110TH CONGRESS
1st Session
HOUSE OF REPRESENTATIVES
REPORT
110–302

BIOFUELS RESEARCH AND DEVELOPMENT ENHANCEMENT ACT

AUGUST 3, 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

together with

ADDITIONAL VIEWS

[To accompany H.R. 2773]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 2773) to enhance research, development, demonstration, and commercial application of biofuels related technologies, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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59–006

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 "Biofuels Research and Development Enhancement Act".

SEC. 2. BIOFUELS AND BIOREFINERY INFORMATION CENTER.

(a) IN GENERAL.—The Secretary of Energy (in this Act referred to as the "Secretary"), in cooperation with the Secretary of Agriculture, shall establish a technology transfer center to make available information on research, development, and commercial application of technologies related to biofuels and biorefineries, including—

(1) biochemical and thermochemical conversion technologies capable of making fuels from lignocellulosic feedstocks;

(2) biotechnology processes capable of making biofuels with an emphasis on development of biorefinery technologies using enzyme-based processing systems;

(3) biogas collection and production technologies suitable for vehicular use;

(4) cost-effective reforming technologies that produce hydrogen fuel from biogas sources;

(5) biogas production from cellulosic and recycled organic waste sources and advancement of gaseous storage systems and advancement of gaseous storage systems; and

(6) other advanced processes and technologies that will enable the development of biofuels.

(b) ADMINISTRATION.—In administering this section, the Secretary shall ensure that the center shall—

(1) continually update information provided by the center;

(2) make information available on biotechnology processes; and

(3) make information and assistance provided by the center available for those involved in energy research, development, demonstration, and commercial application.

SEC. 3. BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.

Section 932 of the Energy Policy Act of 2005 (42 U.S.C. 16232) is amended by adding at the end the following new subsection:

"(f) BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.—The Secretary, in consultation with the Secretary of Transportation and the Assistant Administrator for Research and Development of the Environmental Protection Agency, shall carry out a program of research, development, and demonstration as it relates to existing transportation fuel distribution infrastructure and new alternative distribution infrastructure. The program shall focus on the physical and chemical properties of biofuels and efforts to prevent or mitigate against adverse impacts of those properties in the following areas:

"(1) Corrosion of metal, plastic, rubber, cork, fiberglass, glues, or any other material used in pipes and storage tanks.

"(2) Dissolving of storage tank sediments.

"(3) Clogging of filters.

"(4) Contamination from water or other adulterants or pollutants.

"(5) Poor flow properties related to low temperatures.

"(6) Oxidative and thermal instability in long-term storage and use.

"(7) Microbial contamination.

"(8) Problems associated with electrical conductivity.

"(9) Such other areas as the Secretary considers appropriate.".

SEC. 4. BIODIESEL.

(a) BIODIESEL STUDY.—Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to Congress a report on any research and development challenges inherent in increasing to 2.5 percent the proportion of diesel fuel

sold in the United States that is biodiesel (within the meaning of section 211(o) of the Clean Air Act).

(b) MATERIALS FOR THE ESTABLISHMENT OF STANDARDS.—The Director of the National Institute of Standards and Technology shall make publicly available the physical property data and characterization of biodiesel, as is defined in subsection (a), in order to encourage the establishment of standards that will promote their utilization in the transportation and fuel delivery system.

SEC. 5. BIOGAS.

Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to Congress a report on any research and development challenges inherent in increasing to 5 percent of the transportation fuels sold in the United States fuel with biogas or a blend of biogas and natural gas.

SEC. 6. BIORESEARCH CENTERS FOR SYSTEMS BIOLOGY PROGRAM.

Section 977(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16317(a)(1)) is amended by inserting before the period at the end the following: ", including the establishment of at least 5 bioresearch centers of varying sizes, as appropriate, that focus on biofuels, of which at least 1 center shall be located in each of the 5 Petroleum Administration for Defense Districts, which shall be established for a period of 5 years, after which the grantee may reapply for selection on a competitive basis".

SEC. 7. GRANTS FOR BIOFUEL PRODUCTION RESEARCH AND DEVELOPMENT IN CERTAIN STATES.

(a) IN GENERAL.—The Secretary shall provide grants to eligible entities for research, development, demonstration, and commercial application of biofuel production technologies in States with low rates of ethanol production, including low rates of production of cellulosic biomass ethanol, as determined by the Secretary.

(b) ELIGIBILITY.—To be eligible to receive a grant under this section, an entity shall—

(1)(A) be an institution of higher education (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)) located in a State described in subsection (a); or

(B) be a consortium including at least 1 such institution of higher education, and industry, State agencies, Indian tribal agencies, National Laboratories, or local government agencies located in the State; and

(2) have proven experience and capabilities with relevant technologies.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section $25,000,000 for each of fiscal years 2008 through 2010.

SEC. 8. BIOREFINERY ENERGY EFFICIENCY.

Section 932 of Energy Policy Act of 2005 (42 U.S.C. 16232), is amended by adding at the end the following new subsections:

"(g) BIOREFINERY ENERGY EFFICIENCY.—The Secretary shall establish a program of research, development, demonstration, and commercial application for increasing energy efficiency and reducing energy consumption in the operation of biorefinery facilities.

"(h) RETROFIT TECHNOLOGIES FOR THE DEVELOPMENT OF ETHANOL FROM CELLULOSIC MATERIALS.—The Secretary shall establish a program of research, development, demonstration, and commercial application on technologies and processes to enable biorefineries that exclusively use corn grain or corn starch as a feedstock to produce ethanol to be retrofitted to accept a range of biomass, including lignocellulosic feedstocks.".

SEC. 9. STUDY OF INCREASED CONSUMPTION OF ETHANOL-BLENDED GASOLINE WITH HIGHER LEVELS OF ETHANOL.

(a) IN GENERAL.—The Secretary, in cooperation with the Secretary of Agriculture, the Administrator of the Environmental Protection Agency, and the Secretary of Transportation, shall conduct a study of the methods of increasing consumption in the United States of ethanol-blended gasoline with levels of ethanol that are not less than 10 percent and not more than 40 percent.

(b) STUDY.—The study under subsection (a) shall include—

(1) a review of production and infrastructure constraints on increasing consumption of ethanol;

(2) an evaluation of the environmental consequences of the ethanol blends described in subsection (a) on evaporative and exhaust emissions from on-road, off-road, and marine vehicle engines;

(3) an evaluation of the consequences of the ethanol blends described in subsection (a) on the operation, durability, and performance of on-road, off-road, and marine vehicle engines; and

(4) an evaluation of the life cycle impact of the use of the ethanol blends described in subsection (a) on carbon dioxide and greenhouse gas emissions.

(c) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to Congress a report describing the results of the study conducted under this section.

SEC. 10. STUDY OF OPTIMIZATION OF FLEXIBLE FUELED VEHICLES TO USE E–85 FUEL.

(a) IN GENERAL.—The Secretary, in consultation with the Secretary of Transportation, shall conduct a study of whether optimizing flexible fueled vehicles to operate using E–85 fuel would increase the fuel efficiency of flexible fueled vehicles.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results of the study under this section, including any recommendations of the Secretary.

SEC. 11. STUDY OF ENGINE DURABILITY AND PERFORMANCE ASSOCIATED WITH THE USE OF BIODIESEL.

(a) IN GENERAL.—Not later than 30 days after the date of enactment of this Act, the Secretary shall initiate a study on the effects of the use of biodiesel on the performance and durability of engines and engine systems.

(b) COMPONENTS.—The study under this section shall include—

(1) an assessment of whether the use of biodiesel lessens the durability and performance of conventional diesel engines and engine systems; and

(2) an assessment of the effects referred to in subsection (a) with respect to biodiesel blends at varying concentrations, including the following percentage concentrations of biodiesel:

(A) 5 percent biodiesel.

(B) 10 percent biodiesel.

(C) 20 percent biodiesel.

(D) 30 percent biodiesel.

(E) 100 percent biodiesel.

(c) REPORT.—Not later than 24 months after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results of the study under this section, including any recommendations of the Secretary.

SEC. 12. BIOENERGY RESEARCH AND DEVELOPMENT, AUTHORIZATION OF APPROPRIATION.

(a) Section 931 of the Energy Policy Act of 2005 (42 U.S.C. 16231) is amended—

(1) in subsection (b)—

(A) at the end of paragraph (2) by striking "and";

(B) at the end of paragraph (3) by striking the period and inserting "; and"; and

(C) by adding at the end the following new paragraph:

"(4) $963,000,000 for fiscal year 2010."; and

(2) in subsection (c)—

(A) in paragraph (2), by striking "$251,000,000" and inserting "$377,000,000";

(B) in paragraph (3), by striking "$274,000,000" and inserting "$398,000,000"; and

(C) by adding at the end the following new paragraph:

"(4) $419,000,000 for fiscal year 2010, of which $150,000,000 shall be for section 932(d).".

SEC. 13. ENVIRONMENTAL RESEARCH AND DEVELOPMENT.

(a) AMENDMENTS.—Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317) is amended—

(1) in subsection (a)(1), by striking "and computational biology" and inserting "computational biology, and environmental science"; and

(2) in subsection (b)—

(A) in paragraph (1), by inserting "in sustainable production systems that reduce greenhouse gas emissions" after "hydrogen";

(B) at the end of paragraph (3), by striking "and";

(C) by redesignating paragraph (4) as paragraph (5); and

(D) by inserting after paragraph (3) the following new paragraph:

"(4) develop cellulosic and other feedstocks that are less resource and land intensive and that promote sustainable use of resources, including soil, water, energy, forests, and land, and ensure protection of air, water, and soil quality; and".

(b) TOOLS AND EVALUATION.—The Secretary, in consultation with the Administrator of the Environmental Protection Agency and the Secretary of Agriculture, shall establish a research and development program to—

(1) improve and develop analytical tools to facilitate the analysis of life-cycle energy and greenhouse gas emissions, including emissions related to direct and indirect land use changes, attributable to all potential biofuel feedstocks and production processes; and

(2) promote the systematic evaluation of the impact of expanded biofuel production on the environment, including forestlands, and on the food supply for humans and animals.

(c) SMALL-SCALE PRODUCTION AND USE OF BIOFUELS.—The Secretary, in cooperation with the Secretary of Agriculture, shall establish a research and development program to facilitate small-scale production, local, and on-farm use of biofuels, including the development of small-scale gasification technologies for production of biofuel from cellulosic feedstocks.

SEC. 14. STUDY OF OPTIMIZATION OF BIOGAS USED IN NATURAL GAS VEHICLES.

(a) IN GENERAL.—The Secretary of Energy shall conduct a study of methods of increasing the fuel efficiency of vehicles using biogas by optimizing natural gas vehicle systems that can operate on biogas, including the advancement of vehicle fuel systems and the combination of hybrid-electric and plug-in hybrid electric drive platforms with natural gas vehicle systems using biogas.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Secretary of Energy shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science and Technology of the House of Representatives a report that describes the results of the study, including any recommendations of the Secretary.

SEC. 15. STANDARDS FOR BIOFUELS DISPENSERS.

In the absence of appropriate private sector standards adopted prior to the date of enactment of this Act, and consistent with the National Technology Transfer and Advancement Act of 1995, the Secretary of Energy, in consultation with the Director of the National Institute of Standards and Technology, shall develop standards for biofuel dispenser systems in order to promote broader biofuels adoption and utilization.

SEC. 16. ALGAL BIOMASS.

Not later than 90 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the progress of the research and development that is being conducted on the use of algae as a feedstock for the production of biofuels. The report shall identify continuing research and development challenges and any regulatory or other barriers found by the Secretary that hinder the use of this resource, as well as recommendations on how to encourage and further its development as a viable transportation fuel.

II. PURPOSE

The purpose of H.R. 2773 is to enhance research, development, demonstration, and commercial application of biofuels related technologies and promote a greater degree of federal coordination of research and development materials related to biofuels.

III. BACKGROUND AND NEED FOR THE LEGISLATION

High gasoline prices, a desire to reduce our dependence on foreign sources of energy, and concerns over climate change have greatly increased interest in bio-based fuels as an alternative to petroleum for transportation fuel. Over the last several years, in part as a result of the Renewable Fuel Standard included in the Energy Policy Act of 2005, the use of biofuels—most notably corn-based ethanol—has grown significantly. Ethanol is most commonly blended with gasoline at a level of 10 percent or less. And, this still only represents a small portion (less than 5 percent) of the total gasoline sold.

Recent proposals in Congress and by the Administration have called for significant increases in the use of biofuels over the next ten years. Currently biofuel supply relies almost exclusively on corn-based ethanol. Concerns have been raised about further expansion of corn-based ethanol to meet the targets set for biofuel production. Competition with food and feed supply, water and nutrient demand associated with corn production, and continued questions about the energy balance of corn-based ethanol production all suggest that biomass sources for biofuel production must be diversified.

The majority of this focus to diversify the feedstocks has been on cellulosic materials including grasses, wood, and waste materials. However, current technologies for the development of fuel from these sources continue to be expensive and not cost-competitive with corn-based ethanol. If we are going to move toward broader use of biofuels, technology will be necessary to create reasonably priced fuels from cellulosic materials.

The Agricultural Risk Protection Act of 2000 (Title III), the Farm Security and Rural Investment Act of 2002, and the Energy Policy Act of 2005 created bioenergy research and development programs to focus federal research funding on the development of biofuels derived from cellulosic materials. This research is ongoing and operates under a Memorandum of Understanding between the Department of Energy and the Department of Agriculture.

Though these efforts present a reasonable starting point, an enhanced federal commitment will be needed. To realize this needed improvement in technology, we must increase our investment in research and development, focus our research on the most promising technologies, and ensure that the latest research information is readily available for those looking to either expand their biofuels production or embark upon the development of new facilities. ÷

IV. HEARING SUMMARY

The Subcommittee on Energy and Environment held a hearing on June 14, 2007 entitled "A path toward the broader use of Biofuels: "Enhancing the federal commitment to research and development to meet the growing need." The purpose of this hearing was to examine the federal efforts on research, development and demonstration of technologies related to the production of biofuels, the development of biorefineries and demonstrations of those technologies and to identify gaps in current federal research and development programs.

The hearing further focused on legislative proposals to restructure and enhance the biofuels research and development programs of the Department of Energy and the Department of Agriculture under consideration in the House and Senate, including an evaluation of a "Discussion Draft" version of H.R. 2773. At the hearing, the witnesses appearing before the Subcommittee were Mr. Robert Dinneen, President, Renewable Fuels Association. RFA is a national trade association for the domestic ethanol industry. RFA's membership includes a broad cross-section of businesses, individuals and organizations dedicated to the expansion of the U.S. fuel ethanol industry. Dr. Thomas Foust, Biofuels Research Director, National Renewable Energy Laboratory. The National Renewable Energy Laboratory (NREL) is the Nation's primary laboratory for

renewable energy research and development. The Biomass Program includes NREL R&D focused on biomass characterization, thermochemical and biochemical biomass conversion technologies, biobased products development, and biomass process engineering and analysis. Mr. John Berger, Chairman and CEO, Standard Renewable Energy and CEO, BioSelect. Standard Renewable Energy is a leader in renewable energy, serving commercial and residential customers with clean, renewable energy and energy efficiency technologies. BioSelect, a division of Standard Renewable Energy, is a developer and operator of biodiesel production facilities. Mr. David Waskow, Policy Analyst, Friends of the Earth, U.S. Friends of the Earth, U.S. is part of a network of international groups in 70 countries. David Waskow is an international policy analyst and works on the environment, trade policy, and corporate accountability. Mr. Michael J. McAdams, Executive Director, Advanced Biofuels Coalition. The Advanced Biofuels Coalition is a collection of companies who utilize advanced technologies or provide renewable-based feedstocks to produce renewable fuels—both biodiesel and gasoline compatible components.

Members of the Subcommittee asked the panelists questions related to:

- The need for a dedicated infrastructure to transport large volumes of biofuels and the possible use of the petroleum transport and storage infrastructure for transporting biofuels;
- The need for sustainable management of forest and agricultural lands to ensure long term health of these lands when they are being used as a feedstock for biofuels;
- Issues related to food supply and food and feed prices as it relates to greater production of ethanol;
- The need for additional bioresearch centers, the possible focus of these centers, and need for regional distribution of these centers;
- Whether the focus on efficient production of biofuels needs to be feedstock specific; and
- On the promise of algal biomass as a feedstock for the development of biofuels, what challenges are still present, and what can Congress do to support this research.

V. Committee Actions

H.R. 2773 was introduced by Subcommittee Chairman Lampson on June 19, 2007, and referred to the House Committee on Science and Technology, Subcommittee on Energy and Environment.

The Subcommittee on Energy and Environment met to consider H.R. 2773 on June 21, 2007. The Subcommittee considered the following amendments:

(1) A Manager's Amendment offered by Chairman Lampson, makes several technical changes; clarifies that the Technology Transfer Center, not the Secretary of Energy, will carry out the tasks of the center; recognizing that the Department of Transportation regulates pipelines, the amendment ensures that the Secretary of Energy will consult with the Department of Transportation as it engages in the infrastructure research and development program created in section 3 of the bill; removes a few unnecessary focus areas for the infrastructure research program created in section 3 and provides the Secretary with the ability to look at other areas deemed appropriate; inserts a more appropriate definition of

biodiesel for the purpose of the study in section 4; and reduces the number of Bioresearch Centers authorized in the bill from 11 to 5. Agreed to by voice vote.

(2) An amendment offered by Ms. Woolsey and Mr. Bartlett, amends section 977 of the Energy Policy Act of 2005 to add environmental science to the list of disciplines that the Bioenergy Centers created in the Act may pursue; indicates the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions; adds a new goal for the research conducted by the Centers to develop cellulosic feedstocks that efficiently utilize resources and promote environmental sustainability; adds a research and development program in consultation with EPA to develop tools to do life-cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production; and adds a research and development program in consultation with the Secretary of Agriculture for small-scale production and processing of biofuels for on-farm use. Agreed to by voice vote.

The subcommittee favorably reported the bill H.R. 2773, as amended, to the Full Committee. A quorum was noted and the motion was agreed to by voice vote.

The Committee on Science and Technology met in open session to consider H.R. 2773 as reported by the Subcommittee on Energy and Environment on June 27, 2007. The Committee considered 11 amendments to H.R. 2773—9 were approved by voice vote and 2 failed by recorded vote. The amendments were considered in the following order:

(1) A Manager's amendment offered by Mr. Gordon adding consultations with additional agencies for two studies in the bill and making the national laboratories eligible participants in the consortium in Section 7. Agreed to by voice vote.

(2) An amendment offered by Mr. Hall adding a new section creating a research program on blending biofuels with coal-to-liquids. Defeated on a recorded vote of 12–20.

(3) An amendment offered by Mr. Hall adding a new section with provisions related to biogas. Specifically, the amendment incorporated biogas information into the technology transfer center in section 2 and directs the Secretary to conduct two biogas studies—related to the challenges of increasing consumption of biogas and optimization of vehicles using biogas. Agreed to by voice vote.

(4) An amendment offered by Mr. Matheson adding a new section allowing for a Federal backstop for development of standards for biofuels dispensers. Agreed to by voice vote.

(5) An En Bloc amendment offered by Ms. Biggert amending multiple sections of the bill by requiring bioresearch centers to reapply and compete for funding every 5 years; adding evaluation of life cycle impacts to the mid-level ethanol blend study; expanding the biodiesel engine durability study to include engine performance and extending the deadline for the study. Agreed to by voice vote.

(6) An amendment offered by Mr. Bartlett and Ms. Woolsey amending section 12 by including food supply and forest lands in the environmental research program. Agreed to by voice vote.

(7) An amendment offered by Mr. Hill amending section 7 by creating a program of research, development, demonstration and com-

mercial application to retrofit corn ethanol plants to accommodate the use of diverse feedstocks including cellulosic materials. Agreed to by voice vote.

(8) An amendment offered by Mr. Bartlett to amend the study authorized in section 4 to report on challenges to increasing the percentage of biodiesel as a proportion of all diesel fuel. The report will now address the challenge of increasing biodiesel to 2.5 percent of diesel fuel production. Agreed to by voice vote.

(9) An amendment offered by Mr. Lampson amending section 4 by adding a new paragraph directing the National Institute of Standards and Technology to compile materials to support the establishment of biodiesel standards. Agreed to by voice vote.

(10) An amendment offered by Mr. A. Smith and Mr. Lampson adding a new section directing the Secretary to conduct a study on algal biomass for biofuels development. Agreed to by voice vote.

(11) An amendment offered by Mr. A. Smith amending section 6 by eliminating the production threshold from the grant program for low ethanol producing states. Defeated on a recorded vote of 11–17.

The committee favorably reported the bill H.R. 2773, as amended, to the House of Representatives. A quorum was noted and the motion was agreed to by voice vote.

VI. Summary of Major Provisions of the Bill, as Reported

H.R. 2773 will expand federal biofuels research efforts and authorizes several studies that will provide necessary information to the Committee that will allow the Committee to make additional research commitments in the future. More specifically, the bill attempts to better coordinate and compile information from federal biofuels research programs, focus some of the biofuels research on infrastructure needs and efficiency of biorefineries, study some of the continuing challenges facing broader use of biofuels, and increase the funding levels for Department of Energy biofuels research.

VII. Section-by-Section Analysis

Section 1. Short Title

Section 2. Biofuels and Biorefinery Information Center—Directs the Secretary of Energy, in cooperation with the Secretary of Agriculture, to establish a technology transfer center to serve as a clearinghouse of information related to the research, development, and commercial application of technologies related to biofuels, biogas and biorefineries.

Section 3. Biofuels and Advanced Biofuels Infrastructure—This section directs the Secretary, in consultation with the Secretary of Transportation and the Assistant Administrator for Research and Development of the Environmental Protection Agency, to establish a program of research, development, and demonstration for modifications and treatments to existing infrastructure and of research into the development of new infrastructure for transporting biofuels to address problems with transporting and storing biofuels in the existing petroleum fuel infrastructure.

Section 4. Biodiesel—This section addresses two matters related to biodiesel.

Subsection (a) directs the Secretary to submit a report to Congress on any research and development challenges inherent in increasing the proportion of biodiesel sold to 2.5 percent of total diesel fuel sales in the U.S.

Subsection (b) provides for the National Institute of Standards and Technology to make available the physical property data and the characterization of biodiesel to support the development of consensus biodiesel standards.

Section 5. Biogas—The Secretary is directed to submit a report to Congress on the research and development challenges inherent in increasing to 5 percent the amount of transportation fuels that is biogas or a biogas and natural gas blend used as a transportation fuel.

Section 6. Bioresearch Centers for Systems Biology Program—The Systems Biology program created in section 977 of the Energy Policy Act of 2005 is amended to establish at least five regionally located centers with a research focus on biofuels. The centers are to be located in each of the five Petroleum Administration Defense Districts (PADDs).

Section 7. Grants for Biofuels Production Research and Development in Certain States—The Secretary is directed to establish a research and development grant program in states with low rates of ethanol production, as determined by the Secretary, to support research on feedstock and biofuel production technologies.

Section 8. Biorefinery Energy Efficiency—Adds two new subsections to section 932 of the Energy Policy Act of 2005 (Bioenergy Program).

Section 8(a) directs the Secretary to establish a program of research, development, demonstration and commercial application of technologies to reduce the energy consumption of biorefinery facilities.

Section 8(b) directs the Secretary to establish a program of research, development, demonstration and commercial application of technologies that would enable facilities that currently produce ethanol exclusively from corn and corn starch, to accept other feedstocks.

Section 9. Study of Increased Consumption of Ethanol-Blended Gasoline with Higher Levels—Directs the Secretary of Energy to conduct a study, in cooperation with the Secretaries of Agriculture and Transportation and the Administrator of EPA, on the feasibility of increasing the consumption of ethanol-blended gasoline at blend levels between 10 and 40 percent.

Section 10. Study of Optimization of Flexible Fueled Vehicles to use E–85—Directs the Secretary of Energy, in consultation with the Secretary of Transportation, to conduct a study to determine if optimizing flexible fuel vehicles to operate using E–85 would increase vehicle fuel efficiency while using E–85.

Section 11. Study of Engine Durability and Performance Associated with the Use of Biodiesel—Directs the Secretary of Energy, to conduct a study on the effects of the use of biodiesel, at varying blend levels, on engine and engine system durability and performance and to issue a report to Congress on the findings within two years of enactment.

Section 12. Authorization for Appropriation—This section makes the following changes to authorizations in the Energy Policy Act of 2005:

- Extends the authorization for section 931 (Renewable Energy) of the Energy Policy Act by one year and funds the programs at $963 million in FY 2010.
- Increases the authorization levels for section 932 (Bioenergy Programs) of the Energy Policy Act of 2005 to $377 million in FY 2008, $398 million in FY 2009, and $419 million in FY 2010.

Section 13. Environmental Research and Development—This section amends section 977 of the Energy Policy Act of 2005 to add environmental science to the list of disciplines that the Bioenergy Centers created in the Act may pursue. It modifies the goal of developing technologies and methods to produce biofuels to specify this production should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions. It also adds a goal of producing biofuels in a manner that promotes the sustainable use of resources and the protection of air, water resources and soil quality.

This section also directs the Secretary to establish a research and development program in consultation with the Administrator of EPA and the Secretary of Agriculture to develop tools to do lifecycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production and to establish a research and development program in consultation with the Secretary of Agriculture for small-scale production and processing of biofuels for on-farm use.

Section 14. Study of Optimization of Biogas Used in Natural Gas Vehicles—Directs the Secretary of Energy to conduct a study of methods available to optimize natural gas-fueled vehicles to operate using biogas such that the efficiency of the vehicles while using biogas would be increased. This is also to include an analysis of hybrid technologies using biogas as primary fuel. The Secretary will report to Congress on the results of the study within six months of enactment.

Section 15. Standards for Biofuels Dispensers—The Secretary, in consultation with the Director of the National Institute of Standards and Technology, shall develop standards for biofuels retail dispensers if an appropriate private sector standard is not adopted prior to the date of enactment.

Section 16. Algal Biomass—Directs the Secretary to conduct a study on the progress of the Department's research and development related to the use of algae as a feedstock for development of biofuels. The report is to identify any research and development challenges, as well as any regulatory barriers, that hinder the use of algae for biofuels development.

VIII. COMMITTEE VIEWS

For sometime now, it has become clear to the Committee that our nation's energy needs can no longer be fully met with fossil fuels. Our reliance on fossil fuels, and more specifically foreign sources of energy, jeopardizes our economy, foreign policy, national security, and most importantly our environment. The scale and complexity of addressing these challenges cannot be overstated.

Though fossil fuels still remain an important part of any viable, balanced energy strategy, we must enhance our efforts to develop a diverse set of alternative energy sources. Biofuels represent one of our best opportunities to accomplish this.

We have seen rapid growth in our country's biofuels development mostly in the forms of corn-based ethanol and soy-based biodiesel. However, ethanol still represents only 5 percent of the total gasoline sold, and biodiesel is an even smaller portion of the total diesel market.

The Committee recognizes we would not be where we are today without the efforts of those who pioneered the development of our corn-based ethanol industry. However, concerns have been raised about further expansion of corn-based ethanol, its impact on food and feed supply and costs, and on the sustainability of expanded corn production for ethanol. It would require nearly half of the current corn crop produced annually to meet the biofuels targets that have been proposed. The Committee recognizes further expansion of the current corn-based ethanol production system will have negative consequences for commodity prices and the environment. Therefore, a greater effort must be made to diversify the biomass sources for biofuel production.

The Committee believes the future of biofuels lies in diversifying the feedstocks to include cellulosic materials such as grasses, wood, and waste materials. Current technologies for the development of cellulosic biofuels continue to be expensive and not yet cost-competitive with corn-based ethanol. Research should be focused on improving cellulosic ethanol production methods to increase the processing efficiencies and lower production costs.

The Committee is very encouraged by the promise of diversified feedstocks to be used for the development of biofuels. However, the Committee believes this development needs to occur in an environmentally sensitive way that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions, and in fuel that will improve air quality. Therefore, a portion of the biofuel research and development program should focus on the environmental aspects of biofuel production, processing, and use.

The Committee believes the establishment of a Biofuels and Biorefinery Information Center will facilitate the dissemination of research findings and the status of technology development for biofuel production and processing. The Center will provide a convenient entry point for all interested parties seeking the latest information on research, development, and demonstration projects conducted on biofuels and help to support the growth and deployment of biofuel production and processing methods.

The Committee is aware of the significant barrier to more widespread distribution of biofuels presented by the lack of dedicated pipeline infrastructure to transport biofuels. The current problems associated with using the existing petroleum infrastructure for distributing and dispensing fuel must be addressed if we are to achieve goals of wider distribution of biofuel. The Committee also believes consideration must be given to the development of new biofuel distribution infrastructure. Rural areas of the U.S. are presumed to be the future source of most biofuel feedstocks. However, the areas of greatest fuel use are in urban and suburban areas.

Fuel must be able to reach areas with high demand in an efficient, cost-effective manner.

The Committee intends the research program authorized in Section 3 of the legislation to examine all issues associated with the development of an efficient distribution system for biofuels. This would include consideration of the transportation and distribution of feedstocks to biofuel refineries as well as the transportation and distribution of biofuel or biodiesel from the processing plant to the customer.

The Committee believes we must address barriers to realizing broader use of biofuels. Standardization of biofuels to ensure fuel fungibility remains an important goal to facilitate the widespread use of biofuels. The Committee believes that setting standards for biofuels with an understanding of the potential impacts of these fuels on engines, engine systems, and engine performance will facilitate the broader use of biofuels in commerce and provide more consumer confidence in these new products.

The Committee believes there is also a need for uniformity in the biodiesel market to ensure consistent performance and durability of engines and the ability to move biodiesel through storage and transport infrastructure. Though private sector standards exist for certain biodiesel, new renewable forms of diesel continue to be presented. Providing a set of standards for these fuels will ensure consistency in the performance of this product.

The Committee believes another bio-based fuel with potential for expanded use as a transportation fuel is biogas—gas produced through microbial digestion of organic materials under anaerobic conditions. Biogas is primarily composed of carbon dioxide and methane. There are numerous sources for biogas, however they are diverse and due to a variety of barriers, they are not being exploited for significant biogas production, capture, and distribution. These sources include manure, sewage sludge, and municipal solid waste. The Committee recognizes that natural gas fueled vehicles have been introduced for sometime and are in regular use in some fleets. However, these vehicles comprise a small percentage of the vehicle fleet and natural gas is not widely available at all fueling stations. Section 5 of the legislation directs the Secretary to provide Congress with a report on the barriers to achieving broader use of natural gas, including biogas as a transportation fuel.

The Energy Policy Act of 2005 authorized the Department to establish Bioresearch Centers in microbial and plant systems biology, protein science and computational biology to support DOE missions. Committee believes the Department should establish five centers distributed within each of the five Petroleum Administration Defense Districts (PADDs). The centers are to include those already established by the Secretary and are not to be in addition to already established centers. With centers already being established in three of the five Petroleum Administration Defense Districts (PADDs), the Committee expects that the next two centers to be established would be in the PADDs without an established center.

Biofuel production is currently concentrated in States with significant corn production. The Committee believes we need to diversify biofuel production in terms of both the feedstock used to produce fuel and the regions of our Nation where fuel is produced. While the grain-based ethanol market has grown significantly, the

future of biofuels lies in the ability to make fuels out of a wide variety of region-specific feedstocks. The Committee believes that research directed to development of feedstock-flexible refining systems could enable a much wider, more flexible and resilient market to develop that would not require long-distance transportation of feedstocks and fuels.

The Committee believes we should pursue multiple strategies to ensure widespread availability of biofuels. The current barriers to long-distance transport of ethanol would be overcome through the development of more biofuel production sites throughout the country. The grain-based ethanol industry benefits from a wide range of subsidies, tariff protections, and loan guarantees, including a 51 cent tax credit for ethanol blended with gasoline. The Committee believes States with the potential for biofuel production from other feedstocks should be supported through additional Federal support of research and development to overcome the processing challenges associated with cellulosic feedstocks. Section 7 will provide grants in States with low levels of ethanol production to spur the development of ethanol from cellulosic materials—the materials these States are more likely to utilize for ethanol production.

The Committee believes we should increase the energy yield of biofuels by making ethanol production plants more energy efficient. The Committee also recognizes that as new feedstocks are developed ethanol production from grain may be reduced. The existing infrastructure that is now dedicated to ethanol production from grain should be adapted to ensure that we continue to utilize this infrastructure for biofuel production. The Committee directs the Department to focus research on the development of technologies and processes that will permit us to retrofit existing ethanol plants to accept feedstocks other than grains.

It is the Committee's expectation that the Department will use a representative sample of diesel engines, each of which has differing duty cycles, to conduct the study of the potential effects of different biodiesel blends on engine and engine system durability. This includes diesel engines of differing applications including on-road, off-road, marine, agricultural related uses, and construction related uses.

The Committee believes we should pursue the expanded use of biofuels in an environmentally responsible manner. Expanded biofuel production that results in degraded soil, water, or air quality will not provide the long-term fuel supply stability the Nation needs. Research support for biofuels must also include research to develop production systems for biofuel feedstocks that will maintain soil, water, and air quality.

The Committee also believes we need a better understanding of the emissions and energy balance associated with the full life-cycle of biofuels from feedstock production to final use. If we are to reduce carbon emissions associated with fuel use, we need to understand the emissions associated with biofuels as well as others. Because biofuels are produced from feedstocks that first absorb carbon from the atmosphere, it may be possible to produce, process, and utilize biofuels in a manner that substantially reduces our current level of greenhouse gas emissions. Better life-cycle models that track emissions throughout the production, processing and fuel use cycle can help in the design of systems to minimize carbon emis-

sions. The Committee intends that DOE support improvements to the current modeling capabilities in this area as well as supporting research to develop new modeling and analytical techniques.

The Committee is also concerned about the increases in food and animal feed prices related to the expansion of ethanol production from corn. The Committee recognizes the competition for productive land for biofuel and food production has implications for food production and therefore, food and animal feed prices.

The Committee does not intend the goals included in Section 13 of the bill to be a barrier to research and development of any biofuel or to prejudge the ultimate outcome of research on any fuel regarding its sustainability and greenhouse gas emissions. The Committee believes the ultimate goal we should be striving to achieve through the research programs funded on biofuels is to develop them in a manner that expands our fuel supply in a manner that is environmentally sound. At the outset of the research, the fuel or system for producing may not have achieved this ultimate goal, but certainly should be focused in that direction. The Committee believes that all fuels need research and development support to achieve these important goals, however if it is discovered that a fuel cannot be produced in a manner that provides a net energy yield, reduced greenhouse gas emissions or through production systems that degrade air, soil, and water resources, the Committee feels it should be abandoned.

The Committee is concerned that the absence of private sector-developed standards for biofuels dispensers, specifically E–85, has been an impediment to the broader use of biofuels. Though private sector standard-setting organizations have been examining this issue for some time, the Committee is concerned with the lack of progress toward establishment of such standards. As the production of biofuels increases, the retail outlets for distributing these fuels to consumers must also be available. The absence of standards for equipment to dispense these fuels should not be an impediment to their broader use. If no standards are in place at the time this legislation is enacted, it is the Committee's intention to have the Director of NIST and the Secretary of Energy utilize the authorities in the National Technology Transfer Act to establish standards for biofuel dispensing equipment.

The Committee believes there is potential for utilizing algal biomass as a feedstock for the production of biofuels. Algae are extremely productive and may be grown in areas that are unsuitable for growing land-based biofuel feedstocks. DOE's National Renewable Energy Laboratory has conducted research in this area in the past. With renewed interest in biofuel production and new technologies available to lower the costs associated with algal production, the Committee believes additional research in this area is warranted.

In summary, the Committee believes we must increase our investment in research and development on biofuels, focus on overcoming the barriers to broader biofuel production and use, ensure the expansion of biofuel production occurs in an environmentally responsible manner, and that the latest research information is readily available for those looking to expand their biofuels production or embark upon the development of new facilities.

H.R. 2773 will help to enhance the on-going Federal efforts to support biofuels research and development, as well provide necessary information back to Congress that will allow us to make additional research commitments in the future.

IX. 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. 2773 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. 2773 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.

X. Congressional Budget Office Cost Estimate

July 5, 2007.

Hon. Bart Gordon,
Chairman, Committee on Science and Technology,
House of Representatives, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 2773, the Biofuels Research and Development Enhancement Act.

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

Sincerely,

Peter R. Orszag.

Enclosure.

H.R. 2773—Biofuels Research and Development Enhancement Act

Summary: H.R. 2773 would authorize the appropriation of $963 million in 2010 for the Department of Energy (DOE) to research and develop renewable energy technologies. The bill also would authorize $75 million over the 2008–2010 period for DOE to make grants to certain institutions of higher education to research and develop biofuel production technologies. Moreover, H.R. 2773 would authorize additional funding for systems biology (the study of the structural and functional design of organisms) and bioenergy programs from amounts authorized in 2008 and 2009 under current law.

CBO estimates that implementing H.R. 2773 would cost $16 million in 2008 and about $1 billion over the 2008–2012 period, assuming appropriation of the authorized funds. Enacting H.R. 2773 would have no effect on direct spending or revenues.

H.R. 2773 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would benefit state and local governments.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 2773 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					
Renewable Energy Programs:					
Authorization Level [1]	0	0	963	0	0
Estimated Outlays	0	0	530	289	144
Biofuels Production Research Grants:					
Authorization Level	25	25	25	0	0
Estimated Outlays	14	21	25	11	4
Bioenergy Studies:					
Estimated Authorization Level	2	1	0	0	0
Estimated Outlays	2	1	0	0	0
Total Changes:					
Estimated Authorization Level	27	26	988	0	0
Estimated Outlays	16	22	555	300	148

[1] Public Law 109–58 authorized the appropriation of $743 million in 2008 and $852 million in 2009 for renewable energy programs.

Basis of estimate: For this estimate, CBO assumes that the bill will be enacted in fiscal year 2007 and that the amounts authorized and estimated to be necessary will be appropriated for each fiscal year.

Renewable energy programs

H.R. 2773 would authorize the appropriation of $963 million in 2010 for renewable energy research and development. Based on the historical spending patterns of DOE research programs, CBO estimates that implementing this provision would cost $963 million over the 2010–2012 period, subject to appropriation of the specified amount. In 2005, the Congress authorized the appropriation of $743 million in 2008 and $852 million in 2009 for renewable energy research and development (see Public Law 109–58).

Biofuels production research grants

H.R. 2773 would authorize the appropriation of $25 million a year over the 2008–2010 period to research and develop biofuel production technologies. The bill would direct the Secretary to make research grants to institutions of higher education located in states with low rates of ethanol production. Based on information from DOE, CBO estimates that implementing this provision would cost $75 million over the 2008–2012 period, subject to appropriation of the specified amounts.

Bioenergy studies

H.R. 2773 would require DOE to examine several issues involving the production, consumption, and impact of bioenergy fuels. The bill would require the Secretary to complete those studies within two years of enactment. Based on the costs of similar activities, CBO estimates that producing the studies outlined in the bill would cost $3 million over the next two years, subject to the appropriation of the necessary funds.

Bioenergy research and development

H.R. 2773 would increase the authorized funding level for bioenergy research and development programs of DOE by $126 million in 2008 and $147 million in 2009. (The current law authorization

levels for those programs are $251 million and $274 million, respectively.) Additional amounts authorized by the bill would be used to examine the existing fuel distribution infrastructure as well as ways to improve the energy efficiency of biorefinery facilities and enabling them to accept a wider range of biomass inputs. Funding also would be used to establish an information center for biofuels and biorefineries research.

The additional amounts authorized by the bill would be allocated from $1.6 billion previously authorized to be appropriated for all DOE renewable energy programs in 2008 and 2009 (see Public Law 109–58). Because the additional amounts specified in the bill for bioenergy programs would effectively set aside part of the existing authorization levels for renewable energy programs, CBO estimates that implementing this provision would have no net additional cost over the five-year period.

Systems biology research and development

H.R. 2773 would expand DOE's systems biology research and development programs to include environmental science, and would establish at least five centers for biofuels research. In 2005, the Congress authorized the appropriation of $4.6 billion for 2008 and $5.2 billion for 2009 for the DOE Office of Science. Those authorizations included such sums as necessary for systems biology research and development (see Public Law 109–58). Because H.R. 2773 would not amend the overall authorization level for the Office of Science, it would effectively reallocate the existing authorization levels for DOE science programs, and we estimate that implementing this provision would have no net cost over the five-year period.

Intergovernmental and private-sector impact: H.R. 2773 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would create a grant program benefitting institutions of higher education. Any costs that state, local, or tribal governments might incur, including matching funds, 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: Craig Cammarata.

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

XI. Compliance With Public Law 104–4

H.R. 2773 contains no unfunded mandates.

XII. 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.

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause (3)(c) of House rule XIII, the goal of H.R. 2773 is to advance biofuels related technologies by establishing a biofuels and biorefinery information center, biofuels and advanced biofuels infrastructure, biodiesel, a bioresearch centers for systems

biology program, grants for biofuel production research and development in certain states, biorefinery energy efficiency, and conducting biofuels studies, including a study of increased consumption of ethanol-blended gasoline with higher levels of ethanol, a study of optimization of flexible fueled vehicles to use e–85 fuel, and a study of engine durability associated with the use of biodiesel.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 2773.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 2773 does not establish nor authorize the establishment of any advisory committee.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 2773 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).

XVII. EARMARK IDENTIFICATION

H.R. 2773 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.

XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

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

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

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

ENERGY POLICY ACT OF 2005

* * * * * * *

TITLE IX—RESEARCH AND DEVELOPMENT

* * * * * * *

Subtitle C—Renewable Energy

SEC. 931. RENEWABLE ENERGY.

(a) * * *

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out renewable energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle—

(1) * * *

(2) $743,000,000 for fiscal year 2008; [and]

(3) $852,000,000 for fiscal year 2009[.]*; and*

(4) $963,000,000 for fiscal year 2010.

(c) BIOENERGY.—From the amounts authorized under subsection (b), there are authorized to be appropriated to carry out section 932—

(1) * * *

(2) [$251,000,000] *$377,000,000* for fiscal year 2008, of which $125,000,000 shall be for section 932(d); and

(3) [$274,000,000] *$398,000,000* for fiscal year 2009, of which $150,000,000 shall be for section 932(d).

(4) $419,000,000 for fiscal year 2010, of which $150,000,000 shall be for section 932(d).

* * * * * * *

SEC. 932. BIOENERGY PROGRAM.

(a) * * *

* * * * * * *

(f) BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.—The Secretary, in consultation with the Secretary of Transportation and the Assistant Administrator for Research and Development of the Environmental Protection Agency, shall carry out a program of research, development, and demonstration as it relates to existing transportation fuel distribution infrastructure and new alternative distribution infrastructure. The program shall focus on the physical and chemical properties of biofuels and efforts to prevent or mitigate against adverse impacts of those properties in the following areas:

(1) Corrosion of metal, plastic, rubber, cork, fiberglass, glues, or any other material used in pipes and storage tanks.

(2) Dissolving of storage tank sediments.

(3) Clogging of filters.

(4) Contamination from water or other adulterants or pollutants.

(5) Poor flow properties related to low temperatures.

(6) Oxidative and thermal instability in long-term storage and use.

(7) Microbial contamination.

(8) Problems associated with electrical conductivity.

(9) Such other areas as the Secretary considers appropriate.

(g) BIOREFINERY ENERGY EFFICIENCY.—The Secretary shall establish a program of research, development, demonstration, and commercial application for increasing energy efficiency and reducing energy consumption in the operation of biorefinery facilities.

(h) RETROFIT TECHNOLOGIES FOR THE DEVELOPMENT OF ETHANOL FROM CELLULOSIC MATERIALS.—The Secretary shall establish a program of research, development, demonstration, and commercial application on technologies and processes to enable biorefineries that exclusively use corn grain or corn starch as a feedstock to produce

ethanol to be retrofitted to accept a range of biomass, including lignocellulosic feedstocks.

* * * * * * *

Subtitle G—Science

* * * * * * *

SEC. 977. SYSTEMS BIOLOGY PROGRAM.

(a) PROGRAM.—

(1) ESTABLISHMENT.—The Secretary shall establish a research, development, and demonstration program in microbial and plant systems biology, protein science, [and computational biology] *computational biology, and environmental science* to support the energy, national security, and environmental missions of the Department*, including the establishment of at least 5 bioresearch centers of varying sizes, as appropriate, that focus on biofuels, of which at least 1 center shall be located in each of the 5 Petroleum Administration for Defense Districts, which shall be established for a period of 5 years, after which the grantee may reapply for selection on a competitive basis*.

* * * * * * *

(b) GOALS.—The program shall have the goal of developing technologies and methods based on the biological functions of genomes, microbes, and plants that—

(1) can facilitate the production of fuels, including hydrogen *in sustainable production systems that reduce greenhouse gas emissions*;

* * * * * * *

(3) detoxify soils and water, including at facilities of the Department, contaminated with heavy metals and radiological materials; [and]

(4) develop cellulosic and other feedstocks that are less resource and land intensive and that promote sustainable use of resources, including soil, water, energy, forests, and land, and ensure protection of air, water, and soil quality; and

[(4)] *(5)* address other Department missions as identified by the Secretary.

* * * * * * *

XX. COMMITTEE RECOMMENDATIONS

On June 27, 2007, the Committee on Science and Technology favorably reported H.R. 2773, as amended, by a voice vote and recommended its enactment.

XXI. ADDITIONAL VIEWS

ADDITIONAL VIEWS OF REPRESENTATIVES RALPH M. HALL, F. JAMES SENSENBRENNER, JR., MICHAEL T. MCCAUL, PHIL GINGREY, TODD AKIN, TOM FEENEY, BOB INGLIS, RANDY NEUGEBAUER AND ADRIAN SMITH

At the Committee markup of H.R. 2773, Representative Hall (TX) offered an amendment to direct the Secretary to carry out a program of research, development and demonstration as it relates to the blending of transportation fuels derived from coal-to-liquids with biofuels. This amendment was supported by many of my minority colleagues, but unfortunately was voted down by the majority.

As we continue to work towards energy independence and security in our transportation fuels, we need to look at all our domestic resources both renewable and alternative. On the one hand we have biofuels which are an exciting option using renewable feedstocks, and on the other we have the option of turning coal into a liquid transportation fuel. While biofuels have the potential to displace a portion of our current oil use, we simply don't have the supply to displace all of it. Coal-to-liquids (CTL) also has the potential to displace oil use, but as we develop clean coal technologies for all sectors, we won't have an unlimited supply for this now-abundant domestic resource.

This amendment would have allowed us to conduct R&D into the blending of the two types of fuel in order that by combining them we can increase and prolong our supply of domestic fuels. By combining biofuels with CTL, we use less of our country's—and the world's—food supply, and less of our coal reserves that can also be used for electricity generation and other applications.

I believe we owe it to the American people to explore all avenues of energy independence and I urge my colleagues to consider exploration of coal-to-liquids technology as a viable alternative source of fuel.

RALPH M. HALL,
W. TODD AKIN,
MICHAEL T. MCCAUL,
RANDY NEUGEBAUER,
TOM FEENEY,
F. JAMES SENSENBRENNER, Jr.
PHIL GINGREY,
BOB INGLIS,
ADRIAN SMITH.

XXII. PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 2773, THE BIOFUELS RESEARCH AND DEVELOPMENT ACT

THURSDAY, JUNE 21, 2007

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

The Subcommittee met, pursuant to call, at 2:10 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Nick Lampson [Chairman of the Subcommittee] presiding.

Chairman LAMPSON. 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. 1933, the *Department of Energy Carbon Capture and Storage Research, Development and Demonstration Act of 2007;* H.R. 2774, the *Solar Energy Research and Advancement Act of 2007;* and H.R. 2773, the *Biofuels Research and Development Enhancement Act.*

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

Energy is not something most Americans have thought about since the oil embargo of the 1970s. Gas and electricity were cheap, environmental issues were not a concern and we did not appreciate our increased vulnerability to unstable foreign energy supplies. Consequently, energy stayed out of the legislative spotlight for many years.

The Congress passed significant energy legislation in 2005 in response to rising fuel prices and increased concerns about energy security. Since then the growing public awareness and acceptance of climate change compels us to take further actions on energy. Today this committee is taking yet another step to increase federal investment in energy technologies that we know will lessen the environmental impact of our energy use, decrease our reliance on foreign fuels and still maintain the quality of life we enjoy today.

First on the agenda is H.R. 1933 by Representative Udall which sets out the next steps in DOE's carbon mitigation strategies. In addition to continuing the Department's research on carbon dioxide management, the bill authorizes large-scale demonstrations of carbon sequestration technologies through partnerships with industrial, academic and government entities. An amendment by Mr.

Udall will add demonstrations of carbon capture technology as well. Because we will continue to use our abundant resources of coal to meet our energy needs for the foreseeable future, it is critical that we demonstrate an integrated system of capture, transportation and storage of carbon dioxide at a large scale.

Next we will take H.R. 2774, the *Solar Energy and Advancement Act of 2007,* introduced by Congresswoman Giffords. This bill creates a research and development program on energy storage technology for concentrating solar power plants which allows for the use of solar energy even when the sun isn't shining. It also asks the DOE to conduct studies on how best to integrate concentrating solar plants with the grid and ways to reduce water usage in these plants. I know the Congresswoman also plans to introduce an amendment today that creates a solar workforce program, and this will further improve the bill and I look forward to hearing what my distinguished colleague has to say about it soon.

And finally, the Subcommittee will consider my bill, H.R. 2773, the *Biofuels Research and Development Enhancement Act.* This bill attempts to better coordinate and compile information from federal biofuels research programs, focus some of the biofuels research on infrastructure needs and efficiency of biorefinery technologies, study some of the continuing challenges facing broader use of biofuels, and increase the funding levels for biofuels research.

For each of these bills, the Subcommittee has held hearings examining the various technical barriers and possible pathways for these technologies. Many of the amendments that will be offered today result from the advice and input provided by the witnesses at these hearings. Today the Subcommittee should report meaningful legislation that will bring us one step closer to their consideration on the House Floor in July. I urge support for all of these bills and I look forward to working with all of you as we move these bills forward to Full Committee next week.

[The prepared statement of Chairman Lampson follows:]

PREPARED STATEMENT OF CHAIRMAN NICK LAMPSON

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Chairman LAMPSON. I now recognize Mr. Inglis, the Ranking Member, to present his opening remarks.

Mr. INGLIS. Thank you, Mr. Chairman, and I look forward to this markup.

The bills we mark up today are reflections of the commitment we have made to move away from our dependence on foreign oil and toward solutions that make both economic and environmental sense.

Renewable energy sources give us the opportunity to end our dependence on fossil fuels like oil and coal. In the meantime though, we will use a lot of oil and a lot of coal. That is why we must work to make sure especially that our coal consumption is as emission-free and energy efficient as possible, bringing benefits to both industry and to the environment.

Carbon capture and storage technologies hold significant promise for reducing carbon emissions. H.R. 1933, the *Department of Energy Carbon Capture and Storage Research, Development and Demonstration Act,* will fund demonstration projects that integrate these technologies. The aim is that the research and experience gained from these projects will help bring down the cost of implementing carbon-reducing technologies in the private sector.

As I mentioned earlier, the ultimate goal is energy sources that are renewable and emission-free. H.R. 2774, the *Solar Research and Advancement Act,* and H.R. 2773, the *Biofuels Research and Development Act,* are two steps in that direction. Biofuels and solar energy should be sources of energy for us, and I am looking forward to promoting research programs that will make these alternatives commercially viable.

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

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Thank you for holding this markup, Mr. Chairman.

The bills we're marking up today are reflections of the commitment we have made to move away from our dependence on foreign oil, and toward solutions that make both economic and environmental sense.

Renewable energy sources give us the opportunity to end our dependence on fossil fuels like oil and coal. In the meantime we'll use lots of coal. That's why we must

work to make sure that our coal consumption is as emission-free and energy efficient as possible, bringing benefits to both industry and the environment.

Carbon capture and storage technologies hold significant promise for reducing carbon emissions. H.R. 1933, the *Department of Energy Carbon Capture and Storage Research, Development, and Demonstration Act,* will fund demonstration projects that integrate these technologies. The aim is that the research and experience gained from these projects will help bring down the cost of implementing carbon-reducing technologies in the private sector.

As I mentioned earlier, the ultimate goal is energy sources that are renewable and emission-free. H.R. 2774, the *Solar Research and Advancement Act,* and H.R. 2773, the *Biofuels Research and Development Act,* are two steps in that direction. Biofuels and solar energy should be sources of energy for us, and I'm looking forward to promoting research programs that will make these alternatives commercially viable.

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

Chairman LAMPSON. Thank you, Mr. Inglis.

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

We will now consider H.R. 2773, the *Biofuels Research and Development Enhancement Act.* I yield myself five minutes to describe this bill.

While I believe that fossil fuels still remain an important part of any viable balanced energy strategy, we must enhance our efforts to develop a diverse set of alternative energy sources. Biofuels represent one of our best opportunities to accomplish this. Though we have seen amazing growth in our country's biofuels development mostly in the form of corn-based ethanol and soy-based biodiesel, ethanol still represents only five percent of the total gasoline sold and biodiesel is an even smaller portion of the total diesel market. Surely we would not be where we are today without the efforts of those who pioneered the development of our corn-based ethanol industry but the future of biofuels lies in diversifying the feedstocks to include cellulosic materials such as grasses, wood and waste materials. Current technologies for the development of cellulosic biofuels continue to be expensive and not yet cost-competitive with corn-based ethanol. Research breakthroughs could bring down costs and greatly increase the process efficiency sparking another revolution in the biofuels industry.

H.R. 2773, the *Biofuels Research and Development Enhancement Act,* presents another effort toward reducing our country's dependence on foreign sources of oil and building a domestic industry for clean, renewable fuels. The bill has several key components.

The bill creates two focused research efforts within the existing Bioenergy Research Program created in the *Energy Policy Act of 2005.* First, recognizing the inherent problems with transporting and storing biofuels in the existing petroleum fuels infrastructure, this section establishes a program of research, development and demonstration for modification and treatments to existing infrastructure and research and development of new infrastructure systems for biofuels.

Recognizing the technical barriers to increasing the production of biofuels, the bill also establishes a program of research, development, demonstration and commercial application of technologies to increase the energy efficiency and reduce the energy consumption of biorefinery facilities. The bill will help to better coordinate and compile the rapidly expanding base of information from biofuels re-

search programs by setting up a DOE Center to serve as a clearinghouse of information related to the research, development and commercial applications of technologies related to biofuels and biorefinery technologies. The bill will provide research grants in states with low rates of biofuels production to work toward the development of biofuels assets. And the bill will expand the Bioresearch Center Program created in the *Energy Policy Act of 2005* allowing for the establishment of additional regionally dispersed centers.

The bill also directs the Secretary to conduct several studies. These studies relate to increasing the utilization of biodiesel, examining the feasibility of mid-level ethanol blended gasoline and the challenges of using such blends, the engine durability associated with use of differing blend levels of biodiesel and the technical challenges to optimizing the engines of flex-fuel vehicles to more efficiently use E85.

Last, the bill makes additional commitments to ongoing biofuels research programs by increasing the authorization levels for these programs. This increase will also accommodate the new focused infrastructure and efficiency research efforts I mentioned earlier. This bill will help to enhance the ongoing federal efforts to support biofuels research and development as well as provide necessary information back to Congress that will allow us to make additional research commitments in the future. I urge the Members of the Subcommittee to support the bill, and I yield back the balance of my time.

And at this point I recognize Mr. Inglis to present any remarks on the bill.

Mr. INGLIS. Thank you, Mr. Chairman. I appreciate the Chairman's amendment and—you are on the amendment, right? Or no, you——

Chairman LAMPSON. Yes, I am.

Mr. INGLIS. You are on the amendment. Or are you on the bill itself?

Chairman LAMPSON. The bill.

Mr. INGLIS. Okay. Good. Well, I have already spoken to this bill and we have got a vote on the House Floor, so I thank you for the opportunity to speak, but I will pass.

Chairman LAMPSON. You want to save something for later.

Does 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 Members proceed with the amendments in order of the roster. Without objection, it I so ordered.

The first amendment on the roster is a manager's amendment offered by the Chair. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773 offered by Mr. Lampson of Texas.

Chairman LAMPSON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. And I will now postpone recognizing myself for the five minutes to describe this bill as we have votes and we will come back, and if you see any other Members on the Floor, bring them with you so we can finish this thing and complete our markup. We stand in recess.

[Recess.]

Chairman LAMPSON. I will call the meeting back to order. Thank you for everyone's patience while we went off to vote. We had left with the dispensing of the reading of the bill and at this point will recognize myself five minutes to explain the amendment.

The manager's amendment I offer will make several simple but necessary changes to the bill. Following the testimony of the witnesses at our hearing, consultation with the Minority staff and a last review of the bill, I offer this amendment to resolve a few technical issues, clarify the intent of a few provisions and resolve some concerns raised by Members of the Subcommittee.

More specifically, the amendment makes the following changes. It clarifies that the Technology Transfer Center, not the Secretary of Energy, will carry out the tasks of the Center.

Two, recognizing that the Department of Transportation regulates pipelines, the amendment ensures that the Secretary of Energy will consult with the Department of Transportation as it engages in the infrastructure research and development program created in section III of the bill.

Three, it removes a few unnecessary focus areas for the infrastructure research program created in section III and provides the Secretary with the ability to look at other areas deemed appropriate.

Four, it inserts a more appropriate definition of biodiesel for the purpose of the study in section IV and V, and finally, following discussion at the Subcommittee hearing, the amendment reduces the number of Bioresearch Centers authorized in the bill from 11 to five.

I appreciate the Minority consultation on these changes. I believe they will enhance the bill and I urge adoption of the manager's amendment. With that, I yield back the balance of my time.

Is there further discussion on the amendment? Further discussion on the amendment? If no——

Mr. NEUGEBAUER. Mr. Chairman?

Chairman LAMPSON. Yes, sir.

Mr. NEUGEBAUER. Could you just talk a little bit about the reduction in the bioresearch centers going from 11 to five? I mean, I think that is probably a good idea. How do you see those being determined?

Chairman LAMPSON. I am sure by the Secretary, but if the Counsel would——

The COUNSEL. Pretty much the same way as the program authorizing the *Energy Policy Act of 2005* with the existing two with the third one to come. The total of five would be determined at the discretion of the Secretary through public filing in the *Federal Register* and applications being submitted to the Secretary.

Mr. NEUGEBAUER. I thank the Chairman for that clarification.

Chairman LAMPSON. Thank you. You are welcome.

Any other——

Mr. INGLIS. Mr. Chairman, one question about the term used, Counsel may be able to help us with this, apparently some question about the transportation of fuel infrastructure as a defined term perhaps. Does it include storing and delivering of fuels to the final point of sale?

The COUNSEL. It does, Mr. Inglis.

Mr. INGLIS. It does. And how about does it include tankage and pipelines as well?

The COUNSEL. It does, Mr. Inglis.

Mr. INGLIS. Thanks.

Chairman LAMPSON. Any further discussion on the amendment? If no, the vote occurs on the amendment. All in favor say aye. Those opposed, say no. The ayes have it and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the gentlelady from California, Ms. Woolsey. Are you ready to proceed with your amendment?

Ms. WOOLSEY. Mr. Chairman, Congressman Bartlett and I have an amendment at the desk.

Chairman LAMPSON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773 offered by Ms. Woolsey of California and Mr. Bartlett of Maryland.

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

Ms. WOOLSEY. Mr. Chairman, our amendment adds language to ensure that as we move forward to enhance our nation's fuel supply that we do so in an environmentally responsible manner. As Mr. Waskow pointed out at our hearing last week, biofuels do have the potential to diversify our energy needs and reduce greenhouse gas emissions but only if we pursue this path with a full understanding of the implications of biofuel production and processing. That is why our amendment adds a new section of the bill that does three things.

It amends the *Energy Policy Act of 2005* to explicitly add environmental science to the list of disciplines that the bioenergy centers created in the Act making sure that they are authorized to pursue. Our amendment also specifies the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions. Our amendment also finally adds a new goal for the research conducted by the centers to develop cellulosic feedstocks that efficiently utilize resources and promote environmental sustainability.

Two new research and development programs are also added to the bill. One directs the Secretary in consultation with EPA to develop a research and development program to develop tools to do life cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production. The other new program directs the Secretary in consultation with the Secretary of Agriculture to establish a research and development program on small-scale production and processing of biofuels for farm use.

Mr. Chairman, these are some modest steps and I believe, as does Mr. Bartlett, that we must take these steps to develop information so that we can be guided in our effort to promote biofuel production so that it can be used in a manner that will truly address both our need for energy security and our need for a clean, healthy environment. So I urge my colleagues to support our amendment.

[The prepared statement of Ms. Woolsey follows:]

PREPARED STATEMENT OF REPRESENTATIVE LYNN WOOLSEY

Mr. Chairman, my amendment adds language to ensure that as we move forward to enhance our nation's fuel supply that we do so in an environmentally responsible manner.

As Mr. Waskow pointed out at our hearing last week, biofuels do have potential to diversify our energy needs and reduce greenhouse gas emissions, but only if we pursue this path with a full understanding of the implications of biofuel production and processing.

That's why my amendment adds a new section of the bill that does three things:

It amends the *Energy Policy Act of 2005* to explicitly add environmental science to the list of disciplines that the Bioenergy Centers created in the Act are authorized to pursue. My amendment also specifies the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions.

My amendment also adds a new goal for the research conducted by the Centers to develop cellulosic feedstocks that efficiently utilize resources and promote environmental sustainability.

Two new research and development programs are also added to the bill. One directs the Secretary in consultation with EPA to develop a research and development program to develop tools to do life cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production.

The other new program directs the Secretary in consultation with the Secretary of Agriculture to establish a research and development program on small-scale production and processing of biofuels for on-farm use.

These are some modest steps that I believe we must take to develop information that will guide us in our efforts to promote biofuel production and use in a manner that will truly be address both our need for energy security and our need for a clean, healthy environment.

I urge my colleagues to support my amendment.

Chairman LAMPSON. Thank you, Ms. Woolsey.

I recognize Mr. Bartlett for remarks, five minutes.

Mr. BARTLETT. I am pleased to join my friend in proposing this amendment. Farmers are our best environmental stewards. They do not eat their seed corn so that they can ensure future harvests. Sustainable biofuel production will require reducing fossil fuel inputs and ensure sufficient organic material is retained to maintain soil fertility.

Congresswoman Woolsey and I both represent primarily small and medium-sized family farms. Our family farmers own most of the land and assets in our country. They dedicate the largest proportion of land set aside to protect the environment in the Conservation Reserve Program and the Wetlands Reserve Program. However, more than half of them are losing money farming and must rely on other work for income. We really need to help our family farmers reduce their energy costs and provide them with opportunities to become energy producers.

This program also addresses a tendency for stovepiping that can isolate expertise within departments. Research under this bill should complement rather than duplicate other Federal Government efforts. It is important that research authorized under this bill by the Department of Energy take advantage of and benefit from creating a synergy with ongoing biofuels research and development and field testing initiatives by the Department of Agriculture.

[The prepared statement of Mr. Bartlett follows:]

PREPARED STATEMENT OF REPRESENTATIVE ROSCOE BARTLETT

Mr. Chairman, I am offering an amendment sponsored by my good friend, Congresswoman Lynn Woolsey, and I am presenting it to you on behalf of both of us. The Woolsey amendment adds language to ensure that as we move forward to enhance our nation's fuel supply that we do so in an environmentally responsible manner.

As Mr. Waskow pointed out at our hearing last week, biofuels do have potential to diversify our energy needs and reduce greenhouse gas emissions, but only if we pursue this path with a full understanding of the implications of biofuel production and processing.

That's why this amendment adds a new section of the bill that does three things:

First, it amends the *Energy Policy Act of 2005* to explicitly add environmental science to the list of disciplines that the Bioenergy Centers created in the Act are authorized to pursue. This amendment also specifies the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions. Farmers are our best environmental stewards. They do not eat their seed corn so that they can ensure future harvests. Sustainable biofuel production will require reducing fossil fuel inputs and ensure sufficient organic material is retained to maintain soil fertility.

The amendment also adds a new goal for the research conducted by the Centers to develop cellulosic feedstocks that will not entail a food versus fuel trade-off and efficiently utilize resources and promote environmental sustainability.

The second change is that there would be two new research and development programs also added to the bill. One directs the Secretary in consultation with EPA to develop a research and development program to develop tools to do life cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production.

Third, the other new program directs the Secretary in consultation with the Secretary of Agriculture to establish a research and development program on small-scale production and processing of biofuels for on-farm use.

Congresswoman Woolsey and I both represent primarily small and medium-size family farms. Our family farmers own most of the land and assets in our country. They dedicate the largest proportion of land set aside to protect the environment in the Conservation Reserve Program and the Wetlands Reserve Program. However, more than half of them are losing money farming and must rely on other work for income. We really need to help our family farmers reduce their energy costs and provide them with opportunities to become energy producers.

This program also addresses a tendency for stove piping that can isolate expertise within Departments. Research under this bill should complement rather than duplicate other Federal Government efforts. It is important that research authorized under this bill by the Department of Energy takes advantage of and benefits from creating a synergy with ongoing biofuels research and development and field testing initiatives by the Department of Agriculture.

These are some modest steps that Congresswoman Woolsey and I believe we must take to develop information that will guide us in our efforts to promote biofuel production and use in a manner that will truly address both our need for energy security and our need for a clean, healthy environment.

I urge my colleagues to support the Woolsey amendment.

Chairman LAMPSON. Thank you, Mr. Bartlett.

Is there further discussion on the amendment?

Mr. INGLIS. Mr. Chairman, I——

Chairman LAMPSON. I recognize the Ranking Member.

Mr. INGLIS. A question for Ms. Woolsey and Dr. Bartlett. I want to make sure that what we are doing here is not letting the perfect be the enemy of the good. If we have a requirement that these alternative energies be created in sustainable production systems that reduce greenhouse gas emissions, if that is the case, are we basically making it so that you have got to have a perfectly elegant system to create these new fuels such that we will never get there because right now, for example, we create hydrogen by re-forming natural gas, which creates CO_2, I assume, Dr. Bartlett, and if it does——

Mr. BARTLETT. If the gentleman would yield, that is true, and if you used it no more efficiently than you used the energy source in which you produced it, you would be increasing the CO_2 footprint, but hopefully you would use the hydrogen much more efficiently as, for instance, in a fuel cell, which will operate at at least twice the efficiency of a reciprocating engine where you would reduce the carbon footprint. If you are going to increase the carbon footprint and if it is not going to be sustainable, then I don't know why you would want to do it. It would be counterproductive to even start down that road, wouldn't it?

Mr. INGLIS. Well, no, I don't think so because what you might have to do is, you might have to pursue a technology for a period of time, learn what you can out of it and then proceed to the next technology.

Ms. WOOLSEY. Will the gentleman yield?

Mr. INGLIS. But if you wait for the most elegant technology, you may wait forever so that, you know, the Wright brothers, if they could have waited for a jet engine, it is better than a propeller, I suppose, but you can't do that. You have to go ahead with the propeller and get it going and then later you get a jet engine.

Mr. BARTLETT. If the gentleman would yield, I appreciate what you are saying. I agree with you totally, but this amendment certainly does not do that. All this says is that if you are starting down the road whose terminus you know will result in depletion of our topsoil and then the production of more CO_2, a bigger CO_2 footprint, you would never start down that road. Hopefully tomorrow you will be better than you were today but you shouldn't start down a road that you know leads you totally to the wrong place. If you know that to begin with, you shouldn't start down that road. I think that is all this legislation says.

Mr. INGLIS. Well, then I think that you must be assuming you are clairvoyant then because you must also assume that it is also all linear because it is not linear. The reality is that there may be some breakthrough that comes in from some unexpected source that solves one of the problems you have got. It isn't linear. You can't say we are going to make biofuels in a certain way that is totally elegant because you limit the possibilities, and science should be about expanding the possibilities, not limiting the possibilities.

Ms. WOOLSEY. If the gentleman will yield?

Mr. INGLIS. Yes, I would be happy to.

Ms. WOOLSEY. There is a lot we already know and we are saying apply what we know, and as we learn more, apply that. We want to prevent some fad from being the new biofuel energy and find out 10 years from now that it did nothing but raise the price of corn, for example, so that our dairies can't even afford it and when we haven't gotten any advantage for our environment. So there are things we already know, we will build on that and we take what we know into account and go forward.

Mr. INGLIS. Well, I would observe that there are some exciting things in the area of production of biomass that may be as elegant as what we all hope to have some day but there are others that aren't quite so elegant. In the meantime, we are learning a lot through the not so elegant, and to sort of—it seems to me this

amendment, I am not sure the full effect of it but it seems to me it just—a cursory reading of it that it seems to limit those possibilities by saying you have to have total elegance.

Ms. WOOLSEY. Well, I didn't see the word "elegance"—if the gentleman would yield again—ever in our legislation. What we are looking for is a check and balance so that we don't just go straight down some path and then find out that was the wrong way to go. I mean, assuming that example would be corn and ethanol, that that is the way we are going so then we don't look at some better ways to produce efficiency.

Mr. INGLIS. So the research that we are talking about under this bill, if this amendment prevails, could any of the research be devoted to corn ethanol?

Ms. WOOLSEY. I mean, as far as I am concerned, it could be applied to anything that has to do with biofuels.

Mr. INGLIS. Well, if you insert in 2A, line 8—8, 9, and 10, if you insert that language, I am not sure you can use any of this research that we are setting up here on corn ethanol, or can you? I would—if you say yes, you still could use the money provided in this research for corn ethanol, then I am happy. If you say no, it can't be used on corn ethanol, I am not happy.

Mr. BARTLETT. If the gentleman would yield, why couldn't it be?

Mr. INGLIS. Well, because——

Mr. BARTLETT. Unless you were using more fossil-fuel energy to produce the corn ethanol than you were getting out of the corn ethanol, which I think is not the case, it is around 75, 80 percent of all the energy in corn ethanol is represented by the fossil fuels that it took to produce it. So certainly with this language you could pursue corn ethanol.

Mr. INGLIS. Well, then you are making me happy. So it is—it can be done—corn ethanol can be done in "sustainable production systems that reduce greenhouse gas emissions"?

Mr. BARTLETT. Of course. If it only takes 75 percent as much energy or 80 percent as much energy to produce the corn ethanol as you get out of it, certainly you are reducing the CO_2 footprint.

Mr. INGLIS. Well, then what does that quote that I just read take out of consideration?

Mr. BARTLETT. What quote was that?

Mr. INGLIS. Lines 8, 9 and 10. What does it take out of the realm of possibilities?

Ms. WOOLSEY. Well, actually it is not intended to take anything out. It is intended to be a research project so that we know what is and what is not effective, I mean, where we get the best bang for our buck.

Chairman LAMPSON. If I might add one comment, Ranking Member. There is nothing in this amendment which is intended to stop or slow down the production of biofuels, and if we might call on the Counsel while you are still claiming the time would yield to him for just a minute to hear his comment.

The COUNSEL. Nothing in section 977 of the *Energy Policy Act* would preclude research on corn or any other feedstocks.

Mr. INGLIS. If I may continue. My time is expired, I guess, but you are very gracious to indulge me. I am just trying to make sure—I am trying to clarify the meaning of lines 8, 9 and 10. That

is where some crucial language exists, and what piqued my interest was the word "hydrogen" because, you know, for example, right now we are creating a lot of hydrogen by re-forming natural gas which creates a CO_2 problem.

Mr. BARTLETT. If the gentleman would yield. But hopefully we will use that hydrogen more efficiently than we would have used the natural gas from which we produced it. Otherwise there would be no reason to produce the hydrogen. When you use the hydrogen, you produce water that is pretty clean and it is very much more difficult to clean up the use of energy when you are using it in small amounts as you are in a car. It is a whole lot easier to clean it up in a major, like an electricity-producing facility or something like that. Even if you are coming out even, you might still want to go to hydrogen because when you use it, it is really clean. But hydrogen has such a potential, it is a great candidate for fuel cells, and the hope would be that when we finally get to using hydrogen, having a hydrogen economy, it would be with fuel cells. We are not there yet. It is probably another decade or more before we get there but I think that was the dream of everybody who was promoting hydrogen. It is a great candidate for fuel cells.

Mr. INGLIS. Right, and I am looking for the—maybe the Counsel can help us with this. Can you read the paragraph with the insert in it? It is——

The COUNSEL. We are talking about lines 8, 9——

Mr. INGLIS. Eight, 9 and 10.

The COUNSEL. That would add it to B–1. B would read, "Goals: The program shall have the goal of developing technologies and methods based on the biological functions of genomes, microbes and plants that—" and the amendment is added to the following: "1. Can facilitate the production of fuels including hydrogen," and the language being added is, "in sustainable production systems that reduce greenhouse gas emissions."

Mr. INGLIS. And you said earlier it is not a limitation. It is clearly a limitation, right? I mean, in other words, there might be some——

Ms. WOOLSEY. Mr. Chairman.

Mr. INGLIS.—system that isn't a sustainable production system.

The COUNSEL. Mr. Inglis, those are the goals of the program, exclusively the goals of the program to look at those areas.

Mr. INGLIS. Right, but if I am the guy administering it or the lady administering this, I wouldn't consider making a grant to one that doesn't fit the definition of sustainable, whatever I come up with is my definition of sustainable. I mean, it wouldn't fit the goals and therefore I wouldn't fund it, which seems to me is a little bit odd if it has got to be a jet engine, can't be a propeller.

Chairman LAMPSON. Would the gentleman yield?

Mr. INGLIS. I would be happy to yield.

Ms. WOOLSEY. Well, let us be clear that we are striving to produce biofuels systems that are sustainable.

Mr. INGLIS. Right.

Mr. WOOLSEY. That is our intention, and it is the goal that we are trying to achieve, and if a person wants a grant, did you say they wouldn't apply for a grant if they weren't going to produce

sustainable biofuel? Well, good, we will give the grants to those that do produce sustainability.

Mr. BARTLETT. If the gentlelady would yield, you may decide after pursuing a technology that it is not sustainable but I am having trouble understanding why you would want to start the pursuit of a technology if your perception from the beginning was that it was not going to be sustainable. That is all this says that clearly we are going to start down some paths that won't be fruitful. That is what R&D and research is. And, you know, everything you do in R&D and research is a success. There are no failures. You know you shouldn't go down that road again if it doesn't lead you to where you want to go. People don't understand that about basic research. There are no failures in basic research. You are testing a hypothesis and you test a hypothesis, and if that is the wrong way to go, you go somewhere else. But why would you ever start a program when your perception from the beginning was that it was not going to be sustainable?

Mr. INGLIS. Because you might get some breakthroughs. I know my time has expired but if I could just close with this, Mr. Chairman. The concern I have is having been out to visit in Ms. Woolsey's state to see the hydrogen partnership folks out there, they educated me about a big controversy in California involving whether the hydrogen must be green hydrogen and whether the hydrogen comes from, let us say, re-formed natural gas or coal, then it is not green and the result is, you don't want to make the hydrogen from that, or some people feel that you shouldn't make it from those sources. My view would be, you would want to go ahead and make the hydrogen from any source you can get it to get on down the road with discovery and knowing that you ultimately want to get to a totally green production of hydrogen but you don't let the perfect become the enemy of the good. You move down the road with the propeller and don't wait for the jet.

Ms. WOOLSEY. Mr. Chairman.

Chairman LAMPSON. The gentleman's time is expired.

Mr. NEUGEBAUER. Mr. Chairman.

Chairman LAMPSON. Who seeks—yes?

Mr. NEUGEBAUER. I move to strike the last word. Well, speaking in support of this amendment, I think this is exactly the issue that we actually need to be discussing as we look at alternative energy because in many ways we are talking about policy in this Congress and I think we know there is an energy bill looming both in the House and the Senate that quite honestly pulls us away from traditional sources of producing energy in this country, moving away from coal, moving away from natural gas, moving away from hydrocarbons, and all under the umbrella of the carbon footprint, and I think as we move away from that and quite honestly I think there is some risk in doing that if we do not have developed other alternative energy resources to replace that because the demand for energy in this country, in this world is not going down, it is going up exponentially and all you have to do—and I know that Mr. Bartlett and I were in China not too long ago and there is an economy that is doubling about every six years and their energy consumption is doubling about every six years as well. And so I think as we start down the road with many of these promising—

seemingly promising alternatives, we need to make sure that we understand what our energy goal is and what our goal is for the carbon footprint because there are going to be some tradeoffs, and so it makes sense to measure those tradeoffs before you view the whole industry—and certainly I have a lot of ethanol production plants under construction in my district and there is a lot of promise there but we need to also make sure that in that process that we are accomplishing two goals but the number one goal has to be that we are moving the ball down the field of providing additional energy resources for this country because we are falling behind in that way. But secondly, making sure that we are using science and using our—and in some cases, you know, you have to also throw a little common sense in there at the same time to make sure that these new technologies are in fact accomplishing the environmental pluses that we think should be accruing over walking away from some of our traditional resources. And so I think it makes sense as we move forward to ask that question. I take the gentlewoman, the gentleman at his word that this doesn't prevent them from looking at that but it just says early on, hey, if this doesn't look like this is panning out, let us go in a different direction and not throw out—sometimes I think—and I think we have to be very careful here with the American people letting them think that some of these new technologies are some kind of breakthroughs that are going to solve our energy problems when in fact they are going to be a piece, some of them a small piece, in my estimation, of being able to satisfy and make our country less dependent on foreign oil and other sources of energy. So I would speak in favor of that because I just think—I think this is kind of what I call a common sense amendment. It just says you know what, let us just make sure that we are accomplishing what are the national priorities of this country, and that is more energy, and doing it with the least increase or in any way we can diminish the carbon footprint as we move forward. So I urge my colleagues to support this amendment.

Chairman LAMPSON. Thank you. I recognize Ms. Woolsey.

Ms. WOOLSEY. Well, I couldn't have said it better myself, so I am not going to repeat what the gentleman said. Thank you. I just want to remind all of us that states can set their own standards, they can set higher standards, and California always will. That doesn't mean your state has to. And we already know green hydrogen technologies, so it is not like we have to throw the baby out with the bath water. If other areas want to adopt those standards, I mean they have that opportunity. But, you know, you are a state's rights guy.

Mr. BARTLETT. Mr. Chairman.

Chairman LAMPSON. Will you yield back?

Ms. WOOLSEY. Yes, I yield to Mr. Bartlett.

Mr. BARTLETT. Thank you very much. Mr. Chairman, I am very sensitive to the concerns that our Ranking Member has and I would like to note that this is the Subcommittee, that if this language can be improved, I would like to commit that I would like to work with our Ranking Member so that we can improve this language if it needs improved so that a manager's amendment when this goes to the Full Committee would include the improved lan-

guage so that nobody has the kinds of concerns that our Ranking Member has.

Chairman LAMPSON. Thank you very much. Do you want to make another comment?

Mr. INGLIS. If the gentlelady will yield?

Ms. WOOLSEY. Yes.

Mr. INGLIS. That is a very nice offer from Dr. Bartlett and I accept that offer.

Chairman LAMPSON. Any other discussion on the amendment? Any other discussion on the amendment? If no, the vote occurs on the amendment. All in favor say aye. Those opposed, say no. The ayes have it and the amendment is agreed to.

Are there other amendments? Hearing none, the vote is on the bill, and the Chair makes note of a quorum being present. Hearing none, the vote is on the bill, H.R. 2773, the *Biofuels Research and Development Enhancement Act,* as amended. All those in favor will say aye. All those opposed, say no. In the opinion of the Chair, the ayes have it.

We will recognize Ms. Woolsey to offer a motion.

Ms. WOOLSEY. Mr. Chairman, I move that the Subcommittee favorably report H.R. 2773 as amended to the Full Committee. Furthermore, I move that the staff be instructed to prepare the 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, no. The ayes have it and the bill is favorably reported.

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

[Whereupon, at 4:10 p.m., the Subcommittee was adjourned.]

Appendix:

H.R. 2773, Section-by-Section Analysis, Amendment Roster

.....

(Original Signature of Member)

110TH CONGRESS
1ST SESSION

H. R. _____

To enhance research, development, demonstration, and commercial application of biofuels related technologies and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. LAMPSON introduced the following bill; which was referred to the Committee on

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A BILL

To enhance research, development, demonstration, and commercial application of biofuels related technologies and for other purposes.

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

SECTION 1. SHORT TITLE.

This Act may be cited as the "Biofuels Research and Development Enhancement Act" .

SEC. 2. BIOFUELS AND BIOREFINERY INFORMATION CENTER.

(a) IN GENERAL.—The Secretary of Energy (in this Act referred to as the "Secretary"), in cooperation with the Secretary of Agriculture, shall establish a technology transfer center to make available information on research, development, and commercial application of technologies related to biofuels and biorefineries, including—

(1) biochemical and thermochemical conversion technologies capable of making fuels from lignocellulosic feedstocks;

(2) biotechnology processes capable of making biofuels with an emphasis on development of biorefinery technologies using enzyme-based processing systems; and

(3) other advanced processes and technologies that will enable the development of biofuels.

(b) ADMINISTRATION.—In administering this section, the Secretary shall—

(1) continually update information provided by the center;

(2) make information available on biotechnology processes; and

(3) make information and assistance provided by the center available for those involved in energy

research, development, demonstration, and commercial application.

SEC. 3. BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.

Section 932 of the Energy Policy Act of 2005 (42 U.S.C. 16232) is amendment by adding at the end the following new subsection:

"(f) BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.—

"(1) IN GENERAL.—The Secretary shall carry out a program of research, development, and demonstration as it relates existing transportation fuel distribution infrastructure and new alternative distribution infrastructure. The program shall focus on the physical and chemical properties of biofuels and efforts to prevent or mitigate against adverse impacts of those properties in the following areas:

"(A) Corrosion of metal, plastic, rubber, cork, fiberglass, glues, or any other material used in pipes and storage tanks.

"(B) Dissolving of storage tank sediments.

"(C) Clogging of filters.

"(D) Contamination from water or other adulterants or pollutants.

"(E) Poor flow properties related to low temperatures.

"(F) Oxidative and thermal instability in long-term storage and use.

"(G) Increased volatile emissions.

"(H) Microbial contamination.

"(I) Problems associated with electrical conductivity.

"(J) Increased nitrogen oxide emissions.".

SEC. 4. BIODIESEL.

Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to Congress a report on any research and development challenges inherent in increasing to 5 percent the proportion of diesel fuel sold in the United States that is biodiesel (as defined in section 757 of the Energy Policy Act of 2005 (42 U.S.C. 16105)).

SEC. 5. BIORESEARCH CENTERS FOR SYSTEMS BIOLOGY PROGRAM.

Section 977(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16317(a)(1)) is amended by inserting before the period at the end the following: ", including the establishment of at least 11 bioresearch centers of varying sizes, as appropriate, that focus on biofuels, of which at least 2 centers shall be located in each of the 4 Petroleum Administration for Defense Districts with no subdistricts

and at least 1 center shall be located in each of the subdistricts of the Petroleum Administration for Defense District with subdistricts''.

SEC. 6. GRANTS FOR BIOFUEL PRODUCTION RESEARCH AND DEVELOPMENT IN CERTAIN STATES.

(a) IN GENERAL.—The Secretary shall provide grants to eligible entities for research, development, demonstration, and commercial application of biofuel production technologies in States with low rates of ethanol production, including low rates of production of cellulosic biomass ethanol, as determined by the Secretary.

(b) ELIGIBILITY.—To be eligible to receive a grant under this section, an entity shall—

(1)(A) be an institution of higher education (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)) located in a State described in subsection (a); or

(B) be a consortium including at least 1 such institution of higher education, and industry, State agencies, Indian tribal agencies, or local government agencies located in the State; and

(2) have proven experience and capabilities with relevant technologies.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry

out this section $25,000,000 for each of fiscal years 2008 through 2010.

SEC. 7. BIOREFINERY ENERGY EFFICIENCY.

Section 932 of Energy Policy Act of 2005 (42 U.S.C. 16232), is amended by adding at the end the following new subsection:

''(g) BIOREFINERY ENERGY EFFICIENCY.—The Secretary shall establish a program of research, development, demonstration, and commercial application for increasing energy efficiency and reducing energy consumption in the operation of biorefinery facilities.''.

SEC. 8. STUDY OF INCREASED CONSUMPTION OF ETHANOL-BLENDED GASOLINE WITH HIGHER LEVELS OF ETHANOL.

(a) IN GENERAL.—The Secretary, in cooperation with the Secretary of Agriculture, the Administrator of the Environmental Protection Agency, and the Secretary of Transportation, shall conduct a study of the methods of increasing consumption in the United States of ethanol-blended gasoline with levels of ethanol that are not less than 10 percent and not more than 40 percent.

(b) STUDY.—The study under subsection (a) shall include—

(1) a review of production and infrastructure constraints on increasing consumption of ethanol;

(2) an evaluation of the environmental consequences of the ethanol blends described in subsection (a) on evaporative and exhaust emissions from on-road, off-road, and marine vehicle engines; and

(3) an evaluation of the consequences of the ethanol blends described in subsection (a) on the operation, durability, and performance of on-road, off-road, and marine vehicle engines.

(c) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to Congress a report describing the results of the study conducted under this section.

SEC. 9. STUDY OF OPTIMIZATION OF FLEXIBLE FUELED VEHICLES TO USE E-85 FUEL.

(a) IN GENERAL.—The Secretary shall conduct a study of whether optimizing flexible fueled vehicles to operate using E-85 fuel would increase the fuel efficiency of flexible fueled vehicles.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results

of the study under this section, including any recommendations of the Secretary.

SEC. 10. STUDY OF ENGINE DURABILITY ASSOCIATED WITH THE USE OF BIODIESEL.

(a) IN GENERAL.—Not later than 30 days after the date of enactment of this Act, the Secretary shall initiate a study on the effects of the use of biodiesel on engine durability.

(b) COMPONENTS.—The study under this section shall include—

(1) an assessment of whether the use of biodiesel in conventional diesel engines lessens engine durability; and

(2) an assessment of the effects referred to in subsection (a) with respect to biodiesel blends at varying concentrations, including the following percentage concentrations of biodiesel:

(A) 5 percent biodiesel.

(B) 10 percent biodiesel.

(C) 20 percent biodiesel.

(D) 30 percent biodiesel.

(E) 100 percent biodiesel.

(c) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House

of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results of the study under this section, including any recommendations of the Secretary.

SEC. 11. BIOENERGY RESEARCH AND DEVELOPMENT, AUTHORIZATION OF APPROPRIATION.

(a) Section 931 of the Energy Policy Act of 2005 (42 U.S.C. 16231) is amended—

(1) in subsection (b)—

(A) at the end of paragraph (2) by striking ''and'';

(B) at the end of paragraph (3) by striking the period and inserting ''; and''; and

(C) by adding at the end the following new paragraph:

''(4) $963,000,000 for fiscal year 2010.''; and

(2) in subsection (c)—

(A) in paragraph (2), by striking ''$251,000,000'' and inserting ''$377,000,000'';

(B) in paragraph (3), by striking ''$274,000,000'' and inserting ''$398,000,000''; and

(C) by adding at the end the following new paragraph:

"(4) $419,000,000 for fiscal year 2010, of which $150,000,00 shall be for section 932(d).".

SECTION-BY-SECTION ANALYSIS OF H.R. 2773,
THE BIOFUELS RESEARCH AND DEVELOPMENT ACT

Section 2. Biofuels and Biorefinery Information Center

Directs the Secretary of Energy, in cooperation with the Secretary of Agriculture, to establish an information center to serve as a clearinghouse of information related to the research, development, and commercial applications of technologies related to biofuels and biorefinery technologies. This section will help make readily available to interested parties the latest information on methods for biofuels development to help support the rapid growth and deployment of biofuels.

Section 3. Biofuels and Advanced Biofuels Infrastructure

Recognizing the inherent problems with transporting and storing biofuels in the existing petroleum fuels infrastructure, this section establishes and program of research, development, and demonstration for modifications and treatments to existing infrastructure and development of new infrastructure.

Section 4. Biodiesel

The Secretary is directed to submit a report to Congress on any research and development challenges in increasing to five percent the amount of biodiesel, as compared to the current level, the amount of all diesels sold nationally.

Section 5. Bioresearch Centers for Systems Biology Program

The Bioresearch Center program created in the Energy Policy establish at least 11 regionally located centers.

Section 6. Grants for Biofuels Production Research and Development in Certain States

Establishes a research and development grant program in states with low rates of Biofuels production, as is determined by the Secretary of Energy.

Section 7. Biorefine Energy Efficiency

Adds a new subsection the Section 932 of the *Energy Policy Act of 2005* (Bioenergy Program) to establish a program of research, development, demonstration and commercial application of technologies to increase the energy efficiency and reduce the energy consumption of biorefinery facilities.

Section 8. Stuff of Increase Consumption of Ethanol-Blended Gasoline with Higher Levels

Directs the Secretary of Energy to conduct a study, in cooperation with the Secretaries of Agriculture and Transportation and EPA, on the feasibility of increasing the consumption of ethanol-blended gasoline at blend levels between 10 and 40 percent.

Section 9. Study of Optimization of Flexible Fueled Vehicles to Use E–85

Directs the Secretary of Energy to conduct a study to determine if optimizing flexible fuel vehicles to operate using E–85 would increase the fuel efficiency while using E–85.

Section 10. Study of Engine Durability Associated with the Use of Biodiesel

Directs the Secretary of Energy to conduct a study on the effects of the use of biodiesel, at varying blend levels, on engine durability.

Section 11. Authorization for Appropriation

This section makes the following authorizing changes:

- Extends the authorization of Section 931 (Renewable Energy) *Energy Policy Act of 2005* through 2010 (currently expires in 2009) and funds the programs at $963 million.
- Increases the authorization levels for Section 932 (Bioenergy Programs) of the *Energy Policy Act of 2005* to:
  - FY08—$377 million
  - FY09—$398 million
  - FY10—$419 million

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
SUBCOMMITTEE MARKUP
June 21, 2007

H.R. 2773 – *the Biofuels Research and Development Enhancement Act*

AMENDMENT ROSTER

No.	Sponsor	Description	Results
1	Mr. Lampson	Manager's amendment makes clarifying and technical changes to the bill, and reduces the number of Bioresearch Centers authorized in the bill from 11 to 5.	Agreed to by voice vote.
2	Ms. Woolsey with Mr. Bartlett	Adds a new section by adding environmental science to the list of disciplines the Bioenergy Centers created in the Act are authorized to pursue and adds research and development programs aimed at the environmental impacts of various stages of biofuel production.	Agreed to by voice vote.

AMENDMENT TO H.R. 2773

OFFERED BY MR. LAMPSON OF TEXAS

Page 2, line 19, insert ''shall ensure that the center'' after ''the Secretary''.

Page 3, line 6, strike ''amendment'' and insert ''amended''.

Page 3, line 10, insert '', in consultation with the Secretary of Transportation,'' after ''The Secretary''.

Page 3, line 12, insert ''to'' after ''as it relates''.

Page 4, line 5, strike subparagraph (G).

Page 4, lines 6 and 7, redesignate subparagraphs (H) and (I) as subparagraphs (G) and (H), respectively.

Page 4, line 9, strike subparagraph (J) and insert the following new subparagraph:

(I) Such other areas as the Secretary considers appropriate.

Page 4, lines 15 and 16, strike ''as defined in section 757 of the Energy Policy Act of 2005 (42 U.S.C. 16105)'' and insert ''within the meaning of section 211(o) of the Clean Air Act''.

Page 4, line 22, strike "11" and insert "5".

Page 4, line 24, through page 5, line 3, strike "2 centers" and all that follows through "with subdistricts" and insert "1 center shall be located in each of the 5 Petroleum Administration for Defense Districts".

AMENDMENT TO H.R. 2773

OFFERED BY MS. WOOLSEY OF CALIFORNIA AND MR. BARTLETT OF MARYLAND

Add at the end of the bill the following new section:

SEC. 12. ENVIRONMENTAL RESEARCH AND DEVELOPMENT.

(a) AMENDMENTS.—Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317) is amended—

(1) in subsection (a)(1), by striking "and computational biology" and inserting "computational biology, and environmental science"; and

(2) in subsection (b)—

(A) in paragraph (1), by inserting "in sustainable production systems that reduce greenhouse gas emissions" after "hydrogen";

(B) at the end of paragraph (3), by striking "and";

(C) by redesignating paragraph (4) as paragraph (5); and

(D) by inserting after paragraph (3) the following new paragraph:

"(4) develop cellulosic and other feedstocks that are less resource and land intensive and that promote sustainable use of resources, including soil,

water, energy, and land, and ensure protection of air, water, and soil quality; and''.

(b) TOOLS AND EVALUATION.—The Secretary, in consultation with the Administrator of the Environmental Protection Agency, shall establish a research and development program to—

(1) improve and develop analytical tools to facilitate the analysis of life-cycle energy and greenhouse gas emissions, including emissions related to direct and indirect land use changes, attributable to all potential biofuel feedstocks and production processes; and

(2) promote the systematic evaluation of the impact of expanded biofuel production on the environment.

(c) SMALL-SCALE PRODUCTION AND USE OF BIOFUELS.—The Secretary, in cooperation with the Secretary of Agriculture, shall establish a research and development program to facilitate small-scale production, local, and on-farm use of biofuels, including the development of small-scale gasification technologies for production of biofuel from cellulosic feedstocks.

XXIII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 2773, THE BIOFUELS RESEARCH AND DEVELOPMENT ENHANCEMENT ACT

WEDNESDAY, JUNE 27, 2007

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

The Committee met, pursuant to call, at 10:08 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. The Committee will come to order.

Pursuant to notice, the Committee on Science and Technology meets to consider the following measures: H.R. 906, the *Global Change Research and Data Management Act of 2007;* H.R. 1933, the *Department of Energy Carbon Capture and Storage Research, Development, and Demonstration Act of 2007;* H.R. 2773, the *Biofuels Research and Development Enhancement Act;* and H.R. 2774, the *Solar Energy Research and Investment Act of 2007.*

I know that we have a lot of other markups going on today, so we are going to try to proceed, but I would like to make a couple of announcements at first. Now, some of the Members have been interested in the trip we are going to be taking, the fact-finding trip we are taking to Greenland the weekend of July the 19th. We should know today about—we have a plane, but we still have concern about in-country travel, because we can't use our plane there, because of the lengths of the runway. We should know more about that today, so we will know the size and the number of folks that we can take.

Also, you have received a letter through your office, but I will remind you, in case you didn't know, that there is going to be a climate change meeting of the UN Framework Convention on Climate Change, the parent body that oversees the Kyoto Protocol. It will be held in Bali from December the 3rd to the 14th. There will be important areas of discussion. It will include carbon sequestration, reforestation, avoiding deforestation, and carbon trading. There will be about 10,000 international delegates there. We will not, or as Members, we will not be a credentialed participant, but we will be able to interact with those folks that are there. We will not be taking a Science Committee group as a whole, but we do have some slots, I think, that will be made available to us, for individuals that

would like to go. But again, when you put 10,000 people there, it is going to be crowded, and so, you need to let us know soon.

And finally, I think that we should all say happy birthday to Margaret today. We congratulate her on surviving one more, and hope there will be more to come.

Mr. LAMPSON. And happy anniversary to you and your wife, Mr. Chairman.

Chairman GORDON. Thank you for reminding me. By the way, from 7:00 to 9:00 will be a good time to call votes, because I am not going to be here tonight.

With concern about global climate change, the high gas and electricity prices, and our growing reliance on unstable energy supplying nations, energy has come to the forefront of our constituents' awareness, and has been placed at the top of the Congressional to-do list. Here, on the Science and Technology Committee, we have responded with an aggressive energy agenda. With the addition of four bills, that we are going to mark up today, this committee will contribute an even dozen pieces of bipartisan legislation that made a vital contribution to the national strategy to put U.S. and the world on track to a more sustainable future.

First, we will consider H.R. 906. Mr. Udall and Mr. Inglis, the Ranking Member of the Energy and Environment Subcommittee and co-sponsor of the bill, have worked together to produce this legislation. H.R. 906 re-orients the U.S. Global Change Research Program to produce more policy relevant climate information for regional, State, and local governments, and other groups.

We will then take up H.R. 1933, by Representative Udall, which sets out the next steps in DOE's carbon mitigation strategies. In addition to ongoing research in carbon management, the bill authorizes DOE to conduct demonstrations on large scale Carbon Capture and Storage technologies, through partnerships with industrial, academic, and government entities. Because we will continue to use our abundant resources of coal to meet our energy needs for the foreseeable future, it is critical that we demonstrate an integrated system of capture, transportation, and storage of carbon dioxide, at a scale that encourages industry to start making technological choices.

Next, the Committee will take up a bill by the Chairman of the Energy and Environment Subcommittee, Representative Nick Lampson. H.R. 2773, the *Biofuels Research and Development Enhancement Act,* will better coordinate and compile information from federal biofuels research programs, and focus biofuels research on infrastructure needs and efficiency of biorefinery technologies. H.R. 2773 also provides for the in depth study of several challenges facing broader of biofuels, and increases the funding levels of biofuels research.

Finally, we will consider H.R. 2774, the *Solar Energy Research and Advancement Act of 2007,* introduced by Congresswoman Giffords. This bill creates an R&D program on energy storage technology for concentrating solar plants, which allows for the use of solar energy, even when the sun isn't shining. It also asks DOE to conduct studies on how to best integrate concentrating solar plants within the grid, and ways to reduce water uses in these plants. In addition, it creates a workforce training program for solar installa-

tion and maintenance, which is critical to making solar power a real energy option across the Nation.

For each of these bills, the Energy and Environment Subcommittee held legislative hearings, had markups, where we heard valuable witness testimony, and facilitated good Member discussions on the barriers and possible pathways to these programs. And as you know, we are not alone in this effort. The Energy and Commerce Committee is marking up a series of bills today, at this very moment, and my friend, Congressman Hall, as well as a few of the folks in the Majority, are on both committees, so we are monitoring that, and if you see a dust cloud here at some point, we will be moving to the other committee to make those votes, but I am sure we will be left in good hands here, and we will continue with this markup.

In conclusion, I want to urge my colleagues to support these bills. I know that the Committee's pace has been very aggressive, and it has been difficult at times for all of us. However, I believe the products that have resulted from this process demonstrate the value of this committee, and its bipartisan work reflects the entire membership.

The bottom line is that we are going to have an energy bill in July. The Science Committee is going to, in a bipartisan way, make a major, major contribution with that. There are going to be several other committees that will have bills. We are going to get a reference from most of those, sequential, which we will also put our mark on. Every bill that has come out of this committee has been bipartisan, all but one. We will see what happens today, but so far, all but one has been unanimous, and so, I think everyone on this committee can go home, and claim a great deal of credit for what I think will be not an enormously comprehensive, but a good bill, a step forward, that will pass by a large margin on the House Floor in July.

So now, I recognize Mr. Hall to present his opening remarks.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

With concerns about global climate change, high gas and electricity prices, and our growing reliance on unstable energy-supplying nations, energy has come to the forefront of our constituents' awareness and has been placed at the top of the Congressional "To-Do" list.

Here on the Science and Technology Committee we have responded with an aggressive energy agenda.

With the addition of the four bills we are marking up today, this committee will contribute an even dozen pieces of legislation that make a vital contribution to the national strategy to put the U.S., and the world, on track to a more sustainable future.

First we will consider H.R. 906. Mr. Udall and Mr. Inglis, the Ranking Member of the Energy and Environment Subcommittee and co-sponsor of the bill, have worked together to produce this legislation.

H.R. 906 re-orients the U.S. Global Change Research Program to produce more policy-relevant climate information for regional, State, and local governments and other user groups.

We will then take up H.R. 1933 by Rep. Udall, which sets out the next steps in DOE's carbon mitigation strategies. In addition to ongoing research in carbon management, the bill authorizes DOE to conduct demonstrations of large-scale carbon capture and storage technologies through partnerships with industrial, academic and government entities.

Because we will continue to use our abundant resources of coal to meet our energy needs for the foreseeable future, it is critical that we demonstrate an integrated sys-

tem of capture, transportation, and storage of carbon dioxide at a scale that encourages industry to start making technology choices.

Next, the Committee will take up a bill by the Chairman of the Energy & Environment Subcommittee, Rep. Nick Lampson. H.R. 2773, the *Biofuels Research and Development Enhancement Act,* will better coordinate and compile information from federal biofuels research programs and focus biofuels research on infrastructure needs and efficiency of biorefinery technologies.

H.R. 2773 also provides for the in-depth study of several challenges facing broader use of biofuels and increases the funding levels for biofuels research.

Finally, we will consider H.R. 2774, the *Solar Energy Research and Advancement Act of 2007,* introduced by Congresswoman Giffords. This bill creates an R&D program on energy storage technology for concentrating solar power plants, which allows for the use of solar energy even when the sun isn't shining.

It also asks DOE to conduct studies on how to best integrate concentrating solar plants with the grid, and ways to reduce water usage in these plants. In addition, it creates a workforce training program for solar installation and maintenance, which is critical to making solar power a real energy option across the country.

For each of these bills the Energy and Environment Subcommittee held legislative hearings and markups where we heard valuable witness testimony and facilitated good Member discussions on the barriers and possible pathways for these programs.

And, as you all may know, we are not alone in this effort today. The Energy and Commerce Committee is also marking up a series of energy bills and I, along with Ranking Member Hall and a few others, may have to excuse myself for votes in that committee.

In conclusion, I urge my colleagues to support these four bills. I know the Committee's pace has been very aggressive and that has been difficult at times for all of us. However, I believe the products that have resulted from this process demonstrate the value of this committee and its work and it reflects well on the entire membership.

I want to thank all the Members for their cooperation and participation.

Mr. HALL. Thank you, Mr. Chairman, and I will try not to take the full length of time, and make one statement. I will be glad, as I am sure you will and others, when this month passes.

I understand that you and your fellow Chairman and other Members have been working, I guess, under the usual pressure of this first year, to get and report bills out of the Committee, and sometimes, I fear that when we rush things through, we don't get the best end product we could have, if we had more time to fully vet the language, but I guess we will be working on that as we go.

You have done a good job of working with us, and I thank you for that. While I think improvements in the bill before us today are going to occur through amendments to be offered, I think they could be improved further, and I hope we will have other opportunities to do this, as the bill moves to the Floor. It is also my hope and understanding that, going forward, there will be more of an effort to have both sides working together, as we craft legislation to come before this committee. We will have more time. I think this would improve not only the quality of work we produce, but also, the bipartisan way in which they are handled.

With that said, I support and believe it is important to our country's energy future to keep all options on the table, and we strive to do that with the three energy bills before us. One of our greatest challenges as a Nation is energy self-sufficiency. We need to break our dependence on foreign sources of energy from countries we don't trust and who don't trust us. To do that, we need to be honest and practical about what needs to be done to get to that point.

Solar and biofuels are an important source of domestic energy, but they are also limited in their scope. It is important that we continue to research and develop the resources we know exist domestically, and currently provide reliable, affordable, and clean

sources of energy. I look forward to working with the Committee and working with you, Mr. Chairman, in the months ahead, to address this reality, so that Americans can enjoy more energy choices at a lower cost.

I yield back.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you Mr. Chairman. In the interest of time, I will keep my statement brief and say that I will be glad when this month is over. I understand that you and your fellow Chairmen have been working under pressure from the Speaker to report bills out of committee, but I fear that sometimes when things are rushed through, we don't get the best end-products we could have if we had more time to fully vet the language. While I think there are improvements in the bills before us today with the Subcommittee markup last week and the amendments to be offered today, I think that they could still be improved upon, and I hope that we'll have other opportunities to do so. It is also my hope and understanding that going forward, there will be more of an effort to have both sides working together as we craft legislation to come before the Committee. I think this would improve not only the quality of work we produce, but also the bipartisan way in which they are handled.

With that said, I support what we're doing here today. It's important to our country's energy future to keep all options on table, and we continue to do that with the three energy bills before us.

With that I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Chairman, or rather, thank you, Mr. Hall.

Let me also say that you may not know, but I met privately and personally with the Republican, both the staff from the Members, as well as the Committee staff the other day, to talk about how we can, you know, do what I think is a good job even better. There were compliments in some areas of the consultation. There were suggestions for improvement in the others. I have asked for them to put together models of how they see things done, and good ways that we have done it, and if we haven't done it as well as we would like, so those kind of models, we are going to continue to work together.

I am a new Chairman, there is a lot of new staff, and we are going to get this thing better and better, as we go along, because I truly believe that more consultation gets us a bipartisan bill, a consensus bill, and we are all going to be better off.

So, does anyone else wish to be recognized?

We will now consider H.R. 2773, the *Biofuels Research and Development Enhancement Act.* I yield the gentleman from Texas, Mr. Lampson, five minutes to describe his bill.

Mr. LAMPSON. Thank you, Mr. Chairman.

As I noted at our recent hearing, and during Subcommittee consideration, I believe that we must enhance our efforts to develop a diverse set of alternative energy sources, and biofuels represents one of our best opportunities to accomplish this.

My bill, H.R. 2773, the *Biofuels Research and Development Enhancement Act,* represents another effort toward reducing our country's dependence on foreign oil, foreign sources of oil, and building a domestic industry for clean, renewable fuels.

The bill has several key components. The bill creates two focused research efforts within the existing Bioenergy Research Program created in the *Energy Policy Act of 2005.* First, recognizing the inherent problems with transporting and storing biofuels in the exist-

ing petroleum fuels infrastructure, the bill establishes a program of research, development, and demonstration for modifications and treatments to existing infrastructure, and research and development of new infrastructure system for biofuels.

Recognizing the technical barriers to increasing the production of biofuels, the bill also establishes a program of research, development, demonstration, and commercial application of technologies to increase the energy efficiency and reduce the energy consumption of biorefinery facilities. The bill will help to better coordinate and compile the rapidly expanding base of information from biofuels research programs, by setting up a DOE center to serve as a clearinghouse of information related to the research, development, and commercial applications of technologies related to biofuels and biorefinery technologies.

The bill will provide research grants in states with low rates of biofuels production, to work toward the development of biofuels assets, and the bill will expand the Bioresearch Center Program created in the *Energy Policy Act of 2005,* allowing for the establishment of additional, regionally dispersed centers.

The bill also directs the Secretary to conduct several studies. The findings of these studies will help to guide the Committee's efforts as we look to make additional federal research commitments in the future.

And last, the bill makes additional commitments to ongoing biofuels research programs, by increasing the authorization levels for these programs. This increase will also accommodate the new, focused infrastructure and efficiency research efforts that I mentioned earlier.

And during Subcommittee consideration, the Committee adopted two amendments. The first was a manager's amendment that made several technical changes, as well as minor substantive changes worked out between the Majority and the Minority staff. The second amendment, offered by Ms. Woolsey and Mr. Bartlett, added to the bill a focus on the environmental impacts of biofuels developments. Both amendments improved the bill, and I am pleased the issues were brought before the Subcommittee.

This bill will help to enhance the ongoing federal efforts to support biofuels research and development, as well as provide necessary information back to Congress, that will allow us to make additional research commitments in the future.

I urge the Members of this committee to support the bill, and I yield back the balance of my time, Mr. Chairman.

[The prepared statement of Mr. Lampson follows:]

PREPARED STATEMENT OF REPRESENTATIVE NICK LAMPSON

Mr. Chairman, as I noted at our recent hearing and during Subcommittee consideration, I believe we must enhance our efforts to develop a diverse set of alternative energy sources. Biofuels represent one of our best opportunities to accomplish this.

My bill, H.R. 2773, the *Biofuels Research and Development Enhancements Act,* represents another effort toward reducing our country's dependence on foreign sources of oil, and building a domestic industry for clean renewable fuels.

The bill has several key components.

The bill creates two focused research efforts within the existing Bioenergy Research Program created in the *Energy Policy Act of 2005.*

First, recognizing the inherent problems with transporting and storing biofuels in the existing petroleum fuels infrastructure, the bill establishes a program of re-

search, development, and demonstration for modifications and treatments to existing infrastructure and research and development of new infrastructure system for biofuels.

Recognizing the technical barriers to increasing the production of biofuels, the bill also establishes a program of research, development, demonstration and commercial application of technologies to increase the energy efficiency and reduce the energy consumption of biorefinery facilities.

The bill will help to better coordinate and compile the rapidly expanding base of information from biofuels research programs by setting up a DOE center to serve as a clearinghouse of information related to the research, development, and commercial applications of technologies related to biofuels and biorefinery technologies.

The bill will provide research grants in states with low rates of biofuels production to work toward the development of biofuels assets.

And the bill will expand the Bioresearch Center program created in the *Energy Policy Act of 2005,* allowing for the establishment of additional, regionally dispersed centers.

The bill also directs the Secretary to conduct several studies. These findings of these studies will help to guide the Committee's efforts as we look make additional federal research commitments in the future.

Last, the bill makes additional commitments to ongoing biofuels research programs by increasing the authorization levels for these programs. This increase will also accommodate the new focused infrastructure and efficiency research efforts I mentioned earlier.

During Subcommittee consideration, the Committee adopted two amendments. The first was a manager's amendment that made several technical changes as well as minor substantive changes worked out between the Majority and Minority staff.

The second amendment offered by Ms. Woolsey and Mr. Bartlett added to the bill a focus on the environmental impacts of biofuels development.

Both amendments improved the bill and I am pleased the issues were brought before the Subcommittee.

This bill will help to enhance the on-going federal efforts to support biofuels research and development, as well provide necessary information back to Congress that will allow us to make additional research commitments in the future.

I urge the Members of the Committee to support the bill and yield back the balance of my time.

Chairman GORDON. I recognize Mr. Hall to present any remarks on the bill.

Mr. HALL. Again, I would like to state my support for this bill, inasmuch as it is looking into the important questions we need to answer, in order for our country to start shifting our dependence from foreign sources of oil.

I thank the Chairman and Chairman Lampson for agreeing to accept my amendment on biogas, the renewable fuel that is generated from landfills and agricultural waste, sewage treatment plants, cellulose, and other biomass sources. I will speak further on my amendments to this bill as they are brought up.

With that, I yield back my time.

Chairman GORDON. Does anyone else wish to be recognized?

Mr. BILBRAY. Mr. Chairman.

Chairman GORDON. Mr. Bilbray is recognized.

Mr. BILBRAY. Mr. Chairman, I don't mean to be, let us just say, ants at the picnic, or whatever you want to call it. I know there are some more colorful terms, but I just ask that as we go through with the biofuel issue, that we recognize that not all biofuels are created equally, from the environmental point of view.

Biodiesel itself has a great environmental benefit, and has a great BTU capability. It is very efficient. But I just feel obligated to say again and again and again that when it comes to virgin fuel ethanol, the emperor has no clothes, that ethanol is not an environmentally friendly fuel. California has been requesting for over a decade the elimination of the mandate, for air pollution reasons, of

ethanol, and I would just like to say that if we are talking about ethanol being the finished product, or the major product in this bill, then the bill is misguided. If we are talking about the development of technologies to where the biofuels are fuels that do not have the vapor emissions problems of ethanol, has a longer carbon chain than alcohol, then I can see we are headed in the right direction, but I cannot allow this time or any time to go by from now on, where everybody sits back and just assumes that because it is "renewable," that ethanol is a clean fuel for the future, and that we should be betting our technology on the use of alcohol as an alternative to gasoline.

And I just ask that we have a frank and open discussion of the fact that ethanol is a use that is going to be curtailed in the future, and that one of the things you are going to hear again and again is people standing up and saying ethanol is not the environmental answer to either the greenhouse gas problem or to our energy crisis.

Mr. LAMPSON. Would the gentleman yield?

Mr. BILBRAY. I would yield to the gentleman.

Mr. LAMPSON. I share your interest and your concerns. It seems that we have tried to make ethanol more or less a silver bullet.

But we tried to craft this legislation to be very balanced, that would include all biomass, and make sure that all of them be given a fair hearing through research as to what can be given back to us in the way of our energy benefits. So, I would be happy to do anything I can to work along with you to make sure that that is the real benefit of this.

Mr. BILBRAY. I appreciate that, and reclaiming my time, I just hope you understand that as a member of the Air Resources Board, we were begging the Federal Government to stop mandating that we have to use this fuel, and I think all of us agree that the California Air Resources Board is a leader in clean air, that the scientists were telling us we need to get this stuff out of our gasoline, to where EPA, recognizing the science, has reduced our mandate down to five percent.

And in reality, during summer use, if the California environmental community had its way, we would outlaw all ethanol use during the summer. And I just want to say that again. I am going to continue to say that. Ethanol is not the environmental silver bullet that everybody is trying to sell it, and they are making a lot of money off of it, but the emperor has no clothes, that this is not an environmental option for the future. We need to get away from the concept of alcohol and go to more environmentally friendly green fuels.

And I yield back, Mr. Chairman.

Chairman GORDON. Thank you, Mr. Bilbray.

Just to get a footnote to this. I don't want to go too long. To President Bush's credit, and the Department of Energy, they have been pushing forward also on biofuels. Yesterday, at 1:00, the Secretary announced three consortiums across the country that will be looking into a diverse use of biofuels, developing enzymes that can break them down.

It is a five-year program. They are going to give $25 million per consortium each year for the next five years. It is a very exciting

program, and it will have, in a diverse area of biomass, as well as the ultimate use for it. So, I think that, and they were excited about what we are doing here today, which I think adds on to that bill.

Does anyone else wish to be recognized? If not, then, does Mr. Inglis, do you want to go forward with the colloquy now?

Mr. INGLIS. Yeah, that would be great.

Chairman GORDON. Okay. Mr. Inglis is recognized for a colloquy.

Mr. INGLIS. Mr. Chairman, I would like to strike the last word for purposes of entering into a colloquy with the gentlelady from California, Ms. Woolsey, and the gentleman from Maryland, Mr. Bartlett.

In the Subcommittee markup on H.R. 2773, we talked at some length about language in Section 12, line 15, which amended the goals of the Systems Biology Program set up under Section 977 of the *Energy Policy Act of 2005,* which says it is "to facilitate the production of fuels in sustainable production systems that reduce greenhouse gas emissions, including hydrogen."

I am concerned that this provision could limit helpful research that might carry emissions at the outset, but which might lead to better technologies in the future. As an example, and I have asked this of Ms. Woolsey, as an example, would coal to hydrogen technologies, that generate carbon emissions, not be eligible for funding under this program?

Ms. WOOLSEY. I appreciate the gentleman's concerns, and as I said in the Subcommittee markup, and Counsel has clarified, the intent of these goals is not to restrict helpful research, or to prejudice the ultimate outcome of the research, in terms of its sustainability and greenhouse gas emissions. Our amendment adds a goal, the goal of achieving sustainable production of fuels and reduced greenhouse gas emissions. At the outset of the research, the fuel or system for producing may not have achieved this ultimate goal, but certainly, we think that it should be the direction of the work.

Actually, if the fuel in question, hydrogen, or any other fuel, has already achieved the goals of sustainable production and reduced greenhouse gas emissions, then its development is probably past the point where much additional research is needed.

I would argue that all these fuels need research and development support to achieve these important goals. If we ultimately discover they can't get there, then we should abandon them, but we can't know, unless from the very start, we point out what the fallacies could be.

However, I do not intend that the Secretary of Energy, when deciding on what fuel production programs to promote, places emphasis on the sustainability of those fuels. Already, we are seeing negative impacts on corn prices due to the ethanol boom. As my colleague, Mr. Bartlett, who co-sponsored the amendment with me in Subcommittee, pointed out, using corn for fuel is not sustainable, at least not the way we are producing it now, and we ought to steer research and development toward fuel development that will yield abundant and renewable results.

Mr. INGLIS. I thank the gentlelady, and I am happy to yield to the gentleman from Maryland, Mr. Bartlett.

Mr. BARTLETT. Thank you. I appreciate the opportunity to address the gentleman's concerns.

It was never my intent, and I do not believe the language in the Woolsey-Bartlett Amendment will restrict research and development of technologies that will ultimately provide payoffs, both for our climate and our energy market. The language I offered along with the gentlelady from California, Ms. Woolsey, was simply a mission statement that we will be supporting programs that aim at having an end result of reducing greenhouse gas emissions, and start with the goal of sustainable energy development.

I want to reiterate that Counsel clarified during our Subcommittee markup that expressing the intent of these goals in our amendment would not restrict helpful research. Take the coal to hydrogen example you mentioned. There is an end result in mind, a clean, emission-free product. In addition, we are working at Carbon Capture and Sequestration projects in other areas that would complement a coal to hydrogen program, and offer solutions on how to cut back on the carbon emissions. So, no, I don't think your example would be prohibited.

Again, I thank the gentleman for his concerns.

[The prepared statements of Mr. Inglis, Ms. Woolsey, and Mr. Bartlett follow:]

PREPARED STATEMENTS OF REPRESENTATIVE BOB INGLIS, REPRESENTATIVE LYNN WOOLSEY, AND REPRESENTATIVE ROSCOE BARTLETT

Mr. Inglis:

Mr. Chairman, I'd like to strike the last word for the purposes of entering into a colloquy with the gentlelady from California, Ms. Woolsey, and the gentleman from Maryland, Mr. Bartlett.

In the Subcommittee markup on H.R. 2773, we talked at some length about language in Sec. 12, line 15, which amended the goals of the Systems Biology Program set up under Sec. 977 of the *Energy Policy Act of 2005* to "facilitate the production of fuels in sustainable production systems that reduce greenhouse gas emissions, including hydrogen."

I'm concerned that this provision could limit helpful research that might carry emissions at the outset, but which might lead to better technologies.

As an example, would coal-to-hydrogen technologies that generate carbon emissions not be eligible for funding under this program?

Ms. Woolsey:

I appreciate the gentleman's concerns, and as I said in the Subcommittee markup, and Counsel clarified, the intent of these goals is not to restrict helpful research or to prejudge the ultimate outcome of the research in terms of its sustainability and greenhouse gas emissions.

Our amendment adds a goal—the goal of achieving sustainable production of fuels and reduced greenhouse gas emissions. At the outset of the research, the fuel or system for producing may not have achieved this ultimate goal, but I certainly think that should be the direction of the work.

Actually, if the fuel in question—hydrogen or any other fuel—has already achieved the goals of sustainable production and reduced greenhouse gas emissions, then its development is probably past the point where much additional research is needed.

I would argue that all these fuels need research and development support to achieve these important goals. If we ultimately discover they can't get there, then we should abandon them, but we can't know that at the start as you have pointed out.

However, I do intend that the Secretary of Energy, when deciding on what fuel production programs to promote, places emphasis on the sustainability of those fuels.

Already we're seeing negative impacts on corn prices due to the ethanol boom. As my colleague Mr. Bartlett, who co-sponsored the amendment with me in Subcommittee, pointed out, using corn for fuel is not sustainable—at least not the way

we are producing it now—and we ought to steer research and development toward fuel development that will yield abundant and renewable results.

Mr. Bartlett:

I appreciate the opportunity to address the gentleman's concerns. It was never my intent and I do not believe the language in the Woolsey-Bartlett amendment will restrict research and development of technologies that will ultimately provide payoffs both for our climate and our energy market.

The language I offered along with the gentlelady from California, Ms. Woolsey, was simply a mission statement—that we will be supporting programs that aim at having an end result of reducing greenhouse gas emissions, and start with the goal of sustainable energy development. I want to reiterate that Counsel clarified during our Subcommittee markup that expressing the intent of these goals in our amendment would not restrict helpful research.

Take the coal-to-hydrogen example you mentioned. There is an end result in mind: a clean, emission-free product. In addition, we are working on carbon capture and sequestration projects in other areas that would complement a coal-to-hydrogen program, and offer solutions on how to cut back on the carbon emissions. So no, I don't think your example would be prohibited.

Again, I thank the gentleman for his concerns.

Mr. INGLIS. And I thank the gentlelady from California and the gentleman from Maryland for their comments.

I yield back, Mr. Chairman.

Chairman GORDON. I assume everybody is happy, so if no one else wishes to be recognized, then I ask unanimous consent that the bill is considered as read and open to amendment at the point, that Members proceed with the amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by myself. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Gordon of Tennessee.

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

I recognize myself for five minutes to explain the amendment.

I have an amendment at the desk. The Clerk will report the amendment. No, excuse me. My manager's amendment makes three minor changes to the bill, all suggested by the Minority.

It adds consultation with EPA in the Infrastructure Research Program. It adds consultation with the Department of Transportation in the study of optimizing flex fuel vehicles to use E–85. And it adds the National Labs to the list of eligible consortium participants in the grant programs for states with low rates of biofuel production.

Again, all three of these changes are based upon suggestions of the Minority, with a specific thanks to Ms. Biggert for raising the oversight of the inclusion of the National Labs, and I appreciate the consultation with my colleagues, and I urge adoption of the amendment.

Is there further discussion? Ms. Biggert is recognized.

Ms. BIGGERT. Thank you. I move to strike the last word.

Chairman GORDON. The gentlelady is recognized for five minutes.

Ms. BIGGERT. Thank you, Mr. Chairman.

I just wanted to express my thanks to you for recognizing the important contributions that our National Labs can play in the biofuels research, and agreeing to allow them to participate in the consortia competing for the grants in Section 6.

It is quite clear that the scientists and engineers at the Labs who have expertise in this area, and just yesterday, Oak Ridge National Laboratory, in the Chairman's home state, was selected by the DOE to lead one of the three Bioenergy Research Centers. Congratulations.

And I don't think we should preclude these distinguished researchers from participating in possible future bioenergy research efforts, which is why I urge my colleagues to support the Chairman's amendment, and yield back the balance of my time.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Thank you, Mr. Chairman. I just wanted to express my thanks to you for recognizing the important contributions that our national laboratories can play in biofuels research, and agreeing to allow them to participate in a consortia competing for the grants in Section 6.

It's quite clear there are scientists and engineers at the labs who have expertise in this area. Just yesterday, Oak Ridge National Laboratory in the Chairman's home state was selected by the DOE to lead one of its three Bioenergy Research Centers.

I don't think we should preclude these distinguished researchers from participating in possible future bioenergy research efforts, which is why I urge my colleagues to support the Chairman's amendment, and yield back the balance of my time.

Chairman GORDON. The gentlelady is absolutely correct. All three of the awards yesterday had significant participation from the Labs. It would have been an oversight not to have done that, and we thank you for reading the bill, and bringing it to our attention.

Is there further discussion on the amendment? If no, then the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it, and the amendment is agreed to.

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

Mr. HALL. I am ready. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, 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. And this is number 008. Correct.

The CLERK. Yes. Amendment #008.

Mr. HALL. Mr. Chairman, I thank you, and my amendment directs the Secretary to carry out a program of research, development, and demonstration, as it relates to the blending of transportation fuels derived from coal to liquids with biofuels.

As we continue to work toward energy independence, and I realize that we all want that. You don't have to be a Republican or a Democrat to want to be independent of those people over there that we rely on for 60 percent of our energy, 40 percent from Saudi Arabia, a country that we don't trust, and we don't really like, nor look to. And our security in transportation fuels, we need to look at all of our domestic resources, both renewable and alternative.

On the one hand, we have biofuels, which are an exciting option, using renewable feedstocks, and the other hand, we have the option of turning coal into a liquid transportation fuel. And I think we all probably want to do this. Maybe our difference is in timing here, and I don't know, there are quarterbacks and then, there are coaches, and they set the timing and everything, and I guess we all have to adhere to it, but we think the time is right to look at this amendment at this time. While biofuels have the potential to displace a portion of our current oil use, we simply don't have the supply to displace all of it. Coal to liquids also has the potential to displace oil use, but as we develop clean coal technologies for all sectors, we won't have an unlimited supply for this now abundant domestic resource.

This amendment would conduct R&D into the blending of the two types of fuel, in order that by combining them, we can increase and prolong our supply of domestic fuels. By combining biofuels with coal to liquid, we use less of our country's, and less of the world's food supply and less of our coal reserves can be used for electricity generation and other applications.

With that, Mr. Chairman, I thank you for the time, and I will yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Hall.

I think you are going to have better luck on your next amendment, but this is, to a great extent, a replay of Mr. McCaul's earlier amendment. So, rather than taking the Committee's time, let me just once again say that I don't think this issue is quite ripe. We are going to aggressively study it this fall.

Is there anyone else that would like to have a discussion? If there is no further discussion, then, the vote occurs on the amendment. All in favor, say aye. Opposed, no. No. The nos have it.

Mr. HALL. Mr. Chairman, we would like a recorded vote.

Chairman GORDON. The Clerk will call the roll.

The CLERK. Chairman Gordon.

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello.

[No response.]

The CLERK. Ms. Johnson.

Ms. JOHNSON. No.

The CLERK. Ms. Woolsey.

Ms. WOOLSEY. No.

The CLERK. Ms. Woolsey votes no. Mr. Udall.

Mr. UDALL. No.

The CLERK. Mr. Udall votes no. Mr. Wu.

[No response.]

The CLERK. Mr. Baird.

[No response.]

The CLERK. Mr. Miller.

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski.

Mr. LIPINSKI. Mr. Lipinski votes no.

The CLERK. Mr. Lipinski votes no. Mr. Lampson.

Mr. LAMPSON. No.

The CLERK. Mr. Lampson votes no. Ms. Giffords.

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Mr. McNerney.
Mr. MCNERNEY. No.
The CLERK. Mr. McNerney votes no. Mr. Kanjorski.
[No response.]
The CLERK. Ms. Hooley.
Ms. HOOLEY. No.
The CLERK. Ms. Hooley votes no. Mr. Rothman.
Mr. ROTHMAN. No.
The CLERK. Mr. Rothman votes no. Mr. Honda.
Mr. HONDA. No.
The CLERK. Mr. Honda votes no. Mr. Matheson.
Mr. MATHESON. No.
The CLERK. Mr. Matheson votes no. Mr. Ross.
Mr. ROSS. No.
The CLERK. Mr. Ross votes no. Mr. Chandler.
Mr. CHANDLER. No.
The CLERK. Mr. Chandler votes no. Mr. Carnahan.
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Melancon.
Mr. MELANCON. No.
The CLERK. Mr. Melancon votes no. Mr. Hill.
[No response.]
The CLERK. Mr. Hill.
[No response.]
The CLERK. Mr. Mitchell.
Mr. MITCHELL. No.
The CLERK. Mr. Mitchell votes no. Mr. Wilson.
[No response.]
The CLERK. Mr. Hall.
Mr. HALL. Aye.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner.
[No response.]
The CLERK. Mr. Lamar Smith.
[No response.]
The CLERK. Mr. Rohrabacher.
[No response.]
The CLERK. Mr. Bartlett.
[No response.]
The CLERK. Mr. Ehlers.
[No response.]
The CLERK. Mr. Lucas.
[No response.]
The CLERK. Mrs. Biggert.
Ms. BIGGERT. Aye.
The CLERK. Mrs. Biggert votes aye. Mr. Akin.
[No response.]
The CLERK. Mr. Bonner.
[No response.]
The CLERK. Mr. Feeney.
Mr. FEENEY. Aye.
The CLERK. Mr. Feeney votes aye. Mr. Neugebauer.
Mr. NEUGEBAUER. Aye.
The CLERK. Mr. Neugebauer votes aye. Mr. Inglis.
Mr. INGLIS. Aye.

The CLERK. Mr. Inglis votes aye. Mr. Reichert.
Mr. REICHERT. No.
The CLERK. Mr. Reichert votes no. Mr. McCaul.
Mr. MCCAUL. Yes.
The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart.
Mr. DIAZ-BALART. Aye.
The CLERK. Mr. Diaz-Balart votes aye. Mr. Gingrey.
Mr. GINGREY. Aye.
The CLERK. Mr. Gingrey votes aye. Mr. Bilbray.
Mr. BILBRAY. Aye.
The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith.
Mr. SMITH OF NEBRASKA. Aye.
The CLERK. Mr. Adrian Smith votes aye.
Chairman GORDON. Are there other Members whose vote was not recorded, who would like to have their vote recorded? If no, then, the Clerk—oh, Mr. Wu. Thank you, Mr. Wu. Mr. Bartlett.
Mr. BARTLETT. Aye.
The CLERK. Mr. Bartlett votes aye.
Chairman GORDON. If no one else is here, then the Clerk will report. No, but since the Clerk has not reported back, then, with unanimous consent, Mr. Rohrabacher, I would ask that he be able to——
Mr. ROHRABACHER. I would vote yes. Vote several times, if you would let me.
The CLERK. Mr. Rohrabacher votes aye.
Chairman GORDON. Okay. We are going to have to close it now. So, would the Clerk please report?
The CLERK. Mr. Chairman, 12 Members vote aye, and 20 vote no.

COMMITTEE ON SCIENCE AND TECHNOLOGY

ROLL CALL 1 BILL H.R. H.R. 2773 DATE 6/27/07

AMEND # 2 PASSED ___ DEFEATED ✓ VOICE VOTE ___ WITHDRAW ___

SPONSOR/AMENDMENT Hall - Bio Fuels

MEMBER	AYE	NO	PRESENT	NOT VOTING
Mr. GORDON, Chairman		✓		
Mr. COSTELLO				
Ms. JOHNSON		✓		
Ms. WOOLSEY		✓		
Mr. UDALL		✓		
Mr. WU		✓		
Mr. BAIRD				
Mr. MILLER		✓		
Mr. LIPINSKI		✓		
Mr. LAMPSON		✓		
Ms. GIFFORDS		✓		
Mr. McNERNEY		✓		
Mr. KANJORSKI				
Ms. HOOLEY		✓		
Mr. ROTHMAN		✓		
Mr. HONDA		✓		
Mr. MATHESON		✓		
Mr. ROSS		✓		
Mr. CHANDLER		✓		
Mr. CARNAHAN		✓		
Mr. MELANCON		✓		
Mr. HILL				
Mr. MITCHELL		✓		
Mr. WILSON				
Mr. HALL	✓			
Mr. SENSENBRENNER				
Mr. LAMAR SMITH, TX				
Mr. ROHRABACHER	✓			
Mr. BARLETT	✓			
Mr. EHLERS				
Mr. LUCAS				
Mrs. BIGGERT	✓			
Mr. AKIN				
Mr. BONNER				
Mr. FEENEY	✓			
Mr. NEUGEBAUER	✓			
Mr. INGLIS	✓			
Mr. REICHERT		✓		
Mr. McCAUL	✓			
Mr. DIAZ-BALART	✓			
Mr. GINGREY	✓			
Mr. BILBRAY	✓			
Mr. ADRIAN SMITH, NE	✓			
Vacant				
TOTALS				

Mr. Chairman, 12 Members vote AYE and 20 vote NO

43 / Quorum /15 vote / 22 Report

Revised 5/16/07

Chairman GORDON. To answer Mr. Hall's question, no.

Mr. HALL. I have been beat.

Chairman GORDON. The third amendment on the roster is offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I am ready to proceed. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Hall, amendment #009.

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, since I am going to do better on this one, I thank you for agreeing to accept the amendment, so I will be as brief as possible.

My amendment adds biogas where appropriate in the bill, to ensure its inclusion and recognition as a biofuel. Biogas is a renewable fuel that we often tend to overlook, but it provides substantial renewable benefits, in that its production does not require additional land or water supply, and can be transported by pipeline once it meets pipeline gas standards.

Biogas can also be converted to liquefied form, providing critical fuel use for heavy and medium duty trucks. Biogas also, unlike other biofuels, can provide up to 200 percent greenhouse gas reductions, as the gas would otherwise be released into the atmosphere as waste. Hence, by producing biogas as a fuel, as a vehicle fuel, its release into the atmosphere is prevented, and turned into a clean, low carbon fuel that can be applied to some of the cleanest burning engines currently available on the market. As well, biogas clearly provides direct foreign oil displacement, because its sources are domestic.

And I want to thank the staff for working on this with us, thank you, and your staff and our staff for working together. And I yield back the balance of my time.

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

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

Mr. MATHESON. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Matheson of Utah.

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. MATHESON. Thank you, Mr. Chairman.

I think most Members of the Committee are aware that biofuels, particular ethanol, have a different makeup than gasoline, and something that my office has heard a lot about, and probably a lot of other Members have heard about, is the concern that in terms of how you dispense this material, it is a different type of material than gasoline. And so, there have been other issues about how to treat, it is treated in pipelines.

My amendment focuses more on the actual dispenser of the fuel at the service station, and the concern that the various folks in the industry have expressed is that there is not a standard out there for how you design the dispensing equipment to make this work right with this new product. And what I have said in my amendment is, is if the private sector does not come up with its own set of standards for this, and we are going to allow that to happen first, but they don't, then the legislation would direct NIST to undertake the task of developing an industry standard, so that when we try to build out this infrastructure across our country, people are working to the same standard, and it makes for a more efficient circumstance in the marketplace.

That is the amendment, in a simple explanation, Mr. Chairman, and I will be happy to yield for any questions, or yield back my time.

Chairman GORDON. Thank you, Mr. Matheson. There is about a, like what, $15 billion infrastructure out there that would have to be replicated if we don't get this right, and your amendment really, along with the bill that we passed earlier on E–85, in terms of using NIST as that standard setter, is another very good addition.

Is there anybody else? The gentleman from Florida.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. Actually, I think I have a question more to counsel on this, if that is all right. And what does the word "appropriate" specifically mean in this amendment? At what point in the development of the private sector standards do the standards become appropriate under this amendment? That would be really the question.

And Mr. Chairman, my understanding is that the National Technology Transfer and Advancement Act requires that all federal agencies, to use privately developed standards, particularly those developed by the standards developing agencies. I want to also know if that is correct, if the Counsel can let me know if that is correct. Further, does this amendment direct the federal agency, the Department of Energy, to violate that requirement? Does it ask NIST to violate that requirement?

And lastly, Mr. Chairman, if I can also ask Counsel, does this amendment ask NIST to ignore the requirement to, again, coordinate federal, State, and local technical standards activities with private sector technical standards activities, with the goal of eliminating the unnecessary duplication and complexity in the development and promulgation of the measures?

So I would obviously, then, see if Counsel can answer those questions for me, Mr. Chairman.

The COUNSEL. Mr. Diaz-Balart, the appropriate standard language, the appropriate private sector standard language that is in this actually mirrors the language that is in the *National Tech-*

nology Transfer Act. It is a term that is used in there as an appropriate standard.

In the absence of an appropriate private sector standard, the *National Technology Transfer Act* allows for the federal agency, then, the appropriate federal agency to promulgate the standard, if such standard doesn't exist.

Mr. DIAZ-BALART. And Mr. Chairman, this question really is more for Mr. Matheson's amendment.

Chairman GORDON. Would you like for Mr. Matheson to comment, rather than the Counsel? Is that what you are saying.

Mr. DIAZ-BALART. It is actually based on the language in Mr. Matheson's amendment, that I am asking this question about. I just want to make sure we are on the right place here.

The COUNSEL. Oh, yes, correct. Correct.

Mr. DIAZ-BALART. Right. Okay.

The COUNSEL. Okay, so I want to understand what I did not answer for you, Mr. Diaz-Balart.

Mr. DIAZ-BALART. No, I just want to make sure that I was in the right place.

The COUNSEL. Okay.

Mr. DIAZ-BALART. So, you are fine. I just wanted to make sure that I was not——

The COUNSEL. Understood.

Mr. DIAZ-BALART.—asking you the question in the wrong time. Thank you, sir.

Chairman GORDON. Thank you, and we have the Counsel's comments on record.

And is there further discussion on the amendment? If not, all in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is passed.

I understand that Ms. Biggert has, like many of us, has an additional markup, has to leave, and so, I am going to ask unanimous consent that her amendment, which is the last amendment in the series, be moved up to deal with now. And if there is no objection, then——

Ms. WOOLSEY. Mr. Chairman, I don't object, but I am at the same markup as she is.

Chairman GORDON. Do you have an amendment?

Ms. WOOLSEY. Yes.

Chairman GORDON. Well, then, why don't we——

Ms. WOOLSEY. Well, go with Ms. Biggert, but I just want you to know, we are at the same markup. Okay.

Chairman GORDON. Okay. Well, then, we will do hers, and move yours up, if that is necessary, also. The next amendment on the roster is the gentlelady from Illinois, Ms. Biggert. Are you ready to proceed?

Ms. BIGGERT. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mrs. Biggert of Illinois.

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

The gentlelady is recognized for five minutes to explain her amendment.

Ms. BIGGERT. Thank you, Mr. Chairman.

My amendment does three things. First, it amends Section 5 of the bill to limit to five years the duration of any grants for the creation of up to five Biofuel Research Centers. After five years, if the DOE chooses not to terminate the grant, then my amendment still requires the grantee to reapply for another grant, and may have to compete to receive additional funds.

This amendment ensures that DOE holds these centers accountable for conducting research that produces results. To be effective, the kind of research centers established in Section 5 of this bill should concentrate resources on a specific problem for a finite period of time. If this kind of concentrated effort doesn't yield any breakthroughs, the DOE should focus its research efforts elsewhere. The amendment gives the DOE the flexibility to end its support for one center and take the research in a new and different direction, plus it prevents these centers from becoming another part of the entrenched DOE bureaucracy.

Second, my amendment would require the DOE to evaluate the life cycle impact, and I think that, it is too bad Mr. Bilbray is not here right now, because he would like this, to evaluate the life cycle impact of the use of various ethanol blends on carbon dioxide and greenhouse gas emissions, as part of the ethanol blend studies in Section 8.

If we are truly concerned about energy efficiency and climate change, then we need to think about increasing ethanol consumption within that context. We need to think about not just the efficiency of and emissions from our vehicles, but also, the efficiency of and emissions from biorefineries and the production of ethanol feedstocks. This provision of the amendment will allow Congress, the DOE, and potential ethanol producers to take a big picture look at how expanding the use of ethanol will affect carbon dioxide and greenhouse gas emissions.

Finally, the amendment expands the study on biodiesel's impact on engine and engine durability in Section 10 of the bill, to also include its impact on the performance of engines and engine systems. This amendment also extends from one year to two the time allowed for DOE to complete this study.

We have got to develop a better understanding of biodiesel's impact on engines and engine systems to be able to perfect a biodiesel blend that maximizes both their durability and performance. That is why the study in Section 10 should focus on more than durability. What good will biodiesel be to consumers, if it is formulated to minimize any wear and tear on a diesel engine, but it leads to clogged fuel filters, higher emissions, or lower fuel economy.

And the converse is just as true. What good will biodiesel be to consumers if it doesn't clog filters and lead to lower emissions and better fuel economy, but the engine only lasts a few years. Not much in either case, and that is why this amendment would require the DOE to take a broader look at biodiesel's impact on engines and engine systems.

I urge my colleagues to support the amendment, and yield back the balance of my time.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Thank you, Mr. Chairman.

My amendment does three things.

First, it amends Section 5 of the bill to limit to five years the duration of any grants for the creation of up to five biofuels research centers. After five years, if the DOE chooses not to terminate the grant, my amendment still requires the grantee to reapply for another grant, and may have to compete to receive additional funds.

My amendment ensures that DOE holds these centers accountable for conducting research that produces results. To be effective, the kind of research centers established in Section 5 of this bill should concentrate resources on a specific problem for a finite period of time. If this kind of concentrated effort doesn't yield any breakthroughs, the DOE should focus its research efforts elsewhere.

My amendment gives the DOE the flexibility to end its support for one center, and take the research in a new and different direction. Plus, it prevents these centers from becoming another part of the entrenched DOE bureaucracy.

Second, my amendment would require the DOE to evaluate the life cycle impact of the use of various ethanol blends on carbon dioxide and greenhouse gas emissions as a part of the ethanol blends study in Section 8.

If we are truly concerned about energy efficiency and climate change, then we need to think about increasing ethanol consumption within that context. We need to think about not just the efficiency of and emissions from our vehicles, but also the efficiency of and emissions from biorefineries and the production of ethanol feedstocks. This provision of my amendment will allow Congress, the DOE, and potential ethanol producers to take a "big picture" look at how expanding the use of ethanol will affect carbon dioxide and greenhouse gas emissions.

Finally, my amendment expands the study on biodiesel's impact on engine and engine system durability in Section 10 of the bill to also include its impact on the performance of engines and engine systems. The amendment also extends from one year to two the time allowed for DOE to complete the study.

We've got to develop a better understanding of biodiesel's impact on engines and engine systems if we are to perfect a biodiesel blend that maximizes both their durability and performance. That's why the study in Section 10 should focus on more than durability.

What good will biodiesel be to consumers if it's formulated to minimize any wear and tear on a diesel engine, but it leads to clogged fuel filters, higher emissions, or lower fuel economy? And the converse is just as true. What good will biodiesel be to consumers if it doesn't clog fuel filters and leads to lower emissions and better fuel economy, but the engine only lasts a few years?

Not much in either case. That's why my amendment would require the DOE to take a broader look at biodiesel's impact on engines and engine systems.

I urge my colleagues to support my amendment, and I yield back the balance of my time.

Chairman GORDON. I thank you, Ms. Biggert, for this good amendment.

Anyone else would like to make a comment? If not, all in favor of the amendment, say aye. Aye. Opposed, nay. The amendment passes.

Also, first of all, let me thank those of you that are still here. I know there is lots going on today. We are going to try to move on through this. I think we are through with the toughest part of it.

Ms. Woolsey also is going to the same markup as you, and so, I don't want to make this too confusing, but we are going to move to amendment #010, which is Mr. Bartlett and Mr. Woolsey. Is there a further——

Ms. WOOLSEY. Mr. Woolsey.

Chairman GORDON. Pardon me. I know the difference. Is there further discussion or rather, let me ask, are you ready to proceed with your amendment? I guess that would be Mr. Bartlett. Are you the lead, or Ms. Woolsey?

Ms. WOOLSEY. Mr. Woolsey is.

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

The CLERK. Amendment to H.R. 2773, offered by Mr. Bartlett and Ms. Woolsey.

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

The gentlelady is recognized for five minutes to explain her amendment.

Ms. WOOLSEY. Thank you, Mr. Chairman, and I would like to thank Mr. Bartlett, the gentleman from Maryland, for introducing this amendment with me. He is a great leader of sensible energy policy, and his involvement adds credibility to this amendment for sure.

As I have said before, my dairy farmers are seeing their small profits wiped out by the rising cost of feed corn, due to increased demand to make ethanol. That is why I rise today to offer this amendment with Mr. Bartlett, that directs research and development for biofuels to take into consideration the effects on the food supply for both humans and animals.

We are now at a crossroads. The American public is overwhelmingly concerned about the effects of global climate change, and they are looking to Congress to lead this effort. Our challenge is not only to bring forth new energy policy, but to do so in a way that solves more problems than it creates. That is why our amendment is important. We need new energy sources, and I think cellulosic biofuels will be part of that solution to get us there, but not at the expense of taking food out of our mouths, or driving up the price of basic food products like milk and eggs, because the price of feed is being passed along to the consumer.

Mr. Chairman, I urge my colleagues to support the Bartlett-Woolsey amendment, and ensure that development of biofuels is done in a sensible way, and I yield back the balance of my time.

[The prepared statement of Ms. Woolsey follows:]

PREPARED STATEMENT OF REPRESENTATIVE LYNN WOOLSEY

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

Mr. Chairman, I would like to thank the gentleman from Maryland, Mr. Bartlett, for introducing this amendment with me. He is a great leader on sensible energy policy.

As I have said before, my dairy farmers are seeing their small profits wiped out by the rising cost of feed corn due to increased demand to make ethanol. That's why I rise today to offer this amendment with Mr. Bartlett that directs research and development for biofuels to take into consideration the effects on the food supply for both humans and animals.

We are now at a crossroads. The American public is overwhelmingly concerned about the effects of global climate change and they are looking to Congress to lead this effort. Our challenge is not only bring forth new energy policy, but to do so in a way that solves more problems than it creates. That's why our amendment is so important. We need new energy sources and I think cellulosic biofuels may be part of the solution to get us there, but not at the expense of taking food out of our mouths or driving up the price of basic food products like milk and eggs because the price of feed is being passed along to the consumer.

Mr. Chairman, I urge my colleagues to support the Bartlett-Woolsey amendment and ensure that development of biofuels is done a sensible way.

Thank you and I yield back the balance of my time.

Chairman GORDON. Is there further discussion on the amendment? Mr. Bartlett is recognized.

Mr. BARTLETT. Mr. Chairman, I have some prepared remarks that I would ask unanimous consent to submit for the record.

Chairman GORDON. I am sure they are wonderful, and without objection.

Mr. BARTLETT. Thank you, sir.

[The prepared statement of Mr. Bartlett follows:]

PREPARED STATEMENT OF REPRESENTATIVE ROSCOE BARTLETT

I appreciate the cooperation and collaboration from Chairman Lampson which he provided to me and my good friend, the gentlewoman from California, Ms. Woolsey, to ensure that as we move forward to enhance our nation's fuel supply with biofuels that we do so in an environmentally responsible and sustainable manner.

Chairman Lampson and our colleagues on the Energy and Environment Subcommittee already approved an amendment by us.

This is an amendment to our amendment. It complements the announcement made yesterday by U.S. Department of Energy Secretary Samuel W. Bodman that DOE will invest up to $375 million in three new Bioenergy Research Centers intended to accelerate basic as well as applied research in the development of cellulosic ethanol and other biofuels. These Centers aim to identify real steps toward practical solutions regarding to the challenge of producing renewable, carbon-neutral energy.

The amendment that has already been approved added environmental science to the list of disciplines that the Bioenergy Centers are authorized to pursue. It also established a goal of to "facilitate the production of fuels in sustainable production systems that reduce greenhouse gas emissions." I'll discuss this goal in more detail a little later with my good friend, the gentleman from South Carolina, Mr. Inglis.

The amendment also added the goal to develop cellulosic feedstocks that will not entail a food versus fuel trade-off and to efficiently utilize resources and promote environmental sustainability. It also added two new research and development programs. The first directs the Secretary of Energy in consultation with EPA to develop a research and development program to develop tools to do life cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production. The second directs the Secretary of Energy in consultation with the Secretary of Agriculture to establish a research and development program on small-scale production and processing of biofuels for on-farm use.

Our family farmers own most of the land and assets in our country. They dedicate the largest proportion of land set aside to protect the environment in the Conservation Reserve Program and the Wetlands Reserve Program. However, more than half of them are losing money farming and must rely on other work for income. We really need to help our family farmers reduce their energy costs and provide them with opportunities to become energy producers.

The amendment offered today by myself and Ms. Woolsey adds that the Secretary of Energy should consult with the Secretary of Agriculture in addition to the EPA to develop the tools for life cycle analysis of biofuel feedstocks. It adds study of the environmental impact on forests and the goal of ensuring the sustainability of forestlands. It also explicitly requires studies to consider the impact of biofuels on the food supply for humans and animals in addition to the impact on the environment.

These changes clarify the intent of Congress that Federal Government studies of biofuels address the potential food versus fuel trade-offs. It also explicitly addresses the tendency for stove piping that can isolate expertise by and within Departments. Research under this bill should complement rather than duplicate ongoing Federal Government efforts. It is important that research authorized under this bill by the Department of Energy benefits from creating a synergy with ongoing biofuels research and development, field and environmental testing initiatives by the Department of Agriculture and the Environmental Protection Agency.

I urge my colleagues to approve the Woolsey-Bartlett amendment.

Chairman GORDON. If there is no further discussion, all those in favor of the amendment, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

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

Mr. HILL. I am, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Hill of Indiana.

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. HILL. Thank you, Mr. Chairman.

Mr. Chairman, it is imperative for our country to get off our dependency upon foreign oil. Corn-based ethanol is market ready, and can currently be produced at market competitive prices. This year, we are expected to hit seven billion gallons of ethanol produced in this country, of which almost all is corn-based ethanol. Scientists estimate that we can produce 14 billion gallons of corn-based ethanol.

Our economy usually uses approximately 200 billion gallons of fuel a year. Corn is vitally important to other sources of food, having effects on the price of milk, beef, pork, and a variety of other products. It is also possible to produce ethanol from a variety of feedstocks, such as corn stalks, switchgrass, wood chips, and other forms of biomass.

While corn-based ethanol is market proven, cellulosic ethanol has not yet reached a technological point where it is cost competitive. However, scientists predict that we can get there, and I want to make sure that we have the technology to help in this transition. We must prepare for the future, where ethanol can be produced from a variety of feedstocks.

My amendment would propose a study to retrofit corn-based ethanol plants, allowing them to use a variety of biomass feedstocks. This study will help us prepare for the future, and help our companies with technologies and strategies to best maximize their current assets.

I urge my colleagues to support this amendment.

Mr. Chairman, departing from my prepared remarks, I would simply say that during the campaign last year, I made ethanol one of the cornerstones of energy independence. It is not the entire solution, but it is an important contributor to our getting off our dependency upon foreign oil.

This amendment of mine is an amendment that will allow the study of cellulosic forms of ethanol production, which is sorely needed in this country. It is good for farmers. It is good for our environment, and it helps us get off our dependency upon foreign oil.

And I urge my colleagues to support the amendment. Thank you.

[The prepared statement of Mr. Hill follows:]

PREPARED STATEMENT OF REPRESENTATIVE BARON HILL

It's imperative for our country to get off of foreign oil.

Corn-based ethanol is market ready, and can currently be produced at market competitive prices. This year, we are expected to hit seven billion gallons of ethanol produced in this country, of which almost all is corn-based ethanol.

Scientists estimate that we can sustainably produce 14 billion gallons of corn-based ethanol.

Our economy uses approximately 200 billion gallons of fuel a year.

Corn also is vitally important to other sources of food, having effects on the price of milk, beef, pork, and a variety of products.

It is also possible to produce ethanol from a variety of feedstocks, such as corn stocks, switch grass, wood chips, and other forms of biomass.

While corn-based ethanol is market proven, cellulosic ethanol has not yet reached a technological point where it is cost competitive. However, scientists predict that we can get there, and I want to make sure that we have the technology to help this transition.

Corn-based ethanol is a great bridge technology, but we must prepare for a future where ethanol can be produced from a variety of feed stocks.

My amendment would propose a study to retrofit corn-based ethanol plants, allowing them to use a variety of biomass feedstocks.

This study will help us prepare for the future, and help our companies with technologies and strategies to best maximize their current assets.

I urge my colleagues to support.

Chairman GORDON. Is there further discussion on this thoughtful amendment? If not, then the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

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

Mr. BARTLETT. I am. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Bartlett of Maryland, amendment #011.

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. The amendment I propose is a change to Section 4, which directs the Secretary of Energy to submit to Congress within 180 days, a report on any research and development challenges inherent in increasing the proportion of diesel sold in the U.S. to five percent biodiesel. This amendment very simply cuts that proportion in half to 2.5 percent, so as not to present unrealistic expectations.

It is important for the biofuels program enacted under this bill to be realistic, and to take account of the food versus tradeoff inherent with biodiesel. Constraints on the contributions of biodiesel were documented in a 2006 National Academy of Sciences study released on July 25, 2006. I want to share the most relevant excerpt from this report, and I quote: "Devoting all 2005 U.S. soybean production to biodiesel would have offset six percent of U.S. diesel demand. However, because of the fossil fuel energy required to produce biodiesel, this change would provide a net energy gain equivalent to just 2.9 percent of U.S. diesel consumption. Reaching this maximal rate of biofuel supply from soybeans is unlikely, because this crop is a major contributor to human food supplies, through livestock feed and direct consumption."

There are, of course, other potential sources of biodiesel, but it is hard to imagine that they could be much larger than all of our soybeans. Two of the coauthors of this National Academy of Sciences report, David Tilman and Jason Hill, wrote an op-ed published by *The Washington Post* on March 25 of this year: "Ethanol Hype: Corn Can't Solve Our Problem." They noted that if Americans kept their car engines tuned and maintained proper tire pressure, these changes would save more than the 2.4 percent net gaso-

line consumption if all 70 million acres of corn planted in the U.S. were devoted to ethanol production.

Biofuels can make a small and important contribution to diversity in our liquid fuel supply, but we really need to avoid hype and giving Americans and our colleagues unrealistic expectations that biofuels can replace gasoline or diesel fuel in the foreseeable future, without significant, and at present, unidentified technological breakthroughs.

I urge my colleagues to approve this amendment.

[The prepared statement of Mr. Bartlett follows:]

PREPARED STATEMENT OF REPRESENTATIVE ROSCOE BARTLETT

The amendment I propose is a change to Section 4 which directs the Secretary of Energy to submit to the Congress within 180 days a report on any research and development challenges inherent in increasing the proportion of diesel sold in the U.S. to five percent biodiesel. This amendment very simply cuts that proportion in half to 2.5 percent so as not to present unrealistic expectations.

It is important for the biofuels program enacted under this bill to be realistic and to take account of the food vs. fuel trade-off inherent with biodiesel. Constraints on the contributions of biodiesel were documented in a 2006 National Academies of Science study released on July 25, 2006: "Environmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels," by a team of researchers from the University of Minnesota and St. Olaf College.

I want to share the most relevant excerpt: Devoting *all* 2005 U.S. soybean production to biodiesel would have offset 6.0 percent of U.S. diesel demand. However, because of the fossil energy required to produce biodiesel, this change would provide a net energy gain equivalent to just 2.9 percent of U.S. diesel consumption. Reaching this *maximal rate* of biofuel supply from soybeans *is unlikely* because this crop is a major contributor to human food supplies through livestock feed and direct consumption.

There are other potential sources of biodiesel that are not food crops. However, it's hard to imagine they could reach the amount of the entire soybean crop.

Two of the co-authors of this NAS report, David Tilman and Jason Hill, wrote an op-ed published by *The Washington Post* on March 25, 2007, *Ethanol Hype, Corn Can't Solve Our Problem.* They noted that if Americans kept their car engines tuned-up and maintained proper tire air pressure, these changes would save more than the 2.4 percent net gasoline consumption if all 70 million acres of corn planted in the U.S. was devoted to ethanol production.

Biofuels can make a small and important contribution to diversity in our liquid fuel supply, but we really need to avoid hype and giving Americans and our colleagues unrealistic expectations that biofuels could replace gasoline or diesel fuel in the foreseeable future without significant and at present unidentified technological breakthroughs.

I urge my colleagues to approve this amendment.

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

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

Mr. LAMPSON. We have an amendment at the desk, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 2773, offered by Mr. Lampson 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. LAMPSON. Did I have the correct one here, Mr. Chairman?

Chairman GORDON. This would be #010, I believe.

The CLERK. 12.

Chairman GORDON. Is it?

The CLERK. I have in front of me 012.

Chairman GORDON. Well, let us be sure we are all consistent, then. Oh, okay.

Mr. LAMPSON. Okay. Mr. Chairman.

Chairman GORDON. Oh, pardon me, yes. I see.

Mr. LAMPSON. I will proceed with my comments.

On this committee, we are very familiar with the important role that standards play in commerce. Establishing standards ensures that a product sold anywhere and by any firm meets the expectation of the customer. Making sure that a Coke is a Coke. Biofuels are no exception. We need standards to ensure the quality and performance of these fuels, if they are to enter the mainstream of commerce and transportation fuels.

My amendment adds a new section to the study in Section 4 of the bill, requiring the Director of the National Institute of Standards and Technology to make physical property data and information necessary to characterize biodiesel publicly available. The information will encourage the establishment of standards for these fuels.

And I urge support for this amendment, and yield back the balance of my time.

Chairman GORDON. Is there further discussion on the amendment? The gentleman from Florida is recognized for five minutes.

Mr. DIAZ-BALART. Thank you, Mr. Chairman, and I don't know if this is for the gentleman or for Counsel, but what does "publicly available," mean. If you look at the amendment, there is a part that makes "publicly available the physical property data and characterization of biodiesel." Specifically, what information would be provided as physical property data, and also characterization?

I am concerned, because can any of this stuff be considered proprietary or confidential business information? If not, why not, and obviously, we understand where the sponsor is going. We just need to make sure that we clearly are not opening up to making some proprietary information public that shouldn't be made public. So, why is it not, and could any of it be proprietary?

Mr. LAMPSON. Mr. Diaz-Balart, it would be physical property data. It is not going to get into the information of the operation of that business. It is going to be specific to this. And it is the same language provided within, in other places in the law pertaining to the National Institute of Standards and Technology, and all that is defined within other legislation.

Mr. DIAZ-BALART. And if I can, Mr. Chairman, so it doesn't go into proprietary, it would not include proprietary data at all? Is that the intent?

Mr. LAMPSON. It does not impact proprietary, no.

Mr. DIAZ-BALART. All right. Thank you, Mr. Chairman.

Chairman GORDON. Thank you for that clarification.

Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

The ninth amendment on the roster is offered by the gentleman from Nebraska, Mr. Smith. He was here earlier. There he is. Okay. Are you ready to proceed with your amendment?

Mr. SMITH OF NEBRASKA. I do have an amendment on the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment #010. Amendment to H.R. 2773, offered by Mr. Smith of Nebraska and Mr. Lampson 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. SMITH OF NEBRASKA. Thank you, Mr. Chairman, and Members.

This amendment would require the Secretary of Energy to submit to the Committee on Science and Technology a report on the progress of the research and development that is being conducted on the use of algae as a feedstock for the production of biofuels.

The report shall also include any regulatory or other barriers found by the Secretary that hinder the economic development of this resource, as well as a recommendation on how to encourage and further its development as a viable transportation fuel.

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 algae production with electric power generation, and use the carbon dioxide waste to fuel algae production.

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 must explore 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.

And I yield back.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE ADRIAN SMITH

Mr. Chairman and Members of the Committee,

This amendment would require the Secretary of Energy to submit to the Committee on Science and Technology a report on the progress of the research and development that is being conducted on the use of algae as a feedstock for the production of biofuels. The report shall also include any regulatory or other barriers found by the Secretary that hinder the economic development of this resource as well as a recommendation on how to encourage and further its development as a viable transportation fuel.

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.

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 must explore 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.

Chairman GORDON. Is there further discussion on this good amendment?

Mr. LAMPSON. Mr. Chairman, may I just make a simple comment, that I concur in the remarks that have been made, and certainly support this. And appreciate support for them, and thank you, Mr. Smith.

Chairman GORDON. Thank you, and Mr. Bartlett is recognized.

Mr. BARTLETT. Mr. Chairman, I have a personal anecdote relative to the amount of energy we are likely to get from these algal masses. I have a farm pond that is too well fertilized, and every year at this time, it looks like you could walk on it, it has so much algae on it.

This spring, I put a pair of swans on the pond, and apparently, they ate it all. There isn't any there. So, that is an indication of how much energy there might be in these. But it is clearly a potential source of energy, and we need to exploit all of them. So, we have——

Mr. LAMPSON. Mr. Bartlett, would you yield?

Mr. BARTLETT. Can we say we have hyper swans now, is that—it is all gone. I don't know if they ate it or not, but there is none there this year.

Mr. LAMPSON. Well, if two swans can eat an acre of this stuff, it is my understanding that you can get several thousand gallons of oil off an acre of algae, so it is certainly worth research.

Mr. BARTLETT. It is a small pond, about a half an acre pond.

Chairman GORDON. Does anyone else wish to be recognized? Again, I thank the gentlemen for, these were good, thoughtful amendments that are making us have a better bill here.

So, if not, then, the vote occurs on the amendment. All in favor, say aye. Aye. Opposed, no. The ayes have it. The amendment is agreed to.

The tenth amendment, and what I think is the last amendment on this bill, is offered also by the gentleman from Nebraska, Mr. Smith. Are you ready to proceed?

Mr. SMITH OF NEBRASKA. Yes. I have an amendment on the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment #014, amendment to H.R. 2773, 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 his amendment.

Mr. SMITH OF NEBRASKA. Thank you, Mr. Chairman and Members.

Coming from Nebraska, a state that is actually third in the Nation, in terms of ethanol, current ethanol production, and largely, corn-based ethanol production, we have heard a variety of comments here today from both sides about the efficacy or efficiency of corn-based ethanol and energy policy in general.

My concerns about the current language, and the reason I am offering this amendment, to open it up to all states, is so that we don't inadvertently, I believe, and I appreciate the objectives of the

current wording. However, excuse me, the unintended consequences, I think, could actually produce results that we would regret, and that is basically an anticompetitive environment. We would more than likely be creating a false market by encouraging states that, perhaps, don't have the expertise already, and basically, establishing an effective on the current expertise that is out there.

Do we want to have states with corn-based ethanol only move forward with corn-based ethanol? We have heard about the challenges facing the livestock industry, and I think that we would serve ourselves very well to open up the research to all states, not just those with low production of ethanol, but put everything on the table. I think that when we look at energy policy and incentives, too many times, we create too many obstacles, and we need to open that up.

And that is why I would like to have a favorable vote on this amendment, so that we can open it up to all states, regardless of where they rank nationally in ethanol production.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE ADRIAN SMITH

Mr. Chairman and Members of the Committee,

This amendment would provide grants to eligible entities for research, development, demonstration, and commercial application of biofuel production technologies with the greatest potential to increase the production of cellulosic biomass ethanol. The eligible entities include institutions of higher education and consortia; including at least one institution of higher education; industry, State agencies, Indian tribal agencies, or local government agencies.

Nebraska, my home State, ranks third nationally in ethanol production—and is the largest ethanol producer west of the Missouri River. Incentives and investment at the State, local, and private levels have helped spur Nebraska's ethanol production.

H.R. 2773, as currently written, would leave states with high rates of ethanol production ineligible to receive research and development grants for biofuels production technologies. States with strong ethanol production from corn should still be able to participate; as they have expertise and experience in producing ethanol; and make a positive contribution to the production of cellulosic biomass ethanol.

Mr. Chairman, at a time when gas prices are high and home-grown alternative energy options are increasingly attractive, we should not exclude any entity from participating in an initiative aimed at lessening our nation's reliance on foreign oil.

Chairman GORDON. Is there further discussion on the amendment?

Mr. LAMPSON. Mr. Chairman.

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

Mr. LAMPSON. Just like we shouldn't be dependent on a handful of countries for our oil, we shouldn't depend on only a handful of states' ability to produce corn to supply the Nation with fuel.

The corn-based ethanol industry benefits from a wide range of subsidies, tariff protections, and loan guarantees, including a 51 percent tax credit for ethanol blended with gasoline, and there are numerous ethanol research grant programs already, some of which will benefit from the increased authorization levels in this bill. The bill also includes a provision to provide grants in states that have low levels of ethanol production, to spur the development of ethanol from cellulosic materials. And the funding level in the bill for these is only $25 million.

This amendment would open up this new grant program, intended for the states with low biofuels production, to all states. Essentially, this amendment defeats the purpose of the provision with the existing programs that are already benefiting states that produce large amounts of biofuels. The provision in the bill attempts to bring these others along.

I would oppose this amendment, Mr. Chairman.

Chairman GORDON. Is there further discussion?

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. I have been advised by my staff that this is a well thought out amendment, and a good amendment. I urge you to support it. Yield back my time.

Chairman GORDON. Is there further discussion?

Ms. BIGGERT. Mr. Chairman. I am back.

Chairman GORDON. She is back.

Ms. BIGGERT. Thank you. I rise in support of this amendment.

I think the purpose of this bill is really to increase the production of cellulosic biomass, and I think that we really should look at all states that have the potential to increase the production. If it limits us to where there is low production, because there also can be no biomass, so I think we should put our emphasis where there is the potential for production.

I can think of a couple states that we probably don't find very much of the feedstock that we could use. I won't mention the states, but maybe in the West in some places, we don't see much grass. And I think this is something that we should try and find, exclude those that really have the potential.

I yield back.

Chairman GORDON. Is there further discussion on the amendment? If not, the vote occurs on the amendment. All in favor, say aye. Opposed, no. No. It appears that the nos have it.

Mr. SMITH OF NEBRASKA. Mr. Chairman, I request a recorded vote.

Chairman GORDON. The Clerk will call the roll.

The CLERK. Chairman Gordon.

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello.

[No response.]

The CLERK. Ms. Johnson.

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey.

Ms. WOOLSEY. No.

The CLERK. Ms. Woolsey votes no. Mr. Udall.

[No response.]

The CLERK. Mr. Wu.

Mr. WU. Mr. Wu votes no. Mr. Baird.

[No response.]

The CLERK. Mr. Miller.

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski.

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Mr. Lampson.

Mr. LAMPSON. No.

The CLERK. Mr. Lampson votes no. Ms. Giffords.
Ms. GIFFORDS. No.
The CLERK. Ms. Giffords votes no. Mr. McNerney.
Mr. MCNERNEY. No.
The CLERK. Mr. McNerney votes no. Mr. Kanjorski.
[No response.]
The CLERK. Ms. Hooley.
[No response.]
The CLERK. Mr. Rothman.
Mr. ROTHMAN. No.
The CLERK. Mr. Rothman votes no. Mr. Honda.
Mr. HONDA. No.
The CLERK. Mr. Honda votes no. Mr. Matheson.
Mr. MATHESON. No.
The CLERK. Mr. Matheson votes no. Mr. Ross.
Mr. ROSS. No.
The CLERK. Mr. Ross votes no. Mr. Chandler.
Ms. CHANDLER. No.
The CLERK. Mr. Chandler votes no. Mr. Carnahan.
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Melancon.
Mr. MELANCON. No.
The CLERK. Mr. Melancon votes no. Mr. Hill.
[No response.]
The CLERK. Mr. Mitchell.
[No response.]
The CLERK. Mr. Wilson.
Mr. WILSON. No.
The CLERK. Mr. Wilson votes no. Mr. Hall.
Mr. HALL. Yes.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner.
[No response.]
The CLERK. Mr. Lamar Smith.
[No response.]
The CLERK. Mr. Rohrabacher.
[No response.]
The CLERK. Mr. Bartlett.
Mr. BARTLETT. Aye.
The CLERK. Mr. Bartlett votes aye. Mr. Ehlers.
Mr. EHLERS. Aye.
The CLERK. Mr. Ehlers votes aye. Mr. Lucas.
Mr. LUCAS. Aye.
The CLERK. Mr. Lucas votes aye. Mrs. Biggert.
Ms. BIGGERT. Aye.
The CLERK. Mrs. Biggert votes aye. Mr. Akin.
[No response.]
The CLERK. Mr. Bonner.
[No response.]
The CLERK. Mr. Feeney.
[No response.]
The CLERK. Mr. Neugebauer.
[No response.]
The CLERK. Mr. Inglis.
Mr. INGLIS. Aye.

The CLERK. Mr. Inglis votes aye. Mr. Reichert.
Mr. REICHERT. Aye.
The CLERK. Mr. Reichert votes aye. Mr. McCaul.
Mr. MCCAUL. Aye.
The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart.
Mr. DIAZ-BALART. Aye.
The CLERK. Mr. Diaz-Balart votes aye. Mr. Gingrey.
[No response.]
The CLERK. Mr. Bilbray.
[No response.]
The CLERK. Mr. Adrian Smith.
Mr. SMITH OF NEBRASKA. Aye.
The CLERK. Mr. Adrian Smith votes aye. Mr. Rohrabacher is not recorded.
Mr. ROHRABACHER. Aye.
The CLERK. Mr. Rohrabacher votes aye.
Chairman GORDON. Are there other Members that have not cast a vote? If not, then the Clerk will report.
The CLERK. Mr. Chairman, 11 Members vote aye, 17 vote no.
Chairman GORDON. The amendment is not agreed to.

COMMITTEE ON SCIENCE AND TECHNOLOGY

ROLL CALL _____ BILL H.R. 2773 DATE 6/27/07

AMEND # 11 PASSED ___ DEFEATED ✓ VOICE VOTE ___ WITHDRAW ___

SPONSOR/AMENDMENT Smith - Nebraska

MEMBER	AYE	NO	PRESENT	NOT VOTING
Mr. GORDON, Chairman		✓		
Mr. COSTELLO				
Ms. JOHNSON		✓		
Ms. WOOLSEY		✓		
Mr. UDALL				
Mr. WU		✓		
Mr. BAIRD				
Mr. MILLER		✓		
Mr. LIPINSKI		✓		
Mr. LAMPSON		✓		
Ms. GIFFORDS		✓		
Mr. McNERNEY		✓		
Mr. KANJORSKI				
Ms. HOOLEY				
Mr. ROTHMAN		✓		
Mr. HONDA		✓		
Mr. MATHESON		✓		
Mr. ROSS		✓		
Mr. CHANDLER		✓		
Mr. CARNAHAN		✓		
Mr. MELANCON		✓		
Mr. HILL				
Mr. MITCHELL				
Mr. WILSON		✓		
Mr. HALL	✓			
Mr. SENSENBRENNER				
Mr. LAMAR SMITH, TX				
Mr. ROHRABACHER	✓			
Mr. BARLETT	✓			
Mr. EHLERS	✓			
Mr. LUCAS	✓			
Mrs. BIGGERT	✓			
Mr. AKIN				
Mr. BONNER				
Mr. FEENEY				
Mr. NEUGEBAUER				
Mr. INGLIS	✓			
Mr. REICHERT	✓			
Mr. McCAUL	✓			
Mr. DIAZ-BALART	✓			
Mr. GINGREY				
Mr. BILBRAY				
Mr. ADRIAN SMITH, NE	✓			
Vacant				
TOTALS				

Mr. Chairman, 11 Members vote AYE and 17 vote NO

43 / Quorum /15 vote / 22 Report

Revised 5/16/07

Chairman GORDON. Are there other amendments? If not, then the vote is on the bill, H.R. 2773, as amended. All those in favor will say aye. Aye. All opposed, no. In the opinion of the Chair, the ayes have it.

I recognize Mr. Hall to offer a motion. Unless he prefers not to.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 2773, as amended, to the House, with the recommendation that the bill do pass. Furthermore, I move that the staff be instructed to prepare the legislative report, and make necessary technical and conforming changes, and that the Chairman take all necessary steps to bring the bill before the House for consideration.

Yield back.

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

Without objection, the motion to reconsider is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental, Minority, or additional views on the measure, ending Monday, January the 2nd, at 9:00 a.m.

I move, pursuant to Clause 1, 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. 2773, the *Biofuels Research and Development Enhancement Act,* as amended. Without objection, so ordered.

I thank all of you, the hard core that are still here. We had a good day. Four more bills of a dozen that will go into a good Energy Bill next month, and again, a bipartisan, everybody go home and take credit. Thank you.

[Whereupon, at 1:10 p.m., the Committee was adjourned.]

Appendix:

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT MARKUP REPORT, H.R. 2773 AS REPORTED, AMENDMENT ROSTER

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
REPORT FROM SUBCOMMITTEE MARKUP
JUNE 21, 2007

H.R. 2773, THE BIOFUELS RESEARCH AND DEVELOPMENT ENHANCEMENT ACT

I. Purpose

The purpose of this bill is to enhance ongoing research in areas related to biofuels and promote a greater degree of coordination of research materials related to biofuels.

II. Background and Need for Legislation

High gasoline prices, a desire to reduce our dependence on foreign sources of energy, and concerns over climate change have greatly increased interest in bio-based fuels as an alternative to petroleum for transportation fuel. Over the last several years, in part as a result of the Renewable Fuel Standard included in the *Energy Policy Act of 2005,* the use of biofuels—most notably corn-based ethanol—has grown significantly. Ethanol is most commonly blended with gasoline at a level of 10 percent or less. And, this still only represents a small portion (less than five percent) of the total gasoline sold.

Recent proposals in Congress and by the Administration have called for significant increases in the use of biofuels over the next ten years. Currently biofuel supply relies almost exclusively on corn-based ethanol. Concerns have been raised about further expansion of corn-based ethanol to meet the targets set for biofuel production. Competition with food and feed supply, water and nutrient demand associated with corn production, and continued questions about the energy balance of corn-based ethanol production all suggest that biomass sources for biofuel production must be diversified.

The majority of this focus to diversify the feedstocks has been on cellulosic materials including grasses, wood, and waste materials. However, current technologies for the development of fuel from these sources continue to be expensive and not cost-competitive with corn-based ethanol. If we are going to move toward broader use of biofuels, technology will be necessary to create reasonably priced fuels from cellulosic materials.

The *Agricultural Risk Protection Act of 2000* (Title III), the *Farm Security and Rural Investment Act of 2002,* and the *Energy Policy Act of 2005* created bioenergy research and development programs to focus federal research funding on the development of biofuels derived from cellulosic materials. This research is ongoing and operates under a Memorandum of Understanding between the Department of Energy and the Department of Agriculture.

Though these efforts present a reasonable starting point, an enhanced federal commitment will be needed. To realize this needed improvement in technology, we must increase our investment in research and development, focus our research on the most promising technologies, and ensure that the latest research information is readily available for those looking to either expand their biofuels production or embark upon the development of new facilities.

III. Subcommittee Actions

H.R. 2773 was introduced by Subcommittee Chairman Lampson on June 19, 2007, and referred to the House Committee on Science and Technology, Subcommittee on Energy and Environment.

The Subcommittee on Energy and Environment held a hearing on June 14, 2007 entitled *A Path Toward the Broader Use of Biofuels: Enhancing the Federal Commitment to Research and Development to Meet the Growing Need.* The purpose of this hearing was to examine the federal efforts on research, development and demonstration of technologies related to the production of biofuels, the development of biorefineries and demonstrations of those technologies. The hearing further focused on legislative proposals to restructure and enhance the biofuels research and development programs of the Department of Energy and the Department of Agriculture under consideration in the House and Senate, including an evaluation of a "Discussion Draft" version of H.R. 2773. At the hearing, the Subcommittee received testimony from the following witnesses:

- **Mr. Robert Dinneen, President, Renewable Fuels Association.** RFA is a national trade association for the domestic ethanol industry. RFA's membership includes a broad cross-section of businesses, individuals and organizations dedicated to the expansion of the U.S. fuel ethanol industry.
- **Dr. Thomas Foust, Biofuels Research Director, National Renewable Energy Laboratory.** The National Renewable Energy Laboratory is the Nation's primary laboratory for renewable energy research and development. The Biomass Program supports NREL R&D focused on biomass characterization, thermochemical and biochemical biomass conversion technologies, biobased products development, and biomass process engineering and analysis.
- **Mr. John Berger, Chairman and CEO, Standard Renewable Energy and CEO, BioSelect.** Standard Renewable Energy is a leader in renewable energy, serving commercial and residential customers with clean, renewable energy and energy efficiency technologies. BioSelect, a division of Standard Renewable Energy, is a developer and operator of biodiesel production facilities.
- **Mr. David Waskow, Policy Analyst, Friends of the Earth, U.S.** Friends of the Earth, U.S. is part of a network of international groups in 70 countries. David Waskow is an international policy analyst and works on the environment, trade policy, and corporate accountability.
- **Mr. Michael J. McAdams, Executive Director, Advanced Biofuels Coalition.** The Advanced Biofuels Coalition is a collection of companies who utilize advanced technologies or provide renewable-based feedstocks to produce renewable fuels—both biodiesel and gasoline compatible components.

The Subcommittee on Energy and Environment met to consider H.R. 2773 on June 21, 2007. The Subcommittee considered and adopted the following amendments by voice vote:

1. A manager's amendment offered by Chairman Lampson, makes several technical changes; clarifies that the Technology Transfer Center, not the Secretary of Energy, will carry out the tasks of the Center; recognizing that the Department of Transportation regulates pipelines, the amendment ensures that the Secretary of Energy will consult with the Department of Transportation as it engages in the infrastructure research and development program created in section 3 of the bill; removes a few unnecessary focus areas for the infrastructure research program created in section 3 and provide the Secretary with the ability to look other areas deemed appropriate; inserts a more appropriate definition of biodiesel for the purpose of the study in section 4; and reduces the number of Bioresearch Centers authorized in the bill from 11 to five.
2. An amendment offered by Ms. Woolsey and Mr. Bartlett, amends section 977 of the *Energy Policy Act of 2005* to add environmental science to the list of disciplines that the Bioenergy Centers created in the Act may pursue; indicates the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions; adds a new goal for the research conducted by the Centers to develop cellulosic feedstocks that efficiently utilize resources and promote environmental sustainability; adds a research and development program in consultation with EPA to develop tools to do life cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production; and adds a research and development program in consultation with the Secretary of Agriculture for small-scale production and processing of biofuels for on-farm use.

Rep. Woolsey moved that the Subcommittee favorably report the bill H.R. 2773, as amended, to the Full Committee. A quorum was noted and the motion was agreed to by voice vote.

IV. Summary of Major Provisions

H.R. 2773 will enhance, focus, and better coordinate federal biofuels research efforts, and it authorizes several studies that will provide necessary information back to the Committee that will allow the Committee to make additional research commitments in the future. More specifically, the bill attempts to better coordinate and compile information from federal biofuels research programs, focus some of the biofuels research on infrastructure needs and efficiency of biorefineries, study some

of the continuing challenges facing broader use of biofuels, and increase the funding levels for Department of Energy biofuels research.

V. Section-by-Section Analysis of the bill as reported by the Subcommittee

Section 2. Biofuels and Biorefinery Information Center—Directs the Secretary of Energy, in cooperation with the Secretary of Agriculture, to establish a Technology Transfer center to serve as a clearinghouse of information related to the research, development, and commercial applications of technologies related to biofuels and biorefinery technologies. This section will help make readily available to interested parties the latest information on methods for biofuels development to help support the rapid growth and deployment of biofuels.

Section 3. Biofuels and Advanced Biofuels Infrastructure—Recognizing the inherent problems with transporting and storing biofuels in the existing petroleum fuels infrastructure, in consultation with the Secretary of Transportation, this section establishes a program of research, development, and demonstration for modifications and treatments to existing infrastructure and development of new infrastructure.

Section 4. Biodiesel—The Secretary is directed to submit a report to Congress on any research and development challenges in increasing to five percent the amount of biodiesel, as compared to the current level, the amount of all diesels sold nationally.

Section 5. Bioresearch Centers for Systems Biology Program—The Bioresearch Center program created in the *Energy Policy Act of 2005* is amended to establish at least five regionally located centers.

Section 6. Grants for Biofuels Production Research and Development in Certain States—Establishes a research and development grant program in states with low rates of ethanol production, as is determined by the Secretary of Energy.

Section 7. Biorefinery Energy Efficiency—Adds a new subsection the Section 932 of the *Energy Policy Act of 2005* (Bioenergy Program) to establish a program of research, development, demonstration and commercial application of technologies to increase the energy efficiency and reduce the energy consumption of biorefinery facilities.

Section 8. Study of Increase Consumption of Ethanol-Blended Gasoline with Higher Levels—Directs the Secretary of Energy to conduct a study, in cooperation with the Secretaries of Agriculture and Transportation and EPA, on the feasibility of increasing the consumption of ethanol-blended gasoline at blend levels between 10 and 40 percent.

Section 9. Study of Optimization of Flexible Fueled Vehicles to use E–85—Directs the Secretary of Energy to conduct a study to determine if optimizing flexible fuel vehicles to operate using E–85 would increase the fuel efficiency while using E–85.

Section 10. Study of Engine Durability Associated with the Use of Biodiesel—Directs the Secretary of Energy to conduct a study on the effects of the use of biodiesel, at varying blend levels, on engine durability.

Section 11. Authorization for Appropriation—This section makes the following authorizing changes:

- Extends the authorization of Section 931 (Renewable Energy) *Energy Policy Act of 2005* through 2010 (currently expires in 2009) and funds the programs at $963 million.
- Increases the authorization levels for Section 932 (Bioenergy Programs) of the *Energy Policy Act of 2005* to:
  - FY08—$377 million
  - FY09—$398 million
  - FY10—$419 million

Section 12. Environmental Research and Development—Amends section 977 of the *Energy Policy Act of 2005* to add environmental science to the list of disciplines that the Bioenergy Centers created in the Act may pursue; indicates the goal of producing biofuels should be pursued in a manner that ensures the cropping systems will be sustainable and the feedstock production and processing will result in lower greenhouse gas emissions; adds a new goal for the research conducted by the Centers to develop cellulosic feedstocks that efficiently utilize resources and pro-

mote environmental sustainability; adds a research and development program in consultation with EPA to develop tools to do life-cycle analysis of biofuel feedstocks and to evaluate the potential environmental impacts associated with increased feedstock production; and adds a research and development program in consultation with the Secretary of Agriculture for small-scale production and processing of biofuels for on-farm use.

H.R. 2773, AS REPORTED BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

June 21, 2007

SECTION 1. SHORT TITLE.

This Act may be cited as the "Biofuels Research and Development Enhancement Act".

SEC. 2. BIOFUELS AND BIOREFINERY INFORMATION CENTER.

(a) IN GENERAL.—The Secretary of Energy (in this Act referred to as the "Secretary"), in cooperation with the Secretary of Agriculture, shall establish a technology transfer center to make available information on research, development, and commercial application of technologies related to biofuels and biorefineries, including—

(1) biochemical and thermochemical conversion technologies capable of making fuels from lignocellulosic feedstocks;

(2) biotechnology processes capable of making biofuels with an emphasis on development of biorefinery technologies using enzyme-based processing systems; and

(3) other advanced processes and technologies that will enable the development of biofuels.

(b) ADMINISTRATION.—In administering this section, the Secretary shall ensure that the center shall—

(1) continually update information provided by the center;

(2) make information available on biotechnology processes; and

(3) make information and assistance provided by the center available for those involved in energy research, development, demonstration, and commercial application.

SEC. 3. BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.

Section 932 of the Energy Policy Act of 2005 (42 U.S.C. 16232) is amended by adding at the end the following new subsection:

''(f) BIOFUELS AND ADVANCED BIOFUELS INFRASTRUCTURE.—

''(1) IN GENERAL.—The Secretary, in consultation with the Secretary of Transportation, shall carry out a program of research, development, and demonstration as it relates to existing transportation fuel distribution infrastructure and new alternative distribution infrastructure. The program shall focus on the physical and chemical properties of biofuels

and efforts to prevent or mitigate against adverse impacts of those properties in the following areas:

"(A) Corrosion of metal, plastic, rubber, cork, fiberglass, glues, or any other material used in pipes and storage tanks.

"(B) Dissolving of storage tank sediments.

"(C) Clogging of filters.

"(D) Contamination from water or other adulterants or pollutants.

"(E) Poor flow properties related to low temperatures.

"(F) Oxidative and thermal instability in long-term storage and use.

"(G) Microbial contamination.

"(H) Problems associated with electrical conductivity.

"(I) Such other areas as the Secretary considers appropriate.".

SEC. 4. BIODIESEL.

Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to Congress a report on any research and development challenges inherent in increasing to 5 percent the proportion of diesel fuel sold in the United States that is biodiesel (within the meaning of section 211(o) of the Clean Air Act).

SEC. 5. BIORESEARCH CENTERS FOR SYSTEMS BIOLOGY PROGRAM.

Section 977(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16317(a)(1)) is amended by inserting before the period at the end the following: ", including the establishment of at least 5 bioresearch centers of varying sizes, as appropriate, that focus on biofuels, of which at least 1 center shall be located in each of the 5 Petroleum Administration for Defense Districts".

SEC. 6. GRANTS FOR BIOFUEL PRODUCTION RESEARCH AND DEVELOPMENT IN CERTAIN STATES.

(a) IN GENERAL.—The Secretary shall provide grants to eligible entities for research, development, demonstration, and commercial application of biofuel production technologies in States with low rates of ethanol production, including low rates of production of cellulosic biomass ethanol, as determined by the Secretary.

(b) ELIGIBILITY.—To be eligible to receive a grant under this section, an entity shall—

(1)(A) be an institution of higher education (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)) located in a State described in subsection (a); or

(B) be a consortium including at least 1 such institution of higher education, and industry, State

agencies, Indian tribal agencies, or local government agencies located in the State; and

(2) have proven experience and capabilities with relevant technologies.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section $25,000,000 for each of fiscal years 2008 through 2010.

SEC. 7. BIOREFINERY ENERGY EFFICIENCY.

Section 932 of Energy Policy Act of 2005 (42 U.S.C. 16232), is amended by adding at the end the following new subsection:

''(g) BIOREFINERY ENERGY EFFICIENCY.—The Secretary shall establish a program of research, development, demonstration, and commercial application for increasing energy efficiency and reducing energy consumption in the operation of biorefinery facilities.''.

SEC. 8. STUDY OF INCREASED CONSUMPTION OF ETHANOL-BLENDED GASOLINE WITH HIGHER LEVELS OF ETHANOL.

(a) IN GENERAL.—The Secretary, in cooperation with the Secretary of Agriculture, the Administrator of the Environmental Protection Agency, and the Secretary of Transportation, shall conduct a study of the methods of increasing consumption in the United States of ethanol-

blended gasoline with levels of ethanol that are not less than 10 percent and not more than 40 percent.

(b) STUDY.—The study under subsection (a) shall include—

(1) a review of production and infrastructure constraints on increasing consumption of ethanol;

(2) an evaluation of the environmental consequences of the ethanol blends described in subsection (a) on evaporative and exhaust emissions from on-road, off-road, and marine vehicle engines; and

(3) an evaluation of the consequences of the ethanol blends described in subsection (a) on the operation, durability, and performance of on-road, off-road, and marine vehicle engines.

(c) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to Congress a report describing the results of the study conducted under this section.

SEC. 9. STUDY OF OPTIMIZATION OF FLEXIBLE FUELED VEHICLES TO USE E–85 FUEL.

(a) IN GENERAL.—The Secretary shall conduct a study of whether optimizing flexible fueled vehicles to operate using E–85 fuel would increase the fuel efficiency of flexible fueled vehicles.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results of the study under this section, including any recommendations of the Secretary.

SEC. 10. STUDY OF ENGINE DURABILITY ASSOCIATED WITH THE USE OF BIODIESEL.

(a) IN GENERAL.—Not later than 30 days after the date of enactment of this Act, the Secretary shall initiate a study on the effects of the use of biodiesel on engine durability.

(b) COMPONENTS.—The study under this section shall include—

(1) an assessment of whether the use of biodiesel in conventional diesel engines lessens engine durability; and

(2) an assessment of the effects referred to in subsection (a) with respect to biodiesel blends at varying concentrations, including the following percentage concentrations of biodiesel:

(A) 5 percent biodiesel.

(B) 10 percent biodiesel.

(C) 20 percent biodiesel.

(D) 30 percent biodiesel.

(E) 100 percent biodiesel.

(c) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives the Committee on Energy and Natural Resources of the Senate a report that describes the results of the study under this section, including any recommendations of the Secretary.

SEC. 11. BIOENERGY RESEARCH AND DEVELOPMENT, AUTHORIZATION OF APPROPRIATION.

(a) Section 931 of the Energy Policy Act of 2005 (42 U.S.C. 16231) is amended—

(1) in subsection (b)—

(A) at the end of paragraph (2) by striking ''and'';

(B) at the end of paragraph (3) by striking the period and inserting ''; and''; and

(C) by adding at the end the following new paragraph:

''(4) $963,000,000 for fiscal year 2010.''; and

(2) in subsection (c)—

(A) in paragraph (2), by striking ''$251,000,000'' and inserting ''$377,000,000'';

(B) in paragraph (3), by striking "$274,000,000" and inserting "$398,000,000"; and

(C) by adding at the end the following new paragraph:

"(4) $419,000,000 for fiscal year 2010, of which $150,000,00 shall be for section 932(d).".

SEC. 12. ENVIRONMENTAL RESEARCH AND DEVELOPMENT.

(a) AMENDMENTS.—Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317) is amended—

(1) in subsection (a)(1), by striking "and computational biology" and inserting "computational biology, and environmental science"; and

(2) in subsection (b)—

(A) in paragraph (1), by inserting "in sustainable production systems that reduce greenhouse gas emissions" after "hydrogen";

(B) at the end of paragraph (3), by striking "and";

(C) by redesignating paragraph (4) as paragraph (5); and

(D) by inserting after paragraph (3) the following new paragraph:

"(4) develop cellulosic and other feedstocks that are less resource and land intensive and that pro-

mote sustainable use of resources, including soil, water, energy, and land, and ensure protection of air, water, and soil quality; and''.

(b) TOOLS AND EVALUATION.—The Secretary, in consultation with the Administrator of the Environmental Protection Agency, shall establish a research and development program to—

(1) improve and develop analytical tools to facilitate the analysis of life-cycle energy and greenhouse gas emissions, including emissions related to direct and indirect land use changes, attributable to all potential biofuel feedstocks and production processes; and

(2) promote the systematic evaluation of the impact of expanded biofuel production on the environment.

(c) SMALL-SCALE PRODUCTION AND USE OF BIOFUELS.—The Secretary, in cooperation with the Secretary of Agriculture, shall establish a research and development program to facilitate small-scale production, local, and on-farm use of biofuels, including the development of small-scale gasification technologies for production of biofuel from cellulosic feedstocks.

COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
JUNE 27, 2007

AMENDMENT ROSTER

H.R. 2773, the Biofuels Research and Development Enhancement Act

No.	Sponsor	Description	Results
1	Mr. Gordon	Manager's amendment adds consultations with additional agencies for studies in the bill.	Agreed to by voice vote.
2	Mr. Hall	Adds a new section creating a research program on blending biofuels with coal-to-liquids.	Defeated by roll call vote 20-12.
3	Mr. Hall	Adds a new section which adds provisions related to biogas.	Agreed to by voice vote
4	Mr. Matheson	Adds a new section allowing for Federal backstop for development of standards for biofuels dispensers.	Agreed to by voice vote.
5	Ms. Biggert	Amends multiple sections of the bill by requiring bioresearch centers to reapply and compete for funding again after 5 years; adding evaluation of life cycle impacts to mid-level ethanol blend study; expanding biodiesel engine durability study to include engine performance and extendng deadline for the study.	Agreed to by voice vote.
6	Mr. Bartlett with Ms. Woolsey	Amends section 12 by including food supply in the environmental research program.	Agreed to by voice vote.
7	Mr. Hill	Amends section 7 by creating an RD&D program to retrofit corn ethanol plants to accommodate the use of diverse feedstocks including cellulosic materials.	Agreed to by voice vote.
8	Mr. Bartlett	Amends section 4 by amending the study on challenges to increasing the percentage of biodiesel as a proportion of all diesel fuel - changes the percentage of biodiesel from 5% to 2.5%.	Agreed to by voice vote.
9	Mr. Lampson	Amends section 4 by allowing for compilation of materials supporting the establishment of biodisel standards.	Agreed to by voice vote.

10	Mr. Smith with Mr. Lampson	Adds a new section creating a study on algal biomass for biofuels development.	Agreed to by voice vote.
11	Mr. Smith	Amends section 6 by eliminating production threshold from the grant program for low ethanol producing states.	Defeated by roll call vote 17-11.

AMENDMENT TO H.R. 2773

OFFERED BY MR. GORDON OF TENNESSEE

Page 2, line 19, insert ''and the Assistant Administrator for Research and Development of the Environmental Protection Agency,'' after ''Transportation''.

Page 5, line 1, insert ''National Laboratories,'' after ''agencies,''.

Page 6, line 22, insert '', in consultation with the Secretary of Transportation,'' after ''Secretary''.

AMENDMENT TO H.R. 2773

OFFERED BY MR. HALL OF TEXAS

At the end of the bill, insert the following new section:

SEC. 13. BLENDED FUELS.

The Secretary shall carry out a program of research, development, and demonstration as it relates to the blending of transportation fuels derived from coal-to-liquids and the blending thereof with transportation fuels derived from renewable sources, including biomass (as defined in section 932 of the Energy Policy Act of 2005). The program shall focus on—

(1) maximizing the fungibility and supply of blended transportation fuels;

(2) the viability of the blend as a cost competitive replacement for transportation fuels;

(3) evaluation of the environmental consequences of the blend on evaporative and exhaust emissions from on-road and off-road engines;

(4) the quality of the resultant blend at varying concentrations of biofuel; and

(5) other areas the Secretary considers appropriate.

AMENDMENT TO H.R. 2773
OFFERED BY Mr. Hall

Page 1, line 18, strike "and".

Page 1, line 19, redesignate paragraph (3) as paragraph (6).

Page 1, after line 18, insert the following new paragraph:

(3) biogas collection and production technologies suitable for vehicular use;

(4) cost-effective reforming technologies that produce hydrogen fuel from biogas sources;

(5) biogas production from cellulosic and recycled organic waste sources and advancement of gaseous storage systems and advancement of gaseous storage systems; and

Page 3, after line 25, insert the following new section (and redesignate the subsequent sections accordingly):

SEC. 5. BIOGAS.

Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to Congress a re-

port on any research and development challenges inherent in increasing to 5 percent the proportion of gasoline and diesel fuel sold in the United States that is biogas or a blend of biogas and natural gas.

At the end of the bill, insert the following new section:

SEC. 13. STUDY OF OPTIMIZATION OF BIOGAS USED IN NATURAL GAS VEHICLES.

(a) IN GENERAL.—The Secretary of Energy shall conduct a study of methods of increasing the fuel efficiency of vehicles using biogas by optimizing natural gas vehicle systems that can operate on biogas, including the advancement of vehicle fuel systems and the combination of hybrid-electric and plug-in hybrid electric drive platforms with natural gas vehicle systems using biogas.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Secretary of Energy shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science and Technology of the House of Representatives a report that describes the results of the study, including any recommendations of the Secretary.

AMENDMENT TO H.R. 2773

OFFERED BY MR. MATHESON OF UTAH

At the end of the bill, insert the following new section:

SEC. 13. STANDARDS FOR BIOFUELS DISPENSERS.

In the absence of appropriate private sector standards adopted prior to the date of enactment of this Act, and consistent with the National Technology Transfer and Advancement Act of 1995, the Secretary of Energy, in consultation with the Director of the National Institute of Standards and Technology, shall develop standards for biofuel dispenser systems in order to promote broader biofuels adoption and utilization.

AMENDMENT TO H.R. 2773

OFFERED BY MRS. BIGGERT OF ILLINOIS

Page 4, line 9, insert ", which shall be established for a period of 5 years, after which the grantee may re-apply for selection on a competitive basis" after "Defense Districts".

Page 6, line 11, strike "and".

Page 6, line 15, strike the period and insert "; and".

Page 6, after line 15, insert the following new paragraph:

(4) an evaluation of the life cycle impact of the use of the ethanol blends described in subsection (a) on carbon dioxide and greenhouse gas emissions.

Page 7, line 8, insert "**AND PERFORMANCE**" after "**DURABILITY**".

Page 7, lines 12 and 13, strike "engine durability" and insert "the performance and durability of engines and engine systems".

Page 7, lines 16 through 18, amend paragraph (1) to read as follows:

(1) an assessment of whether the use of biodiesel lessens the durability and performance of conventional diesel engines and engine systems; and

Page 8, line 3, strike "1 year" and insert "24 months".

AMENDMENT TO H.R. 2773

OFFERED BY MR. BARTLETT OF MARYLAND AND MS. WOOLSEY OF CALIFORNIA

Page 10, line 2, insert "forests," after "energy,".

Page 10, line 6, insert "and the Secretary of Agriculture" after "Environmental Protection Agency".

Page 10, line 16, insert ", including forestlands, and on the food supply for humans and animals" after "on the environment".

AMENDMENT TO H.R. 2773

OFFERED BY MR. HILL OF INDIANA

Page 5, line 12, strike "subsection" and insert "subsections".

Page 5, after line 17, insert the following new subsection:

"(h) RETROFIT TECHNOLOGIES FOR THE DEVELOPMENT OF ETHANOL FROM CELLULOSIC MATERIALS.—The Secretary shall establish a program of research, development, demonstration, and commercial application on technologies and processes to enable biorefineries that exclusively use corn grain or corn starch as a feedstock to produce ethanol to be retrofitted to accept a range of biomass, including lignocellulosic feedstocks.".

AMENDMENT TO H.R. 2773

OFFERED BY MR. BARTLETT OF MARYLAND

Page 3, line 23, strike "5 percent" and insert "2.5 percent".

AMENDMENT TO H.R. 2773

OFFERED BY MR. LAMPSON OF TEXAS

Page 3, line 20, insert "(a) BIODIESEL STUDY.—" before "Not later than".

Page 3, after line 25, insert the following new subsection:

(b) MATERIALS FOR THE ESTABLISHMENT OF STANDARDS.—The Director of the National Institute of Standards and Technology shall make publicly available the physical property data and characterization of biodiesel, as is defined in subsection (a), in order to encourage the establishment of standards that will promote their utilization in the transportation and fuel delivery system.

AMENDMENT TO H.R. 2773

OFFERED BY MR. SMITH OF NEBRASKA AND MR. LAMPSON OF TEXAS

At the end of the bill, insert the following new section:

SEC. 13. ALGAL BIOMASS.

Not later than 90 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the progress of the research and development that is being conducted on the use of algae as a feedstock for the production of biofuels. The report shall identify continuing research and development challenges and any regulatory or other barriers found by the Secretary that hinder the use of this resource, as well as recommendations on how to encourage and further its development as a viable transportation fuel.

AMENDMENT TO H.R. 2773

OFFERED BY MR. SMITH OF NEBRASKA

Page 4, line 11, strike "**IN CERTAIN STATES**".

Page 4, lines 15 through 17, strike "in States with low rates of ethanol production, including low rates of production of cellulosic biomass ethanol" and insert "with the greatest potential to increase the production of cellulosic biomass ethanol".

Page 4, lines 22 and 23, strike "located in a State described in subsection (a)".

Page 5, lines 1 and 2, strike "or local government agencies located in the State" and insert "National Laboratories, or local government agencies".