

# MARINE RENEWABLE ENERGY RESEARCH AND DEVELOPMENT ACT OF 2007

JUNE 21, 2007.—Committed to the Committee of the Whole House on the State of  
the Union and ordered to be printed

Mr. GORDON of Tennessee, from the Committee on Science and  
Technology, submitted the following

## R E P O R T

[To accompany H.R. 2313]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 2313) to establish research, development, demonstration, and commercial application programs for marine renewable energy technologies, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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## I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

### SECTION 1. SHORT TITLE.

This Act may be cited as the “Marine Renewable Energy Research and Development Act of 2007”.

### SEC. 2. FINDINGS.

The Congress finds the following:

- (1) The United States has a critical national interest in developing clean, domestic, renewable sources of energy in order to reduce environmental impacts of energy production, increase national security, improve public health, and bolster economic stability.
- (2) Marine renewable energy technologies are a nonemitting source of power production.
- (3) Marine renewable energy may serve as an alternative to fossil fuels and create thousands of new jobs within the United States.
- (4) Europe has already successfully delivered electricity to the grid through the deployment of wave and tidal energy devices off the coast of Scotland.
- (5) Recent studies from the Electric Power Research Institute, in conjunction with the Department of Energy’s National Renewable Energy Laboratory, have identified an abundance of viable sites within the United States with ample wave and tidal resources to be harnessed by marine power technologies.
- (6) Sustained and expanded research, development, demonstration, and commercial application programs are needed to locate and characterize marine renewable energy resources, and to develop the technologies that will enable their widespread commercial development.
- (7) Federal support is critical to reduce the financial risk associated with developing new marine renewable energy technologies, thereby encouraging the private sector investment necessary to make marine renewable energy resources commercially viable as a source of electric power and for other applications.

### SEC. 3. DEFINITIONS.

For purposes of this Act—

- (1) MARINE RENEWABLE ENERGY.—The term “Marine Renewable Energy” means energy derived from one or more of the following sources:
  - (A) Waves.
  - (B) Tidal flows.
  - (C) Ocean currents.
  - (D) Ocean thermal energy conversion.
- (2) SECRETARY.—The term “Secretary” means the Secretary of Energy.

### SEC. 4. MARINE RENEWABLE ENERGY RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Secretary, in conjunction with other appropriate agencies, shall support programs of research, development, demonstration, and commercial application to expand marine renewable energy production, including programs to—

- (1) study and compare existing marine renewable energy extraction technologies;
- (2) research, develop, and demonstrate advanced marine renewable energy systems and technologies;
- (3) reduce the manufacturing and operation costs of marine renewable energy technologies;
- (4) investigate efficient and reliable integration with the utility grid and intermittency issues;
- (5) advance wave forecasting technologies;
- (6) conduct experimental and numerical modeling for optimization of marine energy conversion devices and arrays;
- (7) increase the reliability and survivability of marine renewable energy technologies, including development of corrosive-resistant materials;
- (8) study, in conjunction with the Assistant Administrator for Research and Development of the Environmental Protection Agency, the Undersecretary of Commerce for Oceans and Atmosphere, and other Federal agencies as appropriate, the environmental impacts of marine renewable energy technologies and ways to address adverse impacts, and provide public information concerning

technologies and other means available for monitoring and determining environmental impacts;

(9) establish protocols, in conjunction with the National Oceanic and Atmospheric Administration, for how the ocean community may best interact with marine renewable energy devices;

(10) develop power measurement standards for marine renewable energy;

(11) develop identification standards for marine renewable energy devices;

(12) address standards development, demonstration, and technology transfer for advanced systems engineering and system integration methods to identify critical interfaces; and

(13) utilize marine resources in the Gulf of Mexico, the Atlantic Ocean, and the Pacific Ocean.

(b) **SITING CRITERIA.**—The Secretary, in conjunction with other appropriate Federal agencies, shall develop, prior to installation of any technologies under this section, siting criteria for marine renewable energy generation demonstration and commercial application projects funded under this Act.

#### **SEC. 5. NATIONAL MARINE RENEWABLE ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION CENTERS.**

(a) **CENTERS.**—The Secretary, acting through the National Renewable Energy Laboratory, shall award grants to institutions of higher education (or consortia thereof) for the establishment of 1 or more National Marine Renewable Energy Research, Development, and Demonstration Centers. In selecting locations for Centers, the Secretary shall consider sites that meet one of the following criteria:

(1) Hosts an existing marine renewable energy research and development program in coordination with a public university engineering program.

(2) Has proven expertise to support environmental and policy-related issues associated with harnessing of energy in the marine environment.

(3) Has access to and utilizes the marine resources in the Gulf of Mexico, the Atlantic Ocean, or the Pacific Ocean.

The Secretary may give special consideration to historically black colleges and universities and land grant universities that also meet one of these criteria. In establishing criteria for the selection of Centers, the Secretary shall coordinate with the Undersecretary of Commerce for Oceans and Atmosphere on the criteria related to advancing wave forecasting technologies, studying the compatibility with the environment of marine renewable energy technologies and systems, and establishing protocols for how the ocean community best interacts with marine renewable energy devices and parks.

(b) **PURPOSES.**—The Centers shall advance research, development, demonstration, and commercial application of marine renewable energy through a number of initiatives including for the purposes described in section 4(1) through (13), and shall serve as an information clearinghouse for the marine renewable energy industry, collecting and disseminating information on best practices in all areas related to developing and managing enhanced marine renewable energy systems resources.

(c) **DEMONSTRATION OF NEED.**—When applying for a grant under this section, an applicant shall include a description of why Federal support is necessary for the Center, including evidence that the research of the Center will not be conducted in the absence of Federal support.

#### **SEC. 6. APPLICABILITY OF OTHER LAWS.**

Nothing in this Act shall be construed as waiving the applicability of any requirement under any environmental or other Federal or State law.

#### **SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to the Secretary to carry out this Act \$50,000,000 for each of the fiscal years 2008 through 2012, except that no funds shall be appropriated under this section for activities that are receiving funds under section 931(a)(2)(E)(i) of the Energy Policy Act of 2005 (42 U.S.C. 16231(a)(2)(E)(i)).

## **II. PURPOSE**

The purpose of the H.R. 2313 is to establish research, development, demonstration, and commercial application programs for marine renewable energy technologies, including the establishment of one or more National Centers for Marine Renewable Energy Research, Development, and Demonstration.

### III. BACKGROUND AND NEED FOR THE LEGISLATION

For purposes of H.R. 2313, Marine Renewable Energy refers to energy that can be extracted from ocean waves, tidal flows, ocean currents, or ocean thermal gradients. (In some contexts the term may also encompass offshore wind developments, but that is beyond the scope of H.R. 2313.) Although envisioned primarily as a means of electric power production, there is potential for marine energy technologies to provide other services, such as desalination of sea water or cold-water air conditioning onshore. At the Secretary's discretion, these additional applications of marine renewable energy technologies, in addition to electric power generation, may be covered by the research, development, demonstration, and commercial application programs established in H.R. 2313.

Moving water contains a high energy concentration, measured in watts per meter (for waves) or watts per square meter (for tides and currents), compared with other renewable energy resources, such as wind and solar. This creates an opportunity to extract comparable amounts of energy with a smaller apparatus. Other benefits of marine renewable energy include the vast size of the resource (the Electric Power Research Institute has estimated that marine renewables could provide 10 percent of United States electricity needs); it is a domestic resource; it is a predictable resource (waves can be predicted as far as three days in advance, and all other marine renewables can be predicted indefinitely into the future); there are no fuel costs; it is non-emitting source of power production; and the devices have a low profile, which makes them unlikely to incur opposition on aesthetic grounds (unlike some offshore wind installations).

The challenge lies in developing technologies to effectively and efficiently harness the energy contained in ocean movement or thermal gradients. The potential of marine renewable energy technologies has been debated for many years, but they now appear poised for a technological breakthrough. Prototypes or small pilot installations have recently been installed and hooked into the power grid in Australia, Portugal, the United Kingdom, and the United States.

National governments in Europe and Australia are aggressively supporting their nascent, domestic marine renewable energy technology companies, motivated primarily by the potential of these technologies to provide electric power production without greenhouse gas emissions. (Australia is also highly interested in desalination services). In contrast, the United States currently provides no federal support for marine renewable energy technology research and development.

H.R. 2313 would provide federal support for research, development, demonstration, and commercial application of marine renewable energy technologies to ensure that U.S. companies have the support they need to bring their technologies to commercial viability and can be competitive in this emerging global market. The bill would also provide support to ensure that emerging technologies are developed in an environmentally sensitive way. Finally, the bill instructs the Secretary to establish one or more National Centers for Marine Renewable Energy Research, Development, and Demonstration facilities where researchers and developers of marine re-

newable energy technologies could easily research and test their technologies in a facility at an environmentally screened location with an established grid connection.

#### IV. HEARING SUMMARY

The Energy and Environment Subcommittee held a hearing on Thursday, May 17, 2007 to hear testimony on H.R. 2313 (and also H.R. 2304, The Advanced Geothermal Energy Research and Development Act of 2007) from the following witnesses:

- Dr. Annette von Jouanne, Professor of Energy Systems and Power Electronics in the School of Electrical Engineering and Computer Science at Oregon State University (OSU). Dr. von Jouanne also leads the Wave Energy program at OSU.
- Mr. Sean O'Neill, President of the Ocean Renewable Energy Coalition (OREC), a trade association representing the marine renewable energy industry.
- Mr. Nathanael Greene, a Sr. Energy Policy Specialist with the Natural Resources Defense Council with expertise in utility regulation, renewable energy, energy taxes, energy efficiency, and the environmental impacts of energy production.

The following witnesses testified at the hearing, but their testimony was directed to H.R. 2304, The Advanced Geothermal Energy Research and Development Act of 2007.

- Dr. Jefferson Tester, the HP Meissner Professor of Chemical Engineering at the Massachusetts Institute of Technology, an internationally recognized expert in Enhanced Geothermal Systems, and chair of the MIT-led panel that produced the report: The Future of Geothermal Energy, released in January, 2007.
- Mr. Paul Thomsen, Public Policy Manager for Ormat Technologies, Inc., a leading provider of geothermal exploration, development, and power conversion technologies. Mr. Thomsen testified on behalf of both Ormat and the Geothermal Energy Association.

#### V. COMMITTEE ACTIONS

On May 15, 2004, Science and Technology Committee Member Rep. Darlene Hooley, for herself, Science and Technology Committee Member Rep. Dana Rohrabacher, and Rep. Jay Inslee introduced H.R. 2313, the Marine Renewable Energy Research and Development Act of 2007.

The Subcommittee on Energy and Environment met to consider H.R. 2313 on June 6, 2007 and consider the following amendment to the bill:

1. On behalf of Mr. Lampson, which strengthens the provision for studying the environmental impacts of marine renewable energy technologies and ways to address adverse environmental impacts; directs the Secretary to provide public information concerning technologies and other means available for monitoring and determining environmental impacts; and affirms the applicability of all Federal and State laws, including environmental laws and permitting requirements, to projects funded under this Act. The amendment was agreed to by voice vote.

Following consideration of the amendment, the bill, as amended, was passed by voice vote.

Mr. Inglis then moved that the Subcommittee favorably report the bill, H.R. 2313, to the full Committee on Science and Technology. The motion was agreed to by voice vote.

The Committee on Science and Technology met to consider H.R. 2313 on June 13, 2007 and considered the following amendments to the bill:

1. On behalf of Ms. Hooley, which, in addition to changes of a technical nature, instructs the Secretary to develop siting criteria for marine renewable energy projects funded under this Act prior to their installation. The amendment was agreed to by voice vote.

The following two amendments were offered and considered en bloc:

2. On behalf of Mr. Diaz-Balart, which requires the Secretary to coordinate with the Undersecretary of Commerce for Oceans and Atmosphere on certain criteria for the selection of marine renewable energy centers. The amendment was agreed to by voice vote.

3. On behalf of Mr. Diaz-Balart, which requires the participation of the Undersecretary of Commerce for Oceans and Atmosphere in the study on environmental impacts and the participation of NOAA in establishing protocols for interactions between the ocean community and devices. The amendment was agreed to by voice vote.

4. On behalf of Mr. Bartlett, which expands on the instructions to the Secretary to increase the reliability and survivability of marine renewable energy technologies by including the “development of corrosive-resistant materials”. The amendment was agreed to by voice vote.

5. On behalf of Mr. Hall, which expands the eligibility criteria for institutions to qualify for consideration to host a national marine renewable energy RD&D center, and also instructs the Secretary to utilize marine resources in the Atlantic, Pacific, and the Gulf of Mexico. The amendment was agreed to by voice vote.

6. On behalf of Mr. Smith, which adds “algal biomass” to the list of resources considered as a source of marine renewable energy under the Act. The amendment was offered and withdrawn after a colloquy.

7. On behalf of Mr. Gingrey, which prohibits funding under this Act for “ocean energy, including wave energy” programs already receiving funds under the authorization contained in the Energy Policy Act of 2005. The amendment was agreed to by voice vote.

8. On behalf of Mr. Akin, which requires applicants for marine renewable energy RD&D centers to include in their applications a description of why Federal support is necessary and evidence that the proposed research would not be conducted without Federal support. The amendment was agreed to by voice vote.

Following consideration of the amendments, the bill, as amended, was passed by voice vote.

Mr. Hall then moved that the committee favorably report the bill, H.R. 2313, as amended, to the House for consideration. The motion was agreed to by a voice vote.

#### VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL, AS REPORTED

H.R. 2313 authorizes \$50 million a year for each of the fiscal years 2008–2012 (a total of \$250 million) to fund research, development, demonstration, and commercial application of marine renewable energy technologies. The bill instructs the Secretary to support

research, development, demonstration, and commercial application to expand marine renewable energy production; to support programs to reduce the manufacturing and operation costs of marine renewable energy technologies; investigate integration of such technologies with the grid; advance wave forecasting technologies; optimize marine renewable energy technology devices and arrays; increase their reliability and survivability; coordinate with the EPA to study the environmental impact of marine renewable energy technologies and ways to address adverse impacts; establish protocols for how the ocean community may best interact with marine renewable energy devices; develop power measurement standards; develop identification standards; address standards development, demonstration, and technology transfer; utilize marine resources in the Gulf of Mexico, the Atlantic, and Pacific; and establish siting criteria for marine renewable energy technologies. The bill also instructs the Secretary to make grants to institutions of higher education for the establishment of one or more National Marine Renewable Energy Research, Development, and Demonstration Centers.

## VII. SECTION-BY-SECTION ANALYSIS

### *Section 1. Short title*

Act may be cited as the “Marine Renewable Energy Research and Development Act of 2007”.

### *Section 2. Findings*

Marine renewable energy sources—including waves, tidal flows, ocean currents, and thermal gradients—are clean, renewable, domestic sources of energy that have the potential to provide significant amounts of electricity to the nation’s power grid. Technologies designed to harness marine energy sources are already providing grid power in Europe. Recent studies have identified an abundance of viable sites for marine renewable energy production in coastal areas of the United States, but expanded research and development is necessary to further develop the related technologies and hasten their commercial application. Federal support can be instrumental in hastening the development of marine renewable energy technologies and reducing the risk of investing in these areas.

### *Section 3. Definitions*

Provides definitions for the following terms used in the Act: “Marine Renewable Energy” (includes usable energy derived from waves, tidal flows, ocean currents, and thermal gradients), and “Secretary”.

### *Section 4. Marine renewable energy research and development*

Instructs the Secretary to support programs of research, development, demonstration, and commercial application of energy production from renewable marine resources. Specific areas of activity shall include programs to: study and compare existing marine renewable energy extraction technologies; research, develop, and demonstrate advanced marine renewable energy systems and technologies; reduce the manufacturing and operation costs of marine renewable energy technologies; integrate such marine renewable

energy technologies with the grid; advance wave forecasting technologies; optimize marine renewable energy technology devices and arrays; increase the reliability and survivability of marine renewable energy devices; study the environmental impact of marine renewable energy technologies and ways to address adverse impacts; establish protocols for how the ocean community may best interact with marine renewable energy devices; develop power measurement standards; develop identification standards; identify critical interfaces in systems incorporating marine renewable energy technologies; and utilize marine resources in the Gulf of Mexico, the Atlantic Ocean, and the Pacific Ocean.

Section 4 also instructs the Secretary, in conjunction with other appropriate Federal agencies, to develop siting criteria for marine renewable energy technologies. Such criteria must be developed prior to installation of any projects funded under this Act. It is the intent of the Committee that such criteria shall include stringent, risk-averse environmental criteria designed to protect marine life, including fish and marine mammals. Appropriate Federal agencies with which the Secretary should coordinate in developing environmental siting criteria should include NOAA, NOAA Fisheries, the Environmental Protection Agency, and any others that the Secretary deems appropriate.

In addition to addressing environmental sensitivity, siting criteria should also address the suitability of locations for producing energy, the potential for interference with marine navigation, the possibility of interfering with the commercial or recreational use of the ocean, and other issues that the Secretary, in consultation with appropriate agencies, deems appropriate.

The Committee further recognizes that each type of technology has different design characteristics and, as such, should be subject to technology-specific siting criteria. Siting criteria should be developed for each different technology type. For example, the siting criteria for underwater axial-flow turbines designed to harness tidal flows should be different from the siting criteria for point absorber devices designed to harness wave energy.

#### *Section 5. Marine renewable energy research and demonstration centers*

Instructs the Secretary to establish one or more Centers for the research, development, and demonstration of marine renewable energy technologies. The Center(s) is/are intended as a research, development, and demonstration facility/facilities located in an environmentally suitable area(s), subject to all relevant Local, State, and Federal permitting requirements. The Center(s) will be a facility/facilities where prototype marine renewable energy technologies can be easily integrated into the grid, studied, and tested in real-world conditions. The Center(s) will also serve as an information clearinghouse(s), collecting and disseminating scientific and technological data relevant to marine renewable energy development for the benefit of the research community and the industry.

The Center(s) is/are intended to be established under the auspices of a suitable university program(s), but should be available to both the research community and private sector developers, on terms to be established by the Secretary and the host university/universities.



The location for the Center(s) is/are to be chosen from among candidate sites that meet one or more of several criteria specified in the bill. As the purpose of the facility/facilities is intended to be of a technical nature, some demonstrated expertise and capability in marine renewable energy research and development will be essential.

The bill provides the Secretary with the authority to establish more than one Center, if necessary, because it could be that no single location is appropriate for researching energy extraction from all of the different types of marine renewable energy resources covered by the bill: waves, tidal flows, ocean currents, and ocean thermal energy conversion. The determination of the size, location, and number of Center(s) will be at the Secretary's discretion.

*Section 6. Applicability of other laws*

Affirms the applicability of all requirements under Federal and State laws, including environmental laws, to projects undertaken under this Act.

*Section 7. Authorization of appropriations*

Authorizes appropriations of \$50,000,000 for each of the fiscal years 2008 through 2012.

VIII. COST ESTIMATE

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 and Technology prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 2313 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 2313 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

IX. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

*H.R. 2313—Marine Renewable Energy Research and Development Act of 2007*

Summary: H.R. 2313 would authorize the appropriation of \$250 million over the 2008–2012 period for the Department of Energy (DOE) to support research and development programs that expand the production of marine renewable energy. Marine renewable energy includes energy derived from waves, tidal flows, ocean currents, and ocean thermal energy conversion. Additionally, funds authorized to be appropriated under the bill would be used to make grants to institutions of higher education to establish National Marine Renewable Energy Research, Development, and Demonstration Centers that would advance research on marine renewable energy and act as an information clearinghouse for industry. CBO estimates that implementing H.R. 2313 would cost \$220 million over the 2008–2012 period, assuming the appropriation of the specified

funds. Enacting H.R. 2313 would have no effect on direct spending or revenues.

H.R. 2313 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would benefit public institutions of higher education.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 2313 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—				
	2008	2009	2010	2011	2012
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Authorization Level .....	50	50	50	50	50
Estimated Outlays .....	28	42	50	50	50

Basis of estimate: For this estimate, CBO assumes that the bill will be enacted near the end of fiscal year 2007 and that the amounts authorized by the bill will be appropriated for each fiscal year.

H.R. 2313 would authorize the appropriation of \$50 million for each of fiscal years 2008 through 2012 for the research and development of marine renewable energy, including energy derived from waves, tidal flows, ocean currents, and ocean thermal energy conversion. The legislation would direct the Secretary of Energy to support programs studying existing and potential marine energy technologies, including potential environmental impacts, as well as methods to reduce manufacturing costs, increase reliability and survivability, and integrate such technologies into the existing utility grid. Based on information from DOE, CBO expects that funds authorized by the bill would be used to establish new programs within the department for these activities.

H.R. 2313 would also award grants to institutions of higher education to establish National Marine Renewable Energy Research, Development, and Demonstration Centers. Such centers would research and develop marine renewable energy technologies, including their demonstration and commercial application. The centers also would serve as information clearinghouses by collecting and disseminating information on best practices to develop and manage marine renewable energy resources.

Based on the historical spending patterns of DOE research and development programs, CBO estimates that implementing H.R. 2313 would cost \$28 million in 2008 and \$220 million over the 2008–2012 period. Such costs would be subject to appropriation of the specified funds.

Intergovernmental and private-sector impact: H.R. 2313 contains no intergovernmental or private-sector mandates as defined in UMRA and would benefit participating public institutions of higher education. The bill would authorize grants for establishing one or more national centers for researching and developing marine renewable energy. These centers would serve as information clearinghouses for the marine renewable energy industry and would be located at institutions of higher education. Any costs incurred by public entities, as conditions of receiving assistance, would be incurred voluntarily.

Estimate prepared by: Federal Costs: Daniel Hoople; Impact on State, Local, and Tribal Governments: Neil Hood; Impact on the Private Sector: Amy Petz.

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

#### X. COMPLIANCE WITH PUBLIC LAW 104-4

H.R. 2313 contains no unfunded mandates.

#### XI. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The oversight findings and recommendations of the Committee on Science and Technology are reflected in the body of this report.

#### XII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c) of House rule XIII, the goal of H.R. 2313 is to advance marine renewable research and development through federal programs of research, development, demonstration, and commercial application to expand the use of marine renewable energy production from marine renewable energy technology systems and the establishment of national marine renewable energy research, development, and demonstration centers.

#### XIII. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 2313.

#### XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 2313 does not establish nor authorize the establishment of any advisory committee.

#### XV. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 2313 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. EARMARK IDENTIFICATION

H.R. 2313 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9(d), 9(e), or 9(f) of rule XXI.

#### XVII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

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

The bill does not change existing law.

#### XIX. COMMITTEE RECOMMENDATIONS

On June 13, 2007, the Committee on Science and Technology favorably reported H.R. 2313, as amended, by a voice vote and recommended its enactment.



**XX. PROCEEDINGS OF THE MARKUP BY THE  
SUBCOMMITTEE ON ENERGY AND ENVIRON-  
MENT ON H.R. 2313, THE MARINE RENEW-  
ABLE ENERGY RESEARCH AND DEVELOP-  
MENT ACT OF 2007**

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**WEDNESDAY, JUNE 6, 2007**

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

The Subcommittee met, pursuant to call, at 9:44 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Nick Lampson [Chairman of the Subcommittee] presiding.

Chairman LAMPSON. Good morning. The Subcommittee on Energy and Environment will come to order. Pursuant to notice, the Subcommittee on Energy and Environment meets to consider the following measures: H.R. 906, the *Global Change Research and Data Management Act of 2007*; H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*; and H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

We will now proceed with the markup beginning with opening statements, and I will begin.

Today the Subcommittee will consider three bills: H.R. 906, the *Global Change Research and Data Management Act*; H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*; and H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

First, we will take up H.R. 906, the *Global Change Research and Data Management Act of 2007*, which will re-orient the current interagency climate research program to produce information that supports efforts of resource managers, businesses and individuals to understand and reduce our vulnerability to extreme weather events and climate change.

The U.S. Global Change Research Program has been in existence in some form since the late 1970s. This important program has vastly expanded our knowledge of Earth's land, water and atmospheric systems. However, fires, droughts, hurricanes and other natural events have highlighted our increasing vulnerability to extreme weather and climate changes. With better planning and implementation adaptation strategies, these costs can be reduced.

Next, we will consider two pieces of legislation to expand our country's renewable energy portfolio in the areas of geothermal and ocean power. These resources are both potentially vast in size and have potential to provide clean power at competitive rates but they require support to advance to the stage of commercial viability.

H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*, would reinvigorate geothermal research and development in this country. It would provide support and guidance for researchers to develop technologies capable of tapping into the vast quantities of thermal energy that is stored in the Earth's crust.

H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*, would support renewable energy development by exploiting the energy of ocean tides and currents. Today this promising industry is at roughly the same development stage that wind was back 20 years ago. With the support provided by this bill, this industry is poised to grow into a significant contributor of clean electricity to our nation's power grid.

In short, these bills are about addressing overlooked opportunities in our collective efforts to create good American jobs, diversify our energy supply, increase our security and reduce the environmental impact of energy production. All three pieces of legislation are important to our environment and our economy. Therefore, I urge their passage and I look forward to getting them to the House Floor.

[The prepared statement of Chairman Lampson follows:]

#### PREPARED STATEMENT OF CHAIRMAN NICK LAMPSON

Today, the Subcommittee we will consider three bills, H.R. 906, the *Global Change Research and Data Management Act*; H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*; and H.R. 2313, the *Marine Renewable Energy Research and Development Act*.

First, we will take up H.R. 906, the *Global Change Research and Data Management Act of 2007*, which will re-orient the current interagency climate research program to produce information that supports efforts of resource managers, businesses, and individuals to understand and reduce our vulnerability to extreme weather events and to climate change.

The U.S. Global Change Research Program has been in existence in some form since the late 1970s. This important program has vastly expanded our knowledge of Earth's land, water, and atmospheric systems.

However, fires, droughts, hurricanes, and other natural events have highlighted our increasing vulnerability to extreme weather and climate changes. With better planning and implementation of adaptation strategies these costs can be reduced.

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H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*, would support renewable energy development by exploiting the energy of ocean tides and currents.

Today, this promising industry is at roughly the same developmental stage that wind was at 20 years ago. With the support provided by this bill, this industry is poised to grow into a significant contributor of clean electricity to our nation's power grid.

In short, these bills are about addressing overlooked opportunities in our collective efforts to create good American jobs, diversify our energy supply, increase our security, and reduce the environmental impact of energy production.

All three pieces of legislation are important to our environment and our economy. Therefore, I urge their passage, and look forward to getting them to the House Floor.

Chairman LAMPSON. At this time I will recognize Mr. Inglis to present his opening remarks.

Mr. INGLIS. Thank you, Mr. Chairman, and thank you for holding this markup.

I am happy to be a co-sponsor of Mr. Udall's bill, the *Global Change Research and Data Management Act*. For a number of years, the U.S. Global Research Program has coordinated a successful interagency research program on global environmental change and implications of a changing climate for society. H.R. 906 continues support for this research and makes that research user-friendly for federal, State and local decision-makers who are tasked with the job of creating policies that address the challenges associated with climate change.

We also have an opportunity to address the development of clean, renewable energy sources in today's markup of H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*, and H.R. 2313, the *Marine Renewable Energy Research and Development Act*. Geothermal and marine-related energy should be sources of energy for us and I am looking forward to promoting research that will make these alternatives commercially feasible. I hope we can build on what we have already learned and that experience scientists in that program have already achieved and move forward to even greater use of these sources of energy.

And Mr. Chairman, I hope that by the time that we have concluded opening statements, that more Members will appear from the Republican conference that is still underway, and when they do, I suppose we will have a quorum for votes on these bills.

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Thank you for holding this markup, Mr. Chairman.

I'm happy to be a co-sponsor of Mr. Udall's bill, the *Global Change Research and Data Management Act*. For many years, the United States Global Research Program has coordinated a successful interagency research program on global environment change and implications of a changing climate for society. H.R. 906 continues support for this research, and makes that research "user-friendly" for federal, State, and local decision-makers who are tasked with the job of creating policies that address the challenges associated with climate change.

We also have an opportunity to address the development of clean, renewable energy sources in today's markup of H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*, and H.R. 2313, the *Marine Renewable Energy Research and Development Act*. Geothermal and marine-related energy should be sources of energy for us, and I'm looking forward to promoting research that will make these alternatives commercially affordable. I hope that we can build on what we've already learned and that experienced scientists and other professionals are included so that duplication.

Thank you again, Mr. Chairman, and I look forward to working with you to advance this legislation.

Chairman LAMPSON. We will be ready for the votes when they come in. We may get a little ahead of them.

Without objection, Members may place statements in the record at this point.

We will now consider H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*. I yield myself five minutes to describe this bill.

Just a few weeks ago Ms. Hooley of Oregon and Mr. Rohrabacher of California, both Members of the Full Committee on Science and Technology, introduced H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*. Marine renewable energy resources such as ocean waves, tidal currents, ocean currents and ocean thermal gradients contain significant quantities of clean domestic and renewable energy. One study by the Electric Power Research Institute indicates that ocean power resources on the coast of the United States could provide as much as 10 percent of our nation's electricity. The technologies to harness this power are still in the early stages of development but they show great potential. Federal support at this critical stage will help ensure that these technologies get the resources they need to become commercially viable and that the United States becomes a leader in this emerging global industry. The purpose of H.R. 2313 is to authorize funding for research, development, demonstration and commercial application of marine renewable energy technologies. The bill also authorizes funding for the establishment of one or more National Marine Renewable Research, Development and Demonstration Centers, a facility or facilities for the testing and research of marine renewable energy technology. I would like to thank our colleagues, Representative Hooley and Representative Rohrabacher, for recognizing the great value of this overlooked energy resource and urge my colleagues on the Subcommittee to support this bill.

I will recognize Mr. Inglis to present any remarks on this bill.

Mr. INGLIS. Mr. Chairman, I have seen some of Mr. Rohrabacher's surfing tapes and I can assure you there is enormous energy in those waves, and if you catch one and can turn it into electricity, what an awesome thing, and of course the currents as well, so I am happy that we are advancing this bill because it is a source of energy available to us. It is just a matter of figuring out how to harness it and so hopefully this is a contribution that we here in the Science Committee can make to a future of energy independence for the United States.

Chairman LAMPSON. Thank you, Mr. Inglis. I will now recognize Mr. Baird for five minutes.

Mr. BAIRD. I thank the Chairman. Ms. Hooley had hoped to be here herself to speak but she is under the weather now and asked me if I would offer a few comments as her neighbor just slightly to the north, and both of us have districts that have a large extent of coastline. As has been commented on, there is tremendous power in the ocean. European nations are already harnessing some of that tidal power, current power, et cetera. It is clean, it is renewable. The moon provides much of the source combined with the wind, and if we can use that, we would burn zero petro dollars for that or petroleum. It would help us deal with greenhouse gases and produce a great deal of energy potentially. So I applaud both Ms. Hooley and Mr. Rohrabacher. I too have seen his surfing tapes and he apparently, I recall at a hearing a little bit ago, suggested we use waves as transportation but he only meant for 100 yards at a time or so. But nevertheless, this is, I think, a very innovative and



progressive piece of legislation and I strongly support and commend Ms. Hooley and Mr. Rohrabacher for their initiative and urge passage.

Chairman LAMPSON. Thank you, Mr. Baird, for your comments and for the surfing lesson.

Does anyone else wish to be recognized? Anyone else wish to be recognized?

I ask unanimous consent that the bill is considered as read and open to amendment at any point and that the Members proceed with the amendments in the order of the roster. Without objection, it is so ordered.

The first amendment on the roster is an amendment offered by the Chair. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2313 offered by Mr. Lampson of Texas.

Chairman LAMPSON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for five minutes to explain the amendment.

This amendment was drafted based on input from witnesses at our legislative hearing and suggestions from other experts in the ocean power and environmental communities. Almost all of the changes are simple revisions intended to clarify the language. The only substantive changes contained in this amendment strengthen the environmental provisions of the bill. The amendment strengthens the provision for studying the environmental impacts of marine renewable energy technologies and ways to address adverse environmental impacts. The revised language also directs the Secretary to provide public information concerning technologies and other means available for monitoring and determining environmental impacts.

Finally, this amendment contains language affirming the applicability of all federal and State laws including the environmental laws and permitting requirements to projects funded under this Act. The provisions in this amendment improve the clarity and substance of the original bill. I urge my colleagues to support it.

Is there other discussion on this amendment? Other discussion? If no, then the vote occurs on the amendment. All those in favor, say aye. Those opposed, say no. The ayes have it and the amendment is agreed to. Are there any other amendments? Hearing none, the vote is on the bill, H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*, as amended. All those in favor will say aye. Those opposed, say no. In the opinion of the Chair, the ayes have it. I recognize Mr. Inglis to offer a motion.

Mr. INGLIS. Mr. Chairman, I move that the Subcommittee favorably report H.R. 2313 as amended to the Full Committee. Furthermore, I move that the staff be instructed to prepare Subcommittee legislative report and make necessary technical and conforming changes to the bill as amended in accordance with the recommendations of the Subcommittee.

Chairman LAMPSON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Those opposed, say no. The ayes have it and the bill is favorably reported.

Without objection the motion to reconsider is laid upon the table. Subcommittee Members may submit additional or Minority views on the measure.

I want to thank the Members for their attendance, and this concludes our Subcommittee markup. We are adjourned.

[Whereupon, at 10:25 a.m., the Subcommittee was adjourned.]

## Appendix:

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H.R. 2313, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER

110TH CONGRESS  
1ST SESSION

# H. R. 2313

To establish research, development, demonstration, and commercial application programs for marine renewable energy technologies.

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## IN THE HOUSE OF REPRESENTATIVES

MAY 15, 2007

Ms. HOOLEY introduced the following bill, which was referred to the Committee on Science and Technology

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## A BILL

To establish research, development, demonstration, and commercial application programs for marine renewable energy technologies.

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 “Marine Renewable En-  
5 ergy Research and Development Act of 2007”.

### 6 SEC. 2. FINDINGS.

7 The Congress finds the following:

8 (1) The United States has a critical national in-  
9 terest in developing clean, domestic, renewable  
10 sources of energy in order to reduce other environ-

1 mental impacts of energy production, increase na-  
2 tional security, improve public health, and bolster  
3 economic stability.

4 (2) Marine renewable energy is a nonpolluting  
5 energy resource.

6 (3) Marine renewable energy may serve as an  
7 alternative to fossil fuels and create thousands of  
8 new jobs within the United States.

9 (4) Europe has already successfully delivered  
10 electricity to the grid through the deployment of  
11 wave and tidal energy devices off the coast of Scot-  
12 land.

13 (5) Recent studies from the Electric Power Re-  
14 search Institute, in conjunction with the Department  
15 of Energy's National Renewable Energy Laboratory,  
16 have identified an abundance of viable sites within  
17 the United States with ample wave, tidal, and ther-  
18 mal resources to be harnessed by marine power tech-  
19 nologies.

20 (6) Sustained and expanded research, develop-  
21 ment, demonstration, and commercial application  
22 programs are needed to locate and characterize ma-  
23 rine renewable energy resources, and to develop the  
24 technologies that will enable their widespread com-  
25 mercial development.

(7) Federal support is critical to reduce the financial risk associated with developing new marine renewable energy technologies, thereby encouraging the private sector investment necessary to make marine renewable energy resources commercially viable as a source of electric power and for other applications.

**SEC. 3. DEFINITIONS.**

For purposes of this Act—

(1) **MARINE RENEWABLE ENERGY.**—The term “Marine Renewable Energy” means energy derived from one or more of the following sources:

(A) Waves.

(B) Tidal flows.

(C) Ocean currents.

(D) Ocean thermal energy conversion.

(2) **SECRETARY.**—The term “Secretary” means the Secretary of Energy.

**SEC. 4. MARINE RENEWABLE ENERGY RESEARCH AND DEVELOPMENT.**

The Secretary shall support programs of research, development, demonstration, and commercial application to expand the use of marine renewable energy production from marine renewable energy technology systems, including programs to—

- 1           (1) explore and compare existing marine renew-  
2     able energy extraction technologies;
- 3           (2) research, develop, and demonstrate ad-  
4     vanced marine renewable energy systems and tech-  
5     nologies;
- 6           (3) reduce the manufacturing and operation  
7     costs of marine renewable energy technologies;
- 8           (4) investigate efficient and reliable integration  
9     with the utility grid and intermittency issues;
- 10          (5) advance wave forecasting technologies;
- 11          (6) conduct experimental and numerical mod-  
12     eling for device and marine energy conversion device  
13     array optimization;
- 14          (7) increase the reliability and survivability of  
15     marine renewable energy facilities;
- 16          (8) study the compatibility with the environ-  
17     ment of marine renewable energy technologies and  
18     systems;
- 19          (9) establish protocols for how the ocean com-  
20     munity best interacts with marine renewable energy  
21     devices and parks;
- 22          (10) develop marine renewable energy power  
23     measurement and identification standards; and
- 24          (11) address standards development, dem-  
25     onstration, and technology transfer for advanced

1 systems engineering and system integration methods  
2 to identify critical interfaces.

3 **SEC. 5. NATIONAL MARINE RENEWABLE ENERGY RE-**  
4 **SEARCH, DEVELOPMENT, AND DEMONSTRA-**  
5 **TION CENTERS.**

6 (a) **CENTERS.**—The Secretary, acting through the  
7 National Renewable Energy Laboratory, shall award  
8 grants to institutions of higher education (or consortia  
9 thereof) for the establishment of 1 or more National Ma-  
10 rine Renewable Energy Research, Development, and Dem-  
11 onstration Centers. In selecting locations for Centers, the  
12 Secretary shall choose at least 1 site from among sites  
13 that host an existing marine renewable energy research  
14 and development program in coordination with a public  
15 university engineering program.

16 (b) **PURPOSES.**—The Centers shall advance research,  
17 development, demonstration, and commercial application  
18 of marine renewable energy through a number of initia-  
19 tives including for the purposes described in section 4(1)  
20 through (11), and shall serve as an information clearing-  
21 house for the marine renewable energy industry, collecting  
22 and disseminating information on best practices in all  
23 areas related to developing and managing enhanced ma-  
24 rine renewable energy systems resources.



## 1 SEC. 6. AUTHORIZATION OF APPROPRIATIONS.

2       There are authorized to be appropriated to the Sec-  
3 retary to carry out this Act \$50,000,000 for each of the  
4 fiscal years 2008 through 2012.

○

SECTION-BY-SECTION ANALYSIS OF H.R. 2313,  
MARINE RENEWABLE ENERGY RESEARCH AND  
DEVELOPMENT ACT OF 2007

**Summary**

H.R. 2313 directs the Secretary of Energy to support programs of research, development, demonstration, and commercial application in marine renewable energy technologies. It also establishes National Centers for the testing of marine renewable energy technologies.

**Section-by-Section**

**Section 1. Short Title**

Act may be cited as the “Marine Renewable Energy Research and Development Act of 2007.”

**Section 2. Findings**

Marine energy sources—including waves, tidal flows, ocean currents, and thermal gradients—are clean, renewable, domestic sources of energy that have the potential to provide significant amounts of electricity to the Nation’s power grid. Technologies designed to harness marine energy sources are already providing grid power in Europe. Recent studies have identified an abundance of viable sites for marine energy production in coastal areas of the United States, but expanded R&D is necessary to further develop the related technologies and hasten their commercial application. Federal support can be instrumental in hastening the development of marine renewable energy technologies and reducing the risk of investing in these areas.

**Section 3. Definitions**

Provides definitions for the following terms used in the Act: ‘Marine Renewable Energy’ (includes usable energy derived from waves, tidal flows, ocean currents, and thermal gradients), and ‘Secretary.’

**Section. 4. Marine Renewable Energy Research and Development**

Instructs the Secretary to support programs of research, development, demonstration, and commercial application of marine renewable energy technologies. Areas of activity shall include: studying and comparing existing technologies, developing improved technologies, reducing costs of manufacture and operation, investigating integration with power grid, improving wave forecasting technologies, optimizing placement of devices, increasing reliability and survivability, studying technology compatibility with the environment, protocols for interacting with devices, and developing power measurement standards.

**Section 5. Marine Renewable Energy Research and Demonstration Centers**

Calls for the establishment of one or more Centers for the research, development, and demonstration of marine renewable technologies. Such centers shall serve as permanent installations in environmentally approved areas where prototype technologies can be tested in connection with the power grid. Centers shall also serve as clearinghouses of industry relevant information. Sites for Centers shall be chosen on the basis of accessibility to appropriate marine energy resources and proximity to an existing marine renewable energy research and development program.

**Section 6. Authorization of Appropriations**

Authorizes appropriations of \$50,000,000 for each of the fiscal years 2008 through 2012.

**COMMITTEE ON SCIENCE AND TECHNOLOGY  
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT  
SUBCOMMITTEE MARKUP  
June 6, 2007**

**H.R. 2313 – the Marine Renewable Energy Research and Development  
Act of 2007**

**AMENDMENT ROSTER**

<b>No.</b>	<b>Sponsor</b>	<b>Description</b>	<b>Results</b>
1	Mr. Lampson	Amendment strengthens provisions for studying the environmental impacts of marine renewable energy technologies, and makes other miscellaneous and clarifying changes.	Agreed to by voice vote.

**AMENDMENTS TO H.R. 2313**  
**OFFERED BY MR. LAMPSON OF TEXAS**

Page 1, line 10, strike "other".

Page 2, lines 4 and 5, amend paragraph (2) to read as follows:

- 1           (2) Marine renewable energy technologies are a
- 2           nonemitting source of power production.

Page 2, lines 17 and 18, strike "wave, tidal, and thermal" and insert "wave and tidal".

Page 3, line 21, insert ", in conjunction with other appropriate agencies," after "The Secretary".

Page 4, line 1, strike "explore" and insert "study".

Page 4, lines 12 and 13, strike "device and marine energy conversion device array optimization" and insert "optimization of marine energy conversion devices and arrays".

Page 4, line 15, strike "facilities" and insert "technologies".

Page 4, lines 16 through 18, amend paragraph (8) to read as follows:

1           (8) study, in conjunction with the Assistant Ad-  
 2           ministrators for Research and Development of the  
 3           Environmental Protection Agency, and other Federal  
 4           agencies as appropriate, the environmental impacts  
 5           of marine renewable energy technologies and ways to  
 6           address adverse impacts, and provide public infor-  
 7           mation concerning technologies and other means  
 8           available for monitoring and determining environ-  
 9           mental impacts;

Page 4, line 20, strike "best interacts" and insert  
 "may best interact".

Page 4, line 21, strike "and parks".

Page 4, lines 22 and 23, amend paragraph (10) to  
 read as follows:

10           (10) develop power measurement standards for  
 11           marine renewable energy;

Page 4, line 24, redesignate paragraph (11) as para-  
 graph (12).

Page 4, after line 23, insert the following new para-  
 graph:

12           (11) develop identification standards for marine  
 13           renewable energy devices; and

Page 5, line 20, strike "(11)" and insert "(12)".

Page 6, line 1, redesignate section 6 as section 7.

Page 5, after line 24, insert the following new section:

**1 SEC. 6. APPLICABILITY OF OTHER LAWS.**

2       Nothing in this Act shall be construed as waiving the  
3 applicability of any requirement under any environmental  
4 or other Federal or State law.

## **XXI. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 2313, THE MARINE RENEWABLE ENERGY RESEARCH AND DEVELOPMENT ACT OF 2007**

**WEDNESDAY, JUNE 13, 2007**

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE AND TECHNOLOGY,  
*Washington, DC.*

The Committee met, pursuant to call, at 10:12 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. Pursuant to notice, the Committee meets to consider the following measures: H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*, and H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

We will now proceed with the markup. I begin with a brief statement.

Today the Committee will consider two bills, H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*, introduced by Mr. McNerney, and H.R. 2313, the *Marine Renewable Energy Research and Development Act*, introduced by Ms. Hooley and co-sponsored by Mr. Rohrabacher who has had a great deal of input into this bill. Each of these two bills is designed to expand our country's renewable energy production portfolio. Both geothermal energy and marine energy are enormous resources that have great potential to make significant contributions to meeting our nation's energy needs at a competitive cost. But they require more support for research and development in order to advance to a state of commercial readiness.

Geothermal energy is the energy stored as heat in the Earth's crust. It is a resource of truly vast potential. Yet most of this potential goes untapped due to a lack of resources to develop the technologies that would make geothermal energy widely accessible.

H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*, will build on and expand the existing geothermal energy programs and provide support to develop a wide range of hydrothermal and enhanced geothermal systems. In the process, the bill would reinvigorate geothermal research and development in the United States and elevate geothermal energy to a position as a major contributor to our nation's power production portfolio.

Marine renewable energy technologies today are at a stage of development similar to where wind power was about 20 years ago. The prototype technologies show great promise, and the resource is huge, potentially able to provide as much as 10 percent of our nation's energy needs. But here again, researchers and industry require more support if they are going to move these technologies from the experimental stage to commercial viability. H.R. 2313, the *Marine Renewable Energy Research and Development Act*, is designed to do just that.

Both of these bills are designed to address overlooked opportunities in our efforts to create a 21st century energy policy that emphasizes good American jobs, diversity of supply, increased national security, and reduced environmental impact.

I want to thank my colleagues, Mr. McNerney and Mrs. Hooley for introducing them. I urge their passage and look forward to getting them to the House Floor.

I would also like to make one final comment, and before we get down to business I want to offer my sincere thanks and appreciation to my friend and colleague and our Ranking Member, Mr. Hall, and his colleagues on the Minority side for proposing some very thoughtful, meaningful amendments to today's bills for our consideration.

I cannot guarantee that we will be supporting all of them, but we will definitely be supporting many of them; and the Committee staff informs me that the amendments have contributed significantly to the quality of this legislation.

I think this is another very good example of the bipartisan spirit with which we will strive to conduct the business of the Science and Technology Committee.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Today, the Committee will consider two bills, H.R. 2304, the *Advanced Geothermal Energy Research and Development Act*, introduced by Mr. McNerney, and H.R. 2313, the *Marine Renewable Energy Research and Development Act*, introduced by Ms. Hooley and Mr. Rohrabacher.

Each of these two bills is designed to expand our country's renewable energy production portfolio. Both geothermal energy and marine energy are enormous resources that have great potential to make significant contributions to meeting our nation's energy needs at a competitive cost. But they require support for research and development in order to advance to a state of commercial readiness.

Geothermal energy is the energy stored as heat in the Earth's crust, and it is a resource of truly vast potential. Yet most of this potential goes untapped due to lack of resources to develop the technologies that would make geothermal energy widely accessible.

H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*, will build on and expand the existing DOE geothermal energy program and provide the support to develop a wide range of Hydrothermal and Enhanced Geothermal Systems. In the process, the bill would reinvigorate geothermal research and development in the United States, and elevate geothermal energy to a position as major contributor to our nation's power production portfolio.

Marine renewable energy technologies today are at a stage of development similar to where wind power was about 20 years ago. The prototype technologies show great promise, and the resource is huge, potentially able to provide as much as 10 percent of our nation's electricity needs. But here again, researchers and industry require more support if they are going to move these technologies from the experimental stage to commercial viability. H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*, is designed to do just that.



Both of these bills are designed to address overlooked opportunities in our efforts to create a 21st century energy policy that emphasizes good American jobs, diversity of supply, increased national security, and reduced environmental impact.

I want to thank my colleagues, Mr. McNerney and Ms. Hooley and Mr. Rohrabacher, for introducing them. I urge their passage, and look forward to getting them to the House Floor.

I would like to make one final comment before we get down to business. I want to offer my sincere thanks and appreciation to my friend and colleague, the Ranking Member Mr. Hall, and his colleagues on the Minority side for proposing some very thoughtful amendments to these bills for our consideration today.

I can't guarantee that we'll be supporting all of them, but we will definitely be supporting some of them, and the Committee staff informs me that the amendments have contributed significantly to the quality of this legislation.

I think this is another fine example of the bipartisan spirit with which we strive to conduct the business of the Science and Technology Committee.

Thank you to everyone for your thorough consideration of these important bills, and for your substantive contributions to make them even better.

Chairman GORDON. Now, I recognize Mr. Hall to present his opening statement.

Mr. HALL. Thank you, Mr. Chairman. The two renewable energy research and development bills before us today are two more ways that the Science Committee is going to help to further our country's effort to become energy independent. It is no secret, I am an oil and gas guy. I am from an oil and gas state, fossil fuel state; and for those that think we can do away with fossil fuels are just dreaming. These lights would go out, the stations would stop, roads would not be built. We cannot do without fossil fuels, and there is an attack on energy today in general; and certainly there is an attack on fossil fuels, there is an attack on nuclear, even on wind. I think I would like to see our country do this in conjunction with our renewable and alternative thrust. We still need affordable, reliable energy that comes from fossil fuels while we do research, such as that in the bills we are marking up today in order for our country to continue to be a leader in all the areas in the global community. Both bills are going to spur the use of domestic, renewable resources available to us within our borders and in our waters for the production of energy. While I support the thrust of these bills, I do have some concern with them that will be addressed through amendments.

I have one to the geothermal bill that will address the production of geothermal energy from oil and gas wells and production of geopressured gas resources. It is my understanding that the Chairman is prepared to accept this amendment. He spoke kindly about it, and whether the kind words are going to come into reality remains to be seen. To be continued, I guess. And I thank him for it. In addition, I will be offering an amendment to the ocean energy bill that will expand the areas of the country, parts of the country, that participate in research and development activities on marine renewable energy. I will go into these amendments in further detail as they are brought up for consideration. As always, I look forward to the ensuing debate, and I yield back the balance of my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you, Mr. Chairman. The two renewable energy research and development bills before us today are two more ways the Science Committee is helping to further our country's efforts to become energy independent. It's no secret that I'm an oil and gas guy, and that I fully support increasing our domestic supply of oil and gas. I

would like to see our country do this in conjunction with our renewable and alternatives thrust. We still need affordable, reliable energy that comes from fossil fuels, while we do research such as that in the bills we are marking up today, in order for our country to continue to be a leader in all areas in the global community. Both bills will spur the use of domestic, renewable resources available to us within our borders and in our waters for the production of energy. While I support the thrust of the bills, I do have some concerns with them that will be addressed through amendments.

I have one to the geothermal bill that will address the production of geothermal energy from oil and gas wells and production of geopressured gas resources. It is my understanding that the Chairman is prepared to accept this amendment and I thank him. In addition, I will be offering an amendment to the ocean energy bill that will expand the areas of the country eligible to participate in research and development activities on marine renewable energy. I will go into these amendments in further detail as they are brought up for consideration.

As always, I look forward to the ensuing debate, and I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Hall. I want to confirm two things. One is I am kind, and two, you are from fossil fuel country but you are not a fossil.

Without objection, Members may place statements in the record at this point.

We will now consider H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

I yield to the gentlelady from Oregon, Ms. Hooley, for five minutes to describe her bill.

Ms. HOOLEY. Thank you, Chairman Gordon and Ranking Member Hall and Chairman Lampson for working with me on this very important piece of legislation.

Whether or not you agree with the concept of global warming, there is no disputing that we as a country need to do more to increase the development of renewable energy. Marine renewable energy in its various forms holds a potential to play a pivotal role in increasing the renewable energy portfolio in many parts of the country. That is why I introduced H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*. This bill is designed to infuse much-needed federal dollars into a technology that holds infinite possibilities for energy needs.

H.R. 2313 authorizes \$50 million annually over the next five years for R&D activities associated with marine renewable energy including wave, tidal, ocean current, and ocean thermal energy conversion. The bill also authorizes the Secretary of Energy to establish Centers for marine renewable energy research development and demonstration. These Centers will play a crucial role as we work to advance research and commercial application of marine renewable energy. These Centers will also serve as information clearing houses for marine renewable energy industry. Being able to collect and disseminate accurate information on best practices is critical as the industry tries to navigate the myriad of State and federal regulation, jurisdictional issues, and the inevitable red tape.

Many countries are already a step ahead of the United States when it comes to embracing the potential these renewable energy sources hold. As a result, several countries have been able to successfully deploy commercial marine energy projects, something that the United States has yet to accomplish. In testimony before this committee last month, witnesses stated that the technology, ingenuity, and energy is there and all indications suggest a much

shorter time to commercial viability than experienced by many other renewable technologies. We just need to provide the resources.

There was a time when the idea of deploying commercially viable wind and solar energy projects seemed like a pipe dream, but these technologies now represent the vast majority of the country's renewable energy production outside of hydropower. As the House moves forward with this work on energy independence, I ask that my colleagues consider the potential marine renewable energy and I ask that you support this legislation.

Again, thank you, Mr. Chair, for your leadership on this issue. [The prepared statement of Ms. Hooley follows:]

PREPARED STATEMENT OF REPRESENTATIVE DARLENE HOOLEY

Thank you Mr. Chairman.

I would like to thank Chairman Gordon and Chairman Lampson for working with me to move this very important piece of legislation.

Whether or not you agree with the concept of global warming, there is no disputing that we, as a country, need to do more to increase the development of renewable energy and reduce our dependence on fossil fuels.

Marine renewable energy, in its various forms, holds the potential to play a pivotal role in increasing the renewable energy portfolio in many parts of the country.

This is why I introduced H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

This bill is designed to infuse much needed federal resources into a technology that holds infinite possibilities for our energy needs.

H.R. 2313 authorizes \$50 million annually over the next five years for R&D activities associated with marine renewable energy, including: wave, tidal, ocean current, and ocean thermal energy conversion.

The bill also authorizes the Secretary of Energy to establish centers for Marine Renewable Energy Research, Development and Demonstration.

These centers will play a crucial role as we work to advance research, development, demonstration, and commercial application of marine renewable energy.

These centers will also serve as information clearinghouses for the marine renewable energy industry.

Being able to collect and disseminate accurate information on best practices is critical as the industry tries to navigate the myriad of State and federal laws, regulations, jurisdictional issues, and the inevitable red tape.

One thing I think is key for my colleagues to remember is that research and development of technologies to harness marine energy, has been done primarily by universities and private companies without federal resources.

Many countries are already a step ahead of the U.S. when it comes to embracing the potential these renewable energy sources hold.

As a result, several countries have been able to successfully deploy commercial marine energy projects—something that the U.S. has yet to accomplish.

In testimony before this committee last month, witnesses stated that the technology, ingenuity and energy is there and all indications suggest a much shorter time to commercial viability than experienced by many other renewable technologies—we just need to provide the resources.

There was a time when the idea of deploying commercially viable wind and solar energy projects seemed like a pipe-dream, but these technologies now represent the vast majority of the country's renewable energy production outside of hydropower.

As the House moves forward with its work on Energy Independence, I ask that my colleagues consider the potential marine renewable energy and I ask that you support this legislation.

Again, thank you Mr. Chairman for your leadership on this issue.

Chairman GORDON. Thank you, Ms. Hooley. This is a good bill. I recognize Mr. Hall to present any remarks on the bill.

Mr. HALL. I thank you, Mr. Chairman, for the chance to speak on H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*.

As you know and I think this committee knows I am a very strong supporter of research and development for new energy technologies. I agree with the basic idea of this bill to provide federal support where appropriate for developing marine renewable energy. However, I had some concerns about the details of the bill as reported out of the Energy and Environment Subcommittee and that is why I and my colleagues plan to offer some amendments today. I will discuss my amendments in more detail when it is considered. For now, I want to briefly outline some of my concerns which the staff worked to address prior to this markup.

H.R. 2313 authorizes a research program that will likely receive broad bipartisan support, yet the bill was developed with little consultation with the Minority. I am pleased to hear that a number of the amendments offered by the Minority will be accepted today. However, I would encourage us to try to work on these types of bipartisan issues in a more cooperative fashion early on in the future. Whether the problem with the lack of cooperation is on our side or their side is not important at this time. We just want to cooperate and work with you because we have a Chairman that is working in a bipartisan fashion with us, and we appreciate that.

One issue that I was concerned with and am happy to hear that we are going to be correcting through an amendment is the lack of input by other agencies such as the National Oceanic and Atmospheric Administration that have expertise in ocean and coastal science. It was unclear to me the difference if any between Section 4, Marine Renewable Energy Research and Development, and Section 5 of the National Marine Renewable Energy Research and Development and Demonstration Centers. Section 4 directs that the Secretary of Energy to support 2313, Marine Renewable Energy Research Programs but does not explain how the Secretary should support these programs.

I was also concerned that the language in Section 5 restricts research to one geographic area of the country. I intend to offer an amendment to include all promising geographic areas of the United States for research and development activities. I was encouraged to hear this amendment would also be accepted. I think the concept between the legislation is something many of us on this committee can support. I think the amendments offered by my Republican colleagues will help make this a little bit better legislation.

I have a question for Ms. Hooley or for Counsel, and it may take both of you to answer it and I will give plenty of time for you to give me a good answer. Ms. Hooley, I may be your best friend here because I am going to offer up something that in all likelihood you can outvote me. It will really make you look like you are standing up for the people that sent you here, which you are. But I will take any accommodation should you offer a list of your PAC funds or any other thing I can brag on my grandchildren, whatever you want to do to say thanks to me. But my question to you is, under Section 4 of H.R. 2313, it states that the Secretary shall support programs of research and development, demonstration, and commercial application, to expand the use of marine renewable energy production. Then, and I ask Counsel to watch and listen to me carefully, Section 5 of the bill directs the Secretary to provide grants to institutions of higher education to establish Centers to

advance the research described in Section 4. My question is, is it your intention that the Centers are the only way the Secretary shall support marine renewable energy research? If you want to talk with Counsel there, I would appreciate that. You may need some help in answering that. May—not.

Ms. HOOLEY. What we are looking for is coordination with all of the different agencies, and I think I have an amendment and I know with some of the amendments from the people on your side that this will be spread out. I mean, the only way we are going to make this viable is that everyone cooperate with everyone else. And so that is my intention.

Mr. HALL. So I don't really know if that is a yes or a no, but if it is a no, I might ask what other mechanisms of support do you envision and do you have in your amendments? You have correcting amendments, is that—

Ms. HOOLEY. That is correct.

Mr. HALL.—your intent? Would the Secretary provide grants to universities and not call them Centers? If so, please point out to me which parts of the bill explain how the Secretary should support research outside of the Centers that are established?

Chairman GORDON. With Ms. Hooley's permission—

Ms. HOOLEY. Yes.

Chairman GORDON.—we might ask Counsel to—

Mr. HALL. Yeah, that is great.

Ms. HOOLEY. Go ahead.

Chairman GORDON.—if he would like to address the—

The COUNSEL. Yes, the intent of the Center is to create an established location that, once established, would have undergone environmental vetting and all sighting and permitting requirements and would therefore allow easy sort of slotting in of testing of different prototype technologies in a well-chosen and well-vetted location. It was not intended to make those the only vehicle for funding R&D and ocean and marine power technologies. And so if there are other laboratories or university programs that are located elsewhere, they would certainly qualify for funding.

Mr. HALL. Let me ask you directly. Will the Secretary spend part of the authorization at the DOE labs?

The COUNSEL. It would be at the Secretary's discretion.

Mr. HALL. And could the Secretary then at his discretion provide grants to universities but not call them centers?

The COUNSEL. Yes.

Mr. HALL. And then point out to me which parts of the bill explains how they should support this research outside of establishing Centers. Just direct me to that part.

The COUNSEL. In Section 4, the Secretary, in conjunction with other appropriate agencies, shall support programs of research and development, demonstration and commercial application to expand marine renewable energy production.

Mr. HALL. Mr. Chairman, is it unreasonable to ask you if it remains a little bit unclear to us that we work together to clarify this bill as it moves forward?

Chairman GORDON. If it is unclear to you, clearly you need and deserve an answer and we will continue to do that. Hopefully the

answer will be the one you want, but if not, you still deserve an answer to all your questions.

Mr. HALL. I got a pretty good answer. It is not perfect, but pretty good for a government answer. And I will yield back my question. I thank you for that explanation. I thank Ms. Hooley.

Chairman GORDON. Does anyone else wish to be recognized? Let me just quickly say, and then we will go onto the amendments, that our wave expert, Mr. Rohrabacher, was an original co-sponsor of this bill. He gave a lot of input. But the gentleman raised a point earlier in his comments and that was earlier consultation.

Let me tell you. I remember very well in previous Congresses that bills would be developed in this committee, they would be vetted with outside groups, and then the Minority would get it right before we went to have a markup and we would have amendments, and they would mostly all be voted down. That wasn't a very good process. I don't like that. I didn't like it then. Clearly, amendments are being accepted now. If we had not brought the Minority in well enough, early enough, we need to do a better job. And we will try to do a better job, and I want you to know that I heard your comments on that and—

Mr. HALL. I thank you.

Chairman GORDON.—and we are going to act on it.

Mr. HALL. And that was with a different Chairman and a different Ranking Member.

Chairman GORDON. Right. So I am just not trying to again make accusations but say that we want to do a better job. I can personally understand your concerns, and we are going to try to do a better job.

I ask unanimous consent that the bill is considered as read and open to amendment at any point and that the Members proceed with the amendments in the order on the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by the gentlelady from Oregon. Are you ready to proceed with your amendment?

Ms. HOOLEY. Yes, I have an amendment at the desk.

Chairman GORDON. All right. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2313 offered by Ms. Hooley of Oregon.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

Ms. Hooley is recognized for five minutes to explain the amendment.

Ms. HOOLEY. Thank you, Mr. Chair. This is a very straightforward amendment regarding the sighting of marine renewable energy projects funded under this bill. Simply stated, the amendment creates a subsection to the R&D portion of the bill and requires the Secretary of Energy in conjunction with other appropriate federal agencies developing sighting criteria prior to the installation of demonstration projects funded under the bill. The development of this criteria will ensure that universities and industry are receiving the appropriate guidance needed from the relevant federal agencies prior to moving forward with marine renewable

energy projects. This amendment will also help alleviate concerns that any potential impact of fish, wildlife, and the environment are being addressed as well. This is a good amendment and one that I believe improves the bill, and I urge my colleagues to support it. [The prepared statement of Ms. Hooley follows:]

PREPARED STATEMENT OF REPRESENTATIVE DARLENE HOOLEY

Thank you Mr. Chairman.

This is a very straightforward amendment regarding the siting of marine renewable energy projects funded under this bill.

Simply stated the amendment creates a subsection to the R&D portion of the bill and requires the Secretary of Energy, in conjunction with other appropriate federal agencies, develop siting criteria prior to the installation of demonstration projects funded under this bill.

The development of this criteria will ensure that universities and industry are receiving the appropriate guidance needed from the relevant federal agencies prior to moving forward with marine renewable energy projects.

This amendment will also help alleviate concerns that any potential impacts to fish, wildlife and the environment are being addressed as well.

This is a good amendment and one that I believe improves the bill and I urge my colleagues to support it.

Thank you.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor say aye, opposed no. The yeas have it. The amendment is agreed to.

All right. The second amendment on the roster is offered by the gentleman from Florida, Mr. Diaz-Balart. Are you ready to proceed with your amendment?

Mr. DIAZ-BALART. Yes, sir. Thank you. I have amendments at the desk.

Chairman GORDON. The Clerk will report the amendments.

The CLERK. Amendments to H.R. 2313 offered by Mr. Diaz-Balart of Florida.

Chairman GORDON. I ask unanimous consent that both of these amendments we dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendments.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. I won't take the five minutes, but I appreciate your courtesy. Well, I am not totally convinced that we need to create additional Centers as opposed to tapping those that are already doing it including universities, however, if we are going to do that, I think it is important, and I know the sponsor just mentioned that we at least use those Centers and coordinate those that are already doing it to not try to reinvent the wheel. These amendments are basically very similar to that, that DOE shall coordinate with NOAA on the selection of the Centers and certain criteria including advancing wave forecasting technologies. Again, we don't know as we have heard that NOAA's National Ocean and Science works to observe and understand and manage our nation's coastal and marine resources. So again, NOAA already has the knowledge, the capability, and the expertise in these areas. Therefore, it is only logical for them to play a role in this research and in these selections. So again, it simply insures that we use NOAA's expertise since it is already available and since it is already being paid for by the taxpayer.

[The prepared statement of Mr. Diaz-Balart follows:]

## PREPARED STATEMENT OF REPRESENTATIVE MARIO DIAZ-BALART

This amendment simply ensures that NOAA is consulted in Department of Energy Marine Renewable Energy programs.

This amendment adds the Under Secretary of Commerce for Oceans and Atmosphere (NOAA) as a partner in studying and providing information on the environmental impacts of marine renewable energy technologies.

NOAA is the main agency charged with overseeing the ocean community, and therefore it should be listed with EPA to work in conjunction with DOE on this project.

It ensures that NOAA is effectively coordinating with the DOE on this ocean-related project.

As all well know in this committee, NOAA also is the steward of national coastal and marine environments. NOAA coordinates with local, State, and federal authorities on the best management and usage of these environments.

This amendment would also allow NOAA to work with DOE in establishing procedures for ocean community interaction with marine renewable energy devices.

This expertise is already available. NOAA should be a valuable partner in this project.

Chairman GORDON. And the gentleman, we are taking these amendments en bloc, and so if you would like to go into your third amendment.

Mr. DIAZ-BALART. Again, very similar. The other one basically simply ensures that NOAA's consulted in the Department of Energy and marine renewable energy programs, it ensures that NOAA is effectively coordinated with DOE on this ocean-related project. It adds the Undersecretary of Commerce for Oceans and Atmosphere as a partner in the studying and providing information. So it is basically, Mr. Chairman, again just to make sure that NOAA is consulted and is part of the mix as well.

[The prepared statement of Mr. Diaz-Balart follows:]

## PREPARED STATEMENT OF REPRESENTATIVE MARIO DIAZ-BALART

This amendment is very similar to the amendment that I previously offered.

While I am not totally convinced that we need to create additional Centers to study marine renewable energy, NOAA's expertise in many of these fields should not be overlook.

This amendments states that DOE shall coordinate with NOAA on the selection of the Centers on certain criteria.

Criteria includes:

- advancing wave forecasting technologies
- studying the compatibility of the environment with marine renewable energy technologies and systems
- establishing protocols for how the ocean community best interacts with marine renewable energy devices

Currently, NOAA's National Ocean Service (NOS) works to observe, understand, and manage our nation's coastal and marine resources. They measure and predict coastal and ocean occurrences, and provides tools and information to protect and restore coastal and marine resources.

NOAA already has the knowledge, capability, and expertise in these areas, therefore it's only logical for them to play a role in the selection of these Marine Renewable Energy Centers.

It simply insures that we use NOAA expertise that is already available.

Chairman GORDON. Thank you. Are there any comments on the gentleman's amendments?

Mr. EHLERS. Mr. Chairman, I move to strike the last word.

Chairman GORDON. Mr. Ehlers is recognized for five minutes.

Mr. EHLERS. Thank you, Mr. Chairman. I just wanted to rise and speak in strong support of this amendment. It is essential that NOAA be involved in these issues. There is no other agency in or



out of the Federal Government that has greater knowledge of our marine resources, both physical and biological; and it is essential that they be involved here.

Let me also take a moment, Mr. Chairman, to thank the sponsors of both of these bills we are discussing this morning.

I have been advocating for 30 years that we were going to reach the end of our fossil fuel. I should say cheap fossil fuel era, and it is absolutely essential to look at and try to develop every possible alternative source of energy. These are two examples often overlooked but potentially very useful sources of energy, and I commend the sponsors of the bills. I commend you and the whole Committee for the work in speedily processing these bills.

I yield back the balance of my time.

Chairman GORDON. I am sure Mr. Bartlett would concur with your statement. If there is no further discussion, then the vote is on the amendment. All in favor of the amendments in block say aye, opposed no. The amendment is carried and is agreed to.

The fourth amendment on the roster is offered by the gentleman from Maryland, Mr. Bartlett. Are you ready to proceed with your amendment?

Mr. BARTLETT. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2313 offered by Mr. Roscoe Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. BARTLETT. Thank you, Mr. Chairman. Again, I want to recognize support from both sides of the aisle. It is a very simple amendment. If we are going to be doing development of energy from marine renewable sources, clearly the development of corrosive-resistant materials may be very essential. In those developments, it is a very unique and corrosive environment. So this amendment simply adds to the list of marine renewable energy programs supported, the development of corrosive-resistant materials.

Thank you very much. I yield back.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on this good amendment. All in favor say aye, opposed no. The aye's have it. The amendment is agreed to.

The fifth amendment on the roster is offered by the gentleman from Texas. Are you ready to proceed with your amendment?

Mr. HALL. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2313 offered by Mr. Bartlett.

Chairman GORDON. No, by Mr. Hall. The fifth amendment. Fourth was passed.

The CLERK. Amendment to H.R. 2313 offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, this amendment would change the bill to ensure the resources authorized under the bill were dedicated to the research and development activities that have the most potential for payoff in terms of developing alternative sources of energy. The bill as currently drafted restricts the research and development activities to certain parts of the country establishing a Center in only part of the country. It disregards benefits which could be gained by research in other geographic locations. My amendment would simply replace this approach with a more equitable approach that allows the Secretary to dedicate resources to any research and development programs he believes will yield the best opportunities for new energy sources regardless of which area of the country the site of the research is in. My amendment adds the Gulf of Mexico, the Atlantic Ocean, and the Pacific Ocean as potential new sites for dedication of research and development grant funds. It also adds additional criteria for the Secretary to consider in choosing sites for research and development to ensure that the funds are used for research with the most potential for developing alternative sources of energy utilizing marine resources. We think that makes good common sense. The amendment directs the Secretary to consider sites that meet one of the following criteria. One, host an existing marine renewable energy research and development program in coordination with the public university engineering program. Two, has proven expertise to support environmental and policy-related issues associated with harnessing of energy and marine environment. Three, has access to and utilizes the marine resources in the Gulf of Mexico, the Atlantic Ocean or the Pacific Ocean. My amendment also allows the Secretary to give special consideration, and this was done at my request because I am a member of the board of the longest-standing black college and land-grant university in the Southwest. It also meets one of these criteria. I would like for them to have a shot at it. I urge my colleagues to support this amendment.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on this good amendment. All in favor say aye, opposed no. The aye's have it. The amendment is agreed to.

The sixth amendment on the roster is offered by the gentleman from Nebraska, Mr. Smith. Are you ready to proceed with your amendment?

Mr. SMITH OF NEBRASKA. I am, Mr. Chairman.

Chairman GORDON. And there is an amendment at the desk, and the Clerk will report that amendment.

The CLERK. Amendment to H.R. 2313 offered by Mr. Smith of Nebraska.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain the amendment.

Mr. SMITH OF NEBRASKA. Thank you, Mr. Chairman, and Members. My amendment would add algae biomasses and other form of marine renewable energy and provide the technologies for the pro-

duction of energy from algae biomass would be one of the areas for research and development. Biomass can be efficiently converted to biodiesel and used for many types of internal combustion engines, and algae production rates can be more than five times those of land plants. Furthermore, algae can be grown in many types of marine environment including coastal lakes and ponds, and it is also possible to combine algae production with electric power generation and use the carbon dioxide ways to fuel algae production.

The current language of the bill focuses research on heat energy and kinetic energy. My amendment simply expands this research to include another potential renewable energy source widely available in the oceans. In addition, the amendment allows the Secretary to make a determination to develop resources to the most viable, cost-effective source of marine renewable energy available.

Mr. Chairman, this nation is confronted with the reality that prices for motor fuel continue to rise due to the volatility of the price of foreign supplies of crude oil. Therefore we should be exploring any and all viable forms of research and development in the area of marine renewable energy, whether it is for the production of electricity or motor fuels. This is consistent with our goal of energy independence.

Mr. Chairman, I do plan to withdraw this amendment considering that I have received assurances from you and the Committee to work together to incorporate algae biomass in the biofuels bill to be considered by the Committee in the near future. I look forward to continuing consideration and work on this important issue.

Mr. LAMPSON. Will the gentleman yield?

Mr. SMITH OF NEBRASKA. Yes.

Mr. LAMPSON. If the gentleman would consider doing so, I would greatly appreciate the gentleman from Nebraska raising the issue of biodiesel development from algal biomass. Clearly we need to be looking at multiple feedstocks and platforms for the development of biodiesel and other biofuels. Texas A&M as an example and others have an ongoing research program on the use of algal biomass for biodiesel development, and I am told that this research is progressing well. Though I agree with the gentleman that more research is needed in this area and recognize the need to explore this new and cutting-edge research, I must note that this work would be best addressed in the context of a biofuels bill and not an ocean energy bill. As the gentleman may be aware, tomorrow the Energy and Environment Subcommittee will hold a hearing on the subject of biofuels that will include discussion of a draft bill I released earlier this week. It is my expectation that the Subcommittee will consider this bill shortly.

If the gentleman is to withdraw his amendment today, he has my commitment that as we move forward on biofuels legislation, I will work with him on the issue of biodiesel from algal biomass and try to find the most appropriate way to address the issue in the biofuels legislation. And I yield back my time.

Mr. SMITH OF NEBRASKA. And I thank you. Mr. Chairman, I do withdraw this amendment. Thank you.

[The prepared statement of Mr. Smith follows:]

## PREPARED STATEMENT OF REPRESENTATIVE ADRIAN SMITH

Mr. Chairman and Members of the Committee,

My amendment would add algal biomass as another form of marine renewable energy and provide that technologies for the production of energy from algal biomass should be one of the areas for research and development.

Biomass can be efficiently converted to biodiesel and used for many types of internal combustion engines, and algae production rates can be more than five times those of land plants. Furthermore, algae can be grown in many types of marine environments, including coastal lakes and ponds, and it is also possible to combine algal production with electric power generation and use the carbon dioxide waste to fuel algal production.

The current language of the bill focuses research on heat energy and kinetic energy; my amendment simply expands this research to include another potential renewable energy source widely available in the oceans. In addition, the amendment allows the Secretary to make a determination to devote resources to the most viable, cost-effective source of marine renewable energy available.

Mr. Chairman, this nation is confronted with the reality that prices for motor fuel continue to rise due to the volatility of the price of foreign supplies of crude oil. Therefore we should be exploring any and all viable forms of research and development in the area of marine renewable energy, whether it is for the production of electricity or motor fuels. This is consistent with our goal of energy independence.

Mr. Chairman, I plan to withdraw this amendment. I have received assurances you and the Committee will work with me to incorporate algal biomass in the biofuels bill to be considered by the Committee in the near future, and I look forward to continuing consideration and work on this important issue.

Chairman GORDON. And I thank both gentlemen for a good conclusion to that issue.

The seventh amendment on the roster is offered by the gentleman from Georgia, Mr. Gingrey. Are you ready to proceed with your amendment?

Mr. GINGREY. I am, Mr. Chairman.

Chairman GORDON. And you have an amendment at the desk, and the Clerk will report the amendment.

The CLERK. Amendment to H.R. 2313 offered by Mr. Gingrey of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. GINGREY. Mr. Chairman, thank you. And first of all, let me just say that I think this is a great bill, H.R. 2313. The gentlelady from Oregon, Ms. Hooley, I commend her on bringing this to the Full Committee.

My amendment, Mr. Chairman, and I hope that it will be acted favorably upon, you know, basically is concerned for physical management and a restraint and not duplication. And basically if you look at the *Energy Policy Act of 2005*, here is what I am referring to and this is what it says in one of the sections of EPACT of 2005. The Secretary shall conduct research, development, demonstration, and commercial application programs for energy, ocean energy, including wave energy. This language is actually found in Subtitle C of the *Energy Policy Act of 2005*. So basically, does this mean that in the bill that we are discussing today that the Secretary has to decide between two competing sections of two different bills? So basically this amendment says that you can't spend money at the same time on both programs. So, Mr. Chairman, that in essence is the amendment that I am submitting, and I ask for favorable consideration. And I yield back.

Chairman GORDON. Thank you, Dr. Gingrey. Is there further discussion on the amendment?

Mr. BARTLETT. Mr. Chairman?

Chairman GORDON. Yes, Dr. Bartlett.

Mr. BARTLETT. I would just like to——

Chairman GORDON. Dr. Bartlett is recognized for five minutes.

Mr. BARTLETT. Thank you. I would just like some clarification. In a former life I was a basic researcher, and I very frequently applied for money through grants and contracts from different government organizations to do work on the same general area. And the clarification I would like is, is this to prohibit people from getting duplicate funding to do exactly the same thing? I hope that it wouldn't prohibit them from getting funding from these two different sources to amplify what they are doing.

Mr. GINGREY. In response, if the gentleman will yield. In response to Dr. Bartlett, it is just to keep them from spending the same dollars on the exact same research. I think this is an excellent bill as I said at the outset of my remarks, but the section in EPACT, the *Energy Policy Act of 2005*, essentially allows the same funding and it just simply says that we are not going to, in amending this bill, we are not going to allow duplication of that. I don't know exactly what the gentleman objects to in regard to that, but certainly I would hope that you would be in favor of non-duplication and wasteful spending and have overlapping programs which seem to me as a very inefficient way to spend the taxpayers' dollars.

Mr. BARTLETT. I reclaim my time. I certainly am opposed to having overlapping programs and getting money twice for doing exactly the same thing. I hope that the language in the amendment does not prohibit a person who is getting money under the EPACT authorization from getting money from additional sources because very frequently researchers go to several different sources to get monies to carry out their research and development program.

Mr. GINGREY. If the gentleman will yield? And I don't think that it does that, Dr. Bartlett, and of course, I would be perfectly willing to defer to Counsel in regard to interpretation of that amendment if necessary; but I clearly do not think that it does that.

Mr. BARTLETT. Thank you very much for that clarification.

Chairman GORDON. To Dr. Gingrey and Dr. Bartlett, the Majority tried to vet that amendment, feels like it is a good amendment, and agreed to accept and vote for it. So I feel bound by that. Dr. Bartlett has good first-person real-world knowledge here, and what I think we should do is proceed with the amendment. I would like to continue that discussion. If there needs to be some fine tuning in a manager's amendment later or at conference, then that will be done. But Dr. Bartlett brings valuable information to the table on this.

Is there further discussion? If no, the vote will occur on the amendment. All in favor say aye, those opposed no. The amendment is agreed to.

The eighth amendment on the roster is offered by the gentleman from Missouri, Mr. Akin. Are you ready to proceed with your amendment?

Mr. AKIN. Thank you, Mr. Chairman, yes, and I would likewise compliment you and Mr. Hooley on the bill and on your objectives.

Chairman GORDON. You have an amendment at the desk?

Mr. AKIN. I do have an amendment at the desk.

Chairman GORDON. The Clerk will report that amendment number eight.

The CLERK. Amendment to H.R. 2313 offered by Mr. Akin.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. AKIN. Thank you, Mr. Chairman. This is one of those things that is so common sense I would think that most people that would apply for a grant would do this naturally anyway, but it simply says that when you make the application for the grant that you need to explain why federal support is necessary and give evidence that if the federal support weren't there, that then the project would not receive funding. The point of this is if private people are already funding something, we could get a little bit more squeal out of our nickel federally if we put it into places where there's a project that will not be funded.

So this simply just says you have got to make a justification for why we need to have the federal funding because if the federal funding weren't there, then the project wouldn't be funded. So I think it's kind of a common-sense thing but was offered as a friendly suggestion and improvement to the bill, Mr. Chairman.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on this good amendment. All in favor say aye, opposed no. The aye's appear have it and the amendment is agreed to.

Are there any further amendments? If not, then the vote is on the bill, H.R. 2313 as amended. All those in favor will say aye, all those opposed no. In the opinion of the Chair, the ayes have it.

We have a little bit more to do, but let me just say before we start losing people, thank you for your attendance today. I know that it sometimes sounds a little bit mechanical once we get here, but the reason for that is that there has been a lot of consultation, things have been worked out. As I say, we have made a better bill better. Our friend from the Midwest makes us realize that there is a Midwest and not just an east and west of the Mississippi, Mr. Hall has brought to us an oil-and-gas view, and I thank all of you for being here.

Let me also say, I think we have passed 22 bills out. All 22 have been bipartisan. I hope this one will be unanimous today. And by being unanimous, that means we are all for it, we all should take credit for it; and I thank you and I also take Mr. Hall's earlier advice that we need to do more earlier and we are going to do that. And so now I recognize Mr. Hall to offer a motion.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 2313 as amended to the House with a recommendation that the bill do pass. Furthermore, I move that the staff be instructed to make necessary technical and conforming changes, and that the Chairman take all necessary steps to bring the bill before the House for consideration.

I yield back my time.

Chairman GORDON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye, opposed no. The ayes have it. The bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table. The Members will have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure, ending Monday, June 18, at 9:00 a.m. I move pursuant to clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*, as amended. Without objection, so ordered.

I want to thank the Members for their attendance, and this concludes our markup.

[Whereupon, at 11:25 a.m., the Committee was adjourned.]





## Appendix:

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H.R. 2313, AS AMENDED BY THE SUBCOMMITTEE ON ENERGY AND  
ENVIRONMENT; AMENDMENT ROSTER

**COMMITTEE ON SCIENCE AND TECHNOLOGY  
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT  
REPORT FROM SUBCOMMITTEE MARKUP  
JUNE 6, 2007**

H.R. 2313, THE MARINE RENEWABLE ENERGY RESEARCH  
AND DEVELOPMENT ACT OF 2007

**I. Purpose**

The purpose of the H.R. 2313 is to establish research, development, demonstration, and commercial application programs for marine renewable energy technologies.

**II. Background and Need for Legislation**

For purposes of H.R. 2313, Marine Renewable Energy refers to energy that can be extracted from ocean waves, tidal flows, ocean currents, or ocean thermal gradients. (In some contexts the term may also encompass offshore wind developments, but that is beyond the scope of H.R. 2313.) Although envisioned primarily as a means of electric power production, there is potential for marine energy technologies to provide ancillary services, such as desalination of sea water or cold-water air conditioning onshore.

Moving water contains a high energy concentration, measured in watts per meter (for waves) or watts per square meter (for tides and currents), compared with other renewable energy resources, such as wind and solar. This creates an opportunity to extract comparable amounts of energy with a smaller apparatus. Other benefits of marine renewable energy include the vast size of the resource (the Electric Power Research Institute has estimated that marine renewables could provide 10 percent of the United States' electricity needs); it is a domestic resource; it is a predictable resource (waves can be predicted as far as three days in advance, and all other marine renewables can be predicted indefinitely into the future); there are no fuel costs; it is non-emitting source of power production; and the devices have a low profile, which makes them unlikely to incur opposition on aesthetic grounds (unlike offshore wind installations).

The challenge lies in developing technologies to effectively and efficiently harness the energy contained in ocean movement or thermal gradients. The potential of marine renewable energy technologies has been debated for many years, but they appear to be on the verge of a technological breakthrough. Prototypes or small pilot installations have recently been hooked into the power grid in Australia, Portugal, the United Kingdom, and the United States.

National governments in Europe and Australia are aggressively supporting their nascent marine renewable energy companies, primarily motivated by the potential of these technologies to provide non-emitting electric power production and/or desalination services. In contrast, the United States is currently providing no federal support for marine renewable energy technology research and development.

H.R. 2313 would provide federal support for technology research, development, demonstration, and commercial application to ensure that U.S. companies have the support they need to bring their technologies to commercial viability and can be competitive in this emerging global market. The bill would also provide support to ensure that emerging technologies are developed in an environmentally sensitive way.

**III. Subcommittee Actions**

On May 15, 2004, Science and Technology Committee Member Darlene Hooley, for herself, Rep. Dana Rohrabacher, and Rep. Jay Inslee introduced H.R. 2313, the *Marine Renewable Energy Research and Development Act of 2007*. Since introduction, two additional co-sponsors have signed onto the bill.

The Energy and Environment Subcommittee held a hearing on Thursday, May 17, 2007 to hear testimony on H.R. 2313 (and also H.R. 2304, the *Advanced Geothermal Energy Research and Development Act of 2007*) from the following witnesses:

- **Dr. Annette von Jouanne**, Professor of Energy Systems and Power Electronics in the School of Electrical Engineering and Computer Science at Oregon State University (OSU). Dr. von Jouanne also leads the Wave Energy program at OSU.

- **Mr. Sean O'Neill**, President of the Ocean Renewable Energy Coalition (OREC), a trade association representing the marine renewable energy industry.
- **Mr. Nathanael Greene**, a Sr. Energy Policy Specialist with the Natural Resources Defense Council with expertise in utility regulation, renewable energy, energy taxes, energy efficiency, and the environmental impacts of energy production.
- **Dr. Jefferson Tester**, the HP Meissner Professor of Chemical Engineering at the Massachusetts Institute of Technology, an internationally recognized expert in Enhanced Geothermal Systems, and Chair of the MIT-led panel that produced the report: *The Future of Geothermal Energy*, released in January, 2007.
- **Mr. Paul Thomsen**, Public Policy Manager for Ormat Technologies, Inc., a leading provider of geothermal exploration, development, and power conversion technologies. Mr. Thomsen testified on behalf of both Ormat and the Geothermal Energy Association.

The Subcommittee on Energy and Environment met to consider H.R. 2313 on June 6, 2007 and consider the following amendment to the bill:

1. On behalf of Mr. Lampson which strengthens the provision for studying the environmental impacts of marine renewable energy technologies and ways to address adverse environmental impacts; directs the Secretary to provide public information concerning technologies and other means available for monitoring and determining environmental impacts; and affirms the applicability of all federal and State laws, including environmental laws and permitting requirements, to projects funded under this Act. The amendment was agreed to by voice vote.

Mr. Inglis moved that the Subcommittee favorably report the bill, H.R. 2313, to the Full Committee on Science and Technology. The motion was agreed to by a voice vote.

#### **IV. Summary of Major Provisions of the Bill**

H.R. 2313 authorizes \$50 million a year for each of the fiscal years 2008–2012 (a total of \$250 million) to fund research, development, demonstration, and commercial application of marine renewable energy technologies. The bill specifically instructs the Secretary to support programs to: reduce the manufacturing and operation costs of marine renewable energy technologies, investigate integration of such technologies with the grid, advance wave forecasting technologies, optimize marine renewable technology devices, increase their reliability, coordinate with the EPA to study the environmental impact of marine renewable energy technologies and ways to address adverse impacts, establish protocols for how the ocean community may best interact with marine renewable energy devices, develop power measurement standards, and develop identification standards. The bill also provides for grants to institutions of higher education for the establishment of one or more National Marine Renewable energy Research, Development, and Demonstration Centers.

#### **V. Section-by-Section Analysis of the Bill, as reported by the Subcommittee**

##### **Section 1. Short Title**

Act may be cited as the “Marine Renewable Energy Research and Development Act of 2007.”

##### **Section 2. Findings**

Marine energy sources—including waves, tidal flows, ocean currents, and thermal gradients—are clean, renewable, domestic sources of energy that have the potential to provide significant amounts of electricity to the Nation’s power grid. Technologies designed to harness marine energy sources are already providing grid power in Europe. Recent studies have identified an abundance of viable sites for marine energy production in coastal areas of the United States, but expanded R&D is necessary to further develop the related technologies and hasten their commercial application. Federal support can be instrumental in hastening the development of marine renewable energy technologies and reducing the risk of investing in these areas.

##### **Section 3. Definitions**

Provides definitions for the following terms used in the Act: ‘Marine Renewable Energy’ (includes usable energy derived from waves, tidal flows, ocean currents, and thermal gradients), and ‘Secretary.’

**Section 4. Marine Renewable Energy Research and Development**

Instructs the Secretary to support programs of research, development, demonstration, and commercial application of marine renewable energy technologies. Areas of activity shall include: studying and comparing existing technologies, developing improved technologies, reducing costs of manufacture and operation, investigating integration with power grid, improving wave forecasting technologies, optimizing placement of devices, increasing reliability and survivability, studying technology compatibility with the environment, protocols for interacting with devices, and developing power measurement standards.

**Section 5. Marine Renewable Energy Research and Demonstration Centers**

Calls for the establishment of one or more Centers for the research, development, and demonstration of marine renewable technologies. Such Centers shall serve as permanent installations in environmentally approved areas where prototype technologies can be tested in connection with the power grid. Centers shall also serve as clearinghouses of industry relevant information. Sites for Centers shall be chosen on the basis of accessibility to appropriate marine energy resources and proximity to an existing marine renewable energy research and development program.

**Section 6. Applicability of Other Laws**

Affirms the applicability of all requirements under federal and State laws, including environmental laws, to projects undertaken under this Act.

**Section 7. Authorization of Appropriations**

Authorizes appropriations of \$50,000,000 for each of the fiscal years 2008 through 2012.

**H.R. 2313, AS AMENDED BY THE SUBCOMMITTEE  
ON ENERGY AND ENVIRONMENT**

On June 6, 2007

1 **SECTION 1. SHORT TITLE.**

2       This Act may be cited as the “Marine Renewable En-  
3 ergy Research and Development Act of 2007”.

4 **SEC. 2. FINDINGS.**

5       The Congress finds the following:

6           (1) The United States has a critical national in-  
7 terest in developing clean, domestic, renewable  
8 sources of energy in order to reduce environmental  
9 impacts of energy production, increase national secu-  
10 rity, improve public health, and bolster economic  
11 stability.

12          (2) Marine renewable energy technologies are a  
13 nonemitting source of power production.

14          (3) Marine renewable energy may serve as an  
15 alternative to fossil fuels and create thousands of  
16 new jobs within the United States.

17          (4) Europe has already successfully delivered  
18 electricity to the grid through the deployment of  
19 wave and tidal energy devices off the coast of Scot-  
20 land.

1           (5) Recent studies from the Electric Power Re-  
2       search Institute, in conjunction with the Department  
3       of Energy's National Renewable Energy Laboratory,  
4       have identified an abundance of viable sites within  
5       the United States with ample wave and tidal re-  
6       sources to be harnessed by marine power tech-  
7       nologies.

8           (6) Sustained and expanded research, develop-  
9       ment, demonstration, and commercial application  
10      programs are needed to locate and characterize ma-  
11      rine renewable energy resources, and to develop the  
12      technologies that will enable their widespread com-  
13      mercial development.

14          (7) Federal support is critical to reduce the fi-  
15      nancial risk associated with developing new marine  
16      renewable energy technologies, thereby encouraging  
17      the private sector investment necessary to make ma-  
18      rine renewable energy resources commercially viable  
19      as a source of electric power and for other applica-  
20      tions.

21   **SEC. 3. DEFINITIONS.**

22       For purposes of this Act—

23          (1) **MARINE RENEWABLE ENERGY.**—The term  
24      “Marine Renewable Energy” means energy derived  
25      from one or more of the following sources:

- 1 (A) Waves.
- 2 (B) Tidal flows.
- 3 (C) Ocean currents.
- 4 (D) Ocean thermal energy conversion.
- 5 (2) SECRETARY.—The term “Secretary” means
- 6 the Secretary of Energy.
- 7 **SEC. 4. MARINE RENEWABLE ENERGY RESEARCH AND DE-**
- 8 **VELOPMENT.**
- 9 The Secretary, in conjunction with other appropriate
- 10 agencies, shall support programs of research, development,
- 11 demonstration, and commercial application to expand the
- 12 use of marine renewable energy production from marine
- 13 renewable energy technology systems, including programs
- 14 to—
- 15 (1) study and compare existing marine renew-
- 16 able energy extraction technologies;
- 17 (2) research, develop, and demonstrate ad-
- 18 vanced marine renewable energy systems and tech-
- 19 nologies;
- 20 (3) reduce the manufacturing and operation
- 21 costs of marine renewable energy technologies;
- 22 (4) investigate efficient and reliable integration
- 23 with the utility grid and intermittency issues;
- 24 (5) advance wave forecasting technologies;

1 (6) conduct experimental and numerical mod-  
2 eling for optimization of marine energy conversion  
3 devices and arrays;

4 (7) increase the reliability and survivability of  
5 marine renewable energy technologies;

6 (8) study, in conjunction with the Assistant Ad-  
7 ministrator for Research and Development of the  
8 Environmental Protection Agency, and other Federal  
9 agencies as appropriate, the environmental impacts  
10 of marine renewable energy technologies and ways to  
11 address adverse impacts, and provide public infor-  
12 mation concerning technologies and other means  
13 available for monitoring and determining environ-  
14 mental impacts;

15 (9) establish protocols for how the ocean com-  
16 munity may best interact with marine renewable en-  
17 ergy devices;

18 (10) develop power measurement standards for  
19 marine renewable energy;

20 (11) develop identification standards for marine  
21 renewable energy devices; and

22 (12) address standards development, dem-  
23 onstration, and technology transfer for advanced  
24 systems engineering and system integration methods  
25 to identify critical interfaces.



1 SEC. 5. NATIONAL MARINE RENEWABLE ENERGY RE-  
2 SEARCH, DEVELOPMENT, AND DEMONSTRA-  
3 TION CENTERS.

4 (a) CENTERS.—The Secretary, acting through the  
5 National Renewable Energy Laboratory, shall award  
6 grants to institutions of higher education (or consortia  
7 thereof) for the establishment of 1 or more National Ma-  
8 rine Renewable Energy Research, Development, and Dem-  
9 onstration Centers. In selecting locations for Centers, the  
10 Secretary shall choose at least 1 site from among sites  
11 that host an existing marine renewable energy research  
12 and development program in coordination with a public  
13 university engineering program.

14 (b) PURPOSES.—The Centers shall advance research,  
15 development, demonstration, and commercial application  
16 of marine renewable energy through a number of initia-  
17 tives including for the purposes described in section 4(1)  
18 through (12), and shall serve as an information clearing-  
19 house for the marine renewable energy industry, collecting  
20 and disseminating information on best practices in all  
21 areas related to developing and managing enhanced ma-  
22 rine renewable energy systems resources.

23 SEC. 6. APPLICABILITY OF OTHER LAWS.

24 Nothing in this Act shall be construed as waiving the  
25 applicability of any requirement under any environmental  
26 or other Federal or State law.

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## 1 SEC. 7. AUTHORIZATION OF APPROPRIATIONS.

2       There are authorized to be appropriated to the Sec-  
3 retary to carry out this Act \$50,000,000 for each of the  
4 fiscal years 2008 through 2012.

COMMITTEE ON SCIENCE AND TECHNOLOGY  
FULL COMMITTEE MARKUP  
JUNE 13, 2007

AMENDMENT ROSTER

H.R. 2313 – the Marine Renewable Energy Research and Development Act  
of 2007

No.	Sponsor	Description	Results
1	Ms. Hooley	Amends section 4 by adding language on siting for marine renewable energy projects.	Agreed to by voice vote.
2	Mr. Diaz-Balart	Amends section 5 to require the Secretary to coordinate with the Undersecretary of Commerce for Oceans and Atmosphere on certain criteria for the marine renewable energy centers.	Agreed to by voice vote en bloc with 3.
3	Mr. Diaz-Balart	Amends section 4 to require the participation of the Undersecretary of Commerce for Oceans and Atmosphere in the study on environmental impacts and the participation of NOAA in establishing protocols for interactions between the ocean community and devices.	Agreed to by voice vote en bloc with 2.
4	Mr. Bartlett	Amends section 4 by adding to the list of marine renewable energy programs supported, "the development of corrosive-resistant materials."	Agreed to by voice vote.
5	Mr. Hall	Amends section 4 to delineate that the program includes marine resources in the Gulf of Mexico, Atlantic Ocean, and Pacific Ocean; Amends section 5 to change the criteria for choosing National Marine Renewable Energy Centers.	Agreed to by voice vote.
6	Mr. Smith	Amends section 3 by adding "algal biomass" to the list of definitions for sources of marine renewable energy, and amends section 4 by adding "including biodiesel from algal biomass" to the RDD&CA program.	Offered and withdrawn.
7	Mr. Gingrey	Amends section 7 by prohibiting funding for "ocean energy, including wave energy" programs already receiving funds under the EPACK authorization.	Agreed to by voice vote.
8	Mr. Akin	Amends section 5 by requiring applicants for marine renewable energy centers to include in their applications a description of why Federal support is necessary and evidence that the proposed research will not be conducted without Federal support.	Agreed to by voice vote.

**AMENDMENT TO H.R. 2313**  
**OFFERED BY MS. HOOLEY OF OREGON**

Page 3, line 9, insert “(a) IN GENERAL.—” before  
 “The Secretary”.

Page 3, lines 11 through 13, strike “the use of marine renewable energy production from marine renewable technology systems” and insert “marine renewable energy production”.

Page 4, after line 25, insert the following new subsection:

1       (b) SITING CRITERIA.—The Secretary, in conjunction  
 2 with other appropriate Federal agencies, shall develop,  
 3 prior to installation of any technologies under this section,  
 4 siting criteria for marine renewable energy generation  
 5 demonstration and commercial application projects funded  
 6 under this Act.

**AMENDMENT TO H.R. 2313**  
**OFFERED BY MR. MARIO DIAZ-BALART OF**  
**FLORIDA**

Page 5, line 13, insert "In establishing criteria for the selection of Centers, the Secretary shall coordinate with the Undersecretary of Commerce for Oceans and Atmosphere on the criteria related to advancing wave forecasting technologies, studying the compatibility with the environment of marine renewable energy technologies and systems, and establishing protocols for how the ocean community best interacts with marine renewable energy devices and parks." after "university engineering program."

**AMENDMENT TO H.R. 2313****OFFERED BY** *Mario Diaz-Balart*

Page 4, line 8, insert "the Undersecretary of Commerce for Oceans and Atmosphere," after "Protection Agency,".

Page 4, line 15, insert ", in conjunction with the National Oceanic and Atmospheric Administration," after "establish protocols".

AMENDMENT TO H.R. 2313  
OFFERED BY Rep. Roscoe Bartlett (MO-6)

Page 4, line 5, insert “, including development of corrosive-resistant materials” after “energy technologies”.

**AMENDMENT TO H.R. 2313**  
**OFFERED BY MR. HALL OF TEXAS**

Page 4, line 21, strike "and".

Page 4, line 25, strike the period and insert "; and".

Page 4, after line 25, insert the following new paragraph:

- 1           (13) utilize marine resources in the Gulf of
- 2           Mexico, the Atlantic Ocean, and the Pacific Ocean.

Page 5, lines 10 through 13, strike "shall choose at least" and all that follows through "engineering program" and insert "shall consider sites that meet one of the following criteria:".

Page 5, after line 13, insert the following new paragraphs:

- 3           (1) Hosts an existing marine renewable energy
- 4           research and development program in coordination
- 5           with a public university engineering program.
- 6           (2) Has proven expertise to support environ-
- 7           mental and policy-related issues associated with har-
- 8           nessing of energy in marine environment.



- 1           (3) Has access to and utilizes the marine re-  
2       sources in the Gulf of Mexico, the Atlantic Ocean,  
3       or the Pacific Ocean.
- 4 The Secretary may give special consideration to histori-  
5 cally black colleges and universities and land grant univer-  
6 sities that also meet one of these criteria.

Page 5, line 18, strike "(12)" and insert "(13)".

**AMENDMENT TO H.R. 2313****OFFERED BY** *Mr. Smith of Nebraska*

Page 3, after line 4, insert the following new subparagraph:

1                   (E) Algal biomass.

Page 3, line 19, insert "(including biodiesel from algal biomass)" after "technologies".

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**AMENDMENT TO H.R. 2313**  
**OFFERED BY** Mr. Singrey

Page 6, line 4, insert “, except that no funds shall be appropriated under this section for activities that are receiving funds under section 931(a)(2)(E)(i) of the Energy Policy Act of 2005 (42 U.S.C. 16231(a)(2)(E)(i))” after “through 2012”.

AMENDMENT TO H.R. 2313  
OFFERED BY *MR. AKIN*

Page 5, after line 22, insert the following new sub-section:

- 1 (e) DEMONSTRATION OF NEED.—When applying for
- 2 a grant under this section, an applicant shall include a
- 3 description of why Federal support is necessary for the
- 4 Center, including evidence that the research of the Center
- 5 will not be conducted in the absence of Federal support.