELD WORK PROPOSALS.**—

(1) **ASSISTANCE AND COORDINATION.**—The Secretary may award grants or contracts to, or enter into cooperative agreements with, institutions of higher education and industrial enterprises to—

(A) conduct basic and applied research to identify, explore, assess, and develop gas hydrate as a source of energy;

(B) assist in developing technologies required for efficient and environmentally sound development of gas hydrate resources;

(C) undertake research programs to provide safe means of transport and storage of gas produced from gas hydrates;

(D) promote education and training in gas hydrate resource research and resource development;

(E) conduct basic and applied research to assess and mitigate the environmental impacts of hydrate degassing (including both natural degassing and degassing associated with commercial development); and

(F) develop technologies to reduce the risks of drilling through gas hydrates.

(2) **COMPETITIVE MERIT-BASED REVIEW.**—Funds made available under paragraph (1) shall be made available based on a competitive merit-based process.

(c) CONSULTATION.—The Secretary may establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies to—

(1) advise the Secretary on potential applications of gas hydrate; and

(2) assist in developing recommendations and priorities for the gas hydrate research and development program carried out under subsection (a)(1).

(d) LIMITATIONS.—

(1) ADMINISTRATIVE EXPENSES.—Not more than 5 percent of the amount made available to carry out this section for a fiscal year may be used by the Secretary for expenses associated with the administration of the program carried out under subsection (a)(1).

(2) CONSTRUCTION COSTS.—None of the funds made available to carry out this section may be used for the construction of a new building or the acquisition, expansion, remodeling, or alteration of an existing building (including site grading and improvement and architect fees).

(e) RESPONSIBILITIES OF THE SECRETARY.—In carrying out subsection (b)(1), the Secretary shall—

(1) facilitate and develop partnerships among government, industry, and institutions of higher education to research, identify, assess, and explore gas hydrate resources;

(2) undertake programs to develop basic information necessary for promoting long-term interest in gas hydrate resources as an energy source;

(3) ensure that the data and information developed through the program are accessible and widely disseminated as needed and appropriate;

(4) promote cooperation among agencies that are developing technologies that may hold promise for gas hydrate resource development; and

(5) report annually to Congress on accomplishments under this section.

SEC. 4. AMENDMENTS 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) in paragraph (6)—

(A) in subparagraph (F), by striking “and” at the end;

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

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

“(G) for purposes of this section and sections 202 through 205 only, methane hydrate; and”;

(2) by redesignating paragraph (7) as paragraph (8); and

(3) by inserting after paragraph (6) the following:

“(7) 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.”.

SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary of Energy to carry out this Act—

(1) \$5,000,000 for fiscal year 2000;

(2) \$7,500,000 for fiscal year 2001;

(3) \$10,000,000 for fiscal year 2002;

(4) \$10,000,000 for fiscal year 2003; and

(5) \$10,000,000 for fiscal year 2004.

Amounts authorized under this section shall remain available until expended.

SEC. 6. SUNSET.

Section 3 of this Act shall cease to be effective after the end of fiscal year 2004.

Amend the title so as to read:

A bill to promote the research, identification, assessment, exploration, and development of gas hydrate resources, and for other purposes.

II. PURPOSE OF THE BILL

The purpose of H.R. 1753, as amended, 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 (NSF), to commence a program of gas hydrate research and development (R&D).

III. BACKGROUND AND NEED FOR THE LEGISLATION

Gas hydrates consist of a mixture of gas and water frozen into a solid crystalline state. At moderately high pressure and low temperature, the gas molecule is trapped inside a cage of water molecules and chilled into a solid hydrate, while expelling salt.

The most abundant form of gas hydrates is methane hydrates, which are found in many areas throughout the world. The 1995 “National Assessment of United States Oil and Gas Resources” of the U.S. Geological Survey (USGS) estimated the mean (expected value) in-place gas hydrate resource for the entire United States to be 320,000 trillion cubic feet of gas—by comparison, the U.S. annually consumes about 22 trillion cubic feet of methane as natural gas, and the world’s currently known gas reserves are about 5,000 trillion cubic feet. In addition, the occurrence and stability of gas hydrates at oceanic depths offers the possibility that excess greenhouse gases, especially carbon dioxide, may be disposed in the deep ocean as synthetic hydrates.

There have been several attempts to enact legislation authorizing the establishment of a methane hydrates R&D program. In the 105th Congress, the Senate passed S. 1418, the Methane Hydrate Research and Development Act of 1998, on July 17, 1998, by Unanimous Consent. In the House, the bill was referred to the Committee on Science on July 20, 1998, and in addition to the Committee on Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned. Within the Science Committee, S. 1418 was referred to the Subcommittee on Energy and Environment on July 24, 1998, and the Subcommittee held a hearing on the measure on September 15, 1998, but took no further legislative action.

On January 28, 1999, Senators Akaka, Lott, Landrieu, Craig, and Graham introduced S. 330, the Methane Hydrate Research and Development Act of 1999, which is similar to S. 1418. S. 330 passed the Senate by Unanimous Consent on April 19, 1999. In the House, the bill was referred to the Committee on Science on April 27, 1999, and in addition to the Committee on Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned. Within the Science Committee, S. 330 was referred to the Subcommittee on Energy and Environment on April 30, 1999, and within the Committee on Resources, the bill was referred to the Subcommittee on Energy and Mineral Resources on May 3, 1999.

On May 11, 1999, Representative Mike Doyle introduced H.R. 1753, the Methane Hydrate Research and Development Act of 1999, a bill to promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes. H.R. 1753 is similar to S. 330, except that it: (1) requires that any awards of grants or contracts to, or any cooperative agreements entered into with, institutions of higher education and industrial enterprises be subject to a competitive merit-review process; (2) specifies authorization levels for the five-year period covering Fiscal year (FY) 2000 through FY 2004; and (3) sunsets

the methane hydrate R&D program at the end of FY 2004. Also, on May 11, 1998, H.R. 1753 was referred to the Science Committee, and in addition to the Resources Committee, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned. Within the Science Committee, the bill was immediately referred to the Subcommittee on Energy and Environment, and within the Resources Committee, the bill was referred to the Subcommittee on Energy and Mineral Resources on May 21, 1999.

On May 12, 1999, the House Science Subcommittee on Energy and Environment held a hearing on S. 330 and H.R. 1753, and held a markup session immediately following that hearing. The Subcommittee favorably reported both bills, with amendments, to the Full Science Committee by voice vote. The House Resources Subcommittee on Energy and Minerals held a hearing on S. 330 and H.R. 1753 on May 25, 1999. On June 30, 1999, the Full Resources Committee held a markup session on H.R. 1753, and ordered the measure reported to the House, as amended, by voice vote.

Given the great potential for energy and scientific benefits from gas hydrate R&D, H.R. 1753 authorizes the establishment of a gas hydrate R&D program within the Department of Energy (DOE), to be carried out in consultation with the Departments of Defense and the Interior, and the Director of the NSF.

IV. SUMMARY OF HEARINGS

The Science Subcommittee on Energy and Environment held a hearing on May 12, 1999, to receive testimony on S. 330 and H.R. 1753, the Methane Hydrate Research and Development Act of 1999, and heard testimony on the bill from three witnesses: (1) Mr. Robert S. Kripowicz, DOE's Principal Deputy Assistant Secretary for Fossil Energy, (2) Dr. William P. Dillon, Research Geologist, Geologic Division, U.S. Department of Interior, USGS, Woods Hole, MA, and (3) Dr. Gerald D. Holder, USX Dean of Engineering, University of Pittsburgh, Pittsburgh, PA.

Mr. Kripowicz presented DOE's views on the potential for methane hydrates as a future source of natural gas, to review the progress the Department is making in preparing a multi-agency coordinated research plan for this potentially vast energy resource, and DOE's position on S. 330, the Methane Hydrate Research and Development Act, as follows:

- Worldwide, estimates of the natural gas potential of methane hydrates approach 400 trillion cubic feet—a staggering figure compared to the 5,000 trillion cubic feet that make up the world's currently known gas reserves.
- From 1982–1992, DOE's methane hydrate program spent \$8 million in developing a foundation of basic knowledge about the location and thermodynamic properties of gas hydrates.
- In FY 1997 and FY 1998, DOE provided a small amount of funding from its Natural Gas Supply Program to support activities in preparation for a more definitive program proposed for FY 1999.
- In its 1997 report, the Energy Research and Development Panel of the President's Committee of Advisors on Science and Technology (PCAST) recommended “a major initiative for DOE to

work with USGS, the Naval Research Lab, Mineral Management Service, and the industry to evaluate the production potential of methane hydrates in U.S. coastal waters and world wide." PCAST also called attention to the possibility that studies of methane hydrates could lead to possible sequestering of carbon dioxide (CO₂) in CO₂ hydrates.

- On January 21–22, 1998, DOE hosted a workshop in Denver on the "Future of Methane Hydrate Research and Resource Development," and held a second workshop in Washington, DC, on May 12, 1998, to review a "strawman" Methane Hydrates Program Plan. From these workshops and other planning activities carried out cooperatively with the USGS, the Naval Research Laboratory, the NSF, the Minerals Management Service and industrial and academic experts, DOE published a "Strategy for Methane Hydrates Research & Development" in August 1998, which outlines a multidisciplinary 10-year national program that will begin in FY 2000 with the aim of producing the knowledge and products necessary for the private sector to begin commercially-viable production of methane from hydrates by 2015.

- Because future program activities were still in the formative stage, DOE requested only a minimal level of R&D funding (\$500,000) in its FY 1999 budget submission to Congress. In FY 2000, the Department has requested an increase in funding to \$2.0 million to initiate the multidisciplinary program strategy.

- S. 330 would promote the research, identification, assessment, exploration, and development of methane hydrate resources. The legislation is consistent with the goals DOE has established for the Federal hydrates R&D program; therefore, the Department can support this measure.

Dr. Dillon discussed the USGS assessment of natural gas hydrate resources and examined the technology that would be necessary to safely and economically produce gas hydrates, as follows:

- The primary objectives of USGS gas hydrate research are to: (1) document the geologic parameters that control the occurrence and stability of gas hydrates; (2) assess the volume of natural gas stored within gas hydrate accumulations; (3) identify and predict natural sediment destabilization caused by gas hydrate; and (4) analyze the effects of gas hydrate on drilling safety. The USGS in 1995 made the first systematic assessment of the in-place natural gas hydrate resources of the United States, which showed that the amount of gas in the hydrate accumulations of the United States greatly exceeds the volume of known conventional domestic gas resources. However, gas hydrates represent both a scientific and technologic frontier, and much remains to be learned about their characteristics and possible economic recovery.

- The amount of methane contained in the world's gas hydrate accumulations is enormous, but estimates of the amount are speculative and range over three orders-of-magnitude from about 100,000 to 270,000,000 trillion cubic feet of gas. Despite the enormous range of these estimates, gas hydrates seem to be a much greater resource of natural gas than conventional accumulations.

- Even though gas hydrates are known to occur in numerous marine and Arctic settings, little is known about the geologic controls on their distribution. Gas hydrates have been recovered by

scientific drilling along the Atlantic, Gulf of Mexico, and Pacific coasts of the United States, as well as at many international locations.

- To date, onshore gas hydrates have been found in Arctic regions of permafrost and in deep lakes such as Lake Baikal in Russia. Gas hydrates associated with permafrost have been documented on the North Slope of Alaska and Canada and in northern Russia. Combined information from Arctic gas-hydrate studies shows that, in permafrost regions, gas hydrates may exist at subsurface depths ranging from about 130 to 2,000 meters.

- The USGS 1995 "National Assessment of United States Oil and Gas Resources" focused on assessing the undiscovered conventional and unconventional resources of crude oil and natural gas in the United States, and included for the first time a systematic appraisal of the in-place natural gas hydrate resources of the United States, both onshore and offshore. The mean (expected value) in-place gas hydrate resource for the entire United States is estimated to be 320,000 trillion cubic feet of gas. However, this assessment does not address the problem of gas hydrate recoverability.

- Gas recovery from hydrates is hindered because the gas is in a solid form and because hydrates are usually widely dispersed in hostile Arctic and deep marine environments.

- Seafloor stability and safety are two important issues related to gas hydrates. Seafloor stability refers to the susceptibility of the seafloor to collapse and slide as the result of gas hydrate disassociation. The safety issue refers to petroleum drilling and production hazards that may occur in association with gas hydrates in both offshore and onshore environments.

Dr. Holder testified in support of the legislation, and made the following observations:

- S. 330 will not only provide an opportunity for outstanding scientific inquiry into the very frontiers of geophysics, oceanography and chemical engineering, but will also have important consequences for the future of the world's energy supply and for the potential impact of fossil fuels on global climate change.

- The amount of gas in gas hydrate form is sufficient to replace all other forms of fossil fuel. The USGS estimates that hydrates contain 320,000 trillion cubic feet of gas, which currently sells for about \$2.30 per 1000 cubic feet, wholesale, so that the market value of this gas is about \$700 trillion dollars. From another point of view, the amount of energy in hydrate gas is more than twice that in all other forms of fossil fuel combined.

- Methane from hydrates (or other sources) produces much less carbon dioxide per unit energy than other forms of fossil fuel. Wide production of methane from hydrates could reduce carbon dioxide emissions by as much as 20% on a global basis without any reduction in energy consumption. No other technology can compete with methane hydrate fuel in its potential short-term impact on carbon dioxide emissions.

- S. 330 will allow two important areas to be addressed: (1) developing maps of the locations and nature of the hydrate resource; and (2) technology for gas recovery. In addition to these important developments, S. 330 will make important contributions to our sci-

entific knowledge of gas hydrates, their physical properties, and the molecular mechanisms by which hydrates grow and decompose.

V. COMMITTEE ACTIONS

On May 11, 1999, Representative Mike Doyle introduced H.R. 1753, the Methane Hydrate Research and Development Act of 1999, a bill to promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes. Also, on May 11, the bill was referred to the Committee on Science, and in addition to the Committee on Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned. Within the Science Committee, the bill was immediately referred to the Subcommittee on Energy and Environment.

Subcommittee actions

As summarized above, the Subcommittee on Energy and Environment of the Committee on Science heard testimony on H.R. 1753 on May 12, 1999.

The Subcommittee on Energy and Environment also convened on May 12, 1999, to markup H.R. 1753, and favorably considered two amendments.

Amendment 1.—Mr. Calvert, Chairman of the Science Committee's Subcommittee on Energy and Environment, asked and received unanimous consent to offer a manager's amendment on behalf of himself, Mr. Costello, Ranking Minority Member of the Subcommittee on Energy and Environment, and Mr. Doyle, a Subcommittee Member and the lead sponsor of the measure. The manager's amendment substituted the word "gas" for the word "methane" everywhere it appeared in the bill, and also struck subsection 2(6), which defined the term "methane hydrates." The amendment was adopted by voice vote.

Amendment 2.—Mr. Calvert, Chairman of the Science Committee's Subcommittee on Energy and Environment, offered a title amendment on behalf of himself, Mr. Costello, and Mr. Doyle, which amended the bill's title by striking the word "methane" and inserting the word "gas". The amendment as adopted by the voice vote.

With a quorum present, Mr. Costello moved that the Subcommittee favorably report H.R. 1753, as amended, to the full Committee and that the Chairman take all necessary steps to bring the bill before the full Committee for consideration. Further, Mr. Costello asked and received unanimous consent that the staff be instructed to make all necessary and conforming changes to the bill. The motion was also approved by voice vote.

Committee actions

The Full Science Committee met on September 9, 1999, to consider H.R. 1753. Chairman Sensenbrenner asked and received unanimous consent that the amendment in the nature of a substitute adopted by the Subcommittee on Energy and Environment on May 12, 1999, be considered for adoption, and the bill, as amended, was adopted by voice vote.

With a quorum present, Mr. Costello moved that the Committee favorably report H.R. 1753, as amended, to the House with the recommendation that the bill, as amended, do pass. Furthermore, Mr. Costello asked and received unanimous Consent that the staff be instructed to prepare the legislative report and that the Chairman take all necessary steps to bring the bill before the House for consideration. The motion was approved by voice vote.

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

H.R. 1753, as amended, Directs the Secretary of Energy, in consultation with the Secretaries of Defense and the Interior, and the Director of the NSF, to commence a program of gas hydrate R&D. It authorizes the Secretary of Energy \$5.0 million for FY 2000, \$7.5 million for FY 2001, and \$10.0 million for each of FY 2002–FY 2004 to carry out the Program. The bill also:

- Authorizes the Secretary of Energy to award grants or contracts to, or enter into cooperative agreements with, institutions of higher education and industrial enterprises to conduct gas hydrate R&D;
- Requires that all such awards shall be made available based on a competitive merit-review process;
- Allows the Secretary of Energy to establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies;
- Limits administrative expenses to not more than 5 percent and prohibits any funds from being used for either the construction of a new building or alteration of an existing building (including site grading and improvement and architect fees);
- Allows the Secretary of the Interior to award gas hydrate R&D contracts and grants to, and to enter into cooperative agreements with, qualified entities under the Marine Mineral Resources Research Act of 1996; and
- Sunsets the gas hydrate R&D program after the end of FY 2004.

VII. SECTION-BY-SECTION ANALYSIS AND COMMITTEE VIEWS

Section 1. Short title

Section 1 cites the Act as the “Gas Hydrate Research and Development Act of 1999.”

Section 2. Definitions

Section 2 defines: (1) the term “contract” to mean a procurement contract within the meaning of section 6303 of title 31, United States Code (USC); (2) the term “cooperative agreement” to mean a cooperative agreement within the meaning of section 6305 of title 31, USC; (3) the term “Director” to mean the Director of the NSF; (4) the term “grant” to mean a grant awarded under a grant agreement, within the meaning of section 6304 of title 31, USC; (5) the term “institution of higher education” to mean an institution of higher education, within the meaning of section 102(a)(1) of the Higher Education Act of 1965; (6) the term “Secretary” to mean the Secretary of Energy; acting through the Assistant Secretary for Fossil Energy; (7) the term “Secretary of Defense” to mean the Sec-

retary of Defense, acting through the Secretary of the Navy; and (8) the term “Secretary of the Interior” to mean the Secretary of the Interior, acting through the Director of the USGS.

Section 3. Gas hydrate research and development program

Subsection 3(a) directs the Secretary of Energy to commence a gas hydrate R&D program not later than 180 days after the date of enactment of this Act, in consultation with the Secretaries of Defense and the Interior, and the Director of the NSF. These individuals, or their designees, are to meet not later than 120 days after the date on which all such individuals are designated and not less frequently than every 120 days to review the progress of the program and to make recommendations on future activities.

Subsection 3(b)(1) permits the Secretary to award grants or contracts to, or enter into cooperative agreements with, institutions of higher education and industrial enterprises to—(A) conduct basic and applied research to identify, explore, assess, and develop gas hydrate as a source of energy; (B) assist in developing technologies required for efficient and environmentally sound development of gas hydrate resources; (C) undertake research programs to provide safe means of transport and storage of gas produced from gas hydrates; (D) promote education and training in gas hydrate resource research and resource development; (E) conduct basic and applied research to assess and mitigate the environmental impacts of hydrate degassing (including both natural degassing and degassing associated with commercial development); and (F) develop technologies to reduce the risks of drilling through gas hydrates.

Subsection 3(b)(2) requires that all funds under subsection 3(b)(1) shall be made available based on a competitive merit-review process.

Subsection 3(c) allows the Secretary to establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies to—(A) advise the Secretary on potential applications of gas hydrate; and (B) assist in developing recommendations and priorities for the gas hydrate R&D program carried out under subsection 3(a)(1).

Subsection 3(d) provides limitations on the use of funds made available to carry out the gas hydrate R&D program, including: (1) an administrative expense limit of not more than 5 percent; and (2) a prohibition against any funding being used for either the construction of a new building or alteration of an existing building (including site grading and improvement and architect fees).

Subsection 3(e) lists the responsibilities of the Secretary of Energy in implementing the gas hydrate R&D program, which shall include—(1) facilitating and developing partnerships among government, industry, and institutions of higher education to research, identify, assess, and explore gas hydrate resources; (2) undertaking programs to develop basic information necessary for promoting long-term interest in gas hydrate resources as an energy source; (3) ensuring that the data and information developed through the program are accessible and widely disseminated as needed and appropriate; (4) promoting cooperation among agencies that are developing technologies that may hold promise for gas hydrate resource

development; and (5) reporting annually to Congress on accomplishments under this section.

Section 4. Amendment to the Mining and Minerals Policy Act of 1970

Section 4 amends the definition of “marine mineral resource” in the Mining and Minerals Policy Act of 1970 (P.L. 91–621), as added by the Marine Mineral Resources Research Act of 1996 (P.L. 104–325), to include gas hydrates. It also limits the definition of gas hydrates as a “marine mineral resource” to only that Act. This provision allows the Secretary of the Interior to award gas hydrate R&D contracts and grants to, and to enter into cooperative agreements with, qualified entities under the Marine Mineral Resources Research Act of 1996.

Section 5. Authorization of appropriations

Section 5 authorizes to be appropriated to the Secretary of Energy to carry out this Act—(1) \$5,000,000 for fiscal year (FY) 2000; (2) \$7,500,000 for FY 2001; (3) \$10,000,000 for FY 2002; (4) \$10,000,000 for FY 2003; and (5) \$10,000,000 for FY 2004.

Section 6. Sunset

Section 6 provides that Section 3 of this Act shall cease to be effective after the end of FY 2004.

VIII. COST ESTIMATE

Rule XIII, clause 3(d)(2) of Rules of the House of Representatives requires that each report of a committee on a public bill or public joint resolution contain: (A) an estimate by the committee of the costs that would be incurred in carrying out the bill or joint resolution in the fiscal year in which it is reported, and in each of the five fiscal years following that fiscal year (or for the authorized duration of any program authorized by such bill or joint resolution if less than five years); (B) a comparison of the estimate of costs described in subdivision (A) made by the committee with any estimate of such costs made by a Government agency and submitted to such committee; and (C) when practicable, a comparison of the total estimated funding level for the relevant programs with the appropriate levels under current law. However, House rule XIII, clause 3(d)(3)(B) provides that this requirement does not apply when a cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been included in the report pursuant to House rule XIII, clause 3(c)(3). A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science prior to the filing of this report and is included in Section IX of this report pursuant to House rule XIII, clause 3(c)(3).

Rule XIII, clause 3(c)(2) of the Rules of the House of Representatives requires that the report of a committee on a measure that has been approved by the committee providing new budget authority (other than continuing appropriations), new spending authority, or new credit authority, or changes in revenues or tax expenditures

include the statement required by section 308(a) of the Congressional Budget Act of 1974, except that an estimate of new budget authority shall include, when practicable, a comparison of the total estimated funding level for the relevant programs to the appropriate levels under current law. H.R. 1753 does not contain any new budget authority, new spending authority, or new credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 1753 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section IX of this report.

IX. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Rule XIII, clause 3(c)(3) of the Rules of the House of Representatives requires that the report of a committee on a measure that has been approved by the committee include an estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 if timely submitted to the committee before the filing of the report. The Committee on Science has received the following cost estimate for H.R. 1753 from the Director of the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, September 15, 1999.

Hon. F. JAMES SENSENBRENNER, Jr.,
*Chairman, Committee on Science,
House of Representatives, Washington, DC.*

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed revised cost estimate for H.R. 1753, the Gas Hydrate Research and Development Act of 1999. The previous estimate referred to the bill's original title, which was amended by the committee. This estimate reflects the bill's new amended title.

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

Sincerely,

BARRY B. ANDERSON
(For Dan L. Crippen, Director).

Enclosure.

H.R. 1753—Gas Hydrate Research and Development Act of 1999

Summary: H.R. 1753 would authorize appropriations for a new research and development program at the Department of Energy (DOE) on the use of gas hydrate as a source of energy. DOE would administer the program through grants, contracts, and cooperative agreements with universities and industrial enterprises. Deposits of gas hydrate occur in deep ocean and permafrost areas of the world and consist of methane-water ice-like crystalline material.

CBO estimates that appropriating the specified amounts would increase discretionary spending by \$35 million over the next five years. H.R. 1753 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 (UNRA) and would not impose costs on state, local, or tribal governments.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1753 is shown in the following table. For purposes of this estimate, CBO assumes that H.R. 1753 will be enacted by or near the beginning of fiscal year 2000, that the authorized amounts will be appropriated for each year, and that outlays will occur at the rate observed for similar existing programs. The costs of this legislation fall within budget function 270 (energy).

Pay-as-you-go considerations: None.

	By fiscal year, in millions of dollars—				
	2000	2001	2002	2003	2004
SPENDING SUBJECT TO APPROPRIATION					
Authorization Level	5	8	10	10	10
Estimated Outlays	2	5	8	10	10

Intergovernmental and private-sector impact: H.R. 1753 contains no intergovernmental or private-sector mandates as defined in UMRA and would not impose any costs on state, local, or tribal governments. State universities might benefit from research grants, contracts, or cooperative agreements provided through this bill.

Previous CBO estimates: On September 13, 1999, CBO prepared a cost estimate for H.R. 1753 that did not reflect the correct title for the bill as approved by the House Committee on Science. This estimate corrects that error.

On July 9, 1999, CBO prepared a cost estimate for H.R. 1753 as ordered reported by the House Committee on Resources on June 30, 1999. The legislation reported by the Resources Committee would authorize the appropriation of \$8.5 million more (over five years) than the version of the bill reported by the Science Committee.

On March 9, 1999, CBO transmitted a cost estimate for S. 330, the Methane Hydrate Research and Development Act of 1999, as ordered reported by the Senate Committee on Energy and Natural Resources on March 4, 1999. Differences in the estimates are attributable to differences between the two bills. The Senate bill would authorize sums as may be necessary for the program, which CBO estimated would total about \$45 million over the next five years. By comparison, H.R. 1753 would authorize \$43 million for these activities over the same period.

Estimate prepared by: Kim Cawley.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

X. COMPLIANCE WITH PUBLIC LAW 104-4

H.R. 1753 contains no unfunded mandates.

XI. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Rule XIII, clause 3(c)(1) of the Rules of the House of Representatives requires that the report of a committee on a measure that has been approved by the committee oversight findings and rec-

ommendations under clause 2(b)(1) of rule X. The Committee of Science’s oversight findings and recommendations are reflected in the body of this report.

XII. OVERSIGHT FINDINGS AND RECOMMENDATIONS BY THE COMMITTEE ON GOVERNMENT REFORM

Rule XIII, clause 3(c)(4) of the Rules of House Representatives requires that the report of a committee on a measure has been approved by the committee include a summary of oversight findings and recommendations made by the Committee on Government Reform under clause 4(c)(2) of rule X if such findings and recommendations have been submitted to the reporting committee in time to allow it to consider such findings and recommendations during its deliberations on the measure. The Committee on Science has received no such findings or recommendations from the Committee on Government Reform.

XIII. CONSTITUTIONAL AUTHORITY STATEMENT

Rule XIII, clause 3(d)(1) of the Rules of the House of Representatives requires that each report of a committee on a public bill or public joint resolution contain a statement citing the specific powers granted to the Congress in the Constitution to enact the law proposed by the bill or joint resolution. Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 1753.

XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 1753 authorizes the Secretary of Energy to establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies to advise the Secretary on potential applications of gas hydrate; and to assist in developing recommendations and priorities for the gas hydrate R&D program. The functions of this advisory panel are not currently being performed nor could they be performed by one or more agencies or by an advisory committee already in existence, or by enlarging the mandate of an existing advisory committee.

XV. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 1753 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVI. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as 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):

**SECTION 201 OF THE MINING AND MINERALS POLICY
ACT OF 1970**

SEC. 201. DEFINITIONS.

In this title:

(1) * * *

* * * * *

(6) The term "marine mineral resource" means—

(A) * * *

* * * * *

(F) metal sulfides; **[and]**

(G) *for purposes of this section and sections 202 through 205 only, methane hydrate; and*

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

* * * * *

(7) *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.

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

XVII. COMMITTEE RECOMMENDATIONS

On September 9, 1999, a quorum being present, the Committee favorably reported H.R. 1753, the Gas Hydrates Research and Development Act of 1999, as amended, by a voice vote, and recommended its enactment.

**XVIII. PROCEEDINGS OF SUBCOMMITTEE ON ENERGY AND
ENVIRONMENT MARKUP**

**H.R. 1753, THE METHANE HYDRATE
RESEARCH AND DEVELOPMENT ACT OF 1999**

WEDNESDAY, MAY 12, 1999

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to notice, at 1:55 p.m., in room 2318, Rayburn House Office Building, Hon. Ken Calvert (Chairman of the Subcommittee) presiding.

Chairman CALVERT [presiding]. The Subcommittee will come to order.

We convene today to mark up H.R. 1753, the Methane Hydrate Research and Development Act of 1999 and S. 330, the Methane Hydrate Research and Development Act of 1999. Pursuant to notice, the Subcommittee on Energy and Environment is meeting today to consider the following measures as I just indicated.

I would like to ask unanimous consent for the authority to recess at any point. Hearing no objections, I would lead by example and keep things moving along briskly; therefore, I will dispense with my opening remarks and ask unanimous consent that the record, at this point, refer to my earlier opening statement. Hearing no objection, so ordered.

STATEMENT OF CHAIRMAN KEN CALVERT

Today we will hear testimony on H.R. 1753, the Methane Hydrate Research and Development Act of 1999. A similar bill, S. 330 passed the Senate by unanimous consent on April 19. Immediately following the hearing we will markup H.R. 1753.

Our distinguished panel today includes Mr. Robert Kripowitz, Principal Deputy Assistant Secretary for Fossil Energy, at the US Department of Energy (DOE); Dr. William Dillon, a geologist with the US Geological Survey (USGS); and finally, Dr. Gerald Holder, who is the Dean of the School of Engineering at the University of Pittsburgh.

Methane hydrates are methane-bearing, ice-like substances found in undersea sediment and in Arctic permafrost. These methane hydrates will provide an abundant supply of natural gas if science can discover a practical, environmentally sound way to extract them. Unfortunately, as we will hear from our witnesses today, this will not be easy.

The federal government has only sporadically funded research into Methane Hydrates over the past couple of decades. The DOE closed a 10-year research program in 1992, and has maintained a minimally funded program since then, while the USGS has continued its program with some success.

The legislation before us seeks to make funds available to continue looking into extracting methane hydrates. It also seeks to better coordinate research between the Department of Energy, the US Geological Survey and the US Navy.

I look forward to hearing today's testimony and pursuing these subjects in greater detail.

We are short the needed quorum. However, it is my understanding that the minority will not object; thus, we will remain silent and let this fall by the wayside, okay.

I would like to request that members' opening statements be limited to 5 minutes. I would also ask unanimous consent that all members' comments be included in the record. Without objection.

Are there any members seeking recognition for an opening statement? The gentleman from Pennsylvania.

Mr. DOYLE. Thank you and following my Chairman's lead I will be very, very brief. I just want to, first of all, thank you, Mr. Chairman, and let you know it's been a pleasure to work with you and Mr. Costello on this legislation, H.R. 1753. I'm pleased to see that this House is going to give—and this Committee—is going to give this issue the consideration it deserves. I think we've discussed already in some length what the bill does, and we've had a chance to hear from the experts. So, with that, I'd just say thank you, Mr. Chairman, for your expedited consideration of the bill and look forward to working with you and all the colleagues on the Subcommittee as we work for final passage of this bill.

Chairman CALVERT. I'd like to thank the gentleman for his good work in bringing this bill forward today; it's good legislation.

Chairman CALVERT. And we'll now consider H.R. 1753, the Methane Hydrate Research and Development Act of 1999. I would like to ask unanimous consent that the first reading of the bill be dispensed with. The bill will be considered as read and open to amendment at any point.

[The information follows:]

106TH CONGRESS
1ST SESSION

H. R. 1753

To promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 11, 1999

Mr. DOYLE (for himself, Mr. CALVERT, and Mr. COSTELLO) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To promote the research, identification, assessment, exploration, and development of methane hydrate resources, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "Methane Hydrate Re-
5 search and Development Act of 1999".

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

1 (1) CONTRACT.—The term “contract” means a
2 procurement contract within the meaning of section
3 6303 of title 31, United States Code.

4 (2) COOPERATIVE AGREEMENT.—The term “co-
5 operative agreement” means a cooperative agree-
6 ment within the meaning of section 6305 of title 31,
7 United States Code.

8 (3) DIRECTOR.—The term “Director” means
9 the Director of the National Science Foundation.

10 (4) GRANT.—The term “grant” means a grant
11 awarded under a grant agreement, within the mean-
12 ing of section 6304 of title 31, United States Code.

13 (5) INSTITUTION OF HIGHER EDUCATION.—The
14 term “institution of higher education” means an in-
15 stitution of higher education, within the meaning of
16 section 1201(a) of the Higher Education Act of
17 1965 (20 U.S.C. 1141(a)).

18 (6) METHANE HYDRATE.—The term “methane
19 hydrate” means a methane clathrate that—

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

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

1 (7) SECRETARY.—The term “Secretary” means
2 the Secretary of Energy, acting through the Assist-
3 ant Secretary for Fossil Energy.

4 (8) SECRETARY OF DEFENSE.—The term “Sec-
5 retary of Defense” means the Secretary of Defense,
6 acting through the Secretary of the Navy.

7 (9) SECRETARY OF THE INTERIOR.—The term
8 “Secretary of the Interior” means the Secretary of
9 the Interior, acting through the Director of the
10 United States Geological Survey.

11 **SEC. 3. METHANE HYDRATE RESEARCH AND DEVELOP-**
12 **MENT PROGRAM.**

13 (a) IN GENERAL.—

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

20 (2) DESIGNATIONS.—The Secretary, the Sec-
21 retary of Defense, the Secretary of the Interior, and
22 the Director shall designate individuals to carry out
23 this section.

24 (3) MEETINGS.—The individuals designated
25 under paragraph (2) shall meet not later than 120

1 days after the date on which all such individuals are
2 designated and not less frequently than every 120
3 days thereafter to—

4 (A) review the progress of the program
5 under paragraph (1); and

6 (B) make recommendations on future ac-
7 tivities to occur subsequent to the meeting.

8 (b) GRANTS, CONTRACTS, COOPERATIVE AGREE-
9 MENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS,
10 AND FIELD WORK PROPOSALS.—

11 (1) ASSISTANCE AND COORDINATION.—The
12 Secretary may award grants or contracts to, or enter
13 into cooperative agreements with, institutions of
14 higher education and industrial enterprises to—

15 (A) conduct basic and applied research to
16 identify, explore, assess, and develop methane
17 hydrate as a source of energy;

18 (B) assist in developing technologies re-
19 quired for efficient and environmentally sound
20 development of methane hydrate resources;

21 (C) undertake research programs to pro-
22 vide safe means of transport and storage of
23 methane produced from methane hydrates;

1 (D) promote education and training in
2 methane hydrate resource research and re-
3 source development;

4 (E) conduct basic and applied research to
5 assess and mitigate the environmental impacts
6 of hydrate degassing (including both natural
7 degassing and degassing associated with com-
8 mercial development); and

9 (F) develop technologies to reduce the
10 risks of drilling through methane hydrates.

11 (2) COMPETITIVE MERIT-BASED REVIEW.—
12 Funds made available under paragraph (1) shall be
13 made available based on a competitive merit-based
14 process.

15 (c) CONSULTATION.—The Secretary may establish an
16 advisory panel consisting of experts from industry, institu-
17 tions of higher education, and Federal agencies to—

18 (1) advise the Secretary on potential applica-
19 tions of methane hydrate; and

20 (2) assist in developing recommendations and
21 priorities for the methane hydrate research and de-
22 velopment program carried out under subsection
23 (a)(1).

24 (d) LIMITATIONS.—

1 (1) ADMINISTRATIVE EXPENSES.—Not more
2 than 5 percent of the amount made available to
3 carry out this section for a fiscal year may be used
4 by the Secretary for expenses associated with the ad-
5 ministration of the program carried out under sub-
6 section (a)(1).

7 (2) CONSTRUCTION COSTS.—None of the funds
8 made available to carry out this section may be used
9 for the construction of a new building or the acqui-
10 sition, expansion, remodeling, or alteration of an exist-
11 ing building (including site grading and improve-
12 ment and architect fees).

13 (e) RESPONSIBILITIES OF THE SECRETARY.—In car-
14 rying out subsection (b)(1), the Secretary shall—

15 (1) facilitate and develop partnerships among
16 government, industry, and institutions of higher edu-
17 cation to research, identify, assess, and explore
18 methane hydrate resources;

19 (2) undertake programs to develop basic infor-
20 mation necessary for promoting long-term interest in
21 methane hydrate resources as an energy source;

22 (3) ensure that the data and information devel-
23 oped through the program are accessible and widely
24 disseminated as needed and appropriate;

1 (4) promote cooperation among agencies that
2 are developing technologies that may hold promise
3 for methane hydrate resource development; and

4 (5) report annually to Congress on accomplish-
5 ments under this section.

6 **SEC. 4. AMENDMENTS TO THE MINING AND MINERALS POL-**
7 **ICY ACT OF 1970.**

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

10 (1) in paragraph (6)—

11 (A) in subparagraph (F), by striking
12 “and” at the end;

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

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

17 “(G) for purposes of this section and sec-
18 tions 202 through 205 only, methane hydrate;
19 and”;

20 (2) by redesignating paragraph (7) as para-
21 graph (8); and

22 (3) by inserting after paragraph (6) the fol-
23 lowing:

24 “(7) The term ‘methane hydrate’ means a
25 methane clathrate that—

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

3 “(B) is stable and occurs naturally in
4 deep-ocean and permafrost areas.”.

5 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

6 There are authorized to be appropriated to the Sec-
7 retary of Energy to carry out this Act—

8 (1) \$5,000,000 for fiscal year 2000;

9 (2) \$7,500,000 for fiscal year 2001;

10 (3) \$10,000,000 for fiscal year 2002;

11 (4) \$10,000,000 for fiscal year 2003; and

12 (5) \$10,000,000 for fiscal year 2004.

13 Amounts authorized under this section shall remain avail-
14 able until expended.

15 **SEC. 6. SUNSET.**

16 Section 3 of this Act shall cease to be effective after
17 the end of fiscal year 2004.

○

Chairman CALVERT. And the bill is open for amendment. I intend to offer a manager's amendment to H.R. 1753 with the support of Mr. Doyle and Ranking Minority Member, Mr. Costello. The amendment is in the packet before each member. This amendment makes technical changes to the bill, as introduced. It strikes the word "methane" in all but section 4 and inserts the word "gas" in lieu thereof. It also strikes section 2.6, the definition of methane hydrates. The amendment eliminates restrictive language by broadening the scope of research to include the entire family of gas hydrates rather than just methane hydrates.

The clerk will report the amendment.

The CLERK. "Amendment to H.R. 1753 offered by Mr. Calvert, Mr. Doyle, and Mr. Costello."

Chairman CALVERT. I ask unanimous consent to dispense with the reading.

[The information follows:]

AMENDMENT TO H.R. 1753

OFFERED BY MR. CALVERT, MR. DOYLE, AND MR. COSTELLO

Strike "methane" each place it appears in the bill except in section 4, and insert in lieu thereof "gas".

Strike paragraph (6) of section 2, and redesignate subsequent paragraphs accordingly.

Chairman CALVERT. Also, without objection, the amendment will be considered en bloc.

Is there further discussion?

All those in favor say aye.

Those opposed, no.

The ayes have it, and the amendment is agreed to.

Are there any other amendments?

[No response.]

Okay, no other amendments.

Mr. ROHRABACHER. Mr. Chairman.

Chairman CALVERT. Yes? I have a title amendment that I will be offering.

Mr. ROHRABACHER. Before we move on to the final vote, I would just like to emphasize what I mentioned in our hearing—

Chairman CALVERT. The gentleman is recognized.

Mr. ROHRABACHER [continuing]. That this really does exemplify the bipartisan nature of this Committee. Don't want to rub anything in, but when we were not in charge of the Committee, we didn't get opportunities like this a lot of times. We would not have our bills move forward like this, and I know that some Members in Congress, for example, served for 20 years under the Democrats and never got a bill to the Floor, and I think it's—I hope whenever the pendulum swings back in the other direction that we will continue to have bipartisan spirit on both sides of the House.

Mr. DOYLE. Mr. Chairman, when we take over next year, I'm going to let all of Dana's bills on the Floor. [Laughter.]

Mr. ROHRABACHER. But I do commend Mr. Doyle for the time and effort he's put in this. Obviously, this is something that can be of great benefit to our country, uplifting the well-being of our people, improving the environment, if not global warming—if not, even if we disagree on that as the Chairman pointed out—this has

the potential of just purifying the air, helping the air be pure which is important to all of us. So, I think this exemplifies the very best bipartisan spirit and also the multifaceted nature of these decisionmakings. So, thank you very much, Mr. Chairman, and thank you, Mr. Doyle.

Mr. CALVERT. I thank the gentleman. Any other comments before I go to the title amendment?

I intend to offer a title amendment to H.R. 1753 with the support of Mr. Doyle and the Ranking Minority Member, Mr. Costello. The amendment is in the package before each member. This amendment strikes the word "methane" and inserts the word "gas" in its place.

The clerk will report the amendment.

The CLERK. "Title amendment to H.R. 1753——"

Mr. CALVERT. I'd ask unanimous consent to dispense with the reading.

[The information follows:]

TITLE AMENDMENT TO H.R. 1753

OFFERED BY MR. CALVERT, MR. DOYLE, AND MR. COSTELLO

Amend the title by striking "methane" and inserting "gas".

Mr. CALVERT. There is no further discussion.

All those in favor say aye.

Those opposed, no.

The amendment is agreed to, and we have a motion to report the bill.

Mr. COSTELLO. Mr. Chairman, I move that the Subcommittee favorably report H.R. 1753, as amended, to the full Committee and that the Chairman take all such necessary steps to bring the bill before the full Committee for consideration. Further, I ask unanimous consent that the staff be instructed to make all necessary and conforming changes to the bill.

Mr. CALVERT. If there are no further amendments, hearing none, the question is on the bill, H.R. 1753, the Gas Hydrate Research and Development Act of 1999, as amended.

All those in favor say aye.

All those opposed, no.

In the opinion of the Chair, the ayes have it. The Subcommittee has heard the motion.

Those in favor will—hold on—I move the Subcommittee report the bill, H.R. 1753, that's the Gas Hydrate Research and Development Act of 1999, as amended, to the full Committee. The Subcommittee has heard the motion.

Those in favor will say aye.

Those opposed, no.

The ayes have it; the motion's agreed to. Without objection, the motion to reconsider is laid upon the table.

XIX. PROCEEDINGS OF COMMITTEE ON SCIENCE MARKUP

Chairman SENSENBRENNER. Next bill up is the Gas Hydrate Research and Development Authorization Act of 1999.

[The bill H.R. 1753 follows:]

COMMITTEE PRINT
SHOWING H.R. 1753 AS AMENDED BY THE
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
ON MAY 12, 1999

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Gas Hydrate Research
3 and Development Act of 1999”.

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) **CONTRACT.**—The term “contract” means a
7 procurement contract within the meaning of section
8 6303 of title 31, United States Code.

9 (2) **COOPERATIVE AGREEMENT.**—The term “co-
10 operative agreement” means a cooperative agree-
11 ment within the meaning of section 6305 of title 31,
12 United States Code.

13 (3) **DIRECTOR.**—The term “Director” means
14 the Director of the National Science Foundation.

15 (4) **GRANT.**—The term “grant” means a grant
16 awarded under a grant agreement, within the mean-
17 ing of section 6304 of title 31, United States Code.

1 (5) INSTITUTION OF HIGHER EDUCATION.—The
2 term “institution of higher education” means an in-
3 stitution of higher education, within the meaning of
4 section 1201(a) of the Higher Education Act of
5 1965 (20 U.S.C. 1141(a)).

6 (6) SECRETARY.—The term “Secretary” means
7 the Secretary of Energy, acting through the Assist-
8 ant Secretary for Fossil Energy.

9 (7) SECRETARY OF DEFENSE.—The term “Sec-
10 retary of Defense” means the Secretary of Defense,
11 acting through the Secretary of the Navy.

12 (8) SECRETARY OF THE INTERIOR.—The term
13 “Secretary of the Interior” means the Secretary of
14 the Interior, acting through the Director of the
15 United States Geological Survey.

16 **SEC. 3. GAS HYDRATE RESEARCH AND DEVELOPMENT PRO-**
17 **GRAM.**

18 (a) IN GENERAL.—

19 (1) COMMENCEMENT OF PROGRAM.—Not later
20 than 180 days after the date of enactment of this
21 Act, the Secretary, in consultation with the Sec-
22 retary of Defense, the Secretary of the Interior, and
23 the Director, shall commence a program of gas hy-
24 drate research and development.

1 (2) DESIGNATIONS.—The Secretary, the Sec-
2 retary of Defense, the Secretary of the Interior, and
3 the Director shall designate individuals to carry out
4 this section.

5 (3) MEETINGS.—The individuals designated
6 under paragraph (2) shall meet not later than 120
7 days after the date on which all such individuals are
8 designated and not less frequently than every 120
9 days thereafter to—

10 (A) review the progress of the program
11 under paragraph (1); and

12 (B) make recommendations on future ac-
13 tivities to occur subsequent to the meeting.

14 (b) GRANTS, CONTRACTS, COOPERATIVE AGREE-
15 MENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS,
16 AND FIELD WORK PROPOSALS.—

17 (1) ASSISTANCE AND COORDINATION.—The
18 Secretary may award grants or contracts to, or enter
19 into cooperative agreements with, institutions of
20 higher education and industrial enterprises to—

21 (A) conduct basic and applied research to
22 identify, explore, assess, and develop gas hy-
23 drate as a source of energy;

1 (B) assist in developing technologies re-
2 quired for efficient and environmentally sound
3 development of gas hydrate resources;

4 (C) undertake research programs to pro-
5 vide safe means of transport and storage of gas
6 produced from gas hydrates;

7 (D) promote education and training in gas
8 hydrate resource research and resource develop-
9 ment;

10 (E) conduct basic and applied research to
11 assess and mitigate the environmental impacts
12 of hydrate degassing (including both natural
13 degassing and degassing associated with com-
14 mercial development); and

15 (F) develop technologies to reduce the
16 risks of drilling through gas hydrates.

17 (2) COMPETITIVE MERIT-BASED REVIEW.—
18 Funds made available under paragraph (1) shall be
19 made available based on a competitive merit-based
20 process.

21 (c) CONSULTATION.—The Secretary may establish an
22 advisory panel consisting of experts from industry, institu-
23 tions of higher education, and Federal agencies to—

24 (1) advise the Secretary on potential applica-
25 tions of gas hydrate; and

1 (2) assist in developing recommendations and
2 priorities for the gas hydrate research and develop-
3 ment program carried out under subsection (a)(1).

4 (d) LIMITATIONS.—

5 (1) ADMINISTRATIVE EXPENSES.—Not more
6 than 5 percent of the amount made available to
7 carry out this section for a fiscal year may be used
8 by the Secretary for expenses associated with the ad-
9 ministration of the program carried out under sub-
10 section (a)(1).

11 (2) CONSTRUCTION COSTS.—None of the funds
12 made available to carry out this section may be used
13 for the construction of a new building or the acquisi-
14 tion, expansion, remodeling, or alteration of an exist-
15 ing building (including site grading and improve-
16 ment and architect fees).

17 (e) RESPONSIBILITIES OF THE SECRETARY.—In car-
18 rying out subsection (b)(1), the Secretary shall—

19 (1) facilitate and develop partnerships among
20 government, industry, and institutions of higher edu-
21 cation to research, identify, assess, and explore gas
22 hydrate resources;

23 (2) undertake programs to develop basic infor-
24 mation necessary for promoting long-term interest in
25 gas hydrate resources as an energy source;

1 (3) ensure that the data and information devel-
2 oped through the program are accessible and widely
3 disseminated as needed and appropriate;

4 (4) promote cooperation among agencies that
5 are developing technologies that may hold promise
6 for gas hydrate resource development; and

7 (5) report annually to Congress on accomplish-
8 ments under this section.

9 **SEC. 4. AMENDMENTS TO THE MINING AND MINERALS POL-**
10 **ICY ACT OF 1970.**

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

13 (1) in paragraph (6)—

14 (A) in subparagraph (F), by striking
15 “and” at the end;

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

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

20 “(G) for purposes of this section and sec-
21 tions 202 through 205 only, methane hydrate;
22 and”;

23 (2) by redesignating paragraph (7) as para-
24 graph (8); and

1 (3) by inserting after paragraph (6) the follow-
2 ing:

3 “(7) The term ‘methane hydrate’ means a
4 methane clathrate that—

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

7 “(B) is stable and occurs naturally in
8 deep-ocean and permafrost areas.”.

9 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

10 There are authorized to be appropriated to the Sec-
11 retary of Energy to carry out this Act—

12 (1) \$5,000,000 for fiscal year 2000;

13 (2) \$7,500,000 for fiscal year 2001;

14 (3) \$10,000,000 for fiscal year 2002;

15 (4) \$10,000,000 for fiscal year 2003; and

16 (5) \$10,000,000 for fiscal year 2004.

17 Amounts authorized under this section shall remain avail-
18 able until expended.

19 **SEC. 6. SUNSET.**

20 Section 3 of this Act shall cease to be effective after
21 the end of fiscal year 2004.

Amend the title by striking “methane” and inserting
“gas”.

**H.R. 1753—Gas Hydrate Research and Development Act of 1999
As Amended by the Subcommittee on Energy and Environment
On May 12, 1999**

Section-by-Section Analysis

Section 1. Short Title.

Section 1 cites the Act as the “Gas Hydrate Research and Development Act of 1999.”

Section 2. Definitions.

Section 2 defines: (1) the term “contract” to mean a procurement contract within the meaning of section 6303 of title 31, United States Code (USC); (2) the term “cooperative agreement” to mean a cooperative agreement within the meaning of section 6305 of title 31, USC; (3) the term “Director” to mean the Director of the National Science Foundation (NSF); (4) the term “grant” to mean a grant awarded under a grant agreement, within the meaning of section 6304 of title 31, USC; (5) the term “institution of higher education” to mean an institution of higher education, within the meaning of section 102(a)(1) of the Higher Education Act of 1965; (6) the term “Secretary” to mean the Secretary of Energy; acting through the Assistant Secretary for Fossil Energy; (7) the term “Secretary of Defense” to mean the Secretary of Defense, acting through the Secretary of the Navy; and (8) the term “Secretary of the Interior” to mean the Secretary of the Interior, acting through the Director of the United States Geological Survey (USGS).

Section 3. Gas Hydrate Research and Development Program.

Subsection 3(a) directs the Secretary of Energy to commence of a gas hydrate research and development (R&D) program not later than 180 days after the date of enactment of this Act, in consultation with the Secretaries of Defense and the Interior, and the Director of the NSF. These individuals, or their designees, shall meet not later than 120 days after the date on which all such individuals are designated and not less frequently than every 120 days to review the progress of the program and to make recommendations on future activities.

Subsection 3(b)(1) permits the Secretary to award grants or contracts to, or enter into cooperative agreements with, institutions of higher education and industrial enterprises to—(A) conduct basic and applied research to identify, explore, assess, and develop gas hydrate as a source of energy; (B) assist in developing technologies required for efficient and environmentally sound development of gas hydrate resources; (C) undertake research programs to provide safe means of transport and storage of gas produced from gas hydrates; (D) promote education and training in gas hydrate resource research and resource development; (E) conduct basic and applied research to assess and mitigate the environmental impacts of hydrate degassing (including both natural degassing and degassing associated with commercial development); and (F) develop technologies to reduce the risks of drilling through gas hydrates.

Subsection 3(b)(2) requires that all funds under subsection 3(b)(1) shall be made available based on a competitive merit-review process.

Subsection 3(c) allows the Secretary to establish an advisory panel consisting of experts from industry, institutions of higher education, and Federal agencies to—(A) advise the Secretary on potential applications of gas hydrate; and (B) assist in developing recommendations and priorities for the gas hydrate R&D program carried out under subsection 3(a)(1).

Subsection 3(d) provides limitations on the use of funds made available to carry out the gas hydrate R & D program, including: (1) an administrative expense limit of not more than 5 percent; and (2) a prohibition against any funding being used for either the construction of a new building or alteration of an existing building (including site grading and improvement and architect fees).

Subsection 3(e) lists the responsibilities of the Secretary of Energy in implementing the gas hydrate R&D program, which shall include—(1) facilitating and developing partnerships among government, industry, and institutions of higher education to research, identify, assess, and explore gas hydrate resources; (2) undertaking programs to develop basic information necessary for promoting long-term interest in gas hydrate resources as an energy source; (3) ensuring that the data and information developed through the program are accessible and widely disseminated as needed and appropriate; (4) promoting cooperation among agencies that are developing technologies that may hold promise for gas hydrate resource development; and (5) reporting annually to Congress on accomplishments under this section.

Section 4. Amendment to the Mining and Minerals Policy Act of 1970.

Section 4 amends the definition of “marine mineral resource” in the Mining and Minerals Policy Act of 1970 (P.L. 91-621), as added by the Marine Mineral Resources Research Act of 1996 (P.L. 104-325), to include gas hydrates. It also limits the definition of gas hydrates as a “marine mineral resource” to only that Act.

Section 5. Authorization of Appropriations.

Section 5 authorizes to be appropriated to the Secretary of Energy to carry out this Act—(1) \$5,000,000 for fiscal year (FY) 2000; (2) \$7,500,000 for FY 2001; (3) \$10,000,000 for FY 2002; (4) \$10,000,000 for FY 2003; and (5) \$10,000,000 for FY 2004.

Section 6. Sunset.

Section 6 provides that Section 3 of this Act shall cease to be effective after the end of FY 2004.

Chairman SENSENBRENNER. H.R. 1753, as amended by the Subcommittee on Energy and Environment on May 12, directs the Secretary of Energy in consultation with the Secretaries of Defense and the Interior and the Director of NSF to commence a program of gas hydrate R&D. It authorizes the Secretary of Energy \$5 million for Fiscal Year 2000, \$7.5 million for Fiscal Year 2001, and \$10 million for each of Fiscal Year 2002 through Fiscal Year 2004 to carry out the program.

The bill also authorizes the Secretary of Energy to award grants or contracts to or enter into cooperative agreements with institutions of higher education and industrial enterprises to conduct gas hydrate R&D. It requires that all such awards be made available based upon a competitive merit review process, limits administrative expenses to not more than 5 percent, and prohibits any funds from being used either for the construction of a new building or alteration of an existing building, including site grading and improvement and architect fees.

It allows the Secretary of the Interior to award gas hydrate R&D contracts and grants and enter into cooperative agreements with qualified entities under the Marine Mineral Resources Research Act of 1996 and sunsets the Gas Hydrate R&D Program after the end of Fiscal Year 2004.

STATEMENT OF CHAIRMAN F. JAMES SENSENBRENNER, JR., HOUSE AUTHORIZATION ACT OF 1999

H.R. 1753—GAS HYDRATE RESEARCH AND DEVELOPMENT AUTHORIZATION ACT OF 1999

H.R. 1753, as amended by the Subcommittee on Energy and Environment on May 12, directs 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 gas hydrate R&D. It authorizes the Secretary of Energy \$5.0 million for FY 2000, \$7.5 million for FY 2001, and \$10.0 million for each of FY 2000–FY 2004 to carry out the Program. The bill also:

- Authorizes the Secretary of Energy to award grants or contracts to, or enter into cooperative agreements with, institutions with, institutions of higher education and industrial enterprises to conduct gas hydrate R&D.
- Requires that all such awards shall be made available based on a competitive merit-review process;
- Limits administrative expenses to not more than 5 percent and prohibits any funds from being used for either the construction of a new building or alteration of an existing building (including site grading and improvement and architect fees);
- Allows the Secretary of the Interior to award gas hydrate R&D contracts and grants to, and to enter into cooperative agreements with, qualified entities under the Marine Mineral Resources Research Act of 1996; and;
- Sunsets the gas hydrate R&D program after the end of FY 2004.

Chairman SENSENBRENNER. The Chair yields the balance of his time to the gentleman from California, Mr. Calvert, to make whatever comments he is inspired to.

Mr. CALVERT. Thank you, Mr. Chairman. I didn't think being here in Washington I would advocate more gas, but in this case, I do and recommend its passage.

Chairman SENSENBRENNER. OK. The Chair yields back the balance of his time and recognizes the gentleman from Illinois, Mr. Costello, the Ranking Member of the Subcommittee.

Mr. COSTELLO. Mr. Chairman, thank you.

Mr. Chairman, you have accurately described the bill. I want to commend you and Mr. Doyle for working hard on this legislation and yield the balance of my time to Mr. Doyle.

Chairman SENSENBRENNER. The gentleman from Pennsylvania? Mr. DOYLE. Thank you very much, Mr. Chairman.

Mr. Chairman, I'll be brief. I just would like to express my appreciation for the strong cooperation I've received in working with you, Subcommittee Chairman Ken Calvert, and of course my Ranking Member Jerry Costello, and all the staff involved on both sides.

As you know, methane hydrates, or as we now have decided to refer to them, gas hydrates, are potentially a new source of tremendous amounts of clean burning energy, and I think if you look at things very broadly, this is the kind of far-sighted research that we're all working to promote during our service on the Committee.

I look forward to continuing to work with you, Mr. Chairman and all our colleagues on the Committee to see this bill or similar language put into law.

Thank you, and I yield back my time.

Chairman SENSENBRENNER. Okay. The gentleman's time has expired.

Are there any amendments to the bill?

Hearing none, in order to make the paper record complete, without objection, the amendment in the nature of a substitute adopted by the Subcommittee on Energy and Environment is adopted, and the question is adoption of the bill.

Those in favor will signify by saying aye.

Opposed, no.

The ayes appear to have it. The ayes have it, and the Chair recognizes the gentleman from Illinois, Mr. Costello, for the reporting motion.

Mr. COSTELLO. Mr. Chairman, I move that the Committee favorably report H.R. 1753, as amended, to the House with a recommendation that the bill, as amended, do pass.

Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming amendments and that the Chairman take all necessary steps to bring the bill before the House for consideration.

Chairman SENSENBRENNER. You've heard the motion. Is there any discussion?

The Chair notes the presence of a reporting quorum.

Those in favor of the motion to report the bill favorably will signify by saying aye.

Opposed, no.

The ayes appear to have it. The ayes have it, and the bill is favorably reported.

Without objection, the bill will be reported in the form of a single amendment in the nature of a substitute, incorporating the amendment that was adopted today.

Without objection, members will have two days in which to file additional supplemental minority or dissenting views on the bill, and, without objection, the Chairman will be given permission to make motions in the House to go to conference with the Senate on this legislation.