110TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
110–855

HEAVY DUTY HYBRID VEHICLE RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 2008

SEPTEMBER 16, 2008.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

R E P O R T

[To accompany H.R. 6323]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 6323) to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

69–006

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 "Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2008".

SEC. 2. ADVANCED HEAVY DUTY HYBRID VEHICLE TECHNOLOGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a competitive research, development, demonstration, and commercial application program (referred to in this Act as the "program") to provide grants to applicants to carry out projects to advance research and development and to demonstrate technologies for advanced heavy duty hybrid vehicles.

(b) APPLICATIONS.—

(1) IN GENERAL.—The Secretary shall issue requirements for applying for grants under the program.

(2) SELECTION CRITERIA.—The Secretary shall establish selection criteria for awarding grants under the program. In evaluating applications, the Secretary shall—

(A) consider the ability of applicants to successfully complete both phases described in subsection (c); and

(B) give priority to applicants who are best able to—

(i) fill existing research gaps and achieve the greatest advances beyond the state of current technology; and

(ii) achieve the greatest reduction in fuel consumption and emissions.

(3) PARTNERS.—An applicant for a grant under this section may carry out a project in partnership with other entities.

(4) SCHEDULE.—

(A) APPLICATION REQUEST.—Not later than 180 days after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, and elsewhere as appropriate, a request for applications to undertake projects under the program. Applications shall be due not later than 90 days after the date of such publication.

(B) APPLICATION SELECTION.—Not later than 90 days after the date on which applications for grants under the program are due, the Secretary shall select, through a competitive process, all applicants to be awarded a grant under the program.

(5) NUMBER OF GRANTS.—The Secretary shall determine the number of grants to be awarded under the program based on the technical merits of the applications received. The number of grants awarded under the program shall not be less than 3 or more than 7, and at least half of the grants awarded shall be for plug-in hybrid technology.

(6) AWARD AMOUNTS.—The Secretary shall award not more than $3,000,000 to each recipient per year for each of the 3 years of the project.

(c) PROGRAM REQUIREMENTS; TWO PHASES.—Each grant recipient shall be required to complete two phases:

(1) PHASE ONE.—

(A) IN GENERAL.—In phase one, the recipient shall research and demonstrate advanced hybrid technology by producing or retrofitting one or more advanced heavy duty hybrid vehicles.

(B) REPORT.—Not later than 60 days after the completion of phase one, the recipient shall submit to the Secretary a report containing data and analysis of—

(i) the performance of each vehicle in carrying out the testing procedures developed by the Secretary under subparagraph (E);

(ii) the performance during such testing of each vehicle's components, including the battery, energy management system, charging system, and power controls;

(iii) the projected cost of each vehicle, including acquisition, operating, and maintenance costs; and

(iv) the emissions levels of each vehicle, including greenhouse gas levels.

(C) TERMINATION.—The Secretary may terminate the grant program with respect to the project of a recipient at the conclusion of phase one if the Secretary determines that the recipient cannot successfully complete the requirements of phase two.

(D) TIMING.—Phase one begins upon receipt of a grant under the program and has a duration of one year.

(E) TESTING PROCEDURES.—The Secretary shall develop standard testing procedures to be used by recipients in testing each vehicle. Such procedures shall include testing a vehicle's performance under typical operating conditions.

(2) PHASE TWO.—

(A) IN GENERAL.—In phase two, the recipient shall demonstrate advanced manufacturing processes and technologies by producing or retrofitting 50 advanced heavy duty hybrid vehicles.

(B) REPORT.—Not later than 60 days after the completion of phase two, the recipient shall submit to the Secretary a report containing—

(i) an analysis of the technological challenges encountered by the recipient in the development of the vehicles;

(ii) an analysis of the technological challenges involved in mass producing the vehicles; and

(iii) the manufacturing cost of each vehicle, the estimated sale price of each vehicle, and the cost of a comparable non-hybrid vehicle.

(C) TIMING.—Phase two begins at the conclusion of phase one and has a duration of two years.

(d) RESEARCH ON VEHICLE USAGE AND ALTERNATIVE DRIVE TRAINS.—The Secretary shall conduct research into alternative power train designs for use in advanced heavy duty hybrid vehicles. Such research shall compare the estimated cost, including operating and maintenance costs, emissions reductions, and fuel savings of each design with similar non-hybrid power train designs under the conditions in which these vehicles are typically used, including, for each vehicle type—

(1) number of miles driven;

(2) time spent with the engine at idle;

(3) horsepower requirements;

(4) length of time the maximum or near maximum power output of the vehicle is needed; and

(5) any other factors that the Secretary considers appropriate.

(e) REPORT TO THE CONGRESS.—Not later than 60 days after the Secretary receives the reports from grant recipients under subsection (c)(2)(B), the Secretary shall submit to the Congress a report containing—

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of all applicants who submitted applications for the program;

(3) all data contained in reports submitted by grant recipients under subsection (c);

(4) a description of the vehicles produced or retrofitted by recipients in phase one and phase two of the project, including an analysis of the fuel efficiency of such vehicles; and

(5) the results of the research carried out under subsections (d) and (h).

(f) COORDINATION AND NONDUPLICATION.—To the maximum extent practicable, the Secretary shall coordinate, and not duplicate, activities under this Act with other programs and laboratories of the Department of Energy and other Federal research programs.

(g) COST SHARING.—Section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352) shall apply to the program established pursuant to this section.

(h) ELECTRICAL GRID RESEARCH PILOT PROGRAM.—The Secretary shall establish a pilot program through the National Laboratories and Technology Centers of the Department of Energy to research and test the effects on the domestic electric power grid of the widespread use of plug-in hybrid vehicles, including plug-in hybrid vehicles that are advanced heavy duty hybrid vehicles.

(i) DEFINITIONS.—For purposes of this section:

(1) ADVANCED HEAVY DUTY HYBRID VEHICLE.—The term "advanced heavy duty hybrid vehicle" means a vehicle with a gross weight between 14,000 pounds and 33,000 pounds that is fueled, in part, by a rechargeable energy storage system.

(2) GREENHOUSE GAS.—The term "greenhouse gas" means—

(A) carbon dioxide;

(B) methane;

(C) nitrous oxide;

(D) hydrofluorocarbons;

(E) perfluorocarbons; or
(F) sulfur hexafluoride.

(3) PLUG-IN HYBRID.—The term "plug-in hybrid" means a vehicle fueled, in part, by electrical power that can be recharged by connecting the vehicle to an electric power source.

(4) RETROFIT.—The term "retrofit" means the process of creating an advanced heavy duty hybrid vehicle by converting an existing, fuel-powered vehicle.

(5) SECRETARY.—The term "Secretary" means the Secretary of Energy.

(j) AUTHORIZATION OF APPROPRIATIONS.—

(1) There are authorized to be appropriated to the Secretary $16,000,000 for each of fiscal years 2009 through 2011 to carry out this section.

(2) Of the funds authorized under paragraph (1), not more than $1,000,000 per fiscal year may be used for—

(A) carrying out the studies required under subsection (d);
(B) carrying out the pilot program required under subsection (h); and
(C) the administration of the program.

SEC. 3. EXPANDING RESEARCH IN HYBRID TECHNOLOGY FOR LARGE VEHICLES.

Subsection (g)(1) of the United States Energy Storage Competitiveness Act of 2007 (enacted as section 641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(g)(1))) is amended by inserting "vehicles with a gross weight over 16,000 pounds," before "stationary applications".

II. PURPOSE OF THE BILL

The purpose of H.R. 6323, the "Heavy Hybrid Truck Research, Development, and Demonstration Act of 2008," is to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty hybrid vehicles, and for other purposes.

III. BACKGROUND AND NEED FOR LEGISLATION

Because large, heavy duty trucks rely on a diesel or gasoline internal combustion engine for power, they typically have relatively low fuel economy and high emissions. This is especially evident in trucks with duty-cycles that require frequent starts and stops or long periods of engine idling to power auxiliary systems such as bucket lifters, trash compactors, off-board power tools, air conditioning, refrigeration, or other work-related equipment. Switching a portion of the driving and auxiliary power loads away from the internal combustion engine to an alternate power source would enable these vehicles to realize considerable fuel savings and emissions reductions compared to conventional models. The Environmental Protection Agency (EPA) estimates that an average delivery truck using a hybrid drive system could save approximately 1,000 gallons of diesel per year compared to one with a conventional drive system.

High fuel prices and tightening emissions standards provide an added impetus for the development of new heavy duty hybrid truck systems. Several manufacturers have technologies in various stages of development for a range of large commercial vehicle platforms such as package delivery vans, buses, refuse collection trucks, large utility "bucket" trucks, construction vehicles, and short- and long-haul tractor trailer trucks. Research supported by the Department of Defense (DOD) has also been a key driver of innovation for heavy hybrids since these technologies can provide several strategic advantages including substantial noise reduction, a source of alternative power for radar and weapons systems, reduction of overall weight and maintenance requirements, and longer ranges between vehicle refueling. Despite substantial investment in both the de-

fense and commercial sectors, the cost of research and development and the final price of heavy duty hybrid vehicles remain prohibitively high, even for military applications. Consequently, there remain significant technical obstacles to development and final commercial application of these technologies that federally-sponsored R&D activities can help to overcome.

Managing a comprehensive federal R&D program is complicated by the fact that there is no one-size-fits-all hybrid solution for the entire heavy duty vehicle sector. The power demands of heavy duty trucks are as varied as the applications, and deploying hybrid models into heavy truck fleets is more complicated than simply scaling up the hybrid systems used for passenger vehicles. For example, through the course of an average drive cycle the charging and discharging of a hybrid system on a refuse truck with its frequent starts and stops, dumpster lifting, and trash compaction will be considerably different than that of a utility truck, which may idle in one place for several hours to operate a boom or other equipment. Furthermore, developing hybrid systems for long-haul tractor trailer rigs (Class VIII) presents an even greater challenge since these vehicles seldom brake during a drive cycle, providing few opportunities for battery systems to recharge through regenerative braking. The energy storage devices and related control systems may be altogether different for each of these platforms. Future generations of heavy trucks may also include plug-in hybrid electric models that can store more electric energy in larger banks of batteries and charge these batteries through direct connection to the electricity grid either while in operation on a jobsite or in a parking lot or garage.

The majority of federal funding for hybrid vehicle R&D has focused on passenger vehicles which far outnumber heavy trucks. However, the federal R&D portfolio should address the significant potential for fuel savings and emissions reductions through improvements in the heavy duty vehicle sector, and take advantage of the ability of this sector to deploy new technologies quickly. For example, according to the Oshkosh Truck Corporation, there are approximately 90,000 refuse trucks in the United States. Their collective fuel consumption is equivalent to 2.5 million passenger vehicles (based on 10,000 gallons/year per truck). Eaton Corporation estimates that as few as 10,000 hybrid electric trucks could reduce diesel fuel usage by 7.2 million gallons per year (approx. 1 million barrels of oil), reduce annual NO_X emissions by the amount equivalent to removing New York City's passenger cars for 25 days, and reduce carbon dioxide emissions by 83,000 tons.

Energy storage technology options for hybrid trucks generally include batteries, hybrid hydraulic systems, and ultra-capacitors. Batteries receive the most attention and research funding because of their applicability throughout the transportation sector. To expand the use of electricity in the vehicles sector, batteries must be smaller, lighter, cheaper, and more powerful. Vehicle batteries typically fall into one of three families of technologies: lead-acid, nickel metal hydride (NiMH), and lithium-ion (Li-ion). Lead-acid batteries have many advantages including their relative simplicity and low cost, wide-scale availability, domestic manufacturing capacity, and established recycling infrastructure. NiMH batteries are found in the current generation of hybrid vehicles and will be the battery of

choice for many of the first generation heavy hybrid trucks. However, high weight and low power density are significant issues for both lead-acid and NiMH batteries. Many in the industry believe the future of hybrids depends on breakthroughs in new battery technologies, such as the lithium-ion (Li-ion) batteries with their comparatively low weight and high power density. In addition to resolving remaining serious technical issues such as heat management, the cost of manufacturing Li-ion batteries remains prohibitively high for large-scale deployment in vehicles. There is also concern that the U.S. is falling behind countries like Japan, China and France in the race to develop and mass produce batteries for hybrid vehicles. Consequently, a significant effort is underway to build up a domestic supply chain.

Plug-in hybrid applications that include an energy storage system charged by an external power source are a particularly attractive option for certain platforms of heavy duty vehicles. Furthermore, heavy trucks fleets provide a valuable test-bed for demonstrating technologies that may ultimately end up in the passenger vehicle market. Plug-in Hybrid Vehicles (PHEV) is a critical near-to-mid term technology option for drastically reducing the nation's dependence on foreign oil. PHEV's, unlike traditional hybrid application, shift most of the vehicle's energy source from petroleum to domestically-produced power from the electricity grid while still providing sufficient power to handle heavy duty applications. Some studies suggest that PHEV's may have the added benefit of reducing transportation-related carbon emissions, even if the electricity is generated solely from coal. Much research remains in developing the technology to reduce the weight and cost of the systems while improving reliability.

The Department of Energy (DOE) has funded limited research on the hybridization of trucks, most recently through the 21st Century Truck Partnership which conducts research and development through joint public and private efforts. Other federal agencies involved in the 21st Century Truck Partnership include the Department of Defense, the Department of Transportation, and EPA. Because of the highly fragmented nature of the heavy duty vehicle manufacturing industry, there is limited in-house research and testing capabilities for even the largest of firms. The industry often relies on research efforts of unique Federal facilities such as DOE's National Renewable Energy Laboratory and Argonne National Laboratory, the EPA's National Vehicle and Fuel Emissions Laboratory, and the Army's National Automotive Center. Despite the potential economic and environmental benefits of hybrid trucks and the considerable technical hurdles that remain, the 21st Century Truck Partnership is facing decreased funding and an uncertain future as the administration chooses to focus federal research on the passenger vehicle market. DOE does not currently offer any competitive grants that target the development of technologies applicable for use in hybrid trucks.

IV. Hearing Summary

The Subcommittee on Energy and Environment held a hearing entitled, "Hybrid Technologies for Medium-to-Heavy Duty Commercial Vehicles," on Tuesday, June 10, 2008 to receive testimony from the following witnesses:

- Mr. Terry Penney, Technology Manager, Advanced Vehicle and Fuel Technologies, National Renewable Energy Laboratory
- Mr. Eric M. Smith, Chief Engineer, Hybrid Medium Duty Truck, Eaton Corporation
- Mr. Joseph Dalum, Vice President, Dueco Inc.
- Ms. Jill Egbert, Manager, Clean Air Transportation, Pacific Gas & Electric Company (PG&E)
- Mr. Richard Parish, Senior Program Manager, Calstart—Hybrid Truck Users Forum (HTUF)

The hearing focused on a discussion draft of a bill to authorize a research, development and demonstration program on heavy duty hybrid vehicles authored by Rep. James Sensenbrenner.

The witnesses all indicated a need for ongoing federal R&D on hybrid technology applications in heavy duty vehicles. They all pointed to the substantial benefits of broader incorporation of hybrid technologies in this sector to address more stringent emission requirements, higher fuel costs, and as a mechanism to reduce carbon emissions in the transportation sector. They all pointed out the wide variety of medium and heavy duty vehicles and the challenges presented by these vehicles in comparison to the light-duty vehicles.

Mr. Penney noted that although the benefits of integrating hybrid technologies into heavy duty vehicles are considerable, there are significant barriers to the broader adoption of these technologies by this sector. Additional information about the reliability of hybrid systems and the performance of other vehicle components are needed to assure manufacturers of heavy duty vehicles and their customers that these technologies will offer savings in fuel economy to offset any increases in the cost premiums associated with hybrid vehicles. The cost of production for energy storage systems, drive trains and power electronics all need to be reduced to facilitate broader production of hybrid vehicles.

Mr. Smith testified about the work being done by his company, the Eaton Corporation, on hybrid technologies for application in commercial vehicles. Mr. Smith discussed the significant fuel savings and emission reduction that can be realized by hybrid electric power systems. He stated that hybrid power applications are well suited to heavy duty vehicles particularly in those of Classes V through VIII. Mr. Smith testified that the broader application of hybrid technologies is dependent upon the development and commercialization of lithium ion batteries. Mr. Smith urged the Committee to consider research and development support for electric hybrid, hydraulic hybrid, and plug-in hybrid systems for commercial vehicles.

Mr. Dalum testified that rising fuel prices, tighter emission requirements, the national priority to reduce dependence on foreign oil, increased maintenance costs, and the increased interest in lowering carbon emissions are all factors leading to increased interest in applications of hybrid technologies for medium-duty and heavy duty vehicles. Mr. Dalum discussed the benefits of utilizing electric grid power to charge batteries that are then used to power equipment on stationary utility vehicles. Mr. Dalum expressed his belief that additional R&D on hybrid systems would lead to further improvements in fuel savings. Mr. Dalum indicated several areas in need of further R&D including improved battery systems and

powertrain architectures, expanded design and performance evaluation of a broader range of specific applications for medium and heavy duty trucks. Mr. Dalum also indicated there were outstanding questions about the ability of the current electric grid to provide sufficient capacity for recharge of fleets of heavy duty vehicles. Mr. Dalum also urged support for additional research on plug-in hybrid applications for medium and heavy duty vehicles.

Ms. Egbert discussed the experience of Pacific Gas and Electric Company (PG&E) of incorporating medium and heavy duty hybrid and plug-in hybrid vehicles into their fleet. The applications most common in their fleets are for bucket trucks and trouble trucks, the vehicles used by first response teams to restore power outages. Ms. Egbert indicated that PG&E has seen substantial fuel savings as a result of incorporating hybrid vehicles into their fleet. Ms. Egbert identified the significant additional cost for purchase of hybrid vehicles as a major barrier to their broader adoption. Ms. Egbert recommended the acceleration of research, development and deployment of these vehicles to realize the substantial benefits in fuel economy and emission reductions. Ms. Egbert also urged Congress to consider providing additional financial incentives to spur the market for hybrid vehicles.

Mr. Parish discussed the activities of Calstart and the Hybrid Truck Users Forum and their cooperative efforts with the Department of Energy and the U.S. Army National Automotive Center to encourage demonstration of medium and heavy duty hybrid vehicles in commercial fleets. Mr. Parish indicated a need for the development of electrically-driven components required to enable medium and heavy duty trucks to implement engine off at idle capability as is seen in light duty passenger vehicles. Mr. Parish indicated that medium and heavy duty vehicles present additional challenges in design, development and deployment of hybrid technologies due to their weight, the diversity of classes and uses, and the requirement for durability of these vehicles. Mr. Parish expressed support for continuing the R&D efforts that have been supported by the National Renewable Energy Laboratory as well as support for ongoing R&D on heavy duty vehicles. Mr. Parish also indicated a need for purchase incentives to offset the higher upfront costs of medium and heavy duty hybrids.

V. Committee Actions

The Subcommittee on Energy and Environment met to consider a Chairman's Mark of the "Heavy Hybrid Truck Research and Development Act of 2008", a bill authored by Representative F. James Sensenbrenner on June 17, 2008 and to consider the following:

An amendment offered by Ms. Biggert to add a provision to authorize research on alternative power trains for use in heavy duty hybrid vehicles and a study to compare the cost and fuel savings of each hybrid vehicle design receiving a grant under this program with that of a conventional non-hybrid vehicle. The amendment was agreed to by voice vote.

Mr. Baird moved that the Subcommittee favorably report the Chairman's Mark as amended to the Full Committee on Science and Technology. The motion was agreed to by a voice vote.

The Chairman's Mark as reported by the Subcommittee was introduced on June 19, 2008 as H.R. 6323, the "Heavy Hybrid Truck Research and Development Act of 2008."

On July 16, 2008, the House Committee on Science and Technology met to consider H.R. 6323 as reported from the Subcommittee on Energy and Environment and the following:

An amendment-in-the-nature-of-a-substitute offered by Mr. Hall on behalf of Mr. Sensenbrenner to change the number of grantees and broaden the focus of the bill. The amendment was agreed to by voice vote.

An amendment to the amendment-in-the-nature-of-a-substitute offered by Mr. Reichert to establish a pilot program at the Department of Energy to test the impact of plug-in hybrid electric vehicles on the electric power grid. The amendment was agreed to by voice vote.

Mr. Hall offered a motion that the Committee favorably report the bill, H.R. 6323, as amended, to the House of Representatives. The motion was agreed to by voice vote. The bill was ordered to be reported favorably to the House of Representatives.

VI. Summary of Major Provisions of the Bill

H.R. 6323 directs the Secretary of DOE (Secretary) to establish a grant program for the development of advanced heavy duty hybrid vehicles. The bill gives the Secretary the discretion to award between three and seven grants based on the technical merits of the proposals received. At least half of the awarded grants must be for the development of plug-in hybrid trucks.

Grants are awarded to applicants for two phases of research and development. In phase one, recipients must build at least one advanced heavy duty hybrid vehicle, conduct studies of the vehicle, and report to DOE on the performance, cost, and emissions levels of the vehicle. In phase two, recipients must produce 50 advanced heavy duty hybrid vehicles and report to DOE on the technological challenges and estimated costs involved in wide-scale manufacture.

H.R. 6323 also directs the Secretary to conduct a study of alternative power train designs for use in advanced heavy duty hybrid vehicles. The study includes analysis of different designs under conditions of typical use. The bill also directs the Secretary to establish a pilot program through the National Laboratories to research and test the effects on the domestic electric power grid of widespread use of plug-in hybrid vehicles.

Grant applicants may include partnerships between manufacturers, electrical utilities, or other entities to fulfill the program's requirements. Awards under H.R. 6323 will be for up to $3 million per year for three years. Appropriations are authorized for $16 million per year for fiscal years 2009 through 2011. H.R. 6323 also amends the Energy Storage Competitiveness Act of 2007 (enacted as section 641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(g)(1)) to include heavy trucks in the Secretary's priorities for applied energy storage research.

VII. SECTION-BY-SECTION ANALYSIS OF THE BILL (BY SECTION)

Section 1. Short title

H.R. 6323 can be cited as the "Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2008."

Section 2. Advanced Heavy Duty Hybrid Vehicle Technology Research, Development, Demonstration, and Commercial Application Program

Section 2(a) directs the Secretary to establish a program to provide grants to carry out projects to advance research and demonstrate technologies for advanced heavy duty hybrid vehicles.

Section 2(b) requires the Secretary to issue application requirements and to establish criteria for making grant awards. The Secretary must give priority to applicants who are best able to advance the current state of technology and achieve the greatest reductions in fuel consumption and emissions. To be eligible, recipients must produce trucks with a gross weight between 14,000 and 33,000 pounds (e.g. Class IV through Class VII vehicles). The Secretary is given discretion to award between three and seven grants based on the technical merits of the applications received. At least half of the grants are to be awarded for plug-in hybrid technology. Applicants can partner with other entities to fulfill the obligations of the program.

Section 2(c) defines two phases of research by award recipients. In phase one, each recipient has one year to build or retrofit one or more advanced heavy duty hybrid vehicles. Recipients are required to collect and analyze data on the performance of key vehicle components; the estimated costs of producing, operating, and maintaining the vehicle; the emissions of the vehicle; and on overall vehicle performance according to guidelines established by the Secretary.

If, at the conclusion of phase one, it is clear that a grant recipient will be unable to complete the requirements of phase two, the Secretary has the discretion to waive the requirement for phase two research and terminate the grant to that recipient.

In phase two, recipients are required to demonstrate the advanced manufacturing processes of heavy duty plug-in vehicles by producing or retrofitting 50 advanced heavy duty hybrid vehicles within two years. Recipients must also report on the major technological obstacles they encounter in developing and producing the vehicles and on the projected costs of each vehicle.

Award recipients are eligible to receive three million dollars per year for three years to complete both phases of the development program.

Section 2(d) directs the Secretary to conduct a study of alternative power train designs for use in advanced heavy duty hybrid vehicles. The study would analyze these different designs under conditions which they are typically used, including the average number of miles driven, the time spent with the engine at idle, horsepower requirements, the length of time the maximum power is required, and other factors the Secretary determines to be appropriate.

Section 2(e) requires the Secretary to report to Congress within 60 days on the findings of the reports submitted by grant recipients.

Section 2(f) and 2(g) require the Secretary to coordinate the research conducted under this program with other research conducted by the Department. The cost sharing provisions of section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352) apply to the program.

Section 2(h) directs the Secretary to establish a pilot program through DOE's National Laboratories to research and test the effects on the domestic electric power grid of the widespread use of plug-in hybrid vehicles, including heavy duty plug-in hybrid trucks.

Section 2(i) defines the terms: advanced heavy duty hybrid vehicle, greenhouse gas, plug-in hybrid, retrofit, and Secretary for the purposes of this section.

Section 2(j) authorizes appropriations of $16 million per year for fiscal years 2009 through 2011.

Section 3. Expanding research in hybrid technology for large vehicles

This section amends the United States Energy Storage Competitiveness Act of 2007 (enacted as section § 641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. § 17231(g)(1)) to include vehicles with a gross weight over 8501 pounds in the Secretary's priorities for advanced energy storage.

VIII. COMMITTEE VIEWS

The hybridization of heavy duty trucks is an important goal that has been largely overlooked by the Federal government. While numerous federal grants are available for the production of hybrid and plug-in hybrid passenger vehicles, there are no grants available that specifically target the development of heavy duty hybrid vehicles. This is an unfortunate oversight. The Committee believes federal investment in this research will result in improvements in the fuel efficiency and emission profiles of heavy duty vehicles and is likely to provide significant economic benefits as well as benefits in energy efficiency and air quality.

The Committee encourages the Secretary to award the maximum number of grants if sufficient meritorious applications are received. The Committee believes that research applicable to heavy duty vehicles that make frequent stops such as delivery trucks, buses, and refuse collection vehicles and vehicles that idle on job sites for extensive periods to operate auxiliary functions such as utility "bucket" trucks should receive the highest priority for funding under this program. The Committee does not intend this research and development program to provide support for research and development on large, Class IV, passenger trucks. The definition of Advanced Heavy Duty Hybrid Vehicle included in the legislation specifically excludes Class VIII heavy duty vehicles (e.g. long-haul tractor trailer trucks). The Committee believes the significantly different technical requirements of those platforms likely merit funding under separate programs.

The Committee believes it is important to provide funding to applicants best able to provide the greatest potential advancement over current technologies and for research that is most likely to

lead to reduced fuel consumption and reduced emissions. In many cases, this will mean awarding applicants who propose hybrid designs that rely on multiple sources of energy for propulsion, and integration of propulsion and auxiliary power systems as this approach entails a greater technical challenge.

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. 6323 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. H.R. 6323 does authorize additional discretionary spending of $41 million over the 2009–2013 period, with additional spending occurring in later years, 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

H.R. 6323—Heavy-Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2008

Summary: H.R. 6323 would direct the Secretary of Energy to establish a program to promote research and development of technologies to improve the efficiency and reduce emissions of certain types of vehicles. The bill would authorize the appropriation of $16 million in each of fiscal years 2009 through 2011, primarily for grants to support efforts to develop advanced heavy-duty hybrid vehicles. Those funds also would support a program to study how widespread use of plug-in hybrid vehicles would affect the domestic electric power grid.

Based on information from the Department of Energy (DOE) and assuming appropriation of the authorized amounts, CBO estimates that implementing H.R. 6323 would cost $41 million over the 2009–2013 period, with additional spending occurring in later years. Enacting the bill would not affect direct spending or revenues.

H.R. 6323 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would not affect the budgets of state, local, or tribal governments.

Estimated cost to the Federal Government: For this estimate, CBO assumes that the authorized amounts will be provided near the start of each fiscal year and that outlays will follow historical spending patterns for existing research and demonstration programs administered by DOE. The estimated budgetary impact of H.R. 6323 is shown in the following table. The costs of this legislation fall within budget function 270 (energy).

	By fiscal year in millions of dollars—					
	2009	2010	2011	2012	2013	2009–2013
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
Authorization Level	16	16	16	0	0	48

	By fiscal year in millions of dollars—					
	2009	2010	2011	2012	2013	2009–2013
Estimated Outlays	3	11	13	9	5	41

Intergovernmental and private-sector impact: H.R. 6323 contains no intergovernmental or private-sector mandates as defined in UMRA and would not affect the budgets of state, local, or tribal governments.

Estimate prepared by: Federal Costs: Megan Carroll; Impact on State, Local, and Tribal Governments: Leo Lex and Neil Hood; Impact on the Private Sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

XI. Compliance With Public Law 104–4

H.R. 6323 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. 6323 is to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 6323.

XV. Federal Advisory Committee Statement

H.R. 6323 does not establish or authorize a new advisory committee.

XVI. Congressional Accountability Act

The Committee finds that H.R. 6323 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. 6323 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 (new matter is printed in italic and existing law in which no change is proposed is shown in roman):

UNITED STATES ENERGY STORAGE COMPETITIVENESS ACT OF 2007

SEC. 641. ENERGY STORAGE COMPETITIVENESS.

(a) SHORT TITLE.—This section may be cited as the "United States Energy Storage Competitiveness Act of 2007".

* * * * * * *

(g) APPLIED RESEARCH PROGRAM.—

(1) IN GENERAL.—The Secretary shall conduct an applied research program on energy storage systems to support electric drive vehicles, *vehicles with a gross weight over 16,000 pounds,* stationary applications, and electricity transmission and distribution technologies, including—

(A) * * *

* * * * * * *

XX. COMMITTEE RECOMMENDATIONS

On July 17, 2008, the Committee on Science and Technology favorably reported the bill, H.R. 6323, "Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2008" by a voice vote, and recommended its passage by the House of Representatives.

XXI. PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 6323, TO ESTABLISH A RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM TO PROMOTE RESEARCH OF APPROPRIATE TECHNOLOGIES FOR HEAVY DUTY PLUG-IN HYBRID VEHICLES, AND FOR OTHER PURPOSES

WEDNESDAY, JUNE 18, 2008

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

The Subcommittee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Nick Lampson [Chairman of the Subcommittee] presiding.

Chairman LAMPSON. Good morning. This 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. 4174, *Federal Ocean Acidification Research and Monitoring Act of 2007,* H.R. 5618, *National Sea Grant College Program Amendments Act of 2008,* and a bill to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles and for other purposes.

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

Today the Subcommittee will consider three good bills.

The first is H.R. 4174, the *Federal Ocean Acidification Research and Monitoring Act.* This bill establishes an interagency ocean acidification research and monitoring program. H.R. 4174 was introduced by our colleague from Maine, Congressman Tom Allen, and is sponsored by a Member of this Subcommittee, Mr. Baird.

On June 5th we heard from a panel of experts on ocean and atmospheric sciences testify in strong support of this legislation. The bill authorizes the formation of an interagency research and monitoring program to better understand ocean acidification and its potential impacts on marine organisms and marine ecosystems.

The second bill we will is consider is H.R. 5618, the *National Sea Grant College Program Amendments Act.* H.R. 5618 was introduced by Congresswoman Bordallo, Chair of the Committee on Natural Resources, Subcommittee on Fisheries, Wildlife, and Oceans. This bill reauthorizes and amends the *National Sea Grant College Program Act* to implement changes in the program recommended by the National Academies of Science.

The National Sea Grant College Program was last reauthorized in 2002. It is a partnership between states and the Federal Government to promote understanding, conservation, and management of our ocean, coastal, and Great Lakes resources. Sea Grants research, education, and extension programs have been very effective in training future scientists and resource managers, generating information to support sound resource management, and delivering applied research results to the people who rely on our coastal areas and Great Lakes for their livelihoods.

Finally, the Subcommittee will consider draft legislation authored by Mr. Sensenbrenner, Ranking Member of the Investigations and Oversight Subcommittee, to enhance the Department of Energy's research program in heavy duty hybrid trucks.

Mr. Sensenbrenner does not sit on this subcommittee, and thus will not be joining us today. I understand that the manager's amendment has only one small technical change that needs to be made prior to introduction. This bill addresses a narrow segment of the automobile market with a tremendous potential impact. We heard in a Subcommittee hearing last week from witnesses who described the substantial oil savings and emissions reductions to be had in medium-to-heavy hybrid trucks, as well as the benefit to the whole domestic automotive sector from the invaluable lessons learned in designing and manufacturing these systems.

I believe this is a very important piece of legislation in the large and complex puzzle that is our transportation sector, and I look forward to moving this bill through Committee and on to the Floor for consideration by the House.

I urge the support of all Members of the Subcommittee for the three bills we will consider today. I look forward to working with all of you to further improve these important bills as we move to their consideration by the Full Committee.

[The prepared statement of Chairman Lampson follows:]

PREPARED STATEMENT OF CHAIRMAN NICK LAMPSON

Good morning. Today the Subcommittee will consider three bills. The first is H.R. 4174, the *Federal Ocean Acidification Research and Monitoring Act.*

This bill establishes an interagency ocean acidification research and monitoring program. H.R. 4174 was introduced by our colleague from Maine, Congressman Tom Allen, and is sponsored by a Member of this subcommittee, Mr. Baird.

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Mr. Sensenbrenner does not sit on this subcommittee, and thus will not be joining us today. I understand that the manager's amendment has only one small technical change that needs to be made prior to introduction, and that we will take up any additional amendments in a Full Committee markup.

This bill addresses a narrow segment of the automobile market with a tremendous potential impact. We heard in a Subcommittee hearing last week from witnesses who described the substantial oil savings and emissions reductions to be had in medium-to-heavy hybrid trucks, as well as the benefit to the whole domestic automotive sector from the invaluable lessons learned in designing and manufacturing these systems.

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I urge the support of all Members of the Subcommittee for the three bills we will consider today. I look forward to working with all of you to further improve these important bills as we move to their consideration by the Full Committee.

Chairman LAMPSON. I now recognize Mr. Inglis to present his opening remarks.

Mr. INGLIS. Thank you, Mr. Chairman, and thank you for holding this markup. Today we will consider three bills before this Subcommittee. H.R. 4174, the *Federal Ocean Acidification Research and Monitoring Act* would organize and coordinate federal agency efforts to address ocean acidification into a comprehensive research, monitoring, and assessment program. Two weeks ago, this subcommittee held a hearing in which we received several recommended changes from the expert panel of witnesses. Representative Baird and I will introduce an amendment that acts upon these recommendations. As we move forward to Full Committee, I hope that we can further improve the international components of this bill and encourage our scientists to work with their colleagues overseas.

Secondly, we will consider H.R. 5618, the *National Sea Grant College Program Amendments Act.* Since its inception in 1966, the National Sea Grant Program has been a successful collaborative effort of the Federal Government, State governments, and universities. Under the program, these groups work together to understand, develop, and conserve our coastal and ocean resources. As we mark up H.R. 5618, our goal should be a reauthorization that equips the Sea Grant Program to continue providing sound science and management products that benefit our coastal regions and conserve our coastal resources.

Finally, we will consider draft legislation introduced by Mr. Sensenbrenner that would steer federal dollars toward research, development, and demonstration in the area of commercial truck hybrid technologies.

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

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Thank you for holding this markup, Mr. Chairman.

Today we'll consider three bills before this subcommittee. H.R. 4174, the *Federal Ocean Acidification Research and Monitoring Act,* would organize and coordinate federal agency efforts to address ocean acidification into a comprehensive research, monitoring and assessment program. Two weeks ago, this subcommittee held a hearing in which we received several recommended changes from the expert panel

of witnesses. Rep. Baird and I will introduce an amendment that acts upon these recommendations. As we move forward to Full Committee, I hope that we can further improve the international components of this bill and encourage our scientists to work with their colleagues overseas.

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Finally, we will consider draft legislation introduced by Mr. Sensenbrenner that would steer federal dollars toward research, development, and demonstration in the area of commercial truck hybrid technologies.

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 additional opening statements in the record at this point.

We will now consider a Chairman's mark of a bill to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles and for other purposes. This mark is the good work of Congressman Jim Sensenbrenner, and I will just again express my support for the gentleman's bill.

I now recognize Mr. Inglis to present any remarks on the bill.

Mr. INGLIS. Mr. Chairman, I have no further remarks. I look forward to moving it to consideration.

Chairman LAMPSON. Does anyone wish to be recognized?

Mr. BARTLETT. Mr. Chairman?

Chairman LAMPSON. Mr. Bartlett, you are recognized.

Mr. BARTLETT. Thank you very much. This bill recognizes a very serious problem, that is, the fact that trucks deliver most of everything that we have, and in the final delivery, the trucks are stopping and starting; and this is the least efficient, most polluting way to use a reciprocating engine. And so recognizing that the Air Force for several years now has been sponsoring the development of a hybrid truck for fueling their aircraft. My concern is that this bill is too narrowly drawn. The primary challenge in this development is not the plug-in feature. You can buy a Prius automobile and take it to a shop and they will make it a plug-in for you overnight. The primary challenge here is the drive train integrating the electric motor in the drive train and the battery pack. And I would be most favorable to the bill if it could be broadened to recognize the primary challenge, which is not the very simple plug-in feature, but the development of the drive train, the integration of the electric motor into the drive train, and the development of the batteries. These are huge trucks. Batteries will not carry them very far. The plug-in will not add a lot of versatility to it. The primary versatility is the fact that when you stop, your engine stops and you are no longer polluting and using fuel.

So I would hope that before this gets to Full Committee that the bill could be broadened to investigate the really challenging features in this development. Thank you very much.

Chairman LAMPSON. Thank you, Mr. Bartlett. Does anyone else wish to be recognized? I ask unanimous consent that the mark is

considered as read and open to amendment at any point and that Members proceed with amendments in order of the roster. Without objection, so ordered.

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

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

Chairman LAMPSON. The Clerk will report the amendment.

The CLERK. Amendment to the Chairman's mark offered by Mrs. Biggert of Illinois.

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. BIGGERT. Thank you, Mr. Chairman. This is a simple, straightforward amendment that is intended to resolve a potential jurisdictional conflict. Section 1(d) of the bill is rewritten to clarify that the department shall conduct research on vehicle usage and alternative drive trains which may help Mr. Bartlett in doing some more research on this and how those alternative drive trains perform in comparison to their conventional counterparts.

And just to be clear, this language as well as the language of the rest of the bill is still open to critique and modification based on feedback from interested parties as we continue through this legislative process. But this really is a clarification that the jurisdiction will stay within this committee.

So with that, I will yield back the balance of my time.

Chairman LAMPSON. Thank you, Ms. Biggert. Is there further discussion on the amendment? No further discussion on the amendment. If no, the vote occurs on the amendment. All in favor say aye, opposed say no. The ayes have it, and the amendment is agreed to.

Are there any amendments? The hearing on the vote is on the Chairman's mark to establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles and for other purposes as amended. All those in favor will say aye, those opposed say no. In the opinion of the Chair, the ayes have it.

I recognize Mr. Baird to offer a motion.

Mr. BAIRD. Mr. Chair, I would move that the Subcommittee favorably report the mark as amended to the Full Committee. Furthermore, I move that staff be instructed to prepare the Subcommittee legislative report and make necessary technical and conforming changes to the bill in accordance with the recommendations of the Subcommittee.

Chairman LAMPSON. The question is on the motion to report the mark favorably. Those in favor of the motion will signify by saying aye, those opposed no. The ayes have it. The mark is favorably reported. Without objection, the motion to reconsider is laid upon the table. Subcommittee Members may submit additional or Minority views on the measure.

And I want to thank Members for their attendance. This concludes our Subcommittee markup. We are adjourned.

[Whereupon, at 10:27 a.m., the Subcommittee was adjourned.]

Appendix:

H.R. 6323, AMENDMENT ROSTER

.....

(Original Signature of Member)

110TH CONGRESS
2D SESSION

H. R. _____

To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

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

---

A BILL

To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, 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. HEAVY DUTY PLUG-IN HYBRID VEHICLE TECHNOLOGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a competitive research, development, demonstration, and commercial application program (referred to in this Act as the ''development program'') to provide 5 grants to applicants to carry out projects to advance research and development and to demonstrate advanced technologies for heavy duty plug-in hybrid vehicles and for the production of such vehicles.

(b) APPLICATIONS.—

(1) IN GENERAL.—The Secretary shall issue requirements for applying for grants under the development program.

(2) SELECTION CRITERIA.—The Secretary shall establish selection criteria for awarding grants under the development program. In evaluating applications, the Secretary shall—

(A) consider the ability of applicants to successfully complete both phases described in subsection (c)(1); and

(B) give priority to applicants who are best able to—

(i) fill existing research gaps and advance current technology; and

(ii) achieve the greatest reduction in fuel consumption in delivery vehicles and utility vehicles.

(3) PARTNERS.—An applicant for a grant under this section may carry out a project in partnership with other entities.

(4) SCHEDULE.—

(A) APPLICATION REQUEST.—Not later than 180 days after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, and elsewhere as appropriate, a request for applications to undertake projects under the development program. Applications shall be due not later than 90 days after the date of such publication.

(B) APPLICATION SELECTION.—Not later than 90 days after the date on which applications for grants under the development program are due, the Secretary shall select, through a competitive process, all applicants to be awarded a grant under the development program.

(c) DEVELOPMENT PROGRAM REQUIREMENTS.—

(1) TWO PHASES.—Each grant recipient shall be required to complete two phases:

(A) PHASE ONE.—

(i) IN GENERAL.—In phase one, the recipient shall produce or retrofit one or more plug-in hybrid delivery vehicles, one or more plug-in hybrid utility vehicles, or a combination of such vehicles.

(ii) REPORT.—Not later than 60 days after the completion of phase one, the recipient shall submit to the Secretary a report containing data and analysis of—

(I) the performance of each produced or retrofitted vehicle in carrying out the testing program established by the Secretary under clause (iv);

(II) the performance during such testing of each vehicle's components, including the battery, energy management system, and charging system;

(III) the projected cost of each produced or retrofitted vehicle, including acquisition, operating, and maintenance costs of each vehicle; and

(IV) the emissions levels of each produced or retrofitted vehicle, including greenhouse gas levels.

(iii) TIMING.—Phase one begins upon receipt of a grant under the development program and lasts for one year.

(iv) TESTING PROGRAM.—The Secretary shall establish a testing program to be used by recipients in testing each produced or retrofitted vehicle. Such testing program shall include testing a vehicle's performance at various driving speeds, distances, and traffic conditions.

(B) PHASE TWO.—

(i) IN GENERAL.—In phase two, the recipient shall demonstrate the advanced manufacturing processes required for producing or retrofitting heavy duty plug-in hybrid vehicles by producing or retrofitting 50 plug-in hybrid delivery vehicles or plug-in hybrid utility vehicles.

(ii) REPORT.—Not later than 60 days after the completion of phase two, the recipient shall submit to the Secretary a report containing—

(I) an analysis of the main technological hurdles encountered by the recipient in the development of the plug-in hybrid delivery vehicles and plug-in hybrid utility vehicles;

(II) an analysis of the main technological hurdles involved in mass producing plug-in hybrid delivery vehicles and plug-in hybrid utility vehicles; and

(III) the manufacturing cost of each produced or retrofitted vehicle, the actual or projected sale price of each produced or retrofitted vehicle, and the cost of a similar non-hybrid vehicle.

(iii) TIMING.—Phase two begins at the conclusion of phase one and lasts for two years.

(2) AWARD AMOUNTS.—The Secretary shall award not more than $3,000,000 to each recipient per year for each of the 3 years of the project.

(d) STUDY ON VEHICLE USAGE AND ALTERNATIVE DRIVE TRAINS.—

(1) The Secretary shall carry out a study of the conditions under which delivery vehicles and utility vehicles are generally used, including, for each type of vehicle, the average—

(A) number of miles driven;

(B) time spent with the engine at idle;

(C) horsepower requirements;

(D) length of time the maximum or near maximum power output of the vehicle is needed; and

(E) fuel consumption.

(2) The Secretary shall carry out a study of alternative power train designs for use in non-hybrid and plug-in hybrid delivery vehicles and utility vehicles. The study shall compare the estimated cost and fuel savings of each design.

(e) REPORT TO THE CONGRESS.—Not later than 60 days after the Secretary receives the reports from grant recipients under subsection (c)(1)(B)(ii), the Secretary shall submit to the Congress a report containing—

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of all applicants who submitted applications for the development program;

(3) all data contained in reports submitted by grant recipients under subsection (c)(1);

(4) a description of the vehicles produced or retrofitted by recipients in phase one and phase two of the project, including an analysis of the fuel efficiency of such vehicles; and

(5) the results of the studies carried out under subsection (d).

(f) DEFINITIONS.—For purposes of this section:

(1) DELIVERY VEHICLE.—The term ''delivery vehicle'' means a heavy duty vehicle intended to be used commercially for delivering goods.

(2) GREENHOUSE GAS.—The term ''greenhouse gas'' means—

(A) carbon dioxide;

(B) methane;

(C) nitrous oxide;

(D) hydrofluorocarbons;

(E) perfluorocarbons; or

(F) sulfur hexafluoride.

(3) HEAVY DUTY.—The term ''heavy duty'' means, with respect to a vehicle, a vehicle with a gross weight over 8501 pounds.

(4) PLUG-IN HYBRID.—The term ''plug-in hybrid'' means a vehicle fueled, in part, by electrical

power that can be recharged by connecting the vehicle to an electric power source.

(5) SECRETARY.—The term "Secretary" means the Secretary of Energy.

(6) RETROFIT.—The term "retrofit" means the process of creating a plug-in hybrid by converting an existing, fuel-powered vehicle.

(7) UTILITY VEHICLE.—The term "utility vehicle" means a heavy duty vehicle used commercially by electric utilities.

(g) AUTHORIZATION OF APPROPRIATIONS.—

(1) There are authorized to be appropriated to the Secretary $16,000,000 for each of fiscal years 2009 through 2011 to carry out this section.

(2) Of the funds authorized under paragraph (1), not more than $1,000,000 per fiscal year may be used for—

(A) carrying out the studies required under subsection (d); and

(B) the administration of the development program.

SEC. 2. EXPANDING RESEARCH IN HYBRID TECHNOLOGY FOR LARGE VEHICLES.

Subsection (g)(1) of the United States Energy Storage Competitiveness Act of 2007 (enacted as section

641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(g)(1))) is amended by inserting "vehicles with a gross weight over 8501 pounds," before "stationary applications".

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
SUBCOMMITTEE MARKUP
June 18, 2008

H.R. 6323 – *To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes.*

AMENDMENT ROSTER

No.	Sponsor	Description	Results
1	Ms. Biggert	Amendment to section 1(d), clarifies that the study to be conducted is research oriented.	Agreed to by voice vote.

AMENDMENT

OFFERED BY M<u>s</u>. Biggert

Section 1(d) is amended to read as follows:

(d) RESEARCH ON VEHICLE USAGE AND ALTERNATIVE DRIVE TRAINS.—The Secretary shall conduct research into alternative power train designs for use in delivery vehicles and utility vehicles. Such research shall compare the estimated cost and fuel savings of each design with similar non-hybrid power train designs under the conditions in which these vehicles are typically used, including, for each vehicle type—

(1) number of miles driven;

(2) time spent with the engine at idle;

(3) horsepower requirements;

(4) length of time the maximum or near maximum power output of the vehicle is needed; and

(5) fuel consumption.

Amend section 1(e)(5) by striking "studies" and inserting "research".

☒

XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 6323, TO ESTABLISH A RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM TO PROMOTE RESEARCH OF APPROPRIATE TECHNOLOGIES FOR HEAVY DUTY PLUG-IN HYBRID VEHICLES, AND FOR OTHER PURPOSES

WEDNESDAY, JULY 16, 2008

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

The Committee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. Good morning. The Committee will come to order.

Pursuant to notice, the Committee on Science and Technology meets to consider the following measures: H.R. 3957, the *Water Use Efficiency and Conservation Research Act;* H.R. 2339, the *Produced Water Utilization Act of 2007;* and H.R. 6323, *To establish a research, development, demonstration and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes.*

Before we start the markup, we have some Committee business to attend to. Yesterday, Ms. Donna Edwards of Maryland was appointed to serve on the Committee on Science and Technology. We currently have an open subcommittee slot on the Energy and Environmental Subcommittee, and I would like to ask unanimous consent that Ms. Edwards be elected to the Subcommittee. Without objection, so ordered.

Congratulations, Ms. Edwards. I know that a lot that we do here on this committee affects Maryland and we look forward to working with you to get your input on that and also for you to be a liaison as well as Mr. Bartlett.

Mr. Bartlett, do you want to welcome our new Member?

Mr. BARTLETT. Very happy to have you aboard. Our districts adjoin each other. When we have common interests, I will look forward to working with you. Thank you.

Ms. EDWARDS. Thank you, Mr. Chairman and Mr. Bartlett. Thank you.

Chairman GORDON. And when you don't have common interests, you will still work with her though, won't you?

Mr. BARTLETT. Absolutely, but all the more so when we have common interests.

Chairman GORDON. Thank you. We will now proceed with the markup.

Dwindling water supplies across the United States continue to percolate as the major disaster on our nation's horizon. Despite large spring rains in some states, the U.S. Drought Monitor shows that severe drought still grips the American Southeast, California across the Rocky Mountains, and Oklahoma and the Texas panhandle. In an effort to protect the country from an impending water scarcity crisis, the Committee has begun to search out ways for the Federal Government to spur new technology innovation in water research and development. Today the Committee will consider two bills aimed at preventing a future water supply catastrophe.

First, we will take up H.R. 3957, the *Water Use Efficiency and Conservation Research Act,* introduced by Representative Jim Matheson. H.R. 3957 establishes a research and development program within the Environmental Protection Agency's Office of Research and Development to promote water-use efficiency and conservation.

Through this program, EPA will be able to develop and encourage the adoption of technologies and processes that will achieve greater water-use efficiencies, thus helping to address the water supply shortages. In addition, H.R. 3957 directs EPA to disseminate information on current water-use efficiencies and conservation technologies. This information will include incentives and impediments to development and commercialization.

Next we will consider H.R. 2339, the *Produced Water Utilization Act,* introduced by our colleague from Texas and our Ranking Member, Mr. Hall. This bill creates a research, development and demonstration program to promote beneficial reuse of water produced in connection with oil and gas extraction. In the United States, up to 2.3 billion gallons per day of produced water is generated. Unfortunately, this water is not of sufficient quality to be used to meet our many needs for water. This legislation will provide innovative treatment technologies that will enable the reuse of this water in an environmentally responsible way.

Let me also say that Congressman Hall and I have been discussing the issues of water. We think there are a variety of other things. We started this effort this year. We are going to continue to look into it next year and we hope that we are going to have again probably a series of bipartisan bills that we might combine for a real, again a major effort in water conservation and technologies for this important problem that faces our nation.

Finally, we will consider H.R. 6323, the *Heavy Duty Hybrid Research, Development and Demonstration Act,* introduced by the Ranking Member of the Investigations and Oversight Subcommittee, Mr. Sensenbrenner. With skyrocketing full prices, energy concerns have been cemented at the forefront of public awareness. This committee has responded by pursuing an aggressive energy agenda in 2010 and we will continue this in the next Congress, and we provided a substantial portfolio of bills to the comprehensive energy package which became law last December. Mr. Sensenbrenner's bill represents another common sense approach to chipping away at our energy challenge.

The heavy duty sector accounts for a very large portion of the Nation's fuel use and transportation-based emissions and even

small improvements in their efficiency can have a substantial impact. Hybrid technologies hold the promise of greatly reducing the fuel consumption by the Nation's truck fleet. Mr. Sensenbrenner and his staff have worked closely with the Majority to ensure that grants under this program explore a wide range of hybrid technologies and applications and he has made further improvements with an amendment in the nature of a substitute.

These three bills are important steps in ensuring that we have adequate water and power supplies across the country, and in pushing innovation in the heavy truck sector. I want to thank Representative Matheson, Representative Sensenbrenner and Ranking Member Hall for their efforts in these two important areas, and I ask that Members of the Committee support all three bills and move for their passage out of the Committee.

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

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Good Morning. The Committee will come to order. Pursuant to notice, the Committee on Science and Technology meets to consider the following measures:

- H.R. 3957, the *Water Use Efficiency and Conservation Research Act;*
- H.R. 2339, the *Produced Water Utilization Act of 2007;* and,
- H.R. 6323, *To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes.*

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We currently have an open subcommittee slot on the Energy and Environment Subcommittee. I would ask unanimous consent that Ms. Edwards be elected to this subcommittee. Without objection, so ordered.

Congratulations, and welcome to the Committee Ms. Edwards.

We will now proceed with the markup.

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First, we will take up H.R. 3957, the *Water Use Efficiency and Conservation Research Act* introduced by Representative Jim Matheson. H.R. 3957 establishes a research and development program within the Environmental Protection Agency's Office of Research and Development to promote water-use efficiency and conservation.

Through this program, EPA will be able to develop and encourage the adoption of technologies and processes that will achieve greater water-use efficiency, thus helping to address the water supply shortages. In addition, H.R. 3957 directs EPA to disseminate information on current water-use efficient and conservation technologies. This information will include incentives and impediments to development and commercialization.

Next, we will consider H.R. 2339, the *Produced Water Utilization Act* introduced by my colleague from Texas and our Ranking Member, Mr. Hall. This bill creates a research, development, and demonstration program to promote the beneficial reuse of water produced in connection with oil and gas extraction. In the United States, up to 2.3 billion gallons per day of produced water is generated. Unfortunately, this water is not of sufficient quality to be used to meet our many needs for water. This legislation will provide innovative treatment technologies that will enable the reuse of this water in an environmentally responsible way.

Finally, we will consider H.R. 6323, the *Heavy Duty Hybrid Research, Development, and Demonstration Act,* introduced by the Ranking Member of the Investiga-

tions and Oversight Subcommittee, Mr. Sensenbrenner. With skyrocketing fuel prices, energy concerns have been cemented at the forefront of public awareness.

This committee responded by pursuing an aggressive energy agenda in 110th Congress, and provided a substantial portfolio of bills to the comprehensive energy package which became law last December. Mr. Sensenbrenner's bill represents another common sense approach to chipping away at our energy challenge.

The heavy truck sector accounts for a very large portion of the Nation's fuel use and transportation-based emissions, and even small improvements in their efficiency can have a substantial impact. Hybrid technologies hold the promise of greatly reducing the fuel consumed by the Nation's truck fleet. Mr. Sensenbrenner and his staff have worked closely with the Majority to ensure that grants under this program explore a wide range of hybrid technologies and applications, and he has made further improvements with the Amendment in the Nature of a Substitute.

These three bills are important steps in ensuring that we have adequate water and power supplies across the country, and in pushing innovation in the heavy truck sector. I want to thank Representative Matheson, Representative Sensenbrenner, and Ranking Member Hall for their efforts in these two important areas. I ask that Members of the Committee support all three bills and move for their passage out of the Committee.

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

Mr. HALL. Mr. Chairman, I thank you for holding the markup today and for the three bills before us, and because you have so adequately explained these bills, I can make my remarks very brief.

I simply would put my entire statement into the record with unanimous consent and I support the three bills we are marking up today and hope our colleagues will as well, and I yield back the balance of my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Mr. Chairman, thank you for holding this markup today to advance the three bills before us today. I will keep my opening remarks brief.

H.R. 3957, the *Water Use Efficiency and Conservation Research Act* introduced by Mr. Matheson would create a water technology research program at the EPA. Research and development of technologies that promote greater efficiencies in water use is one of the several responses we can make to the water shortages many of our constituents are experiencing.

The second bill, H.R. 2339, the *Produced Water Utilization Act of 2008* is one I introduced, and I feel strongly about its potential to benefit our dual needs of energy and water. This bill would provide important funding for research, development, demonstration, and commercial application of technologies to purify and use produced water from oil and natural gas extraction for human, agricultural, and industrial purposes.

H.R. 6323, Mr. Sensenbrenner's heavy duty hybrid vehicle bill, would establish a program at DOE to provide grants to carry out projects to advance research and development and to demonstrate advanced technologies for heavy duty plug-in hybrid vehicles. While heavy duty trucks make up a small portion of the market, the potential for fuel savings through hybrid technology is substantial.

Thank you, Mr. Chairman. I support the three bills we're marking up today and hope that our colleagues will as well. I yield back the balance of my time.

Chairman GORDON. That was a wonderful statement, Mr. Hall.

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

[The prepared statement of Ms. Richardson follows:]

PREPARED STATEMENT OF REPRESENTATIVE LAURA RICHARDSON

Chairman Gordon, Ranking Member Hall, and fellow Members of the Science and Technology Committee, I rise in strong support of each piece of legislation that is slated for today's Full Committee markup.

H.R. 3957, the Water Use Efficiency and Conservation Research Act

First I would like to thank my colleague Rep. Matheson (D–UT) for introducing H.R. 3957, the *Water Use Efficiency and Conservation Research Act,* and for his leadership on this issue. My home State of California has dealt with its own series of water supply issues in the past. Likewise, State and local officials in California have pursued this issue in an aggressive manner. In my district we have a nationally recognized desalination project. The Long Beach City Council implemented strict water conservation regulations.

Fact of the matter is Americans consume approximately 26 billion gallons of water per day, and similar to our consumption of oil, we are all going to have to learn to conserve.

H.R. 3957 is a sound piece of legislation that designates the Environmental Protection Agency as the primary federal agency tasked with the responsibility of improving our nation's water use conservation technology. Given the EPA's track record on water quality issues, asking the agency to participate in this endeavor seems like a reasonable fit.

Thirty years ago President Carter advised the Nation that conservation was necessary to our quality of life. This legislation takes a major step in progressing from statements to attainable goals. I encourage my colleagues to support this bill.

H.R. 2339, the Produced Water Utilization Act of 2007

I want to commend the distinguished Ranking Member, Mr. Hall for introducing H.R. 2339, the *Produced Water Utilization Act of 2007.*

We all agree that we must increase our domestic supply of energy. However this process results in a product called produced water, which is water that is contaminated by dissolved solids.

Consequently, this water supply is rendered useless for consumption or irrigation and must be pumped back into the ground to dispose of safely.

The legislation that Mr. Hall introduced will allow us to safely utilize produced water thereby creating an additional source of water for human consumption and irrigation.

This is a sound piece of legislation and I encourage my colleagues to support this bill.

H.R. 6323, Heavy Duty Plug-In Hybrid Vehicle R&D

I want to acknowledge my colleague Rep. Sensenbrenner (R–WI) for introducing H.R. 6323, a bill to promote heavy duty plug-in hybrid R&D.

While we have seen a concerted effort to bring this technology to passenger vehicles, commercial vehicles are far behind despite their heavy fuel consumption.

Indeed we heard testimony during the hearing on Mr. Sensenbrenner's bill that this technology will save each heavy duty truck 1,000 gallons of fuel per year. With the rising cost of energy and many local and State governments facing budget constraints, this legislation could impact their respective departments and reduce the cost of business.

In my home State of California, Pacific Gas & Electric, which serves northern and central California, has been a leader on this issue, utilizing this technology in their service trucks. We have to change the way we consume energy in this country, and the Federal Government has to take a leading role in this effort.

H.R. 6323 will take us in the right direction, and I encourage my colleagues to support this bill.

Mr. Chairman I yield back my time.

[The prepared statement of Mr. Mitchell follows:]

PREPARED STATEMENT OF REPRESENTATIVE HARRY E. MITCHELL

Thank you, Mr. Chairman.

Today we will mark up H.R. 3957, the *Water Use Efficiency and Conservation and Research Act,* H.R. 2339, the *Produced Water Utilization Act,* and H.R. 6323, the *Heavy Hybrid Truck Research, Development, and Demonstration Act.*

Arizona is no stranger to the pressures of rising population and prolonged drought.

We are one of the fastest growing states, and despite some helpful precipitation this winter, many portions of our state our still well into a second decade of drought.

I believe that it is absolutely critical that we address the growing shortage of our nation's water supply and work to establish progressive and cost-effective water resource management policies.

H.R. 3957 would help us gain a better understanding of our water use and shortages by establishing a research and development program within EPA to promote water efficiency and conservation.

I urge my colleagues to support this important legislation.

I yield back.

Chairman GORDON. We will now consider H.R. 6323, *To establish a research, development, demonstration and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles and for other purposes.*

Mr. Sensenbrenner is not able to be here today but he has put together a good bill, and I recognize Mr. Hall to present any remarks he might have.

Mr. HALL. Mr. Chairman, I have the remarks that Mr. Sensenbrenner would deliver if he were here and I ask unanimous consent to put them in the record.

Chairman GORDON. With no objection, the statement is agreed to for the record.

[The prepared statement of Mr. Sensenbrenner follows:]

PREPARED STATEMENT OF F. JAMES SENSENBRENNER JR.

This Monday, President Bush announced that he lifted the executive ban on offshore drilling. Increasing our domestic oil supply is an important part of combating the current energy crisis. But if we're serious about energy independence, we have to do more. We also have to drastically reduce our demand.

This bill is a step in that direction. The Department of Energy (DOE) administers several grants to speed production of hybrid cars, but DOE does not have a single grant specifically intended for trucks. Trucks currently consume 48 percent of our fuel and each individual truck consumes substantially more fuel than a passenger car. In addition, industries turn their trucks over faster than consumers and can therefore adopt new technologies faster. This means trucks, not cars, are the low hanging fruit.

This bill will establish DOE's first grant program to promote hybrid and plug-in hybrid trucks. It will also advance research in the area, expand DOE's focus to include trucks as well as cars, and establish a cost-share program that will put hybrid and plug-in hybrid trucks on the road. I thank the Chairman and his staff for considering this bill.

Chairman GORDON. I would like to express my support for this bill, and I thank my good friend from Wisconsin for working to cooperate with my staff, or our staff, on this.

Does anyone wish to be recognized?

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett.

Mr. BARTLETT. Thank you very much.

Through a series of those infamous earmarks, I have been sponsoring the development of a hybrid plug-in truck through the Mack Truck Company, now known as Volvo Power Train. This bill is an excellent addition to those efforts. This is plug-in hybrid. Many of our large trucks use a reciprocating engine in the least efficient, most polluting way and stop and go, picking up trash, delivering things. There is an enormous need for this. It will greatly reduce pollution and increase the efficiency of these vehicles, so I am in strong support of this bill, which builds on the developments that I have been privileged to support through a series of earmarks. Thank you.

Chairman GORDON. Thank you, Mr. Bartlett. One just quick note also is, one of the benefits of plug-in hybrids is, that you can plug them in at night at an, if you will pardon the expression, off-peak

time, where oftentimes electricity is being generated and not even used. So that is another benefit of this.

Mr. BARTLETT. Mr. Chairman, I would like to note that when we have fully developed these plug-in hybrids, they can really, really add to the efficiency of our electrical net. As you point out, the power company can send a signal through the line as to when to charge them up, like at 2 a.m. in the morning when nobody is taking showers or cooking food. But another thing can happen. When they are through with their day's work and their battery is charged, they now can sell electricity back to the grid. So the more and more these plug-in hybrids we have, the more capability we have to even out the power demand and so they can be charging up during the night and giving some of it back, that they haven't used during the day, give back to the grid in the evening when the demand is very high. So this is a very important development and I am pleased to support this bill.

Chairman GORDON. Well, thanks for your past work. This is a good bill, and I am sorry that Mr. Sensenbrenner couldn't be here but you can tell him on our behalf that even a blind squirrel occasionally gets an acorn and that we appreciate his work.

I ask unanimous consent——

Mr. ROHRABACHER. Mr. Chairman, move to strike the last word. Let me just note, and I agree with Dr. Bartlett, whose Ph.D. and expertise always astonishes me and also I stand in admiration of the great contribution he makes. Let me just note that as we move towards the electrification of American transportation, which I support and think is and should be the long-term goal for people who have long-term strategies for getting us out of this energy crisis, it will not simply do to believe that we do not have to increase the amount of electricity in our society in order to achieve that goal. Not all of the technologies that we are going to be able to bring to play are going to sort of even out so you can plug it in at night and so you don't have to have any more electricity being produced. The fact is, if we are going to move towards an electrified transportation system, we are going to need new sources of electricity. Now, whether that is produced by oil or whether that is produced by natural gas or whether that is produced by solar in some way or whether it is produced by nuclear power, we are going to need more sources of energy to increase the supply if we are going to meet the goals that have just been expressed, and I just want to make sure that is clearly on the record as we start down this road, and I think this committee will play a major role in steering America towards an electrified transportation system that is pollution-free. It is a good thing, but we have some serious challenges of where to get that electricity. We shouldn't downplay that, the importance of finding more sources and more supply for electricity as we move in that direction.

Chairman GORDON. Thank you, Mr. Rohrabacher. I certainly agree with that statement, and I also agree with you that this committee will play a major role and this will be a high priority for this. If there is no one on my left, then Dr. Ehlers is recognized.

Mr. EHLERS. Thank you, Mr. Chairman. Just following this theme, Mr. Rohrabacher did outline the various options, but in view of the issues we are facing with potential global climate

change, CO_2 emissions and so forth, and for other reasons having to do with resource availability, let us face it, it is going to have to be nuclear plants producing electricity, and we might as well face up to that and get on that bandwagon quickly as a nation. We gave it up in a time when we shouldn't have some 20 years ago and that has really set us back compared to the rest of the developed world. It is high time we get in high gear on that program again and get operating so that we will be able to meet the needs of our nation. Thank you.

Chairman GORDON. Does anyone else wish to be recognized? Then Dr. Ehlers—oh, I am sorry. Dr. Bartlett is recognized.

Mr. BARTLETT. Thank you very much. Mr. Rohrabacher is exactly right. As we run down the fossil fuel exhaustion curve, we are going to need more energy everywhere. But our future for electric energy is much brighter than our future for liquid fuels. With more nuclear, with wind, with solar, with micro hydro, with true geothermal where we are close enough to the molten core of the Earth, I think we can make reasonably the amount of electricity that we need, maybe not as much as we would like to use. That same thing is not true of liquid fuel. We have a very, very challenging future in liquid fuels. This is just one more reason that this is really good bill because it moves it in a direction for transportation where we use electricity, which is going to be much easier to produce in the future than liquid fuels.

Mr. GINGREY. Mr. Chairman.

Chairman GORDON. Dr. Gingrey, as long as you are not going to say that Dana Rohrabacher is exactly right. Hearing that twice in one day is a little bit tough. Dr. Gingrey.

Mr. GINGREY. Mr. Chairman, I promise not to say that. I do want to join my colleagues on this side in regard to getting a plug in for—no pun intended there either—for utilizing all sources of energy and the need, of course, to improve the electricity grid. As we know in this country, most electricity is generated by coal, coal-powered plants, some natural gas, which is much cleaner but also much more expensive, and though in this country the supply of coal is estimated to be 1.5 trillion tons of coal and we use about a billion tons a year, so there is plenty of that black rock gold sitting around that we could convert into liquid petroleum. That would help our dependency, relieve our dependency from foreign countries in regard to fossil fuels. So clean coal technology, let me just put in a plug for that. But this is a great bill and I am highly supportive of it and I just wanted to put in my two cents worth in regard to energy, and I yield back, Mr. Chairman.

Chairman GORDON. Thank you, Dr. Gingrey. As we continue the filibuster of Mr. Sensenbrenner's bill, let me also point out that the astronauts from the STS–124 are back. They are going to be in the Rayburn Room B–339 at 5:30 and they are going to have ice cream. You know, I brought my daughter the last time or two and so if you would like to come by, it is a nice environment to bring your constituents, your family and also to say thanks to these brave astronauts.

Now 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, so ordered.

The first amendment on the roster is an amendment in the nature of a substitute offered by Mr. Hall in substitute for the gentleman from Wisconsin, Mr. Sensenbrenner. Are you ready to proceed with your amendment?

Mr. HALL. I think so. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to H.R. 6323 offered by Mr. Sensenbrenner of Wisconsin.

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

I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, this amendment combines input from numerous Members of this committee and from the Department of Energy and from industry leaders in both the utility and truck manufacturing sectors. In addition to technical changes, the amendment changes the number of grants from a set number of five to a range of three to seven. This range will allow DOE to adjust the number of grants it issues based on the quality of applications it receives. The amendment also broadens the platform and allowable technologies that are eligible for grants, allowing more manufacturers to qualify and the best proposals to succeed. Finally, the amendment expands the reporting requirements on both grant recipients and DOE to help advance necessary technologies in this area, and I yield back.

[The prepared statement of Mr. Sensenbrenner follows:]

PREPARED STATEMENT OF F. JAMES SENSENBRENNER JR.

This amendment combines input from numerous Members of the Committee, from the Department of Energy (DOE), and from industry leaders in both the utility and truck manufacturing sectors.

In addition to technical changes, the amendment changes the number of grants from a set number of five to a range of three to seven. The range will allow DOE to adjust the number of grants it issues based on the quality of applications it receives. The amendment also broadens the platforms and allowable technologies that are eligible for grants, allowing more manufacturers to qualify and the best proposals to succeed.

Finally, the amendment expands the reporting requirements on both grant recipients and DOE to help advance necessary technologies in this area.

Chairman GORDON. Is there further discussion on the amendment?

The second amendment on the roster is an amendment offered also—pardon me. Okay. The second amendment on the roster is an amendment offered by the gentleman from Washington, Mr. Reichert. Are you ready to proceed with your amendment?

Mr. REICHERT. Yes, sir.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to the amendment in the nature of a substitute to H.R. 6323 offered by Mr. Reichert of Washington.

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

Mr. REICHERT. Thank you, Mr. Chairman, and I think it is timely, it is convenient, I guess, that this amendment is the last amendment for the day in consideration of all the comments made.

This amendment really applies to some of the ideas and thoughts expressed by the Members here present.

This is a very simple amendment. It seeks to understand the impact that an increasing number of plug-in hybrid vehicles would have on our domestic electric power grid. In Washington State, 85 percent of our power is provided by hydroelectricity so we really understand this issue in the Northwest. Plug-in hybrid electric vehicles offer a clean alternative to our current gas-powered cars, SUVs and trucks. They have the potential to help reduce our nation's dependence on foreign oil as well as fossil fuels, which would increase our national and economic security. The amendment merely directs the Secretary of Energy to establish a pilot program to research and test the effects that this new technology will have on our power grids. The reporting requirements are the same as in the underlying bill. It calls for a report on these findings within 60 days of the completion of the hybrid program and drive train studies. This amendment does not include a new authorization for any additional funds. It merely adds this study on the electric power grid to the list of approved research projects and demonstrations already included in the bill. I ask for the Committee to adopt this common sense amendment, and I yield back the balance of my time.

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

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett.

Mr. BARTLETT. Mr. Chairman, since about half of our electricity is produced by coal, I think it is appropriate to make a brief comment about coal and how much we have. It has been said for several years now that we have 250 years of coal at current use rates. The National Academies of Science has taken a recent look at that. They said that the last time we evaluated the amount of coal we had was in the 1970s and they now believe there is about 100 years of coal at current use rates. But if we had 250 years of coal at current use rates and if you increase its use only two percent—Albert Einstein said the most powerful force in the universe was the power of compound interest. Just two percent growth doubles in 35 years, four times bigger in 70 years, eight times bigger in 105 years, 16 times bigger in 140 years. So if you increase the use of coal only two percent, it drops from 250 years, but the National Academies says we have only 100 years to 85 years. When you use some of the energy from coal to convert it to a gas or a liquid, you have dropped it now to 50 years, and it is unavoidable we will share any of our energy sources with the world, because if we use oil or if we use coal to displace some of the energy here in our country, then we are not buying energy overseas and someone else can buy it, and since we use a fourth of the world's energy, that 50 years shrinks to 12.5 years. So what that means is, if those 250 years of coal—the National Academies says only 100—but if those 250 years and you increase its use only two percent, you convert it to a gas or a liquid and share it with the world, which you must, it lasts 12.5 years.

We just need to keep these realities in mind. There is a lot of—how did Alan Greenspan define it—irrational exuberance out there

about these energy sources we have in our country. That is the reality for coal, and I thank you, sir.

Chairman GORDON. Thank you, Dr. Bartlett.

Is there further discussion on the amendment? Mr. McNerney is recognized.

Mr. MCNERNEY. Thank you, Mr. Chairman. I want to support Mr. Reichert's amendment.

It is clear to me that use of plug-in hybrids is going to have a large impact on our national electric system and it is incumbent upon us to understand what that impact is going to be and how to deal with it because it offers us an opportunity to use vehicles as a storage mechanism for energy. So I applaud the amendment and I offer my support.

Chairman GORDON. Ms. Biggert is recognized.

Ms. BIGGERT. Thank you, Mr. Chairman. I support the amendment and I just wanted to say that I think that this bill and the amendment is so important to really improving the use of hybrids, hybrid plug-ins and particularly looking at commercial trucks, which obviously is going to take this, beyond automobiles and really further our conservation as well as improving the use of gasoline. I think that one of the companies in my district, Navistar, has done so much on this, working with the hybrids and with the hybrid plug-in. I think that having the grants available for all types of commercial vehicles is going to help so much to reduce our oil consumption, and I congratulate the sponsors of the bill. I yield back.

Chairman GORDON. Thank you, Ms. Biggert. Does anyone else have any comments? I think this sets a record for the most nice things said about Mr. Sensenbrenner at any one time. So if there is no further discussion on the——

Mr. EHLERS. Just tell him he should stay away more often.

Chairman GORDON. I will be happy to. If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

Are there other amendments to the amendment in the nature of a substitute? If no, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

The vote is now on the bill, H.R. 6323 as amended. All in favor, say aye. All opposed, no. In the opinion of the Chair, the ayes have it. I recognize Mr. Rohrabacher for a motion.

Mr. ROHRABACHER. I believe it is Mr. Reichert who will——

Chairman GORDON. Okay. I recognize——

Mr. ROHRABACHER. Whoever it is.

Chairman GORDON. Okay.

Mr. ROHRABACHER. No, it is me. Mr. Chairman, I move that the Committee favorably report H.R. 6323 as amended to the House with the recommendation that the bill do pass. Furthermore, I move that staff be instructed to make necessary technical and conforming changes and that the Chairman take all necessary steps to bring the bill before the House for consideration.

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

ported. Without objection, the motion to reconsider is laid up on the table. Members will have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure ending Monday, July 21 at 9 a.m.

I move pursuant to clause 1 of the 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. 6323 as amended. Without objection, so ordered.

Before we adjourn, let me just say to everyone, this appears to be our last markup for this year and this session. Things, you know, went smoothly today, but the reason for that was that there was lots of collaboration. I thank all of you for your presence. It is important for you to be here. I hope that one thing that we can do as we go into maybe September when we are not going to be having any markups is have the opportunity for us to sit down as a committee informally and talk about what we want to do next year, and I think we had a good discussion today. We want to find out what is important to your districts, what is important to the country, and we will try to get an agenda that either we will pass off to Mr. Hall or we will keep it here, whichever way it might be, but one way or the other, we want to work together, and I very, very sincerely thank everyone for a very productive year. I hope that you will all go back to your press secretaries and talk at home about these three bills that you got out today. There are more good ones.

Thank you very much, and we are adjourned.

[Whereupon, at 10:59 a.m., the Committee was adjourned.]

Appendix:

H.R. 6323 AS REPORTED BY THE SUBCOMMITTEE, AMENDMENT ROSTER

I

110TH CONGRESS
2D SESSION

H. R. 6323

To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 19, 2008

Mr. SENSENBRENNER (for himself, Mrs. BIGGERT, Mr. MARIO DIAZ-BALART of Florida, Mr. EHLERS, and Mr. SMITH of Texas) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, 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. HEAVY DUTY PLUG-IN HYBRID VEHICLE TECHNOLOGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a competitive research, development, demonstration, and commercial application program (referred to in this Act as the ''development program'') to provide 5 grants to applicants to carry out projects to advance research and development and to demonstrate advanced technologies for heavy duty plug-in hybrid vehicles and for the production of such vehicles.

(b) APPLICATIONS.—

(1) IN GENERAL.—The Secretary shall issue requirements for applying for grants under the development program.

(2) SELECTION CRITERIA.—The Secretary shall establish selection criteria for awarding grants under the development program. In evaluating applications, the Secretary shall—

(A) consider the ability of applicants to successfully complete both phases described in subsection (c)(1); and

(B) give priority to applicants who are best able to—

(i) fill existing research gaps and advance current technology; and

(ii) achieve the greatest reduction in fuel consumption in delivery vehicles and utility vehicles.

(3) PARTNERS.—An applicant for a grant under this section may carry out a project in partnership with other entities.

(4) SCHEDULE.—

(A) APPLICATION REQUEST.—Not later than 180 days after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, and elsewhere as appropriate, a request for applications to undertake projects under the development program. Applications shall be due not later than 90 days after the date of such publication.

(B) APPLICATION SELECTION.—Not later than 90 days after the date on which applications for grants under the development program are due, the Secretary shall select, through a competitive process, all applicants to be awarded a grant under the development program.

(c) DEVELOPMENT PROGRAM REQUIREMENTS.—

(1) TWO PHASES.—Each grant recipient shall be required to complete two phases:

(A) PHASE ONE.—

(i) IN GENERAL.—In phase one, the recipient shall produce or retrofit one or more plug-in hybrid delivery vehicles, one or more plug-in hybrid utility vehicles, or a combination of such vehicles.

(ii) REPORT.—Not later than 60 days after the completion of phase one, the recipient shall submit to the Secretary a report containing data and analysis of—

(I) the performance of each produced or retrofitted vehicle in carrying out the testing program established by the Secretary under clause (iv);

(II) the performance during such testing of each vehicle's components, including the battery, energy management system, and charging system;

(III) the projected cost of each produced or retrofitted vehicle, including acquisition, operating, and maintenance costs of each vehicle; and

(IV) the emissions levels of each produced or retrofitted vehicle, including greenhouse gas levels.

(iii) TIMING.—Phase one begins upon receipt of a grant under the development program and lasts for one year.

(iv) TESTING PROGRAM.—The Secretary shall establish a testing program to be used by recipients in testing each produced or retrofitted vehicle. Such testing program shall include testing a vehicle's performance at various driving speeds, distances, and traffic conditions.

(B) PHASE TWO.—

(i) IN GENERAL.—In phase two, the recipient shall demonstrate the advanced manufacturing processes required for producing or retrofitting heavy duty plug-in hybrid vehicles by producing or retrofitting 50 plug-in hybrid delivery vehicles or plug-in hybrid utility vehicles.

(ii) REPORT.—Not later than 60 days after the completion of phase two, the recipient shall submit to the Secretary a report containing—

(I) an analysis of the main technological hurdles encountered by the recipient in the development of the plug-in hybrid delivery vehicles and plug-in hybrid utility vehicles;

(II) an analysis of the main technological hurdles involved in mass producing plug-in hybrid delivery vehicles and plug-in hybrid utility vehicles; and

(III) the manufacturing cost of each produced or retrofitted vehicle, the actual or projected sale price of each produced or retrofitted vehicle, and the cost of a similar non-hybrid vehicle.

(iii) TIMING.—Phase two begins at the conclusion of phase one and lasts for two years.

(2) AWARD AMOUNTS.—The Secretary shall award not more than $3,000,000 to each recipient per year for each of the 3 years of the project.

(d) RESEARCH ON VEHICLE USAGE AND ALTERNATIVE DRIVE TRAINS.—The Secretary shall conduct research into alternative power train designs for use in deliv-

ery vehicles and utility vehicles. Such research shall compare the estimated cost and fuel savings of each design with similar non-hybrid power train designs under the conditions in which these vehicles are typically used, including, for each vehicle type—

(1) number of miles driven;

(2) time spent with the engine at idle;

(3) horsepower requirements;

(4) length of time the maximum or near maximum power output of the vehicle is needed; and

(5) fuel consumption.

(e) REPORT TO THE CONGRESS.—Not later than 60 days after the Secretary receives the reports from grant recipients under subsection (c)(1)(B)(ii), the Secretary shall submit to the Congress a report containing—

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of all applicants who submitted applications for the development program;

(3) all data contained in reports submitted by grant recipients under subsection (c)(1);

(4) a description of the vehicles produced or retrofitted by recipients in phase one and phase two of the project, including an analysis of the fuel efficiency of such vehicles; and

(5) the results of the research carried out under subsection (d).

(f) DEFINITIONS.—For purposes of this section:

(1) DELIVERY VEHICLE.—The term ''delivery vehicle'' means a heavy duty vehicle intended to be used commercially for delivering goods.

(2) GREENHOUSE GAS.—The term ''greenhouse gas'' means—

(A) carbon dioxide;

(B) methane;

(C) nitrous oxide;

(D) hydrofluorocarbons;

(E) perfluorocarbons; or

(F) sulfur hexafluoride.

(3) HEAVY DUTY.—The term ''heavy duty'' means, with respect to a vehicle, a vehicle with a gross weight over 8501 pounds.

(4) PLUG-IN HYBRID.—The term ''plug-in hybrid'' means a vehicle fueled, in part, by electrical power that can be recharged by connecting the vehicle to an electric power source.

(5) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

(6) RETROFIT.—The term ''retrofit'' means the process of creating a plug-in hybrid by converting an existing, fuel-powered vehicle.

(7) UTILITY VEHICLE.—The term ''utility vehicle'' means a heavy duty vehicle used commercially by electric utilities.

(g) AUTHORIZATION OF APPROPRIATIONS.—

(1) There are authorized to be appropriated to the Secretary $16,000,000 for each of fiscal years 2009 through 2011 to carry out this section.

(2) Of the funds authorized under paragraph (1), not more than $1,000,000 per fiscal year may be used for—

(A) carrying out the studies required under subsection (d); and

(B) the administration of the development program.

SEC. 2. EXPANDING RESEARCH IN HYBRID TECHNOLOGY FOR LARGE VEHICLES.

Subsection (g)(1) of the United States Energy Storage Competitiveness Act of 2007 (enacted as section 641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(g)(1))) is amended by inserting

"vehicles with a gross weight over 8501 pounds," before "stationary applications".

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COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
JULY 16, 2008

AMENDMENT ROSTER

H.R. 6323, To establish a research, development, demonstration, and commercial application program to promote research of appropriate technologies for heavy duty plug-in hybrid vehicles, and for other purposes

No.	Sponsor	Description	Results
1	Mr. Hall for Mr. Sensenbrenner	Amendment in the Nature of a Substitute incorporates various changes, including: --Changes the number of grants from a set number of 5 to a range of 3-7; --Broadens the bill from focusing exclusively on plug-in hybrids to hybrids in general, but requires that at least half the grants are for plug-in technologies; --Broadens the bill's focus to include all trucks in classes 4-7; --Increases the reporting requirements on both grant recipients and DOE; --Adds emissions reduction as a selection criterion and as a comparative factor for DOE's research design; and --Makes the cost share requirements more explicit.	Agreed to by voice vote.
2.	Mr. Reichert	Amendment to the Amendment in the Nature of a Substitute, amends section 2 to establish a pilot program at the Department of Energy to test the impact of plug-in hybrid electric vehicles on the electric power grid.	Agreed to by voice vote.

AMENDMENT IN THE NATURE OF A SUBSTITUTE TO

H.R. 6323

OFFERED BY Mr. Sensenbrenner

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2008".

SEC. 2. ADVANCED HEAVY DUTY HYBRID VEHICLE TECHNOLOGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a competitive research, development, demonstration, and commercial application program (referred to in this Act as the "program") to provide grants to applicants to carry out projects to advance research and development and to demonstrate technologies for advanced heavy duty hybrid vehicles.

(b) APPLICATIONS.—

(1) IN GENERAL.—The Secretary shall issue requirements for applying for grants under the program.

(2) SELECTION CRITERIA.—The Secretary shall establish selection criteria for awarding grants under the program. In evaluating applications, the Secretary shall—

(A) consider the ability of applicants to successfully complete both phases described in subsection (c); and

(B) give priority to applicants who are best able to—

(i) fill existing research gaps and achieve the greatest advances beyond the state of current technology; and

(ii) achieve the greatest reduction in fuel consumption and emissions.

(3) PARTNERS.—An applicant for a grant under this section may carry out a project in partnership with other entities.

(4) SCHEDULE.—

(A) APPLICATION REQUEST.—Not later than 180 days after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, and elsewhere as appropriate,

a request for applications to undertake projects under the program. Applications shall be due not later than 90 days after the date of such publication.

(B) APPLICATION SELECTION.—Not later than 90 days after the date on which applications for grants under the program are due, the Secretary shall select, through a competitive process, all applicants to be awarded a grant under the program.

(5) NUMBER OF GRANTS.—The Secretary shall determine the number of grants to be awarded under the program based on the technical merits of the applications received. The number of grants awarded under the program shall not be less than 3 or more than 7, and at least half of the grants awarded shall be for plug-in hybrid technology.

(6) AWARD AMOUNTS.—The Secretary shall award not more than $3,000,000 to each recipient per year for each of the 3 years of the project.

(c) PROGRAM REQUIREMENTS; TWO PHASES.—Each grant recipient shall be required to complete two phases:

(1) PHASE ONE.—

(A) IN GENERAL.—In phase one, the recipient shall research and demonstrate ad-

vanced hybrid technology by producing or retrofitting one or more advanced heavy duty hybrid vehicles.

(B) REPORT.—Not later than 60 days after the completion of phase one, the recipient shall submit to the Secretary a report containing data and analysis of—

(i) the performance of each vehicle in carrying out the testing procedures developed by the Secretary under subparagraph (E);

(ii) the performance during such testing of each vehicle's components, including the battery, energy management system, charging system, and power controls;

(iii) the projected cost of each vehicle, including acquisition, operating, and maintenance costs; and

(iv) the emissions levels of each vehicle, including greenhouse gas levels.

(C) TERMINATION.—The Secretary may terminate the grant program with respect to the project of a recipient at the conclusion of phase one if the Secretary determines that the recipi-

ent cannot successfully complete the requirements of phase two.

(D) TIMING.—Phase one begins upon receipt of a grant under the program and has a duration of one year.

(E) TESTING PROCEDURES.—The Secretary shall develop standard testing procedures to be used by recipients in testing each vehicle. Such procedures shall include testing a vehicle's performance under typical operating conditions.

(2) PHASE TWO.—

(A) IN GENERAL.—In phase two, the recipient shall demonstrate advanced manufacturing processes and technologies by producing or retrofitting 50 advanced heavy duty hybrid vehicles.

(B) REPORT.—Not later than 60 days after the completion of phase two, the recipient shall submit to the Secretary a report containing—

(i) an analysis of the technological challenges encountered by the recipient in the development of the vehicles;

(ii) an analysis of the technological challenges involved in mass producing the vehicles; and

(iii) the manufacturing cost of each vehicle, the estimated sale price of each vehicle, and the cost of a comparable non-hybrid vehicle.

(C) TIMING.—Phase two begins at the conclusion of phase one and has a duration of two years.

(d) RESEARCH ON VEHICLE USAGE AND ALTERNATIVE DRIVE TRAINS.—The Secretary shall conduct research into alternative power train designs for use in advanced heavy duty hybrid vehicles. Such research shall compare the estimated cost, including operating and maintenance costs, emissions reductions, and fuel savings of each design with similar non-hybrid power train designs under the conditions in which these vehicles are typically used, including, for each vehicle type—

(1) number of miles driven;

(2) time spent with the engine at idle;

(3) horsepower requirements;

(4) length of time the maximum or near maximum power output of the vehicle is needed; and

(5) any other factors that the Secretary considers appropriate.

(c) REPORT TO THE CONGRESS.—Not later than 60 days after the Secretary receives the reports from grant recipients under subsection (c)(2)(B), the Secretary shall submit to the Congress a report containing—

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of all applicants who submitted applications for the program;

(3) all data contained in reports submitted by grant recipients under subsection (c);

(4) a description of the vehicles produced or retrofitted by recipients in phase one and phase two of the project, including an analysis of the fuel efficiency of such vehicles; and

(5) the results of the research carried out under subsection (d).

(f) COORDINATION AND NONDUPLICATION.—To the maximum extent practicable, the Secretary shall coordinate, and not duplicate, activities under this Act with other programs and laboratories of the Department of Energy and other Federal research programs.

(g) COST SHARING.—Section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352) shall apply to the program established pursuant to this section.

(h) DEFINITIONS.—For purposes of this section:

(1) ADVANCED HEAVY DUTY HYBRID VEHICLE.—The term "advanced heavy duty hybrid vehicle" means a vehicle with a gross weight between 14,000 pounds and 33,000 pounds that is fueled, in part, by a rechargeable energy storage system.

(2) GREENHOUSE GAS.—The term "greenhouse gas" means—

(A) carbon dioxide;

(B) methane;

(C) nitrous oxide;

(D) hydrofluorocarbons;

(E) perfluorocarbons; or

(F) sulfur hexafluoride.

(3) PLUG-IN HYBRID.—The term "plug-in hybrid" means a vehicle fueled, in part, by electrical power that can be recharged by connecting the vehicle to an electric power source.

(4) RETROFIT.—The term "retrofit" means the process of creating an advanced heavy duty hybrid vehicle by converting an existing, fuel-powered vehicle.

(5) SECRETARY.—The term "Secretary" means the Secretary of Energy.

(i) AUTHORIZATION OF APPROPRIATIONS.—

(1) There are authorized to be appropriated to the Secretary $16,000,000 for each of fiscal years 2009 through 2011 to carry out this section.

(2) Of the funds authorized under paragraph (1), not more than $1,000,000 per fiscal year may be used for—

(A) carrying out the studies required under subsection (d); and

(B) the administration of the program.

SEC. 3. EXPANDING RESEARCH IN HYBRID TECHNOLOGY FOR LARGE VEHICLES.

Subsection (g)(1) of the United States Energy Storage Competitiveness Act of 2007 (enacted as section 641(g)(1) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(g)(1))) is amended by inserting "vehicles with a gross weight over 16,000 pounds," before "stationary applications".

AMENDMENT TO THE AMENDMENT IN THE NATURE OF A SUBSTITUTE TO H.R. 6323 OFFERED BY MR. REICHERT OF WASHINGTON

Insert the following after section 2(g) and redesignate succeeding subsections accordingly:

(h) ELECTRICAL GRID RESEARCH PILOT PROGRAM.—The Secretary shall establish a pilot program through the National Laboratories and Technology Centers of the Department of Energy to research and test the effects on the domestic electric power grid of the widespread use of plug-in hybrid vehicles, including plug-in hybrid vehicles that are advanced heavy duty hybrid vehicles.

In section 2(e)(5), strike "subsection (d)" and insert "subsection (d) and (h)".

In section 2(j)(2)(A) (as redesignated) strike "and".

In section 2(j)(2) (as redesignated) redesignate subparagraph (B) as subparagraph (C) and insert after subparagraph (A) the following:

(B) carrying out the pilot program required under subsection (h); and

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