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REPORT
109–611

ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION ACT OF 2006

JULY 28, 2006.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

R E P O R T

together with

ADDITIONAL VIEWS

[To accompany H.R. 5656]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 5656) to provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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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 "Energy Research, Development, Demonstration, and Commercial Application Act of 2006".

SEC. 2. DEFINITIONS.

For the purposes of this Act—

(1) the term "biomass" has the meaning given that term in section 932(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16232(a)(1));

(2) the term "cellulosic feedstock" has the meaning given the term "lignocellulosic feedstock" in section 932(a)(2) of the Energy Policy Act of 2005 (42 U.S.C. 16232(a)(2));

(3) the term "Department" means the Department of Energy;

(4) the term "engineering-scale" means the minimum size required to predict with confidence all physical processes controlling the performance of a full-scale industrial facility;

(5) the term "institution of higher education" has the meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a));

(6) the term "National Laboratory" has the meaning given the term "nonmilitary energy laboratory" in section 903(3) of the Energy Policy Act of 2005 (42 U.S.C. 16182(3)); and

(7) the term "Secretary" means the Secretary of Energy.

SEC. 3. FUTUREGEN.

(a) IN GENERAL.—The Secretary shall carry out a project of research, development, and demonstration designed to demonstrate the feasibility of the commercial application of advanced clean coal energy technology, including carbon capture and geological sequestration, for electricity generation.

(b) INDUSTRY INVOLVEMENT.—The Secretary may conduct the project through a financial assistance cooperative agreement with a consortium of coal-fired power producers, coal companies, and others.

(c) REQUIREMENTS.—The Secretary shall ensure that—

(1) a FutureGen demonstration facility is operating by 2012;

(2) the FutureGen demonstration facility is designed to be able—

(A) to achieve at least a 99 percent reduction in sulfur dioxide emissions or, when burning coal containing 3 pounds or less of sulfur per million British thermal units, the project shall be able to emit no more than 0.03 pounds of sulfur dioxide emissions per million British thermal units;

(B) to emit no more than 0.05 pounds of nitrogen oxide emissions per million British thermal units;

(C) to achieve at least a 90 percent reduction in mercury emissions;

(D) to emit no more than 0.005 pounds of total particulate emissions in the flue gas per million British thermal units;

(E) to achieve at least a 90 percent reduction in carbon dioxide emissions;

(F) to demonstrate that the technology can be applied to a diversity of United States coal types; and

(G) to demonstrate the feasibility of electricity generation from coal using advanced clean coal technology with carbon capture and geological sequestration at a cost not greater than 10 percent higher than the average of all commercial integrated coal gasification combined cycle electric generating plants operating in the United States as of the date of enactment of this Act.

(d) SYSTEM INTEGRATION.—To reduce technical risk and focus development efforts on system integration, the Secretary shall, to the extent practicable, ensure that the FutureGen demonstration facility is designed to utilize available advanced clean coal technology, as well as first-of-a-kind technology components, as appropriate.

(e) DATA PROTECTION.—The Secretary may agree to protect FutureGen information to the same extent authorized for the Clean Coal Power Initiative pursuant to section 402(h) of the Energy Policy Act of 2005 (42 U.S.C. 16231(h)).

(f) CONTRIBUTIONS.—The Secretary may accept contributions from private and public sources, including foreign nations and international contributors, and use such contributions to offset a portion of the Federal share of the project costs.

SEC. 4. ADVANCED NUCLEAR FUEL CYCLE TECHNOLOGIES RESEARCH, DEVELOPMENT, AND DEMONSTRATION PLAN.

(a) DEFINITION.—In this section, the term "advanced recycling reactor" means a nuclear reactor that is capable of significantly reducing the toxicity or radioactivity of spent nuclear fuel components.

(b) SYSTEMS ANALYSIS.—

(1) IN GENERAL.—The Secretary shall develop a comprehensive modeling and simulation capability to enable a thorough analysis of possible advanced nuclear fuel cycle systems. The modeling and simulation capability shall be capable of examining—

(A) all of the components of each advanced nuclear fuel cycle system analyzed, including—

(i) spent fuel separations technologies;

(ii) advanced recycling reactor technologies;

(iii) fuel fabrication technologies;

(iv) advanced thermal reactor technologies, including advanced thermal reactor designs that would be capable of reducing the toxicity or radioactivity of spent nuclear fuel components; and

(v) waste disposal technologies;

(B) the manner in which possible technology and engineering choices for individual components might affect the overall system, and how various system components would interact with one another;

(C) quantitative mass flows of nuclear fuel and spent nuclear fuel, including projected inventories and transportation requirements for nuclear fuel and spent nuclear fuel, for any examined system; and

(D) estimated costs associated with building and operating the examined fuel cycle system, including a comparison with the estimated costs of building and operating a more conventional future fuel cycle system that includes geologic sequestration of high-level nuclear waste but that does not include recycling of spent fuel components.

(2) ADVANCED NUCLEAR FUEL CYCLE TECHNOLOGIES PLAN.—

(A) ANALYSIS.—The Secretary shall conduct a thorough analysis of more than 1 possible configuration of an advanced nuclear fuel cycle system using the analytical capability developed under paragraph (1). Each analysis of a possible configuration of an advanced nuclear fuel cycle system shall examine—

(i) the compatibility of fuel cycle system components, including each of the system component technologies described in paragraph (1)(A); and

(ii) the degree to which the examined system would—

(I) minimize the toxicity and radioactivity of spent nuclear fuel;

(II) increase the proliferation resistance of commercial nuclear power reactors and their associated fuel systems and infrastructure;

(III) maximize the amount of useful energy that can be extracted from nuclear fuel; and

(IV) minimize the costs of construction and operation of commercial nuclear power reactors and their associated fuel systems and infrastructure.

(B) PLAN.—Using the results of the analyses developed under subparagraph (A), and not later than June 30, 2007, the Secretary shall develop a detailed plan for research, development, and demonstration for advanced nuclear fuel cycle system technologies, including proposed technology options for each of the system component technologies described in paragraph (1)(A) and any proposed engineering-scale demonstrations of such system component technologies. The plan shall include an estimate of the design, engineering, construction, and lifetime operating costs of any proposed engineering-scale demonstration, including decontamination and decommissioning costs. In developing the plan, the Secretary shall consider the integration into an advanced nuclear fuel cycle system of advanced thermal reactors capable of reducing the toxicity or radioactivity of spent nuclear fuel components.

(C) CONSULTATION.—In developing the plan under subparagraph (B), the Secretary shall consult with—

(i) technical experts from United States and foreign companies that design or engineer nuclear power plants or nuclear fuel reprocessing facilities;

(ii) technical experts from United States electric utilities that operate nuclear power plants;

(iii) economists with expertise in nuclear power and electricity markets;

(iv) the Nuclear Energy Research Advisory Committee;

(v) the Chairman of the Nuclear Regulatory Commission; and

(vi) the Administrator of the Environmental Protection Agency.

(3) NATIONAL ACADEMY OF SCIENCES REVIEW.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a review of the plan developed under paragraph (2)(B), including by reviewing the validity of the underlying analyses required under paragraph (2)(A).

(c) REPORT.—Not later than June 30, 2008, the Secretary shall transmit to Congress a report that includes—

(1) the research, development, and demonstration plan developed under subsection (b)(2)(B), and the report from the National Academy of Sciences on the review conducted under subsection (b)(3);

(2) a revised research, development, and demonstration plan that takes into account the findings, conclusions, and recommendations of the report from the National Academy of Sciences; and

(3) an explanation of any instances where the Secretary does not concur with the findings, conclusions, and recommendations of the report from the National Academy of Sciences.

(d) PROHIBITION.—The Secretary shall not initiate detailed design or construction of any demonstration facility that is capable of processing 750 kilograms or more per year of nuclear fuel or spent nuclear fuel and that is designed to demonstrate the advanced nuclear fuel system component technologies described in subsection (b)(1)(A)(ii) and (iii) until 90 days after the report under subsection (c) has been transmitted to Congress.

SEC. 5. ADVANCED BIOFUEL TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for production of motor and other fuels from biomass.

(b) OBJECTIVES.—The Secretary shall design the program under this section to—

(1) develop technologies that would make ethanol produced from cellulosic feedstocks cost competitive with ethanol produced from corn by 2012;

(2) conduct research and development on how to apply advanced genetic engineering and bioengineering techniques to increase the efficiency and lower the cost of industrial-scale production of liquid fuels from cellulosic feedstocks; and

(3) conduct research and development on the production of hydrocarbons other than ethanol from biomass.

(c) INSTITUTION OF HIGHER EDUCATION GRANTS.—The Secretary shall designate not less than 10 percent of the funds appropriated under subsection (d) for each fiscal year to carry out the program for grants to competitively selected institutions of higher education around the country focused on meeting the objectives stated in subsection (b).

(d) AUTHORIZATION OF APPROPRIATIONS.—From amounts authorized to be appropriated under section 931(c) of the Energy Policy Act of 2005 (42 U.S.C. 16231(c)), there are authorized to be appropriated to the Secretary to carry out this section—

(1) $150,000,000 for fiscal year 2007;

(2) $160,000,000 for fiscal year 2008; and

(3) $175,000,000 for fiscal year 2009.

SEC. 6. ADVANCED HYDROGEN STORAGE TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for technologies to enable practical onboard storage of hydrogen for use as a fuel for light-duty motor vehicles.

(b) OBJECTIVE.—The Secretary shall design the program under this section to develop practical hydrogen storage technologies that would enable a hydrogen-fueled light-duty motor vehicle to travel 300 miles before refueling.

SEC. 7. ADVANCED SOLAR PHOTOVOLTAIC TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced solar photovoltaic technologies.

(b) OBJECTIVES.—The Secretary shall design the program under this section to develop technologies that would—

(1) make electricity generated by solar photovoltaic power cost-competitive by 2015; and

(2) enable the widespread use of solar photovoltaic power.

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

(1) $148,000,000 for fiscal year 2007;

(2) $155,000,000 for fiscal year 2008;

(3) $165,000,000 for fiscal year 2009; and

(4) $180,000,000 for fiscal year 2010.

SEC. 8. ADVANCED WIND ENERGY TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced wind energy technologies.

(b) OBJECTIVES.—The Secretary shall design the program under this section to—

(1) improve the efficiency and lower the cost of wind turbines;

(2) minimize adverse environmental impacts; and

(3) develop new small-scale wind energy technologies for use in low wind speed environments.

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

(1) $44,000,000 for fiscal year 2007;

(2) $48,400,000 for fiscal year 2008;

(3) $53,240,000 for fiscal year 2009; and

(4) $58,564,000 for fiscal year 2010.

SEC. 9. CONTINUING PROGRAMS.

The Secretary shall continue to carry out the research, development, demonstration, and commercial application activities authorized in sections 921(b)(1) (for distributed energy), 923 (for micro-cogeneration technology), and 931(a)(2)(C), (D),and (E)(i) (for geothermal energy, hydropower, and ocean energy) of the Energy Policy Act of 2005.

SEC. 10. PLUG-IN HYBRID ELECTRIC VEHICLE TECHNOLOGY PROGRAM.

(a) SHORT TITLE.—This section may be cited as the "Plug-In Hybrid Electric Vehicle Act of 2006".

(b) DEFINITIONS.—In this section:

(1) BATTERY.—The term "battery" means a device or system for the electrochemical storage of energy.

(2) E85.—The term "E85" means a fuel blend containing 85 percent ethanol and 15 percent gasoline by volume.

(3) ELECTRIC DRIVE TRANSPORTATION TECHNOLOGY.—The term "electric drive transportation technology" means—

(A) vehicles that use an electric motor for all or part of their motive power and that may or may not use offboard electricity, including battery electric vehicles, hybrid electric vehicles, plug-in hybrid electric vehicles, flexible fuel plug-in hybrid electric vehicles, and electric rail; and

(B) related equipment, including electric equipment necessary to recharge a plug-in hybrid electric vehicle.

(4) FLEXIBLE FUEL PLUG-IN HYBRID ELECTRIC VEHICLE.—The term "flexible fuel plug-in hybrid electric vehicle" means a plug-in hybrid electric vehicle warranted by its manufacturer as capable of operating on any combination of gasoline or E85 for its onboard internal combustion or heat engine.

(5) HYBRID ELECTRIC VEHICLE.—The term "hybrid electric vehicle" means a vehicle that—

(A) can be propelled using liquid combustible fuel and electric power provided by an onboard battery; and

(B) utilizes regenerative power capture technology to recover energy expended in braking the vehicle for use in recharging the battery.

(6) PLUG-IN HYBRID ELECTRIC VEHICLE.—The term "plug-in hybrid electric vehicle" means a hybrid electric onroad light-duty vehicle that can be propelled solely on electric power for a minimum of 20 miles under city driving conditions, and that is capable of recharging its battery from an offboard electricity source.

(c) PROGRAM.—The Secretary shall conduct a program of research, development, demonstration, and commercial application on technologies needed for the development of plug-in hybrid electric vehicles and electric drive transportation, including—

(1) high capacity, high efficiency batteries, to—

(A) improve battery life, energy storage capacity, and power delivery capacity, and lower cost; and

(B) minimize waste and hazardous material production in the entire value chain, including after the end of the useful life of the batteries;

(2) high efficiency onboard and offboard charging components;

(3) high power drive train systems for passenger and commercial vehicles and for supporting equipment;

(4) onboard energy management systems, power trains, and systems integration for plug-in hybrid electric vehicles, flexible fuel plug-in hybrid electric vehicles, and hybrid electric vehicles, including efficient cooling systems and systems that minimize the emissions profile of such vehicles; and

(5) lightweight materials, including research, development, demonstration, and commercial application to reduce the cost of materials such as steel alloys and carbon fibers.

(d) PLUG-IN HYBRID ELECTRIC VEHICLE DEMONSTRATION PROGRAM.—

(1) ESTABLISHMENT.—The Secretary shall establish a competitive grant pilot demonstration program to provide not more than 25 grants annually to State governments, local governments and public entities, metropolitan transportation authorities, or combinations thereof to carry out a project or projects for demonstration of plug-in hybrid electric vehicles.

(2) APPLICATIONS.—

(A) REQUIREMENTS.—The Secretary shall issue requirements for applying for grants under the demonstration pilot program. The Secretary shall require that applications, at a minimum, include a description of how data will be—

(i) collected on the—

(I) performance of the vehicle or vehicles and the components, including the battery, energy management, and charging systems, under various driving speeds, trip ranges, traffic, and other driving conditions;

(II) costs of the vehicle or vehicles, including acquisition, operating, and maintenance costs, and how the project or projects will be self-sustaining after Federal assistance is completed; and

(III) emissions of the vehicle or vehicles, including greenhouse gases, and the amount of petroleum displaced as a result of the project or projects; and

(ii) summarized for dissemination to the Department, other grantees, and the public.

(B) PARTNERS.—An applicant under subparagraph (A) may carry out a project or projects under the pilot program in partnership with one or more private or nonprofit entities, which may include institutions of higher education, including Historically Black Colleges and Universities, Hispanic Serving Institutions, and other minority-serving institutions.

(3) SELECTION CRITERIA.—

(A) PREFERENCE.—When making awards under this subsection, the Secretary shall consider each applicant's previous experience involving plug-in hybrid electric vehicles and shall give preference to proposals that—

(i) provide the greatest demonstration per award dollar, with preference increasing as the number of miles that a plug-in hybrid electric vehicle can be propelled solely on electric power under city driving conditions increases; and

(ii) maximize the non-Federal share of project funding and demonstrate the greatest likelihood that each project proposed in the application will be maintained or expanded after Federal assistance under this subsection is completed.

(B) BREADTH OF DEMONSTRATIONS.—In awarding grants under this subsection, the Secretary shall ensure the program will demonstrate plug-in hybrid electric vehicles under various circumstances, including—

(i) driving speeds;

(ii) trip ranges;

(iii) driving conditions;

(iv) climate conditions; and

(v) topography,

to optimize understanding and function of plug-in hybrid electric vehicles.

(4) PILOT PROJECT REQUIREMENTS.—

(A) SUBSEQUENT FUNDING.—An applicant that has received a grant in one year may apply for additional funds in subsequent years, but the Secretary shall not provide more than $10,000,000 in Federal assistance under the pilot program to any applicant for the period encompassing fiscal years 2007 through fiscal year 2011.

(B) INFORMATION.—The Secretary shall establish mechanisms to ensure that the information and knowledge gained by participants in the pilot program are shared among the pilot program participants and are available to other interested parties, including other applicants.

(5) AWARD AMOUNTS.—The Secretary shall determine grant amounts, but the maximum size of grants shall decline as the cost of producing plug-in hybrid electric vehicles declines or the cost of converting a hybrid electric vehicle to a plug-in hybrid electric vehicle declines.

(e) COST SHARING.—The Secretary shall carry out the program under this section in compliance with section 988(a) through (d) and section 989 of the Energy Policy Act of 2005 (42 U.S.C. 16352(a) through (d) and 16353).

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

(1) for carrying out subsection (c), $250,000,000 for each of fiscal years 2007 through 2011, of which up to $50,000,000 may be used for the program described in paragraph (5) of that subsection; and

(2) for carrying out subsection (d), $50,000,000 for each of fiscal years 2007 through 2011.

SEC. 11. PHOTOVOLTAIC DEMONSTRATION PROGRAM.

(a) SHORT TITLE.—This section may be cited as the "Solar Utilization Now Demonstration Act of 2006" or the "SUN Act of 2006".

(b) IN GENERAL.—The Secretary shall establish a program of grants to States to demonstrate advanced photovoltaic technology.

(c) REQUIREMENTS.—

(1) ABILITY TO MEET REQUIREMENTS.—To receive funding under the program under this section, a State must submit a proposal that demonstrates, to the satisfaction of the Secretary, that the State will meet the requirements of subsection (g).

(2) COMPLIANCE WITH REQUIREMENTS.—If a State has received funding under this section for the preceding year, the State must demonstrate, to the satisfaction of the Secretary, that it complied with the requirements of subsection (g) in carrying out the program during that preceding year, and that it will do so in the future, before it can receive further funding under this section.

(3) FUNDING ALLOCATION.—Except as provided in subsection (d), each State submitting a proposal that meets the requirements under subsection (c) shall receive funding under the program based on the proportion of United States population in the State according to the 2000 census. In each fiscal year, the portion of funds attributable under this paragraph to States that have not submitted proposals that meet the requirements under subsection (c) in the time and manner specified by the Secretary shall be distributed pro rata to the States that have submitted proposals that meet the requirements under subsection (c) in the specified time and manner.

(d) COMPETITION.—If more than $80,000,000 is available for the program under this section for any fiscal year, the Secretary shall allocate 75 percent of the total amount of funds available according to subsection (c)(3), and shall award the remaining 25 percent on a competitive basis to the States with the proposals the Secretary considers most likely to encourage the widespread adoption of photovoltaic technologies. In awarding funds under this subsection, the Secretary may give preference to proposals that would demonstrate the use of newer materials or technologies.

(e) PROPOSALS.—Not later than 6 months after the date of enactment of this Act, and in each subsequent fiscal year for the life of the program, the Secretary shall solicit proposals from the States to participate in the program under this section.

(f) COMPETITIVE CRITERIA.—In awarding funds in a competitive allocation under subsection (d), the Secretary shall consider—

(1) the likelihood of a proposal to encourage the demonstration of, or lower the costs of, advanced photovoltaic technologies; and

(2) the extent to which a proposal is likely to—

(A) maximize the amount of photovoltaics demonstrated;

(B) maximize the proportion of non-Federal cost share; and

(C) limit State administrative costs.

(g) STATE PROGRAM.—A program operated by a State with funding under this section shall provide competitive awards for the demonstration of advanced photovoltaic technologies. Each State program shall—

(1) require a contribution of at least 60 percent per award from non-Federal sources, which may include any combination of State, local, and private funds, except that at least 10 percent of the funding must be supplied by the State;

(2) limit awards for any single project to a maximum of $1,000,000;

(3) prohibit any nongovernmental recipient from receiving more than $1,000,000 per year;

(4) endeavor to fund recipients in the commercial, industrial, institutional, governmental, and residential sectors;

(5) limit State administrative costs to no more than 10 percent of the grant;

(6) report annually to the Secretary on—

(A) the amount of funds disbursed;

(B) the amount of photovoltaics purchased; and

(C) the results of the monitoring under paragraph (7);

(7) provide for measurement and verification of the output of a representative sample of the photovoltaics systems demonstrated throughout the average working life of the systems, or at least 20 years;

(8) require that applicant buildings must have received an independent energy efficiency audit during the 6-month period preceding the filing of the application; and

(9) encourage Historically Black Colleges and Universities, Hispanic Serving Institutions, and other minority-serving institutions to apply for grants under this program.

(h) UNEXPENDED FUNDS.—If a State fails to expend any funds received under subsection (c) or (d) within 3 years of receipt, such remaining funds shall be returned to the Treasury.

(i) REPORTS.—The Secretary shall report to Congress 5 years after funds are first distributed to the States under this section—

(1) the amount of photovoltaics demonstrated;

(2) the number of projects undertaken;

(3) the administrative costs of the program;

(4) the amount of funds that each State has not received because of a failure to submit a qualifying proposal, as described in subsection (c)(3);

(5) the results of the monitoring under subsection (g)(7); and

(6) the total amount of funds distributed, including a breakdown by State.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for the purposes of carrying out this section—

(1) $50,000,000 for fiscal year 2007;

(2) $100,000,000 for fiscal year 2008;

(3) $150,000,000 for fiscal year 2009;

(4) $200,000,000 for fiscal year 2010; and

(5) $300,000,000 for fiscal year 2011.

SEC. 12. ENERGY EFFICIENT BUILDING GRANT PROGRAM.

(a) ENERGY EFFICIENT BUILDING PILOT GRANT PROGRAM.—

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Secretary shall establish a pilot program to award grants to businesses and organizations for new construction of energy efficient buildings, or major renovations of buildings that will result in energy efficient buildings, to demonstrate innovative energy efficiency technologies, especially those sponsored by the Department.

(2) AWARDS.—The Secretary shall award grants under this subsection competitively to those applicants whose proposals—

(A) best demonstrate—

(i) likelihood to meet or exceed the standards referred to in subsection (b)(2);

(ii) likelihood to maximize cost-effective energy efficiency opportunities; and

(iii) advanced energy efficiency technologies; and

(B) maximize the leverage of private investment for costs related to increasing the energy efficiency of the building.

(3) CONSIDERATION.—The Secretary shall give due consideration to proposals for buildings that are likely to serve low and moderate income populations.

(4) AMOUNT OF GRANTS.—Grants under this subsection shall be for up to 50 percent of design and energy modeling costs, not to exceed $50,000 per building. No single grantee may be eligible for more than 3 grants per year under this program.

(5) GRANT PAYMENTS.—

(A) INITIAL PAYMENT.—The Secretary shall pay 50 percent of the total amount of the grant to grant recipients upon selection.

(B) REMAINDER OF PAYMENT.—The Secretary shall pay the remaining 50 percent of the grant only after independent certification, by a professional engineer or other qualified professional, that operational buildings are energy efficient buildings as defined in subsection (b).

(C) FAILURE TO COMPLY.—The Secretary shall not provide the remainder of the payment unless the building is certified within 6 months after operation of the completed building to meet the requirements described in subparagraph (B), or in the case of major renovations the building is certified within 6 months of the completion of the renovations.

(6) REPORT TO CONGRESS.—Not later than 3 years after awarding the first grant under this subsection, the Secretary shall transmit to Congress a report containing—

(A) the total number and dollar amount of grants awarded under this subsection; and

(B) an estimate of aggregate cost and energy savings enabled by the pilot program under this subsection.

(7) ADMINISTRATIVE EXPENSES.—Administrative expenses for the program under this subsection shall not exceed 10 percent of appropriated funds.

(b) DEFINITION OF ENERGY EFFICIENT BUILDING.—For purposes of this section the term "energy efficient building" means a building that—

(1) achieves a reduction in energy consumption of—

(A) at least 30 percent for new construction, compared to the energy standards set by the 2004 International Energy Conservation Code (in the case of residential buildings) or ASHRAE Standard 90.1–2004; or

(B) at least 20 percent for major renovations, compared to energy consumption before renovations are begun;

(2) is constructed or renovated in accordance with the most current, appropriate, and applicable voluntary consensus standards, as determined by the Secretary, such as those listed in the assessment under section 914(b), or revised or developed under section 914(c), of the Energy Policy Act of 2005; and

(3) after construction or renovation—

(A) uses heating, ventilating, and air conditioning systems that perform at no less than Energy Star standards; or

(B) if Energy Star standards are not applicable, uses Federal Energy Management Program recommended heating, ventilating, and air conditioning products.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $10,000,000 for each of the fiscal years 2008 through 2012.

SEC. 13. ENERGY TECHNOLOGY TRANSFER.

Section 917 of the Energy Policy Act of 2005 (42 U.S.C. 16197) is amended to read as follows:

"SEC. 917. ADVANCED ENERGY EFFICIENCY TECHNOLOGY TRANSFER CENTERS.

"(a) GRANTS.—Not later than 18 months after the date of enactment of the Energy Research, Development, Demonstration, and Commercial Application Act of 2006, the Secretary shall make grants to nonprofit institutions, State and local governments, cooperative extension services, or universities (or consortia thereof), to establish a geographically dispersed network of Advanced Energy Efficiency Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers. In establishing the network, the Secretary shall consider the special needs and opportunities for increased energy efficiency for manufactured and site-built housing, including construction, renovation, and retrofit. In making awards under this section, the Secretary shall—

"(1) give priority to applicants already operating or partnered with an outreach program capable of transferring knowledge and information about advanced energy efficiency methods and technologies;

"(2) ensure that, to the extent practicable, the program enables the transfer of knowledge and information—

"(A) about a variety of technologies and

"(B) in a variety of geographic areas; and

"(3) give preference to applicants that would significantly expand on or fill a gap in existing programs in a geographical region.

"(b) ACTIVITIES.—Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use. Funds awarded under this section may be used for the following activities:

"(1) Developing and distributing informational materials on technologies that could use energy more efficiently.

"(2) Carrying out demonstrations of advanced energy methods and technologies.

"(3) Developing and conducting seminars, workshops, long-distance learning sessions, and other activities to aid in the dissemination of knowledge and information on technologies that could use energy more efficiently.

"(4) Providing or coordinating onsite energy evaluations, including instruction on the commissioning of building heating and cooling systems, for a wide range of energy end-users.

"(5) Examining the energy efficiency needs of energy end-users to develop recommended research projects for the Department.

"(6) Hiring experts in energy efficient technologies to carry out activities described in paragraphs (1) through (5).

"(c) APPLICATION.—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section. The application shall include, at a minimum—

"(1) a description of the applicant's outreach program, and the geographic region it would serve, and of why the program would be capable of transferring knowledge and information about advanced energy technologies that increase efficiency of energy use;

"(2) a description of the activities the applicant would carry out, of the technologies that would be transferred, and of any other organizations that will help facilitate a regional approach to carrying out those activities;

"(3) a description of how the proposed activities would be appropriate to the specific energy needs of the geographic region to be served;

"(4) an estimate of the number and types of energy end-users expected to be reached through such activities; and

"(5) a description of how the applicant will assess the success of the program.

"(d) SELECTION CRITERIA.—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

"(1) The ability of the applicant to carry out the proposed activities.

"(2) The extent to which the applicant will coordinate the activities of the Center with other entities as appropriate, such as State and local governments, utilities, universities, and National Laboratories.

"(3) The appropriateness of the applicant's outreach program for carrying out the program described in this section.

"(4) The likelihood that proposed activities could be expanded or used as a model for other areas.

"(e) COST-SHARING.—In carrying out this section, the Secretary shall require cost-sharing in accordance with the requirements of section 988 for commercial application activities.

"(f) DURATION.—

"(1) INITIAL GRANT PERIOD.—A grant awarded under this section shall be for a period of 5 years.

"(2) INITIAL EVALUATION.—Each grantee under this section shall be evaluated during its third year of operation under procedures established by the Secretary to determine if the grantee is accomplishing the purposes of this section described in subsection (a). The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for 3 additional years beyond the original term of the grant.

"(3) ADDITIONAL EXTENSION.—If a grantee receives an extension under paragraph (2), the grantee shall be evaluated again during the second year of the extension. The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for a final additional period of 3 additional years beyond the original extension.

"(4) LIMITATION.—No grantee may receive more than 11 years of support under this section without reapplying for support and competing against all other applicants seeking a grant at that time.

"(g) PROHIBITION.—None of the funds awarded under this section may be used for the construction of facilities.

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

"(1) ADVANCED ENERGY METHODS AND TECHNOLOGIES.—The term 'advanced energy methods and technologies' means all methods and technologies that promote energy efficiency and conservation, including distributed generation technologies, and life-cycle analysis of energy use.

"(2) CENTER.—The term 'Center' means an Advanced Energy Technology Transfer Center established pursuant to this section.

"(3) DISTRIBUTED GENERATION.—The term 'distributed generation' means an electric power generation technology, including photovoltaic, small wind and

micro-combined heat and power, that is designed to serve retail electric consumers on-site.

"(4) COOPERATIVE EXTENSION.—The term 'Cooperative Extension' means the extension services established at the land-grant colleges and universities under the Smith-Lever Act of May 8, 1914.

"(5) LAND-GRANT COLLEGES AND UNIVERSITIES.—The term 'land-grant colleges and universities' means—

"(A) 1862 Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601));

"(B) 1890 Institutions (as defined in section 2 of that Act); and

"(C) 1994 Institutions (as defined in section 2 of that Act).

"(i) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts otherwise authorized to be appropriated in section 911, there are authorized to be appropriated for the program under this section such sums as may be appropriated.".

SEC. 14. GREEN ENERGY EDUCATION.

(a) DEFINITION.—For the purposes of this section:

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

(2) HIGH PERFORMANCE BUILDING.—The term "high performance building" has the meaning given that term in section 914(a) of the Energy Policy Act of 2005 (42 U.S.C. 16194(a)).

(b) GRADUATE TRAINING IN ENERGY RESEARCH AND DEVELOPMENT.—

(1) FUNDING.—In carrying out research, development, demonstration, and commercial application activities authorized for the Department, the Secretary may contribute funds to the National Science Foundation for the Integrative Graduate Education and Research Traineeship program to support projects that enable graduate education related to such activities.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(c) CURRICULUM DEVELOPMENT FOR HIGH PERFORMANCE BUILDING DESIGN.—

(1) FUNDING.—In carrying out advanced energy technology research, development, demonstration, and commercial application activities authorized for the Department related to high performance buildings, the Secretary may contribute funds to curriculum development activities at the National Science Foundation for the purpose of improving undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings, including development of curricula, of laboratory activities, of training practicums, or of design projects. A primary goal of curriculum development activities supported under this section shall be to improve the ability of engineers, architects, and planners to work together on the incorporation of advanced energy technologies during the design and construction of high performance buildings.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(3) PRIORITY.—In awarding grants with respect to which the Secretary has contributed funds under this subsection, the Director shall give priority to applications from departments, programs, or centers of a school of engineering that are partnered with schools, departments, or programs of design, architecture, and city, regional, or urban planning, and due consideration to applications from Historically Black Colleges and Universities and other minority serving institutions.

SEC. 15. ARPA–E STUDY.

(a) IN GENERAL.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a detailed study of, and make further recommendations on, the October 2005 National Academy of Sciences recommendation to establish an Advanced Research Projects Agency-Energy (in this section referred to as ARPA–E).

(b) REPORT.—Not later than 12 months after the date of enactment of this Act, the Secretary shall transmit to Congress the study described in subsection (a) and the Secretary's response to the findings, conclusions, and recommendations of that study.

(c) TERMS OF REFERENCE.—The Secretary shall ensure that the study described in subsection (a) addresses the following questions:

(1) What basic research related to new energy technologies is occurring now, what entities are funding it, and what is preventing the results of that research from reaching the market?

(2) What economic evidence indicates that the limiting factor in the market penetration of new energy technologies is a lack of basic research on path-

breaking new technologies? What barriers do those trying to develop new energy technologies face during later stages of research and development?

(3) To what extent is the Defense Advanced Research Projects Agency an appropriate model for an energy research agency, given that the Federal Government would not be the primary customer for its technology and where cost is an important concern?

(4) How would research and development sponsored by ARPA–E differ from research and development conducted by the National Laboratories or sponsored by the Department through the Office of Science, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, the Office of Electricity Delivery and Energy Reliability, and the Office of Nuclear Energy?

(5) Should industry or National Laboratories be recipients of ARPA–E grants? What institutional or organizational arrangements would be required to ensure that ARPA–E sponsors transformational, rather than incremental, research and development?

SEC. 16. COAL METHANATION.

(a) PROGRAM.—The Secretary shall establish a program of research, development, demonstration, and commercial application of coal gasification facilities that convert coal into pipeline quality gaseous fuels for direct use or subsequent chemical or physical conversion.

(b) PROCEDURES.—The program established under subsection (a) shall be carried out using procedures described in title XVII of the Energy Policy Act of 2005.

SEC. 17. ALTERNATIVE BIOBASED FUELS AND ULTRA LOW SULFUR DIESEL.

(a) ALTERNATIVE FUEL AND ULSD INFRASTRUCTURE AND ADDITIVES RESEARCH AND DEVELOPMENT.—The Secretary, in consultation with the National Institute of Standards and Technology, shall carry out a program of research, development, demonstration, and commercial application of materials to be added to alternative biobased fuels and Ultra Low Sulfur Diesel fuels to make them more compatible with existing infrastructure used to store and deliver petroleum-based fuels to the point of final sale. The program shall address—

(1) materials to prevent or mitigate—

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

(B) dissolving of storage tank sediments;

(C) clogging of filters;

(D) contamination from water or other adulterants or pollutants;

(E) poor flow properties related to low temperatures;

(F) oxidative and thermal instability in long-term storage and use;

(G) increased volatile emissions;

(H) microbial contamination;

(I) problems associated with electrical conductivity; and

(J) increased nitrogen oxide emissions;

(2) alternatives to conventional methods for refurbishment and cleaning of gasoline and diesel tanks, including tank lining applications; and

(3) other problems as identified by the Secretary in consultation with the National Institute of Standards and Technology.

(b) SULFUR TESTING FOR DIESEL FUELS.—

(1) PROGRAM.—The Secretary, in consultation with the National Institute of Standards and Technology, shall carry out a research, development, and demonstration program on portable, low-cost, and accurate methods and technologies for testing of sulfur content in fuel, including Ultra Low Sulfur Diesel and Low Sulfur Diesel.

(2) SCHEDULE OF DEMONSTRATIONS.—Not later than 1 year after the date of enactment of this Act, the Secretary shall begin demonstrations of technologies under paragraph (1).

(c) STANDARD REFERENCE MATERIALS AND DATA BASE DEVELOPMENT.—Not later than 6 months after the date of enactment of this Act, the National Institute of Standards and Technology shall develop a physical properties data base and standard reference materials for alternative fuels. Such data base and standard reference materials shall be maintained and updated as appropriate as additional alternative fuels become available.

SEC. 18. BIOENERGY.

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

(1) in subsection (c)(1), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)";

(2) in subsection (c)(2), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)"; and

(3) in subsection (c)(3), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)".

(b) BIOENERGY PROGRAM.—Section 932(d)(1)(B) of the Energy Policy Act of 2005 (42 U.S.C. 16232(d)(1)(B)) is amended—

(1) by striking "and" at the end of clause (iii); and

(2) by adding after clause (iv) the following new clause:

"(v) biodegradable natural plastics from biomass; and".

II. PURPOSE OF THE BILL

The purpose of H.R. 5656, the Energy Research, Development, Demonstration, and Commercial Application Act of 2006, is to authorize energy research, development, and demonstration (RD&D) and commercial application programs, projects, and activities at the Department of Energy.

III. BACKGROUND AND NEED FOR THE LEGISLATION

Affordable energy is essential to the Nation's continued prosperity. Volatile world oil markets, along with soaring natural gas and electricity prices, have replaced the relatively low energy prices enjoyed over most of the two decades before the turn of the century. Recent events have illustrated the important connections between energy policy and national security policy. In addition, there are increasing concerns about the environmental impact of energy use. Consequently, energy is once again on the front burner of the Nation's agenda.

During the first session of the 109th Congress, the Committee on Science reported energy research, development, and demonstration (RD&D) authorizing legislation to the House that was enacted as part of the Energy Policy Act of 2005 (EPACT) (P.L. 109–58). Since enactment of EPACT, world events and changes in the global energy markets have heightened the need to develop alternatives to petroleum.

In February 2006, President Bush announced the Advanced Energy Initiative (AEI) that would accelerate RD&D on non-petroleum energy technologies, particularly clean coal technologies, advanced nuclear energy technologies, renewable energy technologies, and energy efficiency technologies. This legislation authorizes specific elements of the AEI and builds upon the President's proposal to accelerate the development of new energy technologies. For example, section 10 ramps up the RD&D on plug-in hybrid vehicle technology, a technology that has the potential to reduce oil demand by millions of barrels per day. Similarly, section 11 extends the reach of the President's Solar America Initiative (a portion of AEI) to demonstrate advanced solar photovoltaic technologies.

The legislation addresses other opportunities for oil savings, such as energy consumption in buildings. According to Department of Energy (DOE) 2003 statistics, buildings consume more energy than any other sector of the economy, including industrial processes and transportation. Buildings consume 39 percent of primary energy in the United States and 70 percent of electricity. Innovations in energy-efficient building technologies, materials, techniques and systems combined with advances in photovoltaic and other distributed clean energy technologies have the potential to dramatically transform the pattern of energy consumption associated with buildings.

These technologies—coupled with a whole building approach that optimizes the interactions among building systems and components—enable buildings to use considerably less energy, while also helping to meet national goals for sustainable development, environmental protection, and energy security.

IV. Summary of Hearings

During the 109th Congress, the House Committee on Science held the following hearings relevant to H.R. 5656:

On February 15, 2006, the Committee on Science held a hearing on "An Overview of the Federal R&D Budget for Fiscal Year 2007." Appearing as witnesses were (1) Dr. John H. Marburger III, Director, Office of Science and Technology Policy; (2) Dr. Samuel W. Bodman, Secretary, Department of Energy (DOE); (3) Dr. David A. Sampson, Deputy Secretary, Department of Commerce; (4) Dr. Arden Bement, Director, National Science Foundation; and (5) Dr. Charles E. McQueary, Under Secretary for Science and Technology, Department of Homeland Security.

On March 9, 2006, the Committee on Science held a hearing on "Should Congress Establish 'ARPA-E,' The Advanced Research Projects Agency—Energy?" Appearing as witnesses were (1) Dr. Steven Chu, Director, Lawrence Berkeley National Laboratory; (2) Dr. David Mowery, Hasler Professor of New Enterprise Development, Haas School of Business, University of California at Berkeley; (3) Dr. Frank L. Fernandez, President, F.L. Fernandez, Inc; (4) Dr. Catherine Cotell, Vice President for Strategy, University and Early Stage Investment, In-Q-Tel; and (5) Ms. Melanie Kenderdine, Vice President of Washington Operations, Gas Technology Institute.

During the 109th Congress, the Subcommittee on Energy of the House Committee on Science held the following hearings relevant to H.R. 5656:

On April 27, 2005, the Subcommittee on Energy held a hearing on "Priorities in the Department of Energy Budget for Fiscal Year 2006." Appearing as witnesses were (1) Dr. Raymond Orbach, Director of the Office of Science, DOE; (2) Mr. Douglas Faulkner, Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; (3) Mr. Mark Maddox, Principal Deputy Assistant Secretary for Fossil Energy, DOE; (4) Mr. Robert Shane Johnson, Deputy Director for Technology in the Office of Nuclear Energy, Science and Technology, DOE; and (5) Mr. Kevin Kolevar, Director Office of Electricity Delivery and Energy Reliability, DOE.

On June 16, 2005, the Subcommittee on Energy held a hearing on "Nuclear Fuel Reprocessing." Appearing as witnesses were (1) Mr. Robert Shane Johnson, Acting Director of the Office of Nuclear Energy, Science and Technology, and Deputy Director for Technology, DOE; (2) Dr. Phillip J. Finck, Deputy Associate Laboratory Director, Applied Science and Technology and National Security, Argonne National Laboratory; (3) Dr. Roger Hagengruber, Director of the Office for Policy, Security and Technology and Director of the Institute for Public Policy, University of New Mexico; and (4) Mr. Matthew Bunn, Senior Research Associate, John F. Kennedy School of Government, Harvard University.

On July 12, 2005, the Subcommittee on Energy held a hearing on "Economic Aspects of Nuclear Fuel Reprocessing." Appearing as

witnesses were (1) Dr. Richard K. Lester, Director of the Industrial Performance Center and Professor of Nuclear Science and Engineering, Massachusetts Institute of Technology; (2) Dr. Donald W. Jones, Vice President of Marketing and Senior Economist, RCF Economic and Financial Consulting, Inc; (3) Dr. Steve Fetter, Dean of the School of Public Policy, University of Maryland; and (4) Mr. Marvin Fertel, Senior Vice President and Chief Nuclear Officer, Nuclear Energy Institute.

On July 20, 2005, the Subcommittees on Energy and Research held a joint hearing on "Fueling the Future: On The Road To The Hydrogen Economy." Appearing as witnesses were (1) Mr. Douglas Faulkner, Acting Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; (2) Dr. David Bodde, Director of Innovation and Public Policy, International Center for Automotive Research, Clemson University; (3) Mr. Mark Chernoby, Vice President of Advanced Vehicle Engineering, DaimlerChrysler Corporation; (4) Dr. George Crabtree, Director of the Materials Science Division, Argonne National Laboratory; and (5) Dr. John Heywood, Director of the Sloan Automotive Laboratory, Massachusetts Institute of Technology.

On November 2, 2005, the Subcommittee on Energy held a hearing on "Winning Teams and Innovative Technologies from the 2005 Solar Decathlon". Appearing as witnesses were (1) Mr. Richard F. Moorer, Deputy Assistant Secretary for Technology Development, Office of Energy Efficiency and Renewable Energy, DOE; (2) Mr. David G. Schieren, Graduate Student and Energy Team Leader, Energy Management, New York Institute of Technology; (3) Mr. Jeffrey R. Lyng, Graduate Student and Team Project Manager, Civil, Environmental, and Architectural Engineering, University of Colorado; (4) Mr. Jonathan R. Knowles, Professor and Team Advisor, Department of Architecture, Rhode Island School of Design; and (5) Mr. Robert P. Schubert, Professor and Team Advisor, Department of Architecture, Virginia Polytechnic Institute.

On April 6, 2006, the Subcommittee on Energy held a hearing on "Assessing the Goals, Schedule and Costs of the Global Nuclear Energy Partnership." Appearing as witnesses were (1) Mr. Shane Johnson, Deputy Director for Technology, Office of Nuclear Energy Science and Technology, DOE; (2) Dr. Neil Todreas, Kepco Professor of Nuclear Engineering and Professor of Mechanical Engineering, Massachusetts Institute of Technology; (3) Dr. Richard Garwin, IBM Fellow Emeritus, Thomas J. Watson Research Center, Yorktown Heights, NY; and (4) Mr. David Modeen, Vice President and Chief Nuclear Officer, Electric Power Research Institute.

On May 17, 2006, the Subcommittee on Energy held a hearing on "The Plug-in Hybrid Electric Vehicle Act of 2006 (Discussion Draft)." Appearing as witnesses were (1) Mr. Roger Duncan, Deputy General Manager, Austin Energy; (2) Dr. Mark Duvall, Technology Development Manager for Electric Transportation & Specialty Vehicles, Science & Technology Division, Electric Power Research Institute; (3) Dr. Andrew Frank, Professor of Mechanical and Aeronautical Engineering, and the Director of the Hybrid Electric Vehicle Research Center, University of California, Davis; (4) Mr. John German, Manager of Environmental and Energy Analyses, American Honda Motor Company; (5) Dr. Cliff Ricketts, Professor of Agricultural Education, School of Agribusiness and

Agriscience, Middle Tennessee State University; and (6) Dr. Danilo Santini, Senior Economist, Energy Systems Division, Center for Transportation Research, Argonne National Laboratory.

On June 5, 2006, the Subcommittee on Energy held a hearing on "Assessing Progress in Advanced Technologies for Vehicles and Fuels." Appearing as witnesses were (1) Dr. James F. Miller, Manager of the Electrochemical Technology Program, Argonne National Laboratory; (2) Mr. Al Weverstad, Executive Director for Mobile Emissions and Fuel Efficiency, General Motors Public Policy Center; (3) Mr. Jerome Hinkle, Vice President of Policy and Government Affairs, National Hydrogen Association; (4) Dr. Daniel Gibbs, President, General Biomass Company; (5) Mr. Deron Lovaas, Vehicles Campaign Director, Natural Resources Defense Council; and (6) Mr. Philip G. Gott, Director for Automotive Custom Solutions, Global Insight.

V. Committee Actions

On June 21, 2006, Representative Judy Biggert, Chairman of the Subcommittee of Energy, introduced H.R. 5656, the Energy Research, Development, Demonstration, and Commercial Application Act of 2006, a bill to provide for Federal energy research, development, demonstration (RD&D) and commercial application activities, and for other purposes.

The Full Committee on Science met to consider H.R. 5656 on Tuesday, June 27, 2006 and considered the following amendments to the bill:

Mrs. Biggert offered a manager's amendment that made changes to various portions of the bill. The amendment, agreed to by voice vote, contained technical corrections and clarifying language, an amendment offered by Mr. Hall was included in the manager's amendment by unanimous consent, as well as the following substantive provisions:

- FutureGen—Revises this provision on the demonstration of a near zero-emissions coal-fired power plant by removing authorization of appropriations for funds already authorized in EPACT, while adding language on data protection and contributions from public and private sources.
- Advanced Nuclear Fuel Cycle—Focuses the provision on the analysis and plan for the advanced nuclear fuel cycle R&D program, and a report to Congress. It leaves intact the prohibition on certain large-scale demonstrations, while adding new language requiring cost analysis for the demonstration program, including for decommissioning and decontamination costs.
- Battery Technologies—Removes duplicative advanced battery technology language.
- Biofuel Technologies—Expands R&D on biofuels technology to include non-liquid motor fuels such as biobased methane, and requires a minimum 10 percent allocation for university research.
- Plug-in Hybrid Vehicle Technologies—Broadens scope of R&D provision to include technologies for electric drive transportation and broadens list of eligible applicants and partners for the demonstration program, including partners such as minority-serving institutions and other universities.
- Photovoltaic Technology Demonstration—Encourages minority-serving institutions to apply for grants under this program.

• Energy Efficient Building Grant Program—Provides a preference for applicants that can maximize the leverage of private investment in energy efficiency and instructs the Department of Energy to give due consideration to awards for energy efficient buildings that would be likely to serve low- and moderate-income populations.

• Energy Extension—Merges the energy extension language in Section 13 with an existing provision from EPACT—The Advanced Energy Efficiency Technology Transfer Centers in Section 917—to avoid duplication and maximize program effectiveness.

The following five amendments were considered en bloc and agreed to by a voice vote:

(1) Mr. Gordon offered an amendment to authorize RD&D and commercial application on materials to make bio-based transportation fuels more compatible with existing fuel storage and delivery equipment and a program of RD&D on methods to test sulfur content in fuel.

(2) Ms. Matsui offered an amendment to specify that the Secretary of Energy shall continue to carry out RD&D and commercial application on geothermal energy, hydropower, co-generation, and distributed energy production authorized in EPACT.

(3) Ms. Woolsey offered an amendment to require a higher energy efficiency standard for energy efficient buildings.

(4) Ms. Jackson-Lee offered an amendment to specify that, in awarding grants under the Green Energy Education provision, the Director of the National Science Foundation shall give due consideration to applications from Historically Black Colleges and Universities and other minority-serving institutions.

(5) Mr. Green offered an amendment to amend Section 932 of EPACT to include production of certain bio-products from biomass as an authorized activity of the bioenergy demonstration program authorized in that Act.

Mr. Baird offered an amendment to specify that the definition of an energy efficient building under Section 12 of the bill should require the use of heating, ventilation, and air conditioning systems that meet or exceed Energy Star efficiency standards. The amendment was agreed to by a voice vote.

Mr. Gordon offered an amendment to authorize a revolving loan fund for the purposes of improving the energy efficiency of federal buildings and for demonstration and commercial application of innovative energy technologies in federal buildings. The amendment was subsequently withdrawn following a colloquy between Mr. Gordon and Chairman Boehlert.

Mr. Gordon offered an amendment to establish an Advanced Research Projects Agency—Energy (ARPA–E) at DOE. The amendment was defeated by a voice vote.

Mr. Costello offered an amendment as substitute for Section 3 of the bill to give the Secretary of Energy authority to indemnify private sector participants in the FutureGen project and to reimburse private sector participants in the event of project termination. Mr. Costello asked for unanimous consent to withdraw the amendment and the amendment was withdrawn.

Mr. Costello offered an amendment to authorize RD&D and commercial application on coal gasification for ethanol production. The amendment was defeated by a voice vote.

With a quorum present, Mr. Gordon moved that the Committee favorably report the bill, H.R. 5656, as amended, to the House with the recommendation that the bill as amended do pass; that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes; and that the Chairman take all necessary steps to bring the bill before the House for consideration. The motion was agreed to by voice vote.

VI. Summary of Major Provisions of the Bill as Reported

Authorizes a project for research, development, and demonstration (RD&D) on advanced clean coal technology, including carbon capture and geological sequestration; requires a comprehensive analysis, plan and report to Congress for DOE's program of RD&D on advanced nuclear fuel cycle technologies; authorizes RD&D and commercial application programs on methane produced from coal, advanced biofuels technologies (including technologies for storage and delivery of biofuels, and biodegradable plastics from biomass to help advance bioenergy from cellulosic ethanol), advanced hydrogen storage technologies; advanced photovoltaic technologies; advanced wind energy technologies; and other renewable energy and energy efficiency technologies.

Authorizes a program of RD&D on technologies for plug-in hybrid electric vehicles; authorizes a program of grants to States for the demonstration of advanced photovoltaic solar energy technologies; authorizes a pilot program of grants for the demonstration of advanced energy efficiency technologies for buildings; authorizes a program of grants for advanced energy technology transfer centers to increase the efficiency of energy use; authorizes DOE and the National Science Foundation to collaborate on the solicitation and funding of grants related to clean energy and high-performance buildings.

Requires a National Academy of Sciences (NAS) study to elaborate on a 2005 NAS recommendation to establish an Advanced Research Projects Agency-Energy.

VII. Section-by-Section Analysis of the Bill as Reported

Sec. 1. Short title

"The Energy Research, Development, Demonstration, and Commercial Application Act of 2006"

Sec. 2. Definitions

Defines terms used in the text.

Sec. 3. FutureGen

Requires the Secretary of Energy to carry out a project to demonstrate the feasibility of the commercial application of advanced clean coal technology, including carbon capture and geological sequestration, for electricity generation.

Requires the Secretary to design the project to meet specific emissions goals and to demonstrate electricity production using advanced clean coal technology with carbon capture and geological sequestration at a cost not greater than 10 percent higher than current commercial integrated coal gasification combined cycle electric generating plants. Allows the Secretary to protect information asso-

ciated with the project and allows the Secretary to accept contributions from public and private sources to offset the share of Federal cost.

Sec. 4. Advanced fuel cycle technologies research, development, and demonstration plan

Requires the Secretary to develop a comprehensive modeling and simulation capability to analyze advanced nuclear fuel cycle systems, to use this capability to analyze possible advanced nuclear fuel cycle systems, and to use this analysis to develop a plan for advanced nuclear power technology RD&D activities.

Prohibits the Secretary from moving forward on some large-scale advanced nuclear fuel cycle technology demonstration projects until the advanced nuclear power technology RD&D plan is reviewed by the National Academy of Sciences (NAS), revised by the Secretary in light of the NAS findings and recommendations, and delivered to Congress.

Sec. 5. Advanced biofuel technologies

Requires the Secretary to carry out a program of RD&D and commercial application on motor and other fuels from biomass. Not less than 10 percent of funds appropriated to this program shall be competitively awarded to colleges and universities.

Authorizes appropriations to the Secretary to carry out this section from sums already authorized to be appropriated for bioenergy programs in EPACT.

Sec. 6. Advanced hydrogen storage technologies

Requires the Secretary to carry out a program of RD&D and commercial application on technologies to enable practical onboard storage of hydrogen for use as a fuel for light-duty motor vehicles.

Sec. 7. Advanced solar photovoltaic technologies

Requires the Secretary to carry out a program of RD&D and commercial application on advanced solar photovoltaic technologies.

Authorizes appropriations of $648 million over four years to the Secretary to carry out this section.

Sec. 8. Advanced wind energy technologies

Requires the Secretary to carry out a program of RD&D and commercial application on advanced wind energy technologies.

Authorizes appropriations of $204 million over four years to the Secretary to carry out this section.

Sec. 9. Continuing programs

Requires the Secretary to continue to carry out RD&D and commercial application on geothermal energy, hydropower, co-generation, and distributed energy production, as authorized in EPACT.

Sec. 10. Plug-in hybrid electric vehicle technology program

Short Title: this section may be cited as the "Plug-In Hybrid Electric Vehicle Act of 2006"

Defines terms used in this section.

Requires the Secretary to carry out a program of RD&D and commercial application on technologies needed to enable plug-in hybrid electric vehicles and electric drive transportation.

Establishes a competitive grant pilot program to provide up to 25 grants annually for demonstration of plug-in hybrid electric vehicles to State governments, local governments and public entities, metropolitan transportation authorities, or combinations thereof to carry out a project or projects for demonstration of plug-in hybrid electric vehicles.

Authorizes appropriations of $1.5 billion over five years to the Secretary to carry out this section.

Sec. 11. Photovoltaic demonstration program

Short Title: this section may be cited as the "Solar Utilization Now Demonstration Act of 2006" or the "SUN Act of 2006".

Requires the Secretary to establish a grant program to States for the demonstration of advanced photovoltaic solar energy technology. All States that meet the requirements of the program are eligible to receive funding. States are required to award funds in a competitive allocation to eligible recipients and to require a contribution of at least 60 percent per award from non-Federal sources, with at least 10 percent provided by States. No award may be more than $1 million, and unexpended funds will be returned to the Treasury after three years. Requires the Secretary to report to Congress on the costs and results of this program after five years.

Authorizes appropriations of $800 million over five years to the Secretary to carry out this section.

Sec. 12. Energy efficient building grant program

Establishes an energy efficient building pilot program to award grants to business and organizations for new construction of energy efficient buildings, or major renovations of buildings that will result in energy efficient buildings, and to demonstrate innovative energy efficiency technologies. Grants may be for up to 50 percent of design and energy modeling costs, not to exceed $50,000 per building. Fifty percent of the grant is available to the recipient upon selection through a competitive process, and the remaining 50 percent is available only after independent certification that operational buildings are energy efficient as defined in the bill. Requires the Secretary to report to Congress three years after first grant is awarded.

Authorizes appropriations of $50 million over five years to the Secretary to carry out this section.

Sec. 13. Energy technology transfer

Amends Section 917 of EPACT which requires the Secretary to distribute grants to establish a network of Advanced Energy Efficiency Technology Transfer Centers for the transfer of advanced energy technologies and methods to a wide range of energy end-users, including individuals, businesses and building and industrial professionals. Amendment specifies types of activities that may be funded, minimum criteria and priorities for qualifying applications, duration of funding, and grantee evaluation requirements.

Prohibits use of funds for construction of facilities.

Authorizes appropriation of such sums as may be necessary to the Secretary to carry out this section.

Sec. 14. Green energy education

Authorizes DOE's Office of Science and DOE's applied energy technology programs to contribute funds to the National Science Foundation's (NSF) Integrative Graduate Education and Research Traineeship (IGERT) program in support of projects related to the science and energy missions of the department.

Authorizes DOE high performance building technology programs to contribute to NSF's ongoing curriculum development activities for the purpose of improving undergraduate and graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings. Gives priority to applications from schools, departments or programs of engineering that are partnered with schools, departments or programs of design, architecture and city, regional, or urban planning and due consideration to applications from minority-serving institutions.

Sec. 15. ARPA–E study

Requires the Secretary to enter into an arrangement with NAS to conduct a detailed study of, and make further recommendations on, the October 2005 NAS recommendation to establish an Advanced Research Projects Agency—Energy (ARPA–E).

Requires the Secretary, not later than 12 months after the date of enactment of this Act, to transmit a report to Congress containing the NAS study and the Secretary's response to the findings, conclusions, and recommendations of that study.

Sec. 16. Coal methanation

Requires the Secretary to establish a program of RD&D and commercial application on facilities that convert coal into pipeline quality gaseous fuels for direct use or subsequent chemical or physical conversion.

Sec. 17. Alternative biobased fuels and ultra low sulfur diesel

Requires the Secretary to carry out a program of RD&D and commercial application on materials to be added to biobased fuels and ultra low sulfur diesel fuels to make them more compatible with existing fuel storage and delivery infrastructure.

Requires the Secretary to carry out a program of RD&D on methods to test sulfur content in fuels.

Requires the National Institute of Standards and Technology to develop a physical properties database and standard reference materials for alternative fuels.

Sec. 18. Bioenergy

Amends Section 932 of EPACT to require the Secretary to carry out RD&D and commercial application on certain bio-products from biomass.

Authorizes appropriations of $75 million over three years—FY07 to FY09—from within existing authorizations in EPACT.

VIII. COMMITTEE VIEWS

Section 3. FutureGen. The Committee believes that FutureGen, DOE's project to develop and demonstrate technologies for the capture and disposal of carbon dioxide, a greenhouse gas, from a commercial-scale coal-fueled power plant, is a critical element of DOE's Climate Change Technology Program. If successful, technology demonstrated by FutureGen could allow continued use of coal for electricity generation while significantly reducing air pollution and carbon dioxide emissions.

The bill requires the Secretary to choose a project design that will demonstrate that it will be possible for future plants to generate electricity based on the design and lessons learned from this project at a cost, including carbon sequestration capability, that is no greater than 10 percent above standard integrated gasification combined cycle electricity costs. However, it is not the expectation of the Committee that FutureGen, a first-of-a-kind facility, will necessarily be able to produce electricity at this cost.

The intent of the Committee is to support the FutureGen project without disturbing the negotiations currently underway between DOE and private-sector project participants. While the Committee was distressed to learn that DOE apparently circumvented normal competitive procurement procedures in this case by setting partnership criteria that only one organization could meet, this effort may be too important to the nation to require a new solicitation process and impose the associated delay. The Committee does not object to the Secretary selecting a design or site that would maximize the potential for future research projects on site upon completion of the demonstration.

Section 4. Advanced Fuel Cycle Technologies for Nuclear Power. The Committee supports the President's vision for U.S. leadership in developing advanced nuclear power technologies. The Committee is concerned, however, that DOE's proposed RD&D activities for advanced nuclear fuel cycle technologies included under the Global Nuclear Energy Partnership (GNEP) initiative are not sufficiently developed for Congress to act upon. In particular, the Committee is concerned that DOE has selected specific advanced nuclear fuel cycle technologies for large-scale, expensive demonstrations, including fast reactors and fuel fabrication facilities, without conducting the necessary analysis and without consulting a sufficiently wide range of technical experts.

A program of the size and scope that is proposed in DOE's fiscal year 2007 budget request requires rigorous justification of technology choices based on a comprehensive analysis of the entire fuel cycle. For example, DOE appears to have chosen a fast reactor to carry the entire transmutation burden in an advanced fuel cycle. Experts within and outside of DOE have estimated that such a fuel cycle could require one fast reactor to every three or four thermal reactors. The Committee has concerns about the commercial viability of such a reactor fleet. In addition to considering a range of fast reactor designs, the Committee expects DOE to consider the role of advanced thermal reactors that could be capable of carrying some of the transmutation burden at lower cost.

The Committee believes that an open process of broad consultation is essential for a major initiative, such as the nuclear power

technology RD&D components of the GNEP initiative, to succeed. A systematic process for seeking input from technical experts, industry, other entities and individuals interested in an expansion of domestic nuclear power would provide confidence to the Committees of jurisdiction in Congress that DOE's proposal for multi-billion dollar capital investments in large-scale engineering demonstration projects has been widely vetted.

For the future, the Committee believes that DOE should develop an ongoing long-range planning and prioritization process for nuclear energy RD&D modeled on planning and prioritization processes used by the Office of Science and other Federal science agencies, for science programs that require large-scale, complex RD&D facilities. Any such planning process should include a periodic review by an independent body, such as the NAS. The Committee suggests that, at an appropriate time after the NAS review required by this legislation, DOE consider entering into an arrangement with the NAS to conduct a decadal survey, such as those conducted for astronomy and other physical sciences sub-disciplines, of RD&D priorities for nuclear energy.

The Committee does not intend for the prohibition in subsection (d) to limit R&D or conceptual design work on any aspect of nuclear power technology. Nor does the Committee intend to slow or prevent progress on the Uranium Extraction plus (UREX+) demonstration facility, provided that such a demonstration is truly at engineering scale-that is, the minimum size required to predict with confidence all physical processes controlling the performance of a full-scale industrial facility. The Committee understands from a number of experts that an appropriate scale for such a facility is one with the capacity to process approximately 20–25 metric tons of spent nuclear fuel per year.

Section 9. Continuing Programs. It is the intent of the Committee that the programs authorized in EPACT shall continue to be supported by the Secretary. In authorizing programs included in the President's Advanced Energy Initiative (AEI), the Committee did not intend to endorse all program eliminations in the budget request for DOE. The Committee is concerned about the elimination of several renewable energy programs, including geothermal, hydropower, and ocean energy, where significant potential remains for DOE's programs to expand their contribution to our national energy needs. The Committee is also concerned that distributed energy research and development programs, including microcogeneration technology, by being placed in the Office of Electricity Delivery and Energy Reliability, will lose priority to the grid security mission that drives this Office. Distributed energy programs remain a priority for the Committee because of the potential of distributed energy technologies to better manage energy supply and demand.

The Committee intends that DOE, as the central repository of information and expertise on energy matters with a national perspective, should continue to support federal, regional, and state efforts to develop and deploy the full range of renewable energy technologies. DOE should continue to make use of expertise at the National Laboratories to support these efforts. The Committee believes that DOE, in supporting future state and regional efforts, should continue to maintain key competencies in resource assess-

ment, technology characterization, research coordination and planning, and similar activities needed to support federal, regional, and state efforts to develop and transfer new technologies.

Section 10. Plug-in Hybrid Electric Vehicle Technology Program. The Committee's objective in this section is to encourage the development of plug-in hybrid electric vehicles and related advanced vehicle technologies to a sufficient degree to enable their entry into the consumer marketplace. Plug-in hybrid electric vehicles can reduce demand for oil by transferring some of the energy demand for transportation to the electric grid, typically at night, when the grid is operating well below capacity. As the number of plug-in hybrid electric vehicles on the road increases, the demand for petroleum consumed by cars will decrease, as will U.S. dependence on foreign sources of oil. The R&D portion of this section will help advance the development of technology components required for plug-in hybrid electric vehicles, including battery technologies, power electronics, and charging components. In addition, these technologies may be able to serve a variety of transportation needs and other purposes, including medium- and heavy-duty trucks, and a variety of special-purpose vehicles. The authority granted in the legislation is intended to be broad enough to allow the Secretary to pursue promising R&D identified by DOE as offering significant potential for future oil savings.

The Committee has defined a plug-in hybrid electric vehicle as a light-duty vehicle capable of traveling a minimum of twenty miles on a single recharge, under city driving conditions, using energy solely from the battery; this can also be referred to as twenty "electric-only" miles. This definition was necessary to create a minimum threshold of eligibility for the demonstration program. The Committee understands that plug-in hybrid electric vehicles capable of traveling for twenty miles on battery power alone may not be operated that way and that other modes of operation could offer greater potential for oil savings.

The Committee recognizes the significant advances in battery technology that have been achieved through DOE's Advanced Vehicle Battery Technology program, and understands that there is a technical continuum between hybrid electric vehicle batteries and plug-in hybrid electric vehicle batteries. Therefore, the Committee encourages DOE to maintain and expand its current programs with the objective of efficiently managing both hybrid electric vehicle and plug-in hybrid electric vehicle programs in a manner that will optimize synergies and avoid duplication.

To create an incentive for the demonstration of plug-in hybrid electric vehicle technologies with the greatest potential for oil savings, the bill specifies a preference for grant applications that propose to demonstrate a higher "electric-only" range. However, in addition to advancing technologies needed for plug-in hybrid electric vehicles, the Committee believes that the objective of the demonstration program is to gather data on real-world operation of vehicles that consumers would like to drive. Therefore, the Committee intends for DOE to select projects for demonstration that will use vehicles with standard features and characteristics that would make the vehicles attractive to consumers absent the equipment being demonstrated.

The Committee also expects that the program will focus funding on technologies capable of achieving greater than 30 percent power capture from regenerative braking.

The Committee believes that the lightweight materials RD&D and commercial application program authorized in this section should focus on materials that will reduce vehicle weight and increase fuel economy while maintaining safety. Similar to the program in subsection (d), the Committee expects that other vehicles, including medium and heavy-duty vehicles, will benefit from the lightweight materials RD&D program.

While the Secretary is provided the discretion to determine the grant amount needed, the Committee expects that the grant amount will equal no more than the marginal amount needed to provide sufficient incentive for State and local governments to participate in the demonstration program.

The Committee expects the Secretary to require that information and knowledge gained by the participants in the pilot program be summarized and provided to any interested party. The Committee expects that DOE will be the central clearinghouse and repository for that data.

Section 11. Photovoltaic Demonstration Program. The Committee has a strong interest in solar technologies and feels that the benefits of using photovoltaics are worthy of significant increases in Federal investment, especially in light of foreign competition. With the level of funding authorized in this section, the Secretary should be able to demonstrate an aggregate of at least 300 megawatts of power. The benefits of the solar demonstration program include the production of electricity at periods of peak demand, which could reduce the price of electricity for all customers, with minimal environmental impact, and the reduction of natural gas consumption. By conducting the demonstration program through the States, the Committee believes that individual demonstrations can best be targeted to specific needs and opportunities in each region of the country.

The States are required to submit proposals to be eligible for the program, which along with the required 10 percent State cost-share, ensures that the States are committed to the goals of the program. For those States failing to submit qualifying proposals, the unclaimed funds will be distributed pro rata to those States that have submitted qualifying proposals. If sufficient funds are appropriated, then the Secretary shall allocate 25 percent of the available funds through a national competition, based on the quality of the proposals submitted by the States that qualify for the program. The Secretary should support demonstrations that focus on newer materials and technologies in the devices; the Committee expects that the program will be used by the Secretary to fund various types of solar photovoltaic technologies, such as wafer-based silicon (single- and multi-crystalline) photovoltaic modules and thin-film (polycrystalline cadmium telluride, copper indium gallium di-selenide, and amorphous silicon) photovoltaic modules.

Section 12. Energy Efficient Building Grant Program. The Committee views the pilot energy efficient building grant program in this section as a means to promote demonstration and commercial application of innovative energy technologies, to encourage energy efficiency in buildings, and to inform the building design, construc-

tion, and real estate sectors about opportunities for energy efficiency. The Committee expects that the Secretary will establish guidelines for this program within six months of enactment of this Act, and will issue the first solicitation for grant proposals within one year. Furthermore, the Committee intends for the Secretary to consider a broad range of applicants, including owners of commercial, institutional, public, and residential buildings. Finally, in paragraph (4)(B), the Committee expects that the independent certification organization will have procedures for obtaining data, and that a summary of such procedures will be appended to the report to Congress required in paragraph (5). The Committee expects the Secretary to ensure, to the extent practicable, that program funds are targeted to participants that would otherwise not incorporate energy efficient design in their buildings.

Section 13. Energy Extension. The Committee is concerned that the Federal government does not sufficiently assist in helping to transfer and provide education on energy efficiency and distributed clean energy technologies, developed by DOE and at the National Laboratories, to energy end-users. This section is not intended to create a new entity or bureaucracy within DOE but to encourage DOE to partner with existing community outreach networks, including, but not limited to, cooperative extension services and State Energy Offices that have a history of transferring knowledge and technologies through educational activities, to achieve the aforementioned objective. The Committee intends that DOE not fund the creation of entirely new outreach networks under this Act, although the Committee does recognize that existing networks may need to be expanded to bring in appropriate energy expertise and partners. Grantees are encouraged, for example, to work with, and through, utilities to carry out informational activities for energy end-users.

With respect to subsection 13(g), the Committee intends that the construction prohibition apply only to the construction of buildings for the purpose of housing the Centers. Nothing in this subsection should be construed to prohibit leasing of facilities for Centers, nor the interior build-out, renovation, or adaptation of leased space to meet the needs of a Center. For example, the Committee intends that it would be permissible to build a wall for an educational exhibit showing high energy efficiency windows.

Section 14. Green Energy Education. The Committee intends this section to promote broad collaboration between universities and DOE applied energy technology programs. The Committee expects that the funding DOE provides to NSF for IGERT, authorized under this section, will come primarily from the fossil, nuclear, electricity delivery and energy reliability, and energy efficiency and renewable energy programs. The Committee does not intend for the energy technology offices to shift their responsibility of partnering with universities to cultivate the next generation of energy technology experts to the Office of Science.

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 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. 5656 contains new budget authority and new credit authority but does not include changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 5656 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. Congressional Budget Office Cost Estimate

JULY 12, 2006.

Hon. SHERWOOD L. BOEHLERT,
Chairman, Committee on Science,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 5656, the Energy Research, Development, Demonstration, and Commercial Application Act of 2006.

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

Sincerely,

DONALD B. MARRON,
Acting Director.

Enclosure.

H.R. 5656—Energy Research, Development, Demonstration, and Commercial Application Act of 2006

Summary: H.R. 5656 would authorize appropriations for various research and development activities at the Department of Energy (DOE). Most of those activities would be related to energy efficiency and renewable energy technologies.

Assuming appropriation of the specified and estimated amounts, CBO estimates that implementing H.R. 5656 would cost $311 million in 2007 and about $3.2 billion over the 2007–2011 period. Enacting H.R. 5656 would not affect direct spending or revenues.

H.R. 5656 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA); the bill would benefit state, local, and tribal governments, and any costs they incur would result from complying with conditions of federal assistance.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 5656 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology) and 270 (energy).

	By fiscal year, in millions of dollars—					
	2006	2007	2008	2009	2010	2011
SPENDING SUBJECT TO APPROPRIATION						
Spending Under Current Law for Energy Efficiency, Renewable Energy Technology, and Nuclear Fuel Cycle Technology Programs:						
Budget Authority	672	0	0	0	0	0
Estimated Outlays	618	348	97	34	0	0
Proposed Changes:						
Estimated Authorization Level	0	692	773	853	749	610
Estimated Outlays	0	311	625	763	790	698

	By fiscal year, in millions of dollars—					
	2006	2007	2008	2009	2010	2011
Spending Under H.R. 5656 for Energy Efficiency, Renewable Energy Technology, and Nuclear Fuel Cycle Technology Programs:						
Authorization Level	672	692	773	853	749	610
Estimated Outlays	618	659	721	796	790	698
Memorandum:						
Amounts Authorized for Bioenergy Programs	0	213	251	274	0	0

Basis of estimate: For this estimate, CBO assumes that H.R. 5656 will be enacted near the start of fiscal year 2007. We also assume that amounts authorized and estimated to be necessary will be appropriated for each fiscal year and that spending will follow historical patterns for ongoing or similar activities.

CBO estimates that H.R. 5656 would authorize the appropriation of $692 million in 2007 and nearly $3.7 billion over the 2007–2011 period for various research and development activities at DOE. Nearly all of those amounts would be specifically authorized for research, development, and demonstration activities related primarily to energy efficiency and renewable energy technologies. The bill would specify that a portion of amounts authorized to be appropriated under current law for bioenergy programs be used to support projects to develop certain fuels from biomass. The amounts authorized for such programs under H.R. 5656 would exceed current authorization levels, and we have included those amounts in this estimate.

CBO estimates that implementing the bill would cost $311 million in 2007 and nearly $3.2 billion over the next five years. Those amounts include:

- $136 million in 2007 and almost $1.3 billion over the 2007–2011 period for programs to develop technologies related to plug-in hybrid vehicles;
- $67 million in 2007 and $613 million over the 2007–2011 period to expand the use of solar photovoltaic power;
- $23 million in 2007 and $598 million over the 2007–2011 period for grants to states to demonstrate advanced photovoltaic technology;
- $68 million in 2007 and $476 million over the 2007–2011 period to develop technologies to produce certain fuels from biomass;
- $20 million in 2007 and $193 million over the 2007–2011 period to expand the use of wind energy technology;
- $33 million over the 2008–2011 period for grants to businesses and other organizations to enhance the energy efficiency of certain buildings, particularly those used by low and moderate income populations;
- $2 million in 2007 to analyze and report on alternative systems for processing spent nuclear fuel; and,
- $1 million in 2007 for DOE to study and recommend whether to establish an agency to oversee research on advanced energy projects.

The bill would authorize specific amounts for the first six items above; the last two were estimated by CBO.

Based on information from DOE and other affected agencies, CBO estimates that implementing other provisions of H.R. 5656

would have no significant impact on the federal budget. Those provisions would:

- Amend the Energy Policy Act of 2005 to specify certain bioenergy projects that would qualify for funds already authorized to be appropriated under that act;
- Clarify DOE's existing authority to issue loan guarantees to support projects designed to produce methane from coal;
- Specify new requirements for ongoing DOE programs related to coal gasification, advanced technologies for storing hydrogen, public outreach, and curriculum development; and,
- Require the National Institute of Standards and Technology to prepare reference materials related to certain alternative fuels.

Intergovernmental and private-sector impact: H.R. 5656 contains no intergovernmental or private-sector mandates as defined in UMRA. The bill would authorize research activities and grant funds that would primarily benefit institutions of higher education. Any costs they or state, local, or tribal governments might incur, including matching funds, would result from complying with conditions of federal assistance.

Estimate prepared by: Federal Costs: Megan Carroll. Impact on State, Local, and Tribal Governments: Lisa Ramirez-Branum. Impact on the Private Sector: Craig Cammarata.

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

XI. Compliance With Public Law 104–4

H.R. 5656 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

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

XIII. Statement on General Performance Goals and Objectives

The goal of H.R. 5656 is to advance research, development, demonstration, and commercial application of a broad suite of energy technologies that have the potential to enhance energy security, to reduce the environmental impact of energy use, and to improve our balance of trade by reducing our dependence on foreign fuels.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 5656.

XV. Federal Advisory Committee Statement

H.R. 5656 does not create any advisory committees.

XVI. Congressional Accountability Act

The Committee finds that H.R. 5656 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. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

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

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

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

ENERGY POLICY ACT OF 2005

* * * * * * *

TITLE IX—RESEARCH AND DEVELOPMENT

* * * * * * *

Subtitle A—Energy Efficiency

* * * * * * *

[SEC. 917. ADVANCED ENERGY EFFICIENCY TECHNOLOGY TRANSFER CENTERS.

[(a) GRANTS.—Not later than 18 months after the date of enactment of this Act, the Secretary shall make grants to nonprofit institutions, State and local governments, or universities (or consortia thereof), to establish a geographically dispersed network of Advanced Energy Efficiency Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers. In establishing the network, the Secretary shall consider the special needs and opportunities for increased energy efficiency for manufactured and site-built housing.

[(b) ACTIVITIES.—

[(1) IN GENERAL.—Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use.

[(2) ADVISORY PANEL.—Each Center shall establish an advisory panel to advise the Center on how best to accomplish the activities under paragraph (1).

[(c) APPLICATION.—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section.

[(d) SELECTION CRITERIA.—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

[(1) The ability of the applicant to carry out the activities described in subsection (b)(1).

[(2) The extent to which the applicant will coordinate the activities of the Center with other entities, such as State and local governments, utilities, and educational and research institutions.

[(e) COST-SHARING.—In carrying out this section, the Secretary shall require cost-sharing in accordance with the requirements of section 988 for commercial application activities.

[(f) ADVISORY COMMITTEE.—The Secretary shall establish an advisory committee to advise the Secretary on the establishment of Centers under this section. The advisory committee shall be composed of individuals with expertise in the area of advanced energy methods and technologies, including at least one representative from—

[(1) State or local energy offices;
[(2) energy professionals;
[(3) trade or professional associations;
[(4) architects, engineers, or construction professionals;
[(5) manufacturers;
[(6) the research community; and
[(7) nonprofit energy or environmental organizations.

[(g) DEFINITIONS.—For purposes of this section:

[(1) ADVANCED ENERGY METHODS AND TECHNOLOGIES.—The term "advanced energy methods and technologies" means all methods and technologies that promote energy efficiency and conservation, including distributed generation technologies, and life-cycle analysis of energy use.

[(2) CENTER.—The term "Center" means an Advanced Energy Technology Transfer Center established pursuant to this section.

[(3) DISTRIBUTED GENERATION.—The term "distributed generation" means an electric power generation facility that is designed to serve retail electric consumers at or near the facility site.

[(h) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts otherwise authorized to be appropriated in section 911, there are authorized to be appropriated for the program under this section such sums as may be appropriated.]

SEC. 917. ADVANCED ENERGY EFFICIENCY TECHNOLOGY TRANSFER CENTERS.

(a) GRANTS.—Not later than 18 months after the date of enactment of the Energy Research, Development, Demonstration, and Commercial Application Act of 2006, the Secretary shall make grants to nonprofit institutions, State and local governments, cooperative extension services, or universities (or consortia thereof), to establish a geographically dispersed network of Advanced Energy Efficiency Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers. In establishing the network, the Secretary shall consider the special needs and opportunities for increased energy efficiency for manufactured and site-built housing, including construction, renovation, and retrofit. In making awards under this section, the Secretary shall—

(1) give priority to applicants already operating or partnered with an outreach program capable of transferring knowledge and information about advanced energy efficiency methods and technologies;

(2) ensure that, to the extent practicable, the program enables the transfer of knowledge and information—

(A) about a variety of technologies and

(B) in a variety of geographic areas; and

(3) give preference to applicants that would significantly expand on or fill a gap in existing programs in a geographical region.

(b) ACTIVITIES.—Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use. Funds awarded under this section may be used for the following activities:

(1) Developing and distributing informational materials on technologies that could use energy more efficiently.

(2) Carrying out demonstrations of advanced energy methods and technologies.

(3) Developing and conducting seminars, workshops, long-distance learning sessions, and other activities to aid in the dissemination of knowledge and information on technologies that could use energy more efficiently.

(4) Providing or coordinating onsite energy evaluations, including instruction on the commissioning of building heating and cooling systems, for a wide range of energy end-users.

(5) Examining the energy efficiency needs of energy end-users to develop recommended research projects for the Department.

(6) Hiring experts in energy efficient technologies to carry out activities described in paragraphs (1) through (5).

(c) APPLICATION.—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section. The application shall include, at a minimum—

(1) a description of the applicant's outreach program, and the geographic region it would serve, and of why the program would be capable of transferring knowledge and information about advanced energy technologies that increase efficiency of energy use;

(2) a description of the activities the applicant would carry out, of the technologies that would be transferred, and of any other organizations that will help facilitate a regional approach to carrying out those activities;

(3) a description of how the proposed activities would be appropriate to the specific energy needs of the geographic region to be served;

(4) an estimate of the number and types of energy end-users expected to be reached through such activities; and

(5) a description of how the applicant will assess the success of the program.

(d) SELECTION CRITERIA.—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

(1) The ability of the applicant to carry out the proposed activities.

(2) The extent to which the applicant will coordinate the activities of the Center with other entities as appropriate, such as State and local governments, utilities, universities, and National Laboratories.

(3) The appropriateness of the applicant's outreach program for carrying out the program described in this section.

(4) The likelihood that proposed activities could be expanded or used as a model for other areas.

(e) COST-SHARING.—In carrying out this section, the Secretary shall require cost-sharing in accordance with the requirements of section 988 for commercial application activities.

(f) DURATION.—

(1) INITIAL GRANT PERIOD.—A grant awarded under this section shall be for a period of 5 years.

(2) INITIAL EVALUATION.—Each grantee under this section shall be evaluated during its third year of operation under procedures established by the Secretary to determine if the grantee is accomplishing the purposes of this section described in subsection (a). The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for 3 additional years beyond the original term of the grant.

(3) ADDITIONAL EXTENSION.—If a grantee receives an extension under paragraph (2), the grantee shall be evaluated again during the second year of the extension. The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for a final additional period of 3 additional years beyond the original extension.

(4) LIMITATION.—No grantee may receive more than 11 years of support under this section without reapplying for support and competing against all other applicants seeking a grant at that time.

(g) PROHIBITION.—None of the funds awarded under this section may be used for the construction of facilities.

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

(1) ADVANCED ENERGY METHODS AND TECHNOLOGIES.—The term "advanced energy methods and technologies" means all methods and technologies that promote energy efficiency and conservation, including distributed generation technologies, and life-cycle analysis of energy use.

(2) CENTER.—The term "Center" means an Advanced Energy Technology Transfer Center established pursuant to this section.

(3) DISTRIBUTED GENERATION.—The term "distributed generation" means an electric power generation technology, including photovoltaic, small wind and micro-combined heat and power, that is designed to serve retail electric consumers on-site.

(4) COOPERATIVE EXTENSION.—The term "Cooperative Extension" means the extension services established at the land-grant

colleges and universities under the Smith-Lever Act of May 8, 1914.

(5) LAND-GRANT COLLEGES AND UNIVERSITIES.—The term "land-grant colleges and universities" means—

(A) 1862 Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601));

(B) 1890 Institutions (as defined in section 2 of that Act); and

(C) 1994 Institutions (as defined in section 2 of that Act).

(i) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts otherwise authorized to be appropriated in section 911, there are authorized to be appropriated for the program under this section such sums as may be appropriated.

* * * * * * *

Subtitle C—Renewable Energy

SEC. 931. RENEWABLE ENERGY.

(a) * * *

* * * * * * *

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

(1) $213,000,000 for fiscal year 2007, of which $100,000,000 shall be for section 932(d)*, including $25,000,000 for section 932(d)(1)(B)(v)*;

(2) $251,000,000 for fiscal year 2008, of which $125,000,000 shall be for section 932(d)*, including $25,000,000 for section 932(d)(1)(B)(v)*; and

(3) $274,000,000 for fiscal year 2009, of which $150,000,000 shall be for section 932(d)*, including $25,000,000 for section 932(d)(1)(B)(v)*.

* * * * * * *

SEC. 932. BIOENERGY PROGRAM.

(a) * * *

* * * * * * *

(d) INTEGRATED BIOREFINERY DEMONSTRATION PROJECTS.—

(1) IN GENERAL.—The Secretary shall carry out a program to demonstrate the commercial application of integrated biorefineries. The Secretary shall ensure geographical distribution of biorefinery demonstrations under this subsection. The Secretary shall not provide more than $100,000,000 under this subsection for any single biorefinery demonstration. In making awards under this subsection, the Secretary shall encourage—

(A) the demonstration of a wide variety of lignocellulosic feedstocks;

(B) the commercial application of biomass technologies for a variety of uses, including—

(i) * * *

* * * * * * *

(iii) substitutes for petroleum-based feedstocks and products; [and]

* * * * * * *

(v) biodegradable natural plastics from biomass; and

* * * * * * *

XIX. COMMITTEE RECOMMENDATIONS

On June 27, 2006, a quorum being present, the Committee on Science favorably reported H.R. 5656, as amended, by a voice vote, and recommended its enactment.

XX. COMMITTEE CORRESPONDENCE

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE
SUITE 2320 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
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http://www.house.gov/science/welcome.htm

July 28, 2006

The Honorable Howard P. "Buck" McKeon
Chairman
Committee on Education and the Workforce
2181 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Thank you for your letter regarding the consideration of H.R. 5656, the Energy Research, Development, Demonstration, and Commercial Application Act of 2006. I appreciate your waiving your Committee's right to a referral on this bill so that it can move expeditiously to the floor.

I recognize your Committee's jurisdiction over education provisions in Section 14 of the bill as reported and will support any request you may make to have conferees on H.R. 5656 or similar legislation. The exchange of letters between our two committees will be included in the Committee report on H.R. 5656 and will be made part of the floor record.

Thank you for your attention to this matter.

Sincerely,

SHERWOOD BOEHLERT
Chairman

cc: The Honorable John V. Sullivan

COMMITTEE ON EDUCATION
AND THE WORKFORCE
U.S. HOUSE OF REPRESENTATIVES
2181 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6100
MAJORITY (202) 225–4527
MINORITY (202) 225–3725
http://edworkforce.house.gov

July 28, 2006

The Honorable Sherwood Boehlert
Chairman, Committee on Science
2320 Rayburn HOB
Washington, D.C. 20515

Dear Chairman Boehlert:

I am writing to confirm our mutual understanding with respect to consideration of H.R. 5656, to provide for Federal energy research, development, demonstration, and commercial application, activities, and for other purposes. Education provisions in Section 14 of the bill as reported by your committee are within the jurisdiction of the Committee on Education and the Workforce.

Given the importance of moving this bill forward promptly, I will not request the sequential referral of H.R. 5656 to the Committee on Education and the Workforce. However, I do so only with the understanding that this procedural route should not be construed to prejudice the Committee on Education and the Workforce's jurisdictional interest and prerogative on these provisions or any other similar legislation and will not be considered as precedent for consideration of matters of jurisdictional interest to my Committee in the future.

Finally, I ask that you include a copy of our exchange of letters in the Committee Report on H.R. 5656. If you have questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Buck McKeon

HOWARD P. "BUCK" MCKEON
Chairman

cc:

The Honorable J. Dennis Hastert
The Honorable John A. Boehner
The Honorable George Miller
The Honorable John Sullivan

XXI. Additional Views

Additional Views of Hon. Bart Gordon

SECTION 15. ARPA–E

Section 15 of the bill as amended calls for the Secretary, through the National Academies of Science, to revisit the recommendation to create an Advanced Research Projects Agency for Energy (ARPA–E) set out in the October 2005 National Academies Report Rising Above the Gathering Storm, and report back to Congress on the findings and recommendations. It is important to compile a body of information and guidance to aid in the deliberative process of creating an ARPA–E. But reports are not action, and giving the Secretary another year to think about it will get us no closer to solving looming energy problems.

The language in H.R. 5656 raises valid questions about systemic gaps in the current energy R&D structure and how new efforts might augment the work in existing programs. I believe there is a fundamental disconnect between basic, generic energy research conducted largely by universities and government entities, and actual energy technology commercialization which is the prerogative of private industry. Basic research done in hopes of providing breakthroughs for future technology development entails high cost and a risk of failure that all but the largest private companies are unwilling to assume. ARPA–E is the third party that assumes a substantial part of that risk.

Program managers are the heart of DARPA. ARPA–E should have similar flexible authority to hire the right personnel, for specified tenures, that are conversant in both basic research and technology commercialization. Guided by broad strategic challenges, these program managers must be able to identify scientific discoveries, know how these can be translated into breakthroughs for energy technology, and then lay the groundwork between these areas. As a bare-bones organization with no in-house research capabilities of its own, Program Managers will look to government labs, universities and industry as operative components of the mission. There is no evidence that a similar integrative capability for energy technology exists anywhere in the government or industry.

DARPA is an organizational model; not a rigid framework that ARPA–E must adhere to. Indeed, the mission of ARPA–E and the structure and culture of the Department of Energy may prove parts of the DARPA model to be inapplicable. Therefore, I believe it is unwise for Congress to be highly prescriptive here. Though, there are elements of the DARPA model that are key to the success of ARPA–E, and one in particular that diverges from the recommendations in the National Academies report. The Director of

ARPA–E should answer directly to the Secretary of Energy, not to the Undersecretary for Science. Just as DARPA remained independent of the service branches, the role of ARPA–E would be compromised if it is beholden to the research needs of any one particular office within DOE. ARPA–E will be successful if it is an agile, risk-tolerant, malleable organization with the resources, authority and flexibility to respond quickly to great technical challenges within the long-term mission of building a more energy self-reliant nation.

SECTION 17. ALTERNATIVE BIOBASED FUELS AND ULTRA LOW SULFUR DIESEL

I offered this amendment, based on my bill H.R. 5658, and it was accepted in the committee markup. The next generation of fuels, such as ethanol and biodiesel, will present a number of economic and environmental benefits. But the physical and chemical properties of these advanced fuels are fundamentally different than those of conventional petroleum-based fuels. When introduced into the existing infrastructure, these fuels can experience a number of compatibility issues such as corrosion of tank and pipeline materials, increased sediment buildup, clogging of filters, water and microbial contamination, varying flow properties, thermal and oxidative instability, and emissions volatility.

Fuel retailers and distributors will have to have to undertake expensive reconditioning or installation of new infrastructure to accommodate ethanol and biodiesel, thus delaying market introduction of these important fuels. This section requires the Secretary, in consultation with the National Institutes of Standards and Technology, to research fuel additives, blend stocks, materials and alternative methods which can mitigate or preclude such infrastructure modifications.

This section also instructs the Secretary, in consultation with NIST, to develop portable, low-cost, and accurate methods for testing sulfur content in fuels. Federal requirements for Ultra Low Sulfur Diesel go into effect this year. As ULSD moves from the refinery through pipelines, tanks and trucks it absorbs residual sulfur left throughout the distribution infrastructure, resulting in fuel that exceeds EPA sulfur limits for ULSD. With ready access to sulfur testing equipment retailers and distributors will be able to verify that the fuel they receive and sell is compliant with these regulations.

This section also instructs NIST to develop for alternative fuels the same physical properties database and standard reference material that it does for any conventional fuel.

INNOVATIVE ENERGY TECHNOLOGIES FUND AMENDMENT

I offered and withdrew in Committee an amendment to establish at the Department of Energy a program to provide funding to DOE and other agencies to install and utilize innovative technologies that would reduce energy consumption and save the taxpayers money, especially those technologies developed with federal-funding. Under my program DOE could not only use funds from the program for qualified projects but also loan money to other agencies on better-than-market terms and conditions to assist them in

meeting energy reduction goals that were established in the Energy Policy Act of 2005.

This year I have either offered or had included an amendment to the appropriations bill that simply directs the agencies to adhere to buildings performance goals and reporting requirements of two public laws and one executive order. Its purpose is to bring attention to the priority Federal agencies should make in meeting their responsibilities to significantly reduce energy use in Federal buildings at a time when energy prices are soaring, and to put the Executive Branch on notice that the Congress expects it to undertake a serious effort in Fiscal year 2007 and future years to move aggressively to save energy in Federal buildings.

Adoption of the Science Committee amendment would have provided an additional means to sist federal agencies in meeting their energy reduction goals—goals that become harder to achieve as progress is made in reducing energy consumption. At some point the tried and proven methods, if properly implemented, will have achieved almost all of the energy savings possible. It's time to begin now to demonstrate innovative technologies that can produce additional savings in the next few years and see if they work. Not all new technologies will be successful, but there is great potential in finding and demonstrating new ones that can result in substantial additional savings in energy and taxpayer money.

I hope we will be able to agree on satisfactory language to establish Innovative Energy Technology Funds that can be included in any legislation that is enacted by the Congress this year.

BART GORDON.

ADDITIONAL VIEWS OF HON. JERRY F. COSTELLO

In the Committee's markup of H.R. 5656, I offered two amendments to improve the bill. My first amendment replaces the existing FutureGen authorization language in Section 3 with new language supported by the FutureGen Alliance, to authorize the FutureGen Initiative according to the goals and objectives set forth by the Department of Energy's plan submitted to Congress.

The reason I offered my amendment is because the FutureGen authorization, including the corrections made in the manager's amendment, deviates from the plan DOE sets forth and attempts to side-track the performance and economic goals of the project. I have been closely involved with FutureGen since the project was first proposed in 2003, and it is progressing well. While we worked hard to reach an agreement, there is serious concern on behalf of those involved in the project that the current language will impede our ability to ensure FutureGen reaches its goals and objectives. Developing the technologies to burn coal as cleanly as natural gas is extremely important for our future energy independence, and we must get this right.

I realize there was a good faith effort from the beginning to work through this language. However, the changes incorporated from the manager's amendment did not go far enough. For example, the DOE and the Alliance encouraged this Committee to include a section on insurance and indemnification because the DOE needs the authority to enter into contract agreements regarding the legal liability of the carbon sequestration portion of the project. This language was not accepted—not because there was disagreement over the policy—but instead, because it would trigger a referral to the Energy and Commerce Committee. Shying away from issues that are critical to the success of the project because of jurisdictional concerns does a disservice to those involved in trying to make this project succeed. Remaining silent and not taking any action, as this authorization does or even waiting for a period of time, increases the chances of schedule delays and confusion down the road. Given the goals and objectives FutureGen seeks to achieve and the potential benefits to consumers through cheaper energy and cleaner air, we should not be afraid to debate and discuss these tough issues.

The project is continuing along the roadmap DOE set forth, with the support of Congress, the FutureGen Alliance, and international contributors, and the benefit to the public stands to be significant. By eliminating environmental issues as barriers to coal use through the use of efficient generation technologies and carbon sequestration, FutureGen will enable the continued use of secure, domestic coal resources for our future energy needs. I remain committed to the FutureGen Initiative and am pleased with the progress in the past three years since President Bush proposed this

initiative. I believe FutureGen will be a stepping stone toward a cleaner, more energy-secure future.

The second amendment I offered provides grants to states to research, develop, and demonstration the feasibility of using coal gasification technology as the fuel source for ethanol production. There has been record growth in the U.S. ethanol industry over the past several years. Currently, the bulk of energy used to produce ethanol comes from natural gas and electricity. Coal, however, has the potential to significantly contribute to the process and deliver a wide array of benefits. Right now, barriers exist that limit the use of coal gasification as a fuel source in ethanol production. Research is needed to develop the knowledge base that will be needed to use coal gasification technology to power ethanol plants. While several companies are using coal fired co-generation plants in ethanol production, no company in the U.S. is using coal gasification technology. There is a legitimate need for my amendment in the coal and ethanol industries, and I encourage the Committee to embrace opportunities to further the applications for coal gasification, and its use in powering ethanol plants is a great fit for this technology.

We must maintain our efforts in critical research and development and demonstration programs through continued support of the federal government. Advancements in clean coal technologies and renewable fuels, such as ethanol, will improve the environment and reduce our dependence on foreign oil.

JERRY F. COSTELLO.

XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 5656, ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION ACT OF 2006

TUESDAY, JUNE 27, 2006

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

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

Chairman BOEHLERT. Good morning. The Committee on Science will come to order.

Pursuant to notice, the Committee on Science meets to consider the following measure: H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006.* I ask unanimous consent for the authority to recess the Committee at any point during consideration of these matters. Without objection, so ordered.

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

I want to welcome everyone here for this markup on the Science Committee's energy package, which has been skillfully assembled by our Energy Committee Chair, Mrs. Biggert.

As I think everyone knows, having reliable, affordable, clean domestic sources of energy is a must if our nation is to remain safe and prosperous in the future. To do that, we must invest in a balanced portfolio of energy research and development now, so that we have a balanced portfolio of energy sources in the future. And at the same time, we need to develop and promote ways to use these sources more wisely—an aspect of dealing with energy that once again will be conspicuously absent on the House Floor this week.

As usual, this committee is a model of what we should be doing. We have been working for weeks, negotiating on both sides of the aisle, to put forward a sensible comprehensive package that includes investments in clean coal, nuclear energy, and a variety of renewable energy sources, as well as energy efficiency.

I am going to highlight a few aspects of the bill and the manager's amendment now, so I won't have to say much later. We want to be done with this markup, hopefully, by noon.

The first several sections of the bill were originally introduced by Mrs. Biggert, and they are designed to embrace, build on, and guide the implementation of the President's Advanced Energy Initiative.

The language on FutureGen, which supports the project and also aims to ensure that the taxpayers will be getting something for their investments, will be revised in the manager's amendment by language negotiated with Mr. Costello and the Energy and Commerce Committee.

On the Global Nuclear Energy Partnership, the bill gives an amber light—embracing research, but requiring more analysis before large-scale demonstrations of fast reactors or a fuel test facility can proceed. The manager's amendment strips the language down to its bare essentials. This language will probably end up moving on the Floor separately from the rest of the bill, but we thought it was important to put the Committee on record on this program.

The biofuels section emphasizes the need to develop feedstocks other than corn, and the manager's amendment includes language suggested by Mr. Calvert to ensure university participation.

The plug-in hybrid section began as a bill introduced by Mr. Smith of Texas, and he is to be applauded for bringing forward this sensible R&D and demonstration program. Plug-ins have the potential to significantly increase auto and light truck mileage, and those vehicles account for about 40 percent of annual U.S. oil consumption.

Mr. Smith is also responsible for the solar energy demonstration program in the bill, which would help increase the use of that renewable source. The manager's amendment includes language suggested by Ms. Johnson to encourage participation by minority institutions.

Mrs. Biggert introduced the green building design grants and the energy extension portions of the bill, both of which should improve energy efficiency. The manager's amendment includes extension language negotiated with Mr. Miller to make the program consistent with language this committee included in last year's Energy Act.

Mr. McCaul, a very active freshman on this committee, introduced the language on green buildings education. We need to be sure we are training engineers and architects not to unthinkingly build buildings the same old way, when buildings could be so much more energy efficient.

Finally, the bill includes language to, in effect, send back to the National Academy of Sciences for further study the proposal to create an Advanced Research Projects Agency for Energy, or ARPA–E. We just don't think we know enough yet to determine whether an ARPA–E would contribute usefully to our energy future and, if so, how. The questions we raised at our hearing back in March remain unresolved after repeated meetings on the subject.

While ARPA–E is being studied, we will hardly be standing still with the programs in this bill and other efforts already underway. I urge support for the bill and the manager's amendment, which are models of balance and thoughtful policy.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

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As I think everyone knows, having reliable, affordable, clean domestic sources of energy is a must if our nation is to remain safe and prosperous in the future. To do that, we must invest in a balanced portfolio of energy research and development (R&D) now so that we have a balanced portfolio of energy sources in the future. And at the same time we need to develop and promote ways to use those sources more wisely—an aspect of dealing with energy that once again will be conspicuously absent on the House Floor this week.

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While ARPA–E is being studied, we will hardly be standing still with the programs in this bill and other efforts already under way. I urge support for the bill and the manager's amendment, which are models of balance and thoughtful policy.

Chairman BOEHLERT. The Chair is now pleased to recognize the distinguished gentleman from Tennessee, Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman, for the opportunity to consider this important legislation.

Whether we are speaking of increasing reliance on foreign sources of energy, looming environmental concerns, or the high cost of gas and electricity, Congress should respond with forward-looking, aggressive, and sensible energy legislation. The bill and manager's amendment before us today contain many important provisions, several from Democratic Members, and I thank the Chairman for working with us to include them.

I believe we have crafted provisions that accurately reflect our Members' concerns, while staying true to the intent and scope of the bill.

There are still issues left unresolved at this point, and I hope we can come to an agreement on how to handle them before the bill is considered on the Floor.

For example, Mr. Costello has sincere concerns about the way the FutureGen project is authorized in the bill.

And I personally believe that the Committee should be sending a stronger message than the bill contains today about the future of energy research, specifically, the establishment of an Advanced Research Projects Agency for Energy, or ARPA–E.

This follows direct recommendations of the National Academies of Science in the *Gathering Storm* report, which we all applauded, and I believe will be essential to the future of energy in the United States. We must begin to rethink and re-energize the way we approach energy, R&D, and technological development.

Mr. Chairman, with the Senate also including an ARPA–E provision in their competitiveness package, this will not be the last word you hear on the ARPA–E, and I look forward to future conversations with you in hopes that I might be able to change your enlightened mind on this important issue.

We on the Democratic side look forward to this markup, and working with you to move this legislation through Congress.

[The prepared statement of Mr. Gordon follows:]

PREPARED STATEMENT OF REPRESENTATIVE BART GORDON

Thank you, Mr. Chairman for the opportunity to consider this important legislation.

Whether we are speaking of our increasing reliance on foreign sources of energy, looming environmental concerns, or the high cost of gas and electricity, Congress should respond with forward-looking, aggressive, and sensible energy legislation.

The bill and manager's amendment before us today contain many important provisions, several from Democratic Members, and I thank the Chairman for working with us to include them.

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This follows direct recommendations of the National Academies of Science in the *Gathering Storm* report—which we all applauded—and I believe will be essential to the future of energy in the U.S.

We must begin to re-think and re-energize the way we approach energy R&D and technology development. Just yesterday the *Energy Daily* ran my op-ed calling for an ARPA–E, which I believe has the capacity to aid in major technological advancements, and possibly revolutionize energy as we know it.

Mr. Chairman, with the Senate also including an ARPA–E provision in their competitiveness package, this will not be the last word you hear on ARPA–E and I look forward to future debate in hopes that I might change your mind on this one.

We on the Democratic side look forward to this markup and to working with you to move this legislation through Congress.

Chairman BOEHLERT. Thank you very much, Mr. Gordon, and without objection, Members may place statements in the record at this point.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE LAMAR S. SMITH

Thank you, Mr. Chairman, for having this markup on the *Energy Research, Development, Demonstration and Commercial Application Act of 2006.*

This legislation contains two bills I have introduced: The *Plug-In Hybrid Electric Vehicle Act of 2006* and the *Solar Utilization Now (SUN) Act of 2006.*

Americans want lower gas prices, less dependence on foreign oil and a cleaner environment. These bills help achieve all three goals.

The "Plug-In Hybrid Vehicle Act" establishes a partnership between private and public entities to focus on electric drive technology.

The "SUN Act," is needed because part of the answer to our energy needs comes up every morning. Solar power is clean, plentiful, and generates zero emissions and zero waste.

The "SUN Act" encourages State governments and private industry to team up to apply for federal grants.

These two bills are good for our energy security, national security and environmental security and I appreciate their being included in this legislative package.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member.

Investments in energy research and the development of new technologies are strategies that will save America from its dependence on foreign oil.

What a sense of freedom we would have if our automobiles operated off hydrogen, ethanol, or some other renewable resource.

What money would be saved if all building construction incorporated solar panels, insulating glass and even more energy-saving features.

Our environment would certainly be better. The air would have less hydrocarbon pollution and greenhouse gases. Our oceans would not be subjected to oil spills or drilling.

It seems to me, Mr. Chairman, that forward-thinking plans such as H.R. 5656 will help America reach that ideal faster than any other strategy.

Mr. Chairman, I would like to thank you and the staff on both sides of the aisle for your work to consider and include several changes I suggested for this legislation.

For the section of the bill regarding Plug-In Hybrid vehicles, I thank you for adopting language specifying the inclusion of Historically Black Colleges and Universities, Hispanic Serving Institutions, or other Minority Serving Institutions as partners for the applicants in the demonstration program.

A second provision, which was also accepted, is in the photovoltaic demonstration program section of the bill. After some negotiations, I am pleased to know that the manager's amendment will include language indicating that the Secretary may give preference to minority-serving institutions.

A third change that was requested involved the Energy Efficient Building Pilot Grant Program.

This provision, which was also accepted into the manager's amendment, would specify that energy-efficient buildings designed to serve low and moderate income populations would be given "due consideration" by the Secretary. My thinking on this provision is that designs for subsidized housing and other such buildings should include the most cutting-edge energy efficiency technology. Those features will only save taxpayer dollars in the long run. I am happy to know that the Committee will accept this provision.

Finally, Mr. Chairman, I saw the Green Energy Education section of the bill as an opportunity to again specify that Black, Hispanic, and other minority-serving institutions should receive priority consideration for these education grants.

As you may know, these institutions produce a high percentage of minority students receiving advanced degrees in the sciences. For this reason, minority-serving institutions are worthy of extra attention by this committee and by the science policy community overall. My colleague, Representative Jackson Lee, has been an ardent advocate for these institutions, and she had a similar idea for an amendment to this section. I lend my support to that provision.

Again, Mr. Chairman, I appreciate your word that you would work with me, particularly on issues regarding minority participation in science, technology, engineering and math. I also thank the Ranking Member, who has always been an eager advocate and a good partner on this committee.

Over all, I am extremely pleased at the Committee's inclusion of my suggestions and feel a great victory has been won today for under-represented minorities.

Thank you, Mr. Chairman and Ranking Member. I yield back the balance of my time.

Chairman BOEHLERT. And before we proceed, I would like to take just a few seconds to acknowledge that Mr. McCaul has requested to be a co-sponsor of H.R. 5656, and we will make sure that happens before the report is filed. And if anybody else wants to jump aboard, you can.

We will now consider H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006.* And I recognize Mrs. Biggert to describe her bill.

Ms. BIGGERT. Thank you, Mr. Chairman, and thank you for holding this markup of H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act.*

Last year, Congress passed, and the President signed into law, the *Energy Policy Act of 2005,* or EPACT, the first comprehensive energy package enacted in well over a decade. Now, regardless of what my Science Committee colleagues might have thought of this bill in its entirety, I think it is safe to say that the bill's research and development provisions, crafted by this committee, were comprehensive and innovative, and therefore enjoyed broad bipartisan support in the Congress. The bill's R&D provisions are one of the major reasons I supported EPACT. I believe they put the United States on a path towards a more secure energy future by diversifying our energy supplies, improving efficiency, and reducing consumption through research and the use of technology.

That bill was just a first step, and nobody should expect our nation's energy problems to disappear overnight. High natural gas prices and the recent spike in gasoline prices serve as a stark reminder that the path to energy independence is a long and arduous one. To make significant progress down this path requires a steadfast commitment from Congress and the Federal Government to support the development of advanced energy technologies and alternative fuels that will help end our addiction to oil and gasoline.

The bill we are considering today includes provisions that do just that by building on the excellent R&D provisions this committee included in EPACT. As a matter of fact, some of the sections of this bill should be very familiar, as they were approved by this committee and the full House, as part of EPACT, but were not included in the final conference report enacted last August.

This is the case for section 11, creating an Advanced Solar Demonstration Program, and section 12, creating a grant program to encourage the design of energy efficient buildings. The remaining provisions reflect the latest research, the emergence of innovative technologies, and new ways of thinking about our power problems.

Sections 1 through 9 represent the fundamental components of the Advanced Energy Initiative, which the President outlined during this year's State of the Union address. They include sections to advance the development of biofuels from cellulosic feedstocks, or feedstocks other than corn, technologies for hydrogen storage onboard vehicles, new materials to enable the widespread use of solar power, and technologies that minimize the cost and environmental impact, and maximize the efficiency of harnessing the power of wind.

This bill also addresses two other major components of the President's Advanced Energy Initiative, FutureGen and the advanced fuel cycle R&D that is critical to the President's Global Nuclear Energy Partnership, or GNEP. With respect to FutureGen, section 3 of this bill codifies the emissions goals established by DOE for the project. It also directs the Secretary of Energy to use his judgment and discretion to strike the right balance between the use of experimental and readily available components in FutureGen. This will reduce the risk of the project, and ensure that FutureGen can be a model for the coal-fired power plant of the future.

As for advanced fuel cycle R&D, section 4 of this bill gives the Department some much-needed direction. As someone who supports the President's vision to revitalize the domestic nuclear power industry, and recognizes the many potential benefits of the advanced fuel cycle, I also recognize that it is a complex system with complex technologies. As the DOE proceeds with its research, it must be certain that all of the pieces of the complex system fit together and provide the benefits intended. The future of safe, efficient, and emissions-free nuclear power depends on it.

I believe it is only prudent to prohibit the DOE from constructing certain demonstration facilities until it has provided Congress the additional modeling, analysis, and planning necessary to us to make an informed decision about how best to proceed.

The rest of H.R. 5656 represents a compilation of a number of bipartisan bills introduced by Members of the Science Committee. I, too, want to join the Full Committee Chairman in commending our colleagues from Texas, Mr. Smith and Mr. McCaul, for their tremendous contributions to this bill.

Finally, section 15 of the bill requires the National Academy of Sciences to clarify its October 2005 *Gathering Storm* report recommendation that a DARPA-like entity be created at the DOE. I hope the Committee today will agree that we should not rush to create yet another possible duplicate of bureaucracy within DOE before getting more details from the NAS about its recommendation.

With that, I again thank the Chairman for holding this markup, and I would yield the balance of my time to my colleague from Texas, Mr. Smith.

[The prepared statement of Chairman Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Thank you, Mr. Chairman, and thank you for holding this markup of H.R. 5656, the Energy Research Act.

Last year, Congress passed and the President signed into law the *Energy Policy Act of 2005*, or EPACT, the first comprehensive energy package enacted in well over a decade. Now, regardless of what my Science Committee colleagues might have

thought of the bill in its entirety, I think it's safe to say that the bill's research and development provisions—crafted by this committee—were comprehensive and innovative and therefore enjoyed broad, bipartisan support in the Congress.

The bill's R&D provisions are one of the major reasons I supported EPACT. I believe they put the United States on a path toward a more secure energy future by diversifying our energy supplies, improving efficiency, and reducing consumption through research and the use of technology.

That bill was just the first step, and nobody should expect our nation's energy problems to disappear overnight. High natural gas prices and the recent spike in gasoline prices serve as a stark reminder that the path to energy independence is a long and arduous one. To make significant progress down this path requires a steadfast commitment from Congress and the Federal Government to support the development of advanced energy technologies and alternative fuels that will help end our addiction to oil and gasoline.

The bill we are considering today includes provisions that do just that, by building on the excellent R&D provisions this committee included in EPACT. As a matter of fact, some of the sections of this bill should be very familiar, as they were approved by this committee and the full House as part of EPACT, but were not included in the final conference report enacted last August. This is the case for Section 11, creating an advanced solar demonstration program, and Section 12, creating a grant program to encourage the design of energy efficient buildings.

The remaining provisions reflect the latest research, the emergence of innovative technologies, and new ways of thinking about our power problems.

Sections 1 through 9 represent the fundamental components of the Advanced Energy Initiative, which the President outlined during this year's State of the Union address. They include sections to advance the development of:

- Biofuels from cellulosic feedstocks, or feedstocks other than corn,
- Technologies for hydrogen storage onboard vehicles,
- New materials to enable the widespread use of solar power, and
- Technologies that minimize the cost and environmental impact and maximize the efficiency of harnessing the power of the wind.

This bill also addresses two other major components of the President's energy initiative, FutureGen and the advanced fuel cycle R&D that is critical to the President's Global Nuclear Energy Partnership, or GNEP.

With respect to FutureGen, Section 3 of this bill codifies the emissions goals established by DOE for the project. It also directs the Secretary of Energy to use his judgment and discretion to strike the right balance between the use of experimental and readily available components in FutureGen. This will reduce the risk of the project and ensure that FutureGen can be a model for the coal-fired power plant of the future.

As for advanced fuel cycle R&D, Section 4 of this bill gives the Department some much needed direction. As someone who supports the President's vision to revitalize the domestic nuclear power industry and recognizes the many potential benefits of the advanced fuel cycle, I also recognize that it is a complex system with complex technologies. As the DOE proceeds with its research, it must be certain that all the pieces of this complex system fit together and provide the benefits intended. The future of safe, efficient, and emissions free nuclear power depends on it. I believe it is only prudent to prohibit the DOE from constructing certain demonstration facilities until it has provided Congress the additional modeling, analysis, and planning necessary for us to make an informed decision about how best to proceed.

The rest of H.R. 5656 represents a compilation of a number of bipartisan bills introduced by Members of the Science Committee. I, too, want to join the Full Committee Chairman in commending our colleagues from Texas, Mr. Smith and Mr. McCaul, for their contributions to this bill.

Finally, Section 15 of the bill requires the National Academy of Sciences to clarify its October 2005 *Gathering Storm* report recommendation that a DARPA-like entity be created at the DOE. I hope the Committee today will agree that we should not rush to create yet another, possibly duplicative bureaucracy within DOE before getting more details from the NAS about its recommendation.

With that, I again want to thank the Chairman for holding this markup today. I urge my colleagues to support H.R. 5656, and I yield back the balance of my time.

Mr. SMITH. I thank the gentlewoman from Illinois for yielding me time, and I thank her for introducing this great piece of legislation, and I also thank the Chairman for having this markup on the *En-*

ergy Research, Development, Demonstration, and Commercial Application Act of 2006.

As the Chairman mentioned, this legislation contains two bills that I introduced, the *Plug-in Hybrid Electric Vehicle Act of 2006,* and the *Solar Utilization Now Act of 2006.*

Mr. Chairman, Americans want lower gas prices, less dependence on foreign oil, and a cleaner environment. These bills help achieve all three goals. The *Plug-in Hybrid Vehicle Act* establishes a partnership between private and public entities to focus on electric drive technology. The SUN Act is needed because part of the answer to our energy needs, in fact, comes up every morning. Solar power is clean, plentiful, and generates zero emissions and zero waste.

The SUN Act encourages State governments and private industry to team up to apply for federal grants. These two bills are good for our energy security, national security, and environmental security, and I appreciate, Mr. Chairman, their being included in this legislative package, and I will yield back the balance of my time.

Chairman BOEHLERT. I thank the gentleman for yielding, and I thank the distinguished Chair of the Subcommittee for her outstanding explanation.

The Chair now recognizes Mr. Miller for any remarks he might care to deliver.

Mr. MILLER. Thank you, Mr. Chairman.

I do want to seize this opportunity to celebrate my frequent agreements with the Chair of this committee, and with the Members of the majority of this committee.

I originally introduced as an amendment to the Energy Bill, what is now section 917 of the *Energy Policy Act of 2005.* The Chairman accepted that amendment originally, and then made it part of the base bill the next time that it came through this committee.

This bill, with the manager's amendment, makes improving changes to section 917, to make it an even more effective program. The purpose of the program is to encourage the real use, the use in the real world, of energy efficiency technologies that have been developed with, often, federally-funded research, the Department of Energy, but that has sat unused on the shelf.

Using those energy efficiency technologies offers the promise of immediate help with our problems, with our energy needs, our dependency, and we should be using every effort to try to make ourselves more energy independent. This would extend those ways of delivering energy conservation and efficiency programs to include cooperative extension services, which is a definite improvement, and important, that these energy efficiency technologies make their way into rural America.

And again, these improving changes came from the Republican side. There has never been a partisan divide over this position, over this program, but this program is now truly a bipartisan program. And I hope that these improving amendments that really do make the program much more comprehensive will send a message, will get the attention of the Department of Energy, and to the appropriators, that this program has to be funded.

The President's budget request failed to request funding for this program this year. The appropriators failed to include funding in this year's spending bills, despite my best efforts and many efforts to tug at someone's sleeve and get their attention, to try to include it in the appropriations bill. And I hope with a strong bipartisan effort next year, this program can be funded, and we can begin to make sure we get into practical use the energy efficiency technologies that we have developed.

Thank you again, Mr. Chairman, for working with me and working with others on this committee.

Chairman BOEHLERT. Thank you very much, Mr. Miller, and I just want you to know what a pleasure it is to work with you.

I would like to ask unanimous consent to add Mr. Green of Texas as a co-sponsor of H.R. 5656. Without objection, so ordered.

And it just makes me wonder how come Texans are so smart—Mr. McCaul and Mr. Green on a bipartisan basis have joined this love-in. Thank you very much. We do appreciate that.

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 the order of the roster. Without objection, that is so ordered.

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

Chairman BOEHLERT. The first amendment on the roster is the manager's amendment, offered by the gentlelady from Illinois, Mrs. Biggert.

The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Ms. Biggert of Illinois.

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

I recognize the gentlelady for five minutes.

Ms. BIGGERT. Thank you.

Chairman BOEHLERT. To explain the manager's amendment.

Ms. BIGGERT. Thank you, Mr. Chairman.

In addition to making a number of technical corrections to H.R. 5656, this manager's amendment also makes a number of improvements suggested by various Members of the Committee.

After insightful input from Mr. Costello and the FutureGen Alliance, which represents the private sector partners in the FutureGen project, this amendment substitutes section 3 of the bill with language that addresses their interests and concerns, and puts the project on a strong foundation.

More specifically, the amendment adds a provision to protect data collected as part of the FutureGen project, and authorizes contributions to the project from a wide variety of sources, including foreign nations and international companies, to offset the government's share of the total project costs.

At the suggestion of Ms. Johnson, this amendment clarifies that Historically Black Colleges and Universities, minority-serving institutions, and Hispanic Serving Institutions may be included in the State applications for the Solar Demonstration Program. The manager's amendment also clarifies that these institutions and other nonprofit organizations can partner with cities and states to demonstrate plug-in hybrid vehicles.

At the suggestion of Mr. Calvert, this amendment includes a provision requiring the DOE to engage university researchers in the development of advanced biofuels technologies, by requiring not less than 10 percent of the program's funding to be competitively awarded to colleges and universities. At the suggestion of Ms. Johnson, this amendment would modify the green buildings grant program to encourage DOE to fund projects that would serve low and moderate income populations.

At the suggestion of Mr. Miller of North Carolina, this amendment integrates section 917 of EPACT, which authorizes the creation of advanced energy efficiency technology transfer centers, with section 13 of this bill, which uses existing cooperative extension services and other outreach networks to encourage market adoption of the advanced energy technologies. The result of combining these programs will be far more likely to improve technology transfer than either program would on its own.

Finally, at the suggestion of Mr. Baird, this amendment clarifies that a professional engineer or other qualified professional may certify that a project meets the requirements of the green buildings grant program, thus making it eligible for the remainder of the grant payment.

I want to thank my colleagues for great ideas that make a good bill even better. I urge adoption of the manager's amendment, and I yield back the balance of my time.

Chairman BOEHLERT. Making a good bill even better prompted Mr. Green to come aboard, and thank you very much.

We have a late addition to the manager's amendment. Mr. Hall has an amendment, #12 on the roster, that he would like to include in the manager's amendment. I ask unanimous consent that Mr. Hall's amendment be considered part of the manager's amendment, and without objection, so ordered.

And it is my understanding that Mr. Hall would like a moment or two to explain it.

Mr. HALL. Or three.

Mr. Chairman, first, of course, I want to thank you, and I do want to strike the last word, and speak on a portion of the manager's amendment, which I, of course, support.

Thank you and the staff for working with me and with my staff to include my amendment into the manager's amendment. My amendment is simple. It simply ensures that gas, that coal gasification projects that produce methane, which is pipeline quality natural gas, are eligible for equal treatment under the loan guarantee provisions of the *Energy Policy Act.* And the Act currently covers other coal gasification projects.

The loan guarantee provisions of the *Energy Policy Act* clearly specify that they are intended to be useful to expedite the demonstration of coal gasification projects that produce syngas, which is composed primarily of hydrogen and carbon monoxide. Now, that is good, but we need to make sure also that projects that demonstrate the commercial application of technology that convert coal into natural gas are also eligible for the benefit and the very beneficial treatment provided in EPACT.

These technologies are capable of gasifying coals of many different types, Eastern coal, Western coal, bituminous coal, lignite,

and others. All are good feedstocks for these plants. This technology can play an important role in making more of our nation's abundant coal resource a significant part of our energy future, which it should be.

From a guy from the oil patch in Bush's energy of every type, I certainly recognize the value of coal, and this will be a good amendment.

I yield back my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Mr. Chairman,

I would like to thank you and the Committee staff for working with me to include my amendment into the manager's amendment.

My amendment is simple. It will ensure that coal gasification projects that produce methane, which is pipeline quality natural gas, are eligible for equal treatment under the loan guarantee programs of the Energy Policy Act. The act currently covers other coal gasification projects.

The loan guarantee provisions of the Energy Policy Act clearly specify that they are intended to be useful to expedite the demonstration of coal gasification projects that produce syngas which is composed primarily of hydrogen and carbon monoxide.

That is good, but we need to make sure that projects that demonstrate the commercial application of technology that converts coal into natural gas are also eligible for the beneficial treatment provided in EPACT.

These technologies are capable of gasifying coals of many different types—eastern coal, western coal, bituminous coal, lignite and others—are all good feedstock for these plants.

This technology can play an important role in making more of our nation's abundant coal resource a significant part of our energy future.

Thank you and I yield back my time.

Chairman BOEHLERT. Thank you very much, Mr. Hall.

Is there any further discussion of the manager's amendment, including the Hall amendment?

Mr. GORDON. Yes.

Chairman BOEHLERT. If not, the vote—Mr. Gordon.

Mr. GORDON. Mr. Chairman, let me just—I want to thank the Chairman and Chairwoman Biggert, and their staff, for working with the Democratic Members to incorporate language they feel makes the bill better.

Mr. Honda is satisfied that his concerns about cost implementations of the GNEP program would be fully considered in the Department's plan.

Mr. Baird sought to ensure private dollars are leveraged and professional energy audits are conducted in the building grant program. Ms. Johnson, working closely with Ms. Jackson Lee, fought for participation of historic black colleges and Hispanic and minority-serving institutions in several programs.

Mr. Miller stated very articulately earlier his concerns and improvements to the bill. And some of the concerns of Mr. Costello are addressed, but I do not believe it is adequate, and I will let him speak to that later.

Overall, the manager's amendment makes major improvements to the bill, and I support this adoption.

Chairman BOEHLERT. Thank you very much.

And the vote occurs on the manager's amendment. All in favor, say "aye." Aye. No, "no." The "aye's" have it, and the manager's amendment is agreed to.

Pursuant to discussions with Mr. Gordon and others in the minority, I propose that we vote on several amendments, which the Chair supports, en bloc. Therefore, I ask unanimous consent that the following, that following discussion on the amendments, the Committee vote on the following five amendments, which the Chair supports, en bloc: amendment #2, offered by Mr. Gordon; amendment #3, offered by Mrs. Matsui; amendment #4, offered by Ms. Woolsey; amendment #5, offered by Ms. Jackson Lee; and amendment #6, offered by Mr. Green. Without objection, so ordered.

We will proceed with the second amendment on the roster, offered by the gentleman from Tennessee, Mr. Gordon. Are you ready to proceed with your amendment?

Mr. GORDON. Thank you, Mr. Chairman, and let me first say that I think——

Chairman BOEHLERT. The Clerk will report.

The CLERK. Amendment to H.R. 5656, offered by Mr. Gordon of Tennessee.

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

And the gentleman is recognized for five minutes.

Mr. GORDON. Thank you, Mr. Chairman.

This amendment and the following four amendments from the Democratic Members were carefully negotiated by both Committee staffs, and I believe they accurately represent the goals of the Committee Democrats we can all agree with.

Our Members can speak for themselves, so I won't take that time. Let me quickly say a little about my amendment.

It addresses a looming problem with major economic implications. The physical properties of bio-based fuels, such as ethanol and biodiesel, are fundamentally different than petroleum-based fuels, for which the entire country's infrastructure is based.

When introduced into the existing infrastructure, these fuels experience a number of compatibility issues, such as corrosion of tank, pipeline materials, dislodging of sediment, and clogging filters, water contamination of fuels, and poor flow properties. The list of potential problems is actually quite long. Instead of asking fuel retailers and distributors to renovate or install new infrastructures to accommodate biofuels, research into fuel additives and alternative methods may show that such expensive changes may be mitigated or avoided altogether.

This amendment also instructs the Secretary, in consultation with NIST, to develop portable, low cost, and very accurate methods for testing sulfur content in fuels. Federal requirements for ultra-low sulfur diesel go into effect this year, and retailers and distributors should have a way to verify that the fuel they receive and sell is compliant with these regulations.

The amendment also instructs NIST to develop for alternative fuels the same physical properties database and standard reference material that it does for any conventional fuel.

I yield back my time.

Chairman BOEHLERT. I want to thank Mr. Gordon for his amendment. The Chair supports the amendment.

Next, we will proceed with the third amendment on the roster, offered by the gentlelady from California, Mrs. Matsui. Mr. Gordon, would you care to comment on that?

Mr. GORDON. Yes. Thank you, Mr. Chairman. Ms. Matsui presently is on the Floor dealing with a rule right now.

Her amendment is to ensure that the Department of Energy continues to—should I ask for a——

Chairman BOEHLERT. The Clerk will designate the amendment, please?

The CLERK. Amendment to H.R. 5656, offered by Ms. Matsui of California.

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

Continue, please, with your explanation.

Mr. GORDON. Thank you.

This amendment is to ensure that the Department of Energy continues to maintain core competencies in the range of renewable energy technologies, not just those mentioned specifically in this bill.

While this bill covers biomass, solar, wind, it does not mention other renewables, including geothermal, hydropower, and others. These important forms of energy production are already in use. They are not aspirational. So, it is essential that DOE be able to support their application at the regional, State, and local level.

These research and support capabilities should be housed within the National Lab System, so they can be assessed by the organizations and people that are on the ground developing and deploying these important technologies.

I understand the Chairman supports the amendment, and has agreed to work with Ms. Matsui on report language that will clarify the full intent of this amendment. I know she appreciates your willingness to do so, and I yield back the balance of my time.

Chairman BOEHLERT. Thank you very much. I want to thank Mrs. Matsui. I mean, she has hit the ground running. She is a new Member of the Committee, with other important responsibilities in the Congress as a Member of the Rules Committee, but she has been immersed from the beginning in this, and I thank her for the amendment. The Chair supports the amendment.

Next, we will proceed with the fourth amendment on the roster, offered by the gentlelady from California, Mrs. Woolsey. Are you ready to proceed?

Ms. WOOLSEY. Thank you, Mr. Chairman, I am, and I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Ms. Woolsey of California.

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

And the gentlelady is recognized.

Ms. WOOLSEY. Mr. Chairman, I ask unanimous consent to include all of my remarks into the record.

Chairman BOEHLERT. Without objection, so ordered.

Ms. WOOLSEY. And I am going to go very quickly and shortcut it.

As we know on this committee, H.R. 6, the *Energy Policy Act of 2005,* requires new federal buildings deemed energy efficient to exceed 30 percent of the latest efficiency standards. The base standard is one, by the way, that was set by the American Society of Heating, Refrigerating, and Air Conditioning Engineers.

However, this bill before us requires buildings to exceed the standard by only 25 percent, which of course, is a decrease over last year's energy bill, so my amendment would simply increase the definition of an energy efficient building from 25 percent to 30 percent, in accordance with the same standards.

And I hope the Committee will accept this amendment. I yield back, Mr. Chairman.

[The prepared statement of Ms. Woolsey follows:]

PREPARED STATEMENT OF REPRESENTATIVE LYNN WOOLSEY

Mr. Chairman, I would like to offer an amendment to the bill.

Thank you, Chairman Boehlert. I appreciate the Committee holding this markup today.

It is of critical importance that we promote a national energy policy that emphasizes clean, renewable technologies.

The people of the *Bay Area* district I represent—*Marin* and *Sonoma counties,* right across the *Golden Gate Bridge* from *San Francisco*—are keenly aware of the need to re-examine our national energy priorities.

For too long the U.S. has made shortsighted decisions about our energy future, putting our faith in *fossil fuels* as our primary energy source.

H.R. 5656 does much to promote national programs that develop alternative sources of energy, rather than continued reliance on petroleum.

My amendment to *H.R. 5656* would actually augment federal support for energy efficiency in buildings, by changing the definition of "energy efficiency" in the Energy Efficient Grants Program.

As Members of this committee know, *H.R. 6,* the *Energy Policy Act of 2005,* requires new federal buildings deemed "energy efficient" to exceed by *30 percent* the latest efficiency standards. (The base standard is the one set by the *American Society of Heating, Refrigerating, and Air Conditioning Engineers*.)

However, the bill before us today requires buildings to exceed this standard by only *25 percent*—a marked decrease from last year's energy bill.

My amendment would simply increase the definition of an energy efficient building from *25 percent* efficient to *30 percent* efficient in accordance with this same standard.

I hope the Committee will accept this amendment, which has been discussed with the Majority in advance.

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

Chairman BOEHLERT. I want to thank Mrs. Woolsey for her amendment. The Chair, indeed, does support the amendment.

Next, we will proceed with the fifth amendment on the roster, offered by the gentlelady from Texas, Ms. Jackson Lee. Are you ready to proceed?

The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Ms. Jackson Lee of Texas.

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

And the gentlelady is recognized.

Ms. JACKSON LEE. Thank you very much, Mr. Chairman.

I have been very impressed, and I ask unanimous consent that my entire statement be submitted into the record.

Chairman BOEHLERT. Without objection.

Ms. JACKSON LEE. By the interests of this committee in ensuring that the issues of science are broad-based, and that the constituency is broad-based.

Therefore, my amendment deals with awarding grants under the Green Energy and Education Provision, the Director of the National Science Foundation, to give due consideration to the broad-based numbers of minority institutions to ensure that they are both training new leaders in alternative fuel, as well as educating the population in the utilization of alternative fuel.

And I would ask for my colleagues to support this amendment.

Chairman BOEHLERT. Thank you very much, and the gentlelady is right. We do support her amendment.

Ms. JACKSON LEE. Thank you.

[The prepared statement of Ms. Jackson Lee follows:]

PREPARED STATEMENT OF REPRESENTATIVE SHEILA JACKSON LEE

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

Mr. Chairman, I would first like to thank my colleague, Mrs. Johnson, for working with me on her amendment that was included in the manager's amendment.

I have enjoyed working on this committee in large part because of the bipartisan efforts to encourage scientific innovation, as well as widen access to the science, engineering, technical, and mathematic fields for Americans who are underprivileged or disadvantaged.

Today I am introducing an amendment that will designate Historically Black Colleges and Universities and other Minority Serving Institutions as priority applicants for grant awards to undergraduate and graduate interdisciplinary engineering and architecture education related to the design and construction of high performance building. This "Green Energy Education" programming will teach young professional and students the important of design efficiency in addition to functionality. In addition, we must pursue this provision to continue to safeguard equal opportunities in fields of study and professions that have far too low of a minority ratio.

According to the National Center for Educational Statistics, Americans who are African-American, Hispanic, and Native American make up only 9.7 percent of the science and engineering workforce, compared to 16.8 percent of the entire U.S. labor force.

The National Science Foundation contends that although the proportions of women, blacks, and Hispanics in science and engineering occupations have continued to grow over time, there are still fewer numbers in science than their proportions of the population. In addition, the representation of African-Americans in science and engineering occupations increased from 2.6 percent in 1980 to 6.9 percent in 2000. The representation of Hispanics increased from 2.0 percent to 3.2 percent. However, for Hispanics, this is proportionally less than their increase in the population.

With these provisions, the door should be opened a few more inches. We want America's youth to find their way to engineering and the sciences.

I thank the Chairman and the Ranking Member, an I encourage my colleagues to support this amendment. I yield back the remainder of my time.

Chairman BOEHLERT. Next, we will proceed with the amendment, the sixth amendment on the roster, offered by the gentleman from Texas, Mr. Green. Are you ready to proceed?

Mr. GREEN. I am, Mr. Chairman, and Mr. Chairman, I have an amendment.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Mr. Green of Texas.

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

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

Mr. GREEN. Thank you, Mr. Chairman.

Mr. Chairman, I would like to thank you and the Ranking Member for your leadership on this most important piece of legislation. I would also like to thank our staffs for the outstanding effort that they have given to help us bring this piece of legislation to fruition.

Mr. Chairman, I am honored to be a part of this bipartisan effort to actively spearhead opportunities to diversify our energy portfolio, and to reduce our energy consumption through research, innovation, and implementation.

Today, we are taking great strides in achieving this mission, by moving forward H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006.*

My amendment seeks to enhance the potential economic benefits of biofuel refining, specifically, within the process of transforming switchgrass into cellulosic ethanol, a remarkable process, I might add.

Recently, scientists have been able to bioengineer biodegradable natural plastics in certain plants, and with additional federal assistance, there may come a time in the near future when these natural products, these plastics, can be engineered to grow in switchgrass. My amendment would specifically designate $25 million in funds from preexisting EPACT bioproducts authorizations for the research, development, demonstration, and commercialization of biodegradable natural plastics from switchgrass.

The co-production of natural plastics and ethanol from switchgrass will include the currently cost-prohibitive nature of cellulosic ethanol, lowering the price of cellulosic ethanol potentially, and by an estimated $0.30 to $0.40.

The American people are suffering an economic burden from our daily oil production and refinery deficits. The American people support our goals to supplement our fuel needs with renewable biofuels production. Corn ethanol may not meet all of these needs, and the onus is on us to ensure that corn ethanol production is supplemented by the production of cellulosic ethanol from materials such as switchgrass.

With the passage of my amendment, we are one step closer to reducing the CO_2 emissions and plastics pollutions in the environment. With the passage of my amendment, we are enhancing the capability to potentially expand ethanol supplies by as much as 14 billion gallons per year, which would save us 370 million barrels of oil per year, the equivalent of $26 billion spent annually on oil from overseas. With the passage of my amendment, we are fortifying our commitment to energy independence and affordability for the American people.

The time has come for us to actively work towards ensuring that the American people will never again feel the pain at the pumps they currently feel today. And I am proud that this committee is an active participant in striving for this relief.

I urge the adoption of my amendment, and I yield back the balance of my time.

[The prepared statement of Mr. Green follows:]

PREPARED STATEMENT OF REPRESENTATIVE AL GREEN

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

Mr. Chairman, first I would like to thank you and the Ranking Member for your leadership on this important piece of legislation. I would also thank our staffs for their efforts to bring this to fruition.

I am honored to be a part of this bipartisan effort to actively spearhead opportunities to diversify our energy portfolio and reduce our energy consumption through research innovation and implementation.

Today we are taking great strides in achieving this mission by moving forward H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006.*

My amendment seeks to enhance the potential economic benefits of biofuel refining, specifically within the process of transforming switchgrass into cellulosic ethanol—a remarkable accomplishment.

Recently, scientists have been able to bioengineer biodegradable natural plastics in certain plants, and with additional federal assistance, there may come a time in the near future when these natural plastics can be engineered to grow in switchgrass.

My amendment would specifically designate $25 million in funds from a pre-existing EPACT bioenergy authorization for the research, development, demonstration, and commercialization of biodegradable natural plastics from switchgrass.

The co-production of natural plastics and ethanol from switchgrass will improve the currently cost prohibitive nature of cellulosic ethanol, lowering the price of cellulosic ethanol potentially by an estimated 30–40 cents.

The American people are suffering an economic burden from our daily oil production and refinery deficits.

The American people support our goals to supplement our fuel needs with renewable biofuel production.

Corn ethanol may not meet all of these needs and the onus is on us to ensure that corn ethanol production is supplemented by the production of cellulosic ethanol from materials such as switchgrass.

With the passage of my amendment, we are one step closer to reducing certain CO_2 emissions and plastics pollution in the environment.

With the passage of my amendment we are enhancing the capability to potentially expand ethanol supplies by as much as 14 billion gallons per year, which would save us 370 million barrels of oil per year—the equivalent of $26 billion spent annually on oil from overseas.

With the passage of my amendment, we are fortifying our commitment to energy independence and affordability for the American people.

The time has come for us to actively work towards ensuring that the American people will never again have to feel the pain at the pumps as they do today, and I am proud that this committee is an active participant in striving for this relief.

I urge the adoption of my amendment, and I yield back the balance of my time.

Chairman BOEHLERT. I want to thank Mr. Green for his amendment. The Chair does, indeed, support that amendment.

As noted earlier, the Chair supports each of the five amendments just discussed. Is there further discussion on any of these amendments? If no——

Ms. JACKSON LEE. Would the gentleman yield?

Chairman BOEHLERT. The gentlelady.

Ms. JACKSON LEE. I just wanted to make sure that at the time that we discussed the Jackson Lee amendment, it was brought up. I didn't hear the Clerk, but I just wanted to make sure it was before us.

Chairman BOEHLERT. It was. We are all set.

Ms. JACKSON LEE. All right. Thank you.

Chairman BOEHLERT. We would not forget the Jackson Lee amendment.

If no, the vote occurs on the amendments, #2, 3, 4, 5, and 6, including the Jackson Lee amendment. All in favor, say "aye." Aye. Opposed, "no." The "aye's" have it, and the amendments are agreed to.

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

Mr. BAIRD. Mr. Chair, I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Mr. Baird of Washington.

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

The gentleman from Washington is recognized.

Mr. BAIRD. Mr. Chair, I will be very brief.

I want to begin by thanking you and Ranking Member Gordon for working with me on this bill, and of course, Congresswoman Biggert for introducing a bill to establish an energy efficient building grant program. I am an original co-sponsor of that bill, and appreciate her willingness to work with us on this.

Essentially, as I looked at the bill, and we have spent a great deal of time also studying energy efficient buildings, I became aware that we can improve the provisions for heating, ventilation, and air conditioning provisions, which consume, at least in many residential facilities, as much as 50 percent of energy, and therefore, this bill would address that problem, urge that Energy Star efficient heating, ventilation, and air conditioning material be included in green buildings. It has strong support, bipartisan support, and it has also been supported by the Sheet Metal, Air Conditioning, and Contractors Association.

I appreciate the gentlelady's willingness to include it, and would urge its passage.

[The prepared statement of Mr. Baird follows:]

PREPARED STATEMENT OF REPRESENTATIVE BRIAN BAIRD

I would like to thank Chairman Boehlert and Ranking Member Gordon for working with me on this common-sense amendment to H.R. 5656 and supporting its swift passage. I would also like to thank Congresswoman Biggert for introducing a bill to establish an "Energy Efficient Building Grant Program." I am an original co-sponsor of that bill and I appreciate her willingness to support my efforts to strengthen it today.

The energy efficient building grant program that this bill establishes will provide no more than $50,000 per building to help offset energy modeling and design costs often absorbed in constructing or renovating a building to meet "green" standards. Since it is possible to meet the energy efficiency targets set by this program while still *not* upgrading inefficient heating, ventilating and air-conditioning (HVAC) systems, I believe that it is important to emphasize that such systems are worth investing in.

My amendment is simple and straightforward. It states that under the terms of the "Energy Efficient Building Grant Program" established in this bill, any new construction or renovation of a residential or commercial building must include an energy efficient HVAC system. These include products that are no less than 25 percent more energy efficient than current, standard systems.

The amendment stipulates that "ENERGY STAR" HVAC systems should be used in all cases, except where these products do not exist. Such examples include large commercial chillers and boilers. In the larger commercial projects awarded through this program, we stipulate that the Department of Energy's Federal Energy Management Program (FEMP) specifications for these products should be used. These are products that are in the upper 25 percent of energy efficiency in their class.

Increasing incentives for energy efficient building and building systems, particularly high-efficiency energy systems for facility heating and air conditioning, is an area where considerable attention should be given. Efficiency improvements in this area impact air quality in the home and workplace, directly improving the health of families and workers, and a homeowner or business owner's utility bill.

In fact, the Department of Energy reports that if just one household in ten bought ENERGY STAR heating and cooling equipment, the change would keep over 17 billion pounds of pollution out of our air.

It would also save folks a lot of money. The average home spends $1,900 on utility bills every year—with more than half going to heating and cooling. It's expected that using Energy Star systems can cut heating and cooling bills in a home by *as much as 20 percent.*

Additionally, energy use represents the single largest operating expense in an office property. Reducing energy use 30 percent lowers operating costs for businesses by $25,000 per year for every 50,000 square feet of typical office space.

I am pleased that this amendment is supported by the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) as well as my colleagues on both sides of the aisle.

I applaud the Science Committee's leadership on this issue. It is my hope that we continue legislative efforts to incentivize energy efficiency in this country in the years to come.

Mr. Chairman, I yield back my time.

Chairman BOEHLERT. I want to thank Mr. Baird for his amendment. The Chair supports the amendment.

Is there further discussion on the amendment? If not, the vote occurs on the amendment. All in favor, say "aye." Aye. Opposed, "no." The "aye's" have it, and the amendment is agreed to.

The eighth amendment on the roster is offered by the gentleman from Tennessee, Mr. Gordon. Mr. Gordon, are you ready to proceed? The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Mr. Gordon of Tennessee.

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

And the gentleman from Tennessee is recognized for five minutes.

Mr. GORDON. Mr. Chairman, this amendment establishes a revolving loan program within the Department of Energy, to agencies, to carry out demonstration and commercially applicable, applications of federally funded energy technologies in federal buildings.

Now, let me tell you what we have got here. Right now, there is about, it is estimated, $250 million a year is wasted in energy costs through federal buildings alone, and it is wasted by those buildings not using current technologies that they are required to by law, or by specific Presidential requirements. And so, what this bill does is say simply follow the law, and do what the law says or what various Presidential requirements are.

Now, part of the reason that various agencies say that they are not doing it is well, we don't, you know, we have tight budgets, and so, we don't have the money to make these various energy efficiency type improvements. Well, what we do here is set up a revolving fund, so that they can go in, make those changes, and then, whatever the capital costs will be paid for over a fifteen year period by the savings in energy, water, you know, whatever it might be. And geothermal, for example, they will probably save it in about three years.

Now, I understand that the Chairman has jurisdictional concerns here, and for that reason, I know that his heart is right on these types of matters, and I will ask unanimous consent for this amendment to be withdrawn, in hopes that it will be a freestanding amendment that will come before Congress when this bill comes forth, and if not, that we will deal with it in conference.

So, I do ask unanimous consent for it to be withdrawn.

Chairman BOEHLERT. Well, I appreciate the gentleman working with us on this, and good idea. Good ideas should be embraced by all, but you recognize and appreciate the jurisdictional problems this presents.

So, I think it is a good idea, but we need to work on some of the substantive details and jurisdictional concerns, and I am confident we can sort of iron those out.

We will have time to do that before the bill comes to the Floor, and I hope and expect that we will add language on the Floor to accomplish the gentleman's goals.

How is that?

Mr. GORDON. Good.

Chairman BOEHLERT. All right. Thank you.

Without objection, the gentleman's request to have his amendment withdrawn is agreed to.

The ninth amendment on the roster is offered by the gentleman from Tennessee, Mr. Gordon. Are you ready to proceed?

Mr. GORDON. Yes.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Mr. Gordon of Tennessee.

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

And the gentleman is recognized for five minutes.

Mr. GORDON. Mr. Chairman, I won't belabor this, but let me just bring us up to date.

This amendment concerns ARPA–E. My amendment would replace the current ARPA–E language in the bill with the text of H.R. 4435, my bill establishing an ARPA–E at the Department of Energy. Now, what Ms. Biggert has done is, her term in her statement was to clarify the ARPA–E language. Well, I am not sure we need much clarity, in that the National Academies have already spoken very, I think, clearly and loudly with the *Rising Above the Gathering Storm.* When every member of that commission except the Chairman of Exxon said this was a good idea, some might think that is a good endorsement of the ARPA–E proposal.

The problem that we have is that there is oftentimes a disconnect between basic research, technology development, and commercialization. And what we are doing with ARPA–E really is taking the success DARPA has had within the Department of Defense, where, because of its unique sort of "no strings attached" and multi-discipline approach, we were able to develop the Internet, stealth technologies, and many other things for our country.

My hope is that we can use that same type of model within the Department of Energy, and bring together our national labs, our universities, the private sector, take on some, you know, some very cutting edge, serious types of technology that could make a revolutionary change in our energy production and independence in this country.

I think ARPA–E is the place to be. You know, you are just sending it back for them then to send it back to you, so I don't think that really is the right approach.

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

Chairman BOEHLERT. Thank you very much.

I appreciate what the gentleman is trying to do with his amendment, but I am not prepared, at least at this juncture, to support the creation of an ARPA–E yet. I think that before we create a new government agency, and allocate several billion dollars to it, we need to be more sure that the agency is necessary and set up in the right way to accomplish its goals.

Let me give a parenthetical thought here. One of the things we didn't do in the right way was set up the Department of Homeland Security, and we are all living with that today. With you, I requested the Academy, that they write the *Gathering Storm* report, and like you, I am a big fan of its conclusions. In fact, my colleagues are sick of hearing me talk about the American Competitiveness Initiative, which stems, in part, from that report. But the report was written on paper, not chiseled on stone tablets, and its proposals are rightly labeled recommendations, not commandments.

We asked that the report be done quickly, and it was. And the panel, quite honestly, did not have as much experience or expertise, or as many studies to draw on in the energy area as it did in some of the other realms. The ARPA–E recommendation was the most controversial one among the panelists themselves, and not just one person, but several, I would add.

And so, I pointed out at a hearing in March, there are a lot of unanswered questions about ARPA–E. Is a lack of fundamental research our primary energy problem? If so, why couldn't it be handled by the Department of Energy programs? And if these programs are off track, how can we make sure they get back on track? What should the relative priority for ARPA–E be, compared to other DOE programs in allocating funding?

Is DARPA a good analogue for the energy area, where the government is not a primary customer, and price matters? What role should industry play in ARPA–E programs? What role should the National Labs play? To what extent will participation by industry or the Labs enable the program to be both pathbreaking and market-oriented? Should we be focusing more, instead, on applied research or technology transfer, or providing more capital for commercialization? What good will any additional research program do if we don't take the policy steps we need to create a new market for new technologies?

And I think these are pretty fundamental questions. And what I am saying, Mr. Gordon, is we need more analysis to have trustworthy answers to guide us. So the bill language says, let us go back to the source. Let us have the Academy, for whom I have the greatest respect, pull together a panel with the right expertise to sort through these questions, and let us see where they end up.

As I said in my opening statement, we will still be funding plenty of research in the meantime. So, based on all that reasoning, I urge defeat of the amendment, but without prejudice, because there will be another day.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I appreciate what the gentleman is trying to do with this amendment, but I just am not prepared to support the creation of an ARPA–E at this point. I think that before we create a new government agency and allocate several billion dollars to it, we need to be more sure that the agency is necessary and set up in the right way to accomplish its goals.

With you, I requested the Academy write the *Gathering Storm* report, and like you, I am generally a big fan of its conclusions. In fact, my colleagues are sick of hearing me talk about the American Competitiveness Initiative, which stems, in part, from the report. But the report was written on paper, not chiseled on stone tablets, and its proposals are rightly labeled "recommendations" not "commandments."

We asked that the report be done quickly, and it was, and the panel did not have as much experience or expertise, or as many studies to draw on, in the energy area as it did in some other realms. The ARPA–E recommendation was the most controversial one among the panelists themselves, I would add.

And so, as I pointed out at our hearing in March, there are a lot of unanswered questions about ARPA–E. Is a lack of fundamental research our primary energy problem? If so, why couldn't it being handled by current Department of Energy (DOE) programs? And if those programs are off-track, how can we make sure that this program works differently? What should the relative priority for ARPAnE be, compared to other DOE programs, in allocating funding? Is DARPA a good analogue for the energy area, where the government is not a primary customer and price matters?

What role should industry play in ARPA–E programs? What role should the National Labs play? To what extent will participation by industry or the labs enable the program to be both pathbreaking and market-oriented? Should we be focusing more instead on applied research or tech transfer or providing more capital for commercialization? What good will any additional research program do if we don't take the policy steps we need to create a market for new technologies?

These are pretty fundamental questions, and we need more analysis to have trustworthy answers to them.

So the bill language says, "Let's go back to the source." Let's have the Academy pull together a panel with the right expertise to sort through these questions, and then let's see where we end up. As I said in my opening statement, we'll still be funding plenty of research in the meantime.

I urge the defeat of this amendment.

Chairman BOEHLERT. Is there anyone else who seeks to speak? Dr. Bartlett.

Mr. BARTLETT. Thank you, Mr. Chairman.

Oil today is over $72 a barrel. If that is because, as many people suspect, we are approaching or have reached peak oil, it means that oil will not be less on any sustained basis than $72 a barrel in the future, but the supply will be less as we go down the other side of Hubbard's Peak, and the price will go up.

The Department of Energy, supported by SAIC, funded a company report called the *Hirsch Report,* which made the observation that the world has never faced a problem like this. They said that the mitigation consequences will be unprecedented. Business as usual won't be adequate to address the problems that we face, if in fact, we are at peak oil. What we will have to do, indeed, what the world will have to do, is to have a crash program in conservation so that we free up some energy to invest in alternatives. Now, there is no excess energy to invest in alternatives. If there were, oil wouldn't be $72 a barrel.

Once we have bought some time by an aggressive conservation effort, we then must make decisions as to how to spend our time and our money wisely. It may very well be that an ARPA–E will be an essential part of this, but Mr. Chairman, I would like to emphasize that business as usual and the marketplace signals will not solve this problem, and I hope that the National Academy of

Sciences can very quickly address the question that we are giving to them, so that we can come back to this issue sooner rather than later, because I think that time is running out. Indeed, if we are at peak oil, time has, in effect, run out.

Thank you, and I yield back.

Chairman BOEHLERT. And thank you very much. Is there anyone else?

Mr. GORDON. Strike the last word.

Chairman BOEHLERT. Mr. Gordon.

Mr. GORDON. Mr. Chairman, I probably should just say amen to Dr. Bartlett. I think he was more eloquent than I can be, so I will say amen.

Business as usual, status quo, won't get the job done. We have had enough of that. It is time to move forward. This issue has been studied. ARPA–E needs to—you know, every day we waste, every year we waste on more studies, we get further behind. Now is the time to move.

Chairman BOEHLERT. Thank you very much. Is there anyone else who seeks recognition? Mrs. Biggert.

Ms. BIGGERT. Thank you, Mr. Chairman. We have been moving along so nicely, that—but it should come as no surprise that I oppose this amendment to create a DARPA-like entity at DOE.

When the Committee held a hearing in March on this proposal, I raised a number of questions that I don't think have yet been answered, and concerns that have yet to be addressed. I still don't see how the creation of a new agency, a new bureaucracy, achieves the goal of supporting transformational research that could lead to new ways of fueling the Nation and its economy, the stated purpose of the ARPA–E envisioned by the NAS.

And why am I so skeptical? Well, first, I think it is not clear what problems we are trying to solve with the creation of an ARPA–E. Is it a lack of private sector investment in long-term or basic research? If so, how do we solve the problem by creating a new, brand-new agency to distribute scarce federal resources to companies to conduct research that they would otherwise conduct? Correct me if I am wrong, but doesn't the Academy's version of ARPA–E put the Federal Government in the position of picking what companies are winners?

Is it a lack of federal funding for high-risk transformational research? If so, how would you characterize DOE's current FreedomCAR and hydrogen initiatives? How about the President's GNEP, or our U.S. participation in ITER? I don't know about my colleagues, but I would put these in the category of high-risk transformational research.

Is it a failure of the Department of Energy to effectively transfer new energy technologies from the laboratory to the market? If so, wouldn't it make more sense to closely examine the legal and policy obstacles to the transfer of technology from our universities, national laboratories, and other research institutions? In short, is this a solution in search of a problem?

And secondly, this proposal to create an ARPA–E is largely based on the mythology of the agencies, namely, the myths that DARPA can't do anything wrong, and the DOE can't do anything right. Well, I know from personal experience that DARPA has its failings.

And third, we tried to replicate DARPA at the Department of Homeland Security, and did it work? Not according to most accounts. And fourth, where exactly are we going to get the money for ARPA–E? Many of my colleagues here advocating for the creation haven't stopped criticizing the Administration for failing to adequately fund such energy programs as energy efficiency and renewable energy.

And finally, I think it is important to note that ARPA–E was one of the twenty recommendations, and it was the one that opposition came from one of the Committee Members, with arguably the most expertise in energy markets and the energy industry.

I think—but we need to find the right solutions, and not just any solution, and to get, I think, to get the right solution, we need more information, and I need answers to my questions. Section 15 of the bill attempts to get the information we need to make an informed decision, I think, directing the National Academy of Sciences to provide more details and further clarification.

So, I think this is the right approach, and I would urge my colleagues to reject this amendment, and support section 15 of the bill. I yield back the balance of my time.

Chairman BOEHLERT. I thank the gentlelady.

Mr. COSTELLO. Mr. Chairman.

Chairman BOEHLERT. Mr. Costello.

Mr. COSTELLO. Mr. Chairman, thank you.

I would yield at this time to my friend, Mr. Gordon.

Mr. GORDON. Thank you, Mr. Costello.

Ms. Biggert has asked a very legitimate question. Where do we get the money? I think that, quite frankly, with every bill that comes before us, that is why I support "pay as you go." You know, where do we get the money? Well, I will tell you where we get the money. We get the money by repealing the tax credits and benefits that we gave the oil companies to drill for oil that is $70 a barrel. You know, we will take a little bit of that, and give the rest back to the Treasury, and we will all be better off. So, getting the money, that will be an easy matter.

Chairman BOEHLERT. I almost want to call a vote on the last suggestion, because I would vote "aye." Thank you. Anyone else?

If not, the vote occurs on the amendment. All in favor, say "aye." Aye. No, "no." The "no's" appear to have it, and the amendment is not passed.

Let us see. The ninth—where are we? The—now, we are on 10. Yeah, after 9 comes 10. That is correct. The tenth amendment on the roster is offered by the distinguished gentleman from Illinois, Mr. Costello. Are you ready to proceed?

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

Chairman BOEHLERT. Well, the Clerk will report the amendment, and then, we need to see the amendment. That would be very helpful——

The CLERK. Amendment to H.R.——

Chairman BOEHLERT.—to all of us.

The CLERK. Amendment to H.R. 5656, offered by Mr. Costello of Illinois.

Chairman BOEHLERT. I ask unanimous consent to dispense with the reading by the Clerk, so that we can have distribution, so all the Members can know what the amendment contains. Without objection, so ordered.

Now, as the amendment is being passed out.

Mr. COSTELLO. Mr. Chairman.

Chairman BOEHLERT. So, to expedite matters.

Mr. COSTELLO. Mr. Chairman, if I may, I do not intend to go forward with the amendment. I intend to withdraw it, but I would like to explain the purpose of the amendment.

Chairman BOEHLERT. By all means. The gentleman is recognized.

Mr. COSTELLO. Mr. Chairman, thank you.

Mr. Chairman, I offered this amendment to strike section 3 of the Authorizing the Future Generation project from this legislation with a more comprehensive approach to the FutureGen project. However, I do intend to withdraw the amendment.

I want to thank the Chairman, his staff, Ms. Biggert, and others for addressing some of my concerns in the manager's amendment. As you know, both your staff and our staff have been working with the Department of Energy and the FutureGen Alliance on this project. Some of the concerns, I believe, have been addressed in the manager's amendment. I think there are some other issues that we need to take a look at, and I am hopeful that with the letter that we received today, addressed to the Chairman from the FutureGen Alliance, bringing up several issues, I hope that the Chairman will continue with work with us on both sides of the aisle to address some of these issues as we go through the process of getting the bill to the Floor and to conference.

And with that, Mr. Chairman, I will withdraw the amendment.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Mr. Chairman, I have an amendment at the desk. My amendment strikes section 3, the section authorizing FutureGen from H.R. 5656 and replaces it with a more comprehensive approach to the FutureGen project, a public/private partnership to build the world's first coal-based, zero emissions electricity and hydrogen production facility.

I want to say at the outset that I appreciate the Chairman's good faith efforts to work with me on this legislation. However, we have not been able to reach an agreement on a variety of points, and I do believe we can do better than what we have before us today.

I am offering my amendment because the FutureGen authorization in H.R. 5656 deviates from the plan DOE sets forth and would to side-track the performance and economic goals of the project. Mr. Chairman, I was copied on a letter sent to you by the FutureGen Alliance. As you know, it is a consortium of ten coal and utility companies that pledged their financial contribution toward the project. I would like to submit their letter for the record. The letter states that while the Alliance is pleased the Science Committee is supportive of FutureGen, the current authorization is incomplete. It could do more harm than good.

It has been made clear by those involved in the FutureGen project that important changes need to be made to the authorization in the bill to ensure the project moves forward successfully in cooperation with the Department of Energy (DOE).

We have made significant progress in the past three years since President Bush proposed this initiative. Congress has approved $45 million for the project, the FutureGen Alliance was formed by DOE, the Illinois delegation—including Congresswoman Biggert and Congressman Johnson—have signed letters to support FutureGen, and the President continues to show his support for the project. It is unfortunate that this authorization detracts from those milestones.

For the past three years, I have worked with my colleagues on both sides of the aisle to ensure investment in clean coal technology that meets the energy and environmental challenges of the future. As a senior Member of the Science Committee, I believe it is important to lead the way—not stand in the way—of completing the FutureGen project. FutureGen will bring us a step closer to protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

It is evident that FutureGen is an ambitious undertaking that requires careful planning, strong scientific and technological expertise, and a solid commitment from the government and industry. Therefore, a comprehensive FutureGen authorization is required and I encourage my colleagues to support my amendment.

Chairman BOEHLERT. I ask unanimous consent. Without objection, so ordered.

Just let me say I support the FutureGen program, and I have got eloquent words here to verify that support, but I think we have to work some more on the specifics of your one amendment, so without objection, my entire statement will be included in the record at this point.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I support the FutureGen program, and I think we have good language in this bill—language negotiated with the gentleman from Illinois—to get this project moving forward in the appropriate way.

But our fundamental goal in Congress has to be to protect the taxpayer. And I don't think adding this language will help us do that.

It may or may not make sense to offer government indemnification for the carbon sequestration aspects of this project. One would have to see studies of the legal risks from that activity, the availability of private insurance, etc. We haven't done our homework on this issue, so it's premature to decide on it.

Moreover, the Department of Energy (DOE) and industry have not yet tried to negotiate an indemnification agreement. That will hardly be a negotiation between equally matched parties if Congress has already weighed in on one side.

If DOE comes to us in the future with an indemnification proposal and a rationale for it, I'll be happy to listen to them. But this issue is simply not ripe yet.

Moreover, the industry does not say it must have this language now. Other advocates for the coal industry are no longer pushing for this provision. So, again, this issue is not ripe for Congressional action.

The same, and more, can be said to argue against the termination proposal. Industry isn't claiming it has to have this now, negotiations over the issue haven't even begun, we haven't examined the issue's implications, the time is not ripe.

But in addition to those arguments, this language is just a terrible deal for taxpayers. If industry pulls out of the project, the government gets stuck with a white elephant, but if the government pulls out of the project, industry gets back all of its greenbacks. It's a kind of "heads I win, tails you lose" deal that industry is offering the government.

So if we ever decide we need termination language, it shouldn't be this language.

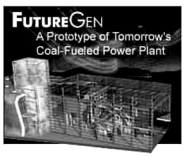
The bill has all the language needed to get FutureGen off the ground in an effective matter. These other matters should wait until the parties can negotiate, and we can think through what they come up with.

I urge the defeat of this amendment.

Mr. COSTELLO. Mr. Chairman, I would ask unanimous consent that the FutureGen Alliance, the letter to this committee, be entered into the record.

Chairman BOEHLERT. Without objection, so ordered.

[The information follows:]



FutureGen Industrial Alliance

June 27, 2006

Chairman Sherwood Boehlert
House Science Committee
2320 Rayburn House Office Building
Washington, D.C. 20515-1312

Dear Chairman Boehlert:

On behalf of the FutureGen Industrial Alliance, I am writing to express my opposition to the FutureGen section H.R. 5656, the "Energy Research, Development, Demonstration, and Commercial Application Act of 2006" because it includes significant barriers which could preclude the ability of the Alliance to continue with this important project.

In addition to other onerous provisions in the FutureGen section, the Alliance particularly objects to the FutureGen project being identified as a "demonstration" project rather than a research and development project. This characterization would significantly alter the current cost-share formula for the project.

It is my understanding that Congressman Costello intends to offer a perfecting amendment to Section 3 of the bill. As the Alliance looks towards entering into the Full Scope Cooperative Agreement with the Department of Energy, the language Congressman Costello will offer seeks to address the concerns the Alliance has at this time. I wish to elaborate on the issues which need to be addressed in H.R. 5656 or any legislation which attempts to authorize the FutureGen project; such legislation must ensure: (1) that Congress understands that FutureGen is a research and demonstration project that would make it eligible for up to 80% Federal cost share, (2) provisions that will provide data protection to the technology suppliers of FutureGen that are consistent with what is acceptable in the marketplace, (3) the Alliance Members who are contributing funds to the FutureGen Alliance, a 501 (c)3 organization (and hence cannot derive any financial benefit from participation), want Congress to grant DOE the authority to enter into a contract agreement with regard the liability for the carbon sequestration aspects of the project, (4) the Secretary may agree to terminate the project, without compensation to the consortium, if the project is terminated due to an insufficiency of consortium funds to complete the project; and the Secretary may agree to reimburse the consortium for the consortium's share of the project costs, if the project is terminated due to an insufficiency of appropriated funds to complete the

project; (5) the necessary flexibility for Congress to fund the project considering escalation that may occur for materials and labor. Of these issues, only the second one was adequately addressed in the manager's amendment to HR5656.

As you are aware, the FutureGen Industrial Alliance, a non-profit consortium, presently has 10 members with other companies considering membership. The Alliance is receiving private industry funding from companies headquartered on six continents: North America, South America, Africa, Asia, Australia and Europe. This level of domestic and international participation demonstrates wide spread interest in a technology-based solution to global energy and climate concerns.

In the current global business environment under which our companies operate, it is unusual for a group of companies to commit $250 million as its share of the cost and risk of developing technology without any expectation of a financial return; as the Alliance has done.

The $1-billion, 275-megawatt coal-fueled FutureGen plant will capture and sequester at least one million tons of carbon dioxide annually, while co-producing electricity and hydrogen. We are pleased to report that the FutureGen project is on schedule. The Alliance is currently reviewing 12 project bids from seven states interested in hosting the FutureGen plant. The Alliance will decide upon a short list of candidate sites by late summer of 2006 and choose the final site by late summer of 2007. Initial conceptual designs for the plant are also underway.

I appreciate your careful consideration of our position.

Sincerely,

Michael J. Mudd
Chief Executive Officer
FutureGen Industrial Alliance

cc: The Honorable Bart Gordon
Ranking Member House Committee on Science

Representative Jerry Costello
House Committee on Science

Chairman BOEHLERT. Before we proceed, I want to welcome Mrs. Matsui back from her Floor responsibilities as a Member of the Rules Committee. In your absence, our heart was in the right place. We passed your amendment. Thank you so much for your contribution.

Ms. MATSUI. Well, thank you very much, and I thank Ranking Member Gordon for offering my amendment, and you for working with me on that. Thank you.

Chairman BOEHLERT. Thank you so much.

The eleventh amendment on the roster is offered by the gentleman from Illinois. Are you ready to proceed?

Mr. COSTELLO. I am, Mr. Chairman.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 5656, offered by Mr. Costello of Illinois.

Chairman BOEHLERT. Now, here is another one, a mystery amendment, so we ask that it be distributed while I ask for unanimous consent to dispense with the reading. Without objection, so ordered.

And as the amendment is being passed out, so we can all appreciate what the gentleman is going to say so eloquently, I will recognize the gentleman for five minutes to explain the amendment.

Mr. COSTELLO. Mr. Chairman, thank you, and Mr. Chairman, let me say that both of these amendments, we have discussed these amendments with your staff in an ongoing discussion over the past several days, if not the last couple of weeks, so this amendment and the last amendment should not have come as any surprise, and in fact, I think in the manager's amendment, you address several issues with the first amendment that I offered.

With that, Mr. Chairman, the amendment provides grants to states to research, develop, and demonstrate the feasibility of using coal gasification technology as the fuel source for ethanol production. As you know, there has been record growth in the U.S. ethanol industry over the past few years just in my State of Illinois alone. There have been six ethanol facilities come online, and there are thirty more that are either planned or under construction at this time.

Some of those facilities use coal, but none of them, in Illinois or in the country, use the cleaner coal gasification process. Ethanol production requires significant amounts of energy. The bulk of energy used to produce ethanol comes from natural gas and electricity. Coal has the potential to significantly contribute to the process, and deliver a wide array of benefits. Coal is less expensive per BTU than natural gas. The Energy Industry Administration predicts that the industrial cost of natural gas will continue to rise, and actually be triple the cost of coal in the not too distant future.

Coal is our most price consistent fossil fuel, whereas natural gas is unpredictable, and as we saw last summer, with the price increases due to the hurricane in the Gulf Coast region, the prices of natural gas certainly are unpredictable. Coal is a domestic fuel. There have been substantial coal reserves and growing production in the United States. In fact, there is about a 250-year supply of coal in the United States. Natural gas supply is dependent on the ever-increasing imports, and production is declining. Coal is reli-

able. It gives ethanol producers the opportunity to sign long-term contracts. Few long-term contracts, if any, for natural gas are available to small producers.

Last, national security—as the Governors Ethanol Coalition noted—increased ethanol production is an important step toward improved national security, utilizing coal as a major fuel source for ethanol production reduces the need to import natural gas for the process.

Mr. Chairman, as you know, the Energy Bill that was signed by the President in 2005 sets forth the goals to rapidly increase ethanol production, but this growth will depend on the availability of an economic fuel source. Events over the past years have painfully demonstrated that natural gas is not that fuel. Coal should be the preferred fuel to produce ethanol.

Given the high price of natural gas, it makes good economic sense to use coal as the fuel source to power ethanol plants. Research is needed to develop the knowledge base to use coal gasification technology to power these ethanol plants. While several companies, including ADM and others, are using coal-fired coal generation plants in ethanol production, no company is using coal gasification technology.

Mr. Chairman, I would ask that Members of this committee support the amendment, and yield back the balance of my time.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Mr. Chairman, I have an amendment at the desk. My amendment provides grants to states to research, develop, and demonstrates the feasibility of using coal gasification technology as the fuel source for ethanol production. There has been record growth in the U.S. ethanol industry over the past several years. In Illinois, we have six ethanol facilities, and there are thirty more that are planned or in the construction phase. Ethanol production requires significant amounts of energy. Currently, the bulk of energy used to produce ethanol comes from natural gas. Coal, however, has the potential to significantly contribute to the process and deliver a wide array of benefits.

Stability—Coal is less expensive per million Btu than natural gas. The Energy Industry Administration (EIA) predicts the industrial cost of natural gas will continue to rise, tripling the cost of coal.

Availability—Coal is our most price-consistent fossil fuel, whereas natural gas is volatile and unpredictable, as seen last summer with price spikes due to the hurricanes in the Gulf Coast region.

Reliability—Coal is a domestic fuel. The U.S. has substantial coal reserves and growing production, whereas natural gas supply is dependent on ever-increasing imports and production is declining.

National Security—Coal gives ethanol producers the opportunity to sign long-term contracts. Few, if any, long term contracts for natural gas are available to small producers.

Socioeconomic Benefit—Increased ethanol production is an important step toward improved national security. Utilizing coal as a major fuel source for ethanol production eliminates the need to import natural gas for the process.

Accelerated Ethanol Production—Using domestic coal to produce ethanol will create jobs, spur new businesses and generate tax revenues for local communities.

Accelerated Ethanol Production—The enactment of the *Energy Policy Act of 2005* sets forth ambitious goals to rapidly increase ethanol production, but the scale of this growth will depend on the availability of an economical fuel source. Events over the past years have painfully demonstrated that natural gas is not that fuel. Coal should be the preferred fuel to produce ethanol.

In the Midwest, coal and corn are two abundant natural resources. Illinois leads the Nation in corn and ethanol production. In addition, Illinois has more than 100 billion tons of coal reserves, enough to supply the needs of the entire Nation for 100

years. Given the high price of natural gas, it makes good economic sense to use coal as the fuel source to power ethanol plants.

Right now, barriers exist that limit the use of coal gasification as a fuel source in ethanol production. Research is needed to develop the knowledge base that will be needed to use coal gasification technology to power ethanol plants. While several companies are using coal fired co-generation plants in ethanol production, no company is using coal gasification technology. There is a legitimate need for my amendment in the coal and ethanol industries, and I encourage my colleagues to support the amendment.

Chairman BOEHLERT. Thank you very much, Mr. Costello.

I have to oppose the amendment. It is a solution looking for a problem. We already know how to use coal as a fuel source for ethanol production. Almost half of Archer Daniels Midland's existing ethanol plants—and they are the biggest of the bunch—are fueled by coal. About one-third of the currently planned new ethanol plants will be fueled by coal, and we know how to use coal in all its guises for this purpose. So there is nothing to research.

But while this amendment is a solution looking for a problem, it is not a solution looking for a recipient. This is, rather, a recipient looking for some more money. It seems pretty clear that this amendment is just designed to give money to one particular entity that wants government help to do what others do without it.

That is not a good use of the taxpayers' money. I oppose this amendment.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I have to oppose this amendment. It is a solution looking for a problem. We already know how to use coal as a fuel source for ethanol production. Almost half of ADM's existing ethanol plants are fueled by coal. About one-third of the currently planned new ethanol plants will be fueled by coal. And we know how to use coal in all its guises for this purpose. So there's nothing to research.

But while this amendment is a solution looking for a problem; it's not a solution looking for a recipient. This is, rather, a recipient looking for some money. It seems pretty clear that this amendment is just designed to give money to one particular entity that wants government help to do what others do without it. That's not a good use of the taxpayers' money.

I oppose this amendment.

Chairman BOEHLERT. Is there any other dialogue on that? So, without——

Mr. GORDON. If there is no one on your side, I ask to strike the last word.

Chairman BOEHLERT. Mr. Gordon is recognized.

Mr. GORDON. And I yield my time.

Mr. COSTELLO. Mr. Chairman, you are correct in the fact that there are a number of coal ethanol projects that are online now, both in my state and in other parts of the country. But the point that I am making is that there are no coal gasification facilities anywhere in the State of Illinois or in the United States.

I have to tell you that we have been in contact with Archer-Daniels-Midland, as you said, the largest producer of ethanol, and we have talked to many small suppliers, as well as the industry throughout the country, and various parts of the country, and I would just ask the Chair if you are aware of any ethanol facility that has a gasification process to produce ethanol, because we are not aware of one facility in the United States.

Chairman BOEHLERT. Gasified coal is not currently used in ethanol production, because the scale of integrated coal gasification combined cycle facilities is significantly larger than the energy needs of a typical ethanol production plant. So, with that understanding, as presented to me, I maintain my position that we don't need to pursue this, but I thank you for offering it, and now, I think we should vote on it.

All in favor of the Costello amendment, say "aye." Opposed, "nay." Nay. The "nay's" appear to have it, and the amendment is not agreed to.

Continuing on, are there any other amendments? Hearing none, the vote is on the bill, H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006,* as amended. All in favor, say "aye." Aye. Opposed, say "no." In the opinion of the Chair, the "aye's" have it.

I recognize Mr. Gordon to offer a motion.

Mr. GORDON. Mr. Chairman, I move that the Committee favorably report H.R. 5656, as amended, to the House, with the recommendation that the bill, as amended, do pass.

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

Chairman BOEHLERT. The question is on the motion to report the bill, as amended, favorably. Those in favor of the motion will signify by saying "aye." Aye. Opposed, "no." The "aye's" have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table. I move that Members have two subsequent calendar days in which to submit supplemental, minority, or additional views on the measure.

I move, pursuant to clause 1 of rule 22 of the Rules of the House of Representatives that the Committee authorizes the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 5656, the *Energy Research, Development, Demonstration, and Commercial Application Act of 2006,* as amended. Without objection, so ordered.

I want to thank the Members. I think we have had a good discussion, but more important, leading up to today's activity, there was a lot of hard work on the part of both sides of the aisle, their very able professional staffs, and we worked out something that makes us all proud, and let us move to the Floor united.

Without objection, the Committee is adjourned.

[Whereupon, at 11:13 a.m., the Committee was adjourned.]

Appendix:

H.R. 5656, SECTION-BY-SECTION ANALYSIS OF H.R. 5656, SUMMARY OF H.R. 5656, AMENDMENT ROSTER, SECTION-BY-SECTION DESCRIPTION OF MANAGER'S AMENDMENT, ADDITIONAL VIEWS OF H.R. 5656

I

109TH CONGRESS
2D SESSION

H. R. 5656

To provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 21, 2006

Mrs. BIGGERT (for herself, Mr. BOEHLERT, Mr. HALL, Mr. SMITH of Texas, Mr. CALVERT, Mr. EHLERS, Mr. INGLIS of South Carolina, and Mr. WAMP) introduced the following bill; which was referred to the Committee on Science

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A BILL

To provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes.

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

SECTION 1. SHORT TITLE.

This Act may be cited as the "Energy Research, Development, Demonstration, and Commercial Application Act of 2006".

SEC. 2. DEFINITIONS.

For the purposes of this Act—

(1) the term ''biomass'' has the meaning given that term in section 932(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16232(a)(1));

(2) the term ''cellulosic feedstock'' has the meaning given the term ''lignocellulosic feedstock'' in section 932(a)(2) of the Energy Policy Act of 2005 (42 U.S.C. 16232(a)(2));

(3) the term ''engineering-scale'' means the minimum size required to predict with confidence all physical processes controlling the performance of a full-scale industrial facility;

(4) the term ''National Laboratory'' has the meaning given the term ''nonmilitary energy laboratory'' in section 903(3) of the Energy Policy Act of 2005 (42 U.S.C. 16182(3)); and

(5) the term ''Secretary''means the Secretary of Energy.

SEC. 3. FUTUREGEN.

(a) IN GENERAL.—The Secretary shall carry out a project to demonstrate the feasibility of the commercial application of advanced clean coal energy technology, including carbon capture and geological sequestration, for electricity generation.

(b) INDUSTRY INVOLVEMENT.—The Secretary may conduct the project through a financial assistance coopera-

tive agreement with a consortium of coal-fired power producers, coal companies, and other electric utility industry and mining industry participants

(c) REQUIREMENTS.—The Secretary shall design the project to ensure that—

(1) the project is operating by 2012;

(2) the project shall be able—

(A) to achieve at least a 99 percent reduction in sulfur dioxide emissions or, when burning coal containing 3 pounds or less of sulfur per million British thermal units, the project shall be able to emit no more than 0.03 pounds of sulfur dioxide emissions per million British thermal units of thermal energy produced by the project;

(B) to emit no more than 0.05 pounds of nitrogen oxide emissions per million British thermal units of thermal energy produced by the project;

(C) to achieve at least a 90 percent reduction in mercury emissions;

(D) to emit no more than 0.005 of total particulate emissions in the flue gas per million British thermal units of thermal energy produced by the project; and

(E) to achieve at least a 90 percent reduction in carbon dioxide emissions; and

(3) the project demonstrates the feasibility of electricity generation from coal using advanced clean coal technology with carbon capture and geological sequestration at a cost not greater than 10 percent higher than the average of all commercial integrated coal gasification combined cycle electric generating plants operating in the United States as of the date of enactment of this Act.

(d) COMMERCIALLY AVAILABLE ADVANCED CLEAN COAL TECHNOLOGY.—To reduce technical risk and focus development efforts on system integration, the Secretary shall, to the extent practicable, ensure that the project utilizes available advanced clean coal technology, such as coal gasification technology, for those components of the project where such technology would be appropriate.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section—

(1) $54,000,000 for fiscal year 2007;

(2) $112,000,000 for fiscal year 2008;

(3) $130,000,000 for fiscal year 2009;

(4) $95,000,000 for fiscal year 2010;

(5) $75,000,000 for fiscal year 2011; and

(6) $71,000,000 for fiscal year 2012.

SEC. 4. ADVANCED FUEL CYCLE TECHNOLOGIES FOR NUCLEAR POWER.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced nuclear fuel cycle technologies for generating electricity and industrial process heat from nuclear power, including technologies for spent fuel recycling, waste minimization, and reduction of radioactivity of final waste products.

(b) OBJECTIVES.—The Secretary shall design the program under this section to develop technologies that would—

(1) minimize the volume and heat load of high-level nuclear waste destined for storage in a geological repository to the extent that a single repository would be sufficient for storing all nuclear waste generated by United States commercial nuclear power plants during this century;

(2) increase the proliferation resistance of commercial nuclear power reactors and their associated fuel systems and infrastructure; and

(3) increase the amount of useful energy that can be extracted from nuclear fuel.

(c) SYSTEMS ANALYSIS.—

(1) IN GENERAL.—The Secretary shall develop a comprehensive modeling and simulation capability to enable a thorough analysis of possible advanced nuclear fuel cycle systems. The modeling and simulation capability shall be capable of examining—

(A) all of the components of each advanced nuclear fuel cycle system analyzed, including—

(i) spent fuel separations technologies;

(ii) advanced burner reactor technologies;

(iii) fuel fabrication technologies;

(iv) advanced thermal reactor technologies, including advanced thermal reactor designs that would be capable of reducing the toxicity or radioactivity of spent nuclear fuel components; and

(v) waste disposal technologies;

(B) the manner in which possible technology and engineering choices for individual components might affect the overall system, and how various system components would interact with one another; and

(C) quantitative mass flows of nuclear fuel and spent nuclear fuel, including projected inventories and transportation requirements for

nuclear fuel and spent nuclear fuel, for any examined system.

(2) ADVANCED NUCLEAR FUEL CYCLE SYSTEM PLAN.—

(A) ANALYSIS.—The Secretary shall conduct a thorough analysis of more than one possible configuration of an advanced nuclear fuel cycle system using the analytical capability developed under paragraph (1). Each possible advanced nuclear fuel cycle system configuration examined shall include both advanced burner reactors and advanced thermal reactors, and the analysis shall consider the degree to which each type of reactor could be utilized to reduce the toxicity or radioactivity of spent nuclear fuel components. The analysis of each possible configuration of an advanced nuclear fuel cycle system examined shall examine the compatibility of fuel cycle system components, including each of the system component technologies described in paragraph (1)(A), and the degree to which the examined system would meet the objectives described in subsection (b).

(B) PLAN.—Using the results of the analyses developed under subparagraph (A), and

not later than June 30, 2007, the Secretary shall develop a detailed plan for research, development, demonstration, and commercial application on advanced nuclear fuel cycle system technologies, including proposed technology options for each of the system component technologies described in paragraph (1)(A) and any proposed engineering-scale demonstrations of such system component technologies. The plan shall include an estimate of the design, engineering, construction and lifetime operating costs of any proposed engineering-scale demonstration. In developing the plan, the Secretary shall consider the integration into an advanced nuclear fuel cycle system of advanced thermal reactors capable of reducing the toxicity or radioactivity of spent nuclear fuel components.

(C) CONSULTATION.—In developing the plan under subparagraph (B), the Secretary shall consult with—

(i) technical experts from United States and foreign companies that design or engineer nuclear power plants or nuclear fuel reprocessing facilities;

(ii) technical experts from United States electric utilities that operate nuclear power plants;

(iii) economists with expertise in nuclear power and electricity markets;

(iv) the Nuclear Energy Research Advisory Committee;

(v) the Chairman of the Nuclear Regulatory Commission; and

(vi) the Administrator of the Environmental Protection Agency.

(3) NATIONAL ACADEMY OF SCIENCES REVIEW.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a review of the plan developed under paragraph (2)(B), including by reviewing the validity of the underlying analyses required in paragraph (2)(A).

(d) REPORT.—Not later than June 30, 2008, the Secretary shall transmit to Congress a report that includes the research, development, demonstration, and commercial application plan developed under subsection (c)(2)(B), the report from the National Academy of Sciences on the review conducted under subsection (c)(3), a revised research, development, demonstration, and commercial application plan that takes into account the findings, conclusions, and

recommendations of the report from the National Academy of Sciences, and an explanation of any instances where the Secretary does not concur with the findings, conclusions, and recommendations of the report from the National Academy of Sciences.

(e) PROHIBITION.—The Secretary shall not initiate detailed design or construction of any demonstration facility that is capable of processing 750 kilograms or more per year of nuclear fuel or spent nuclear fuel and that is designed to demonstrate the advanced nuclear fuel system component technologies described in subsection (c)(1)(A)(ii) and (iii) until 90 days after the report under subsection (d) has been transmitted to Congress.

(f) AUTHORIZATION OF APPROPRIATIONS.—

(1) ALLOCATIONS.—From amounts authorized to be appropriated under section 951(d)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16271(d)(1)), there are authorized to be appropriated to the Secretary to carry out this section such sums as may be necessary for each of fiscal years 2007 through 2009.

(2) ADDITIONAL AMOUNTS.—There are authorized to be appropriated to the Secretary to carry out this section such sums as may be necessary for each of fiscal years 2010 through 2012.

SEC. 5. ADVANCED BATTERY TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced battery technologies for use in motor vehicles, particularly for plug-in hybrid electric vehicles.

(b) OBJECTIVE.—The Secretary shall design the program under this section to develop technologies that would enable a light-duty, plug-in hybrid electric vehicle to travel up to 40 miles on battery power alone.

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

(1) $31,000,000 for fiscal year 2007;

(2) $34,100,000 for fiscal year 2008;

(3) $37,500,000 for fiscal year 2009; and

(4) $41,250,000 for fiscal year 2010.

(d) DEFINITION.—For purposes of this section, the term ''plug-in hybrid electric vehicle'' has the meaning given the term in section 10.

SEC. 6. ADVANCED BIOFUEL TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for production of liquid fuels from biomass.

(b) OBJECTIVES.—The Secretary shall design the program under this section to—

(1) develop technologies that would make ethanol produced from cellulosic feedstocks cost competitive with ethanol produced from corn by 2012;

(2) conduct research and development on how to apply advanced genetic engineering and bioengineering techniques to increase the efficiency and lower the cost of industrial-scale production of liquid fuels from cellulosic feedstocks; and

(3) conduct research and development on the production of hydrocarbons other than ethanol from biomass.

(c) AUTHORIZATION OF APPROPRIATIONS.—From amounts authorized to be appropriated under section 931(c) of the Energy Policy Act of 2005 (42 U.S.C. 16231(c)), there are authorized to be appropriated to the Secretary to carry out this section—

(1) $150,000,000 for fiscal year 2007;

(2) $160,000,000 for fiscal year 2008; and

(3) $175,000,000 for fiscal year 2009.

SEC. 7. ADVANCED HYDROGEN STORAGE TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for technologies to enable practical

onboard storage of hydrogen for use as a fuel for light-duty motor vehicles.

(b) OBJECTIVE.—The Secretary shall design the program under this section to develop practical hydrogen storage technologies that would enable a hydrogen-fueled light-duty motor vehicle to travel 300 miles before refueling.

(c) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts otherwise authorized to be appropriated, there are authorized to be appropriated to the Secretary to carry out this section—

(1) $46,000,000 for fiscal year 2007;

(2) $50,000,000 for fiscal year 2008;

(3) $55,000,000 for fiscal year 2009; and

(4) $60,000,000 for fiscal year 2010.

SEC. 8. ADVANCED SOLAR PHOTOVOLTAIC TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced solar photovoltaic technologies.

(b) OBJECTIVES.—The Secretary shall design the program under this section to develop technologies that would—

(1) make electricity generated by solar photovoltaic power cost-competitive by 2015; and

(2) enable the widespread use of solar photovoltaic power.

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

(1) $148,000,000 for fiscal year 2007;

(2) $155,000,000 for fiscal year 2008;

(3) $165,000,000 for fiscal year 2009; and

(4) $180,000,000 for fiscal year 2010.

SEC. 9. ADVANCED WIND ENERGY TECHNOLOGIES.

(a) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application for advanced wind energy technologies.

(b) OBJECTIVES.—The Secretary shall design the program under this section to—

(1) improve the efficiency and lower the cost of wind turbines;

(2) minimize adverse environmental impacts; and

(3) develop new small-scale wind energy technologies for use in low wind speed environments.

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

(1) $44,000,000 for fiscal year 2007;

(2) $48,400,000 for fiscal year 2008;

(3) $53,240,000 for fiscal year 2009; and

(4) $58,564,000 for fiscal year 2010.

SEC. 10. PLUG-IN HYBRID ELECTRIC VEHICLE TECHNOLOGY PROGRAM.

(a) SHORT TITLE.—This section may be cited as the "Plug-In Hybrid Electric Vehicle Act of 2006".

(b) DEFINITIONS.—In this section:

(1) BATTERY.—The term "battery" means a device or system for the electrochemical storage of energy.

(2) E85.—The term "E85" means a fuel blend containing 85 percent ethanol and 15 percent gasoline by volume.

(3) ELECTRIC DRIVE TRANSPORTATION TECHNOLOGY.—The term "electric drive transportation technology" means—

(A) vehicles that use an electric motor for all or part of their motive power and that may or may not use offboard electricity, including battery electric vehicles, fuel cell vehicles, hybrid electric vehicles, plug-in hybrid electric vehicles, flexible fuel plug-in hybrid electric vehicles, and electric rail; and

(B) related equipment, including electric equipment necessary to recharge a plug-in hybrid electric vehicle.

(4) FLEXIBLE FUEL PLUG-IN HYBRID ELECTRIC VEHICLE.—The term ''flexible fuel plug-in hybrid electric vehicle'' means a plug-in hybrid electric vehicle—

(A) warranted by its manufacturer as capable of operating on any combination of gasoline or E85 for its onboard internal combustion or heat engine; or

(B) that uses a fuel cell for battery charging when disconnected from offboard power sources.

(5) FUEL CELL VEHICLE.—The term ''fuel cell vehicle'' means an onroad vehicle that uses a fuel cell (as defined in section 803 of the Energy Policy Act of 2005 (42 U.S.C. 16152)).

(6) HYBRID ELECTRIC VEHICLE.—The term ''hybrid electric vehicle'' means a vehicle that—

(A) can be propelled using liquid combustible fuel and electric power provided by an onboard battery; and

(B) utilizes regenerative power capture technology to recover energy expended in brak-

ing the vehicle for use in recharging the battery.

(7) PLUG-IN HYBRID ELECTRIC VEHICLE.—The term ''plug-in hybrid electric vehicle'' means a hybrid electric onroad light-duty vehicle that can be propelled solely on electric power for a minimum of 20 miles under city driving conditions, and that is capable of recharging its battery from an offboard electricity source.

(c) PROGRAM.—The Secretary shall conduct a program of research, development, demonstration, and commercial application on technologies needed for the development of plug-in hybrid electric vehicles, including—

(1) high capacity, high efficiency batteries, to—

(A) improve battery life, energy storage capacity, and power delivery capacity, and lower cost; and

(B) minimize waste and hazardous material production in the entire value chain, including after the end of the useful life of the batteries;

(2) high efficiency onboard and offboard charging components;

(3) high power drive train systems for passenger and commercial vehicles and for supporting equipment;

(4) onboard energy management systems, power trains, and systems integration for plug-in hybrid electric vehicles, flexible fuel plug-in hybrid electric vehicles, and hybrid electric vehicles, including efficient cooling systems and systems that minimize the emissions profile of such vehicles; and

(5) lightweight materials, including research, development, demonstration, and commercial application to reduce the cost of materials such as steel alloys and carbon fibers.

(d) PLUG-IN HYBRID ELECTRIC VEHICLE DEMONSTRATION PROGRAM.—

(1) ESTABLISHMENT.—The Secretary shall establish a competitive grant pilot demonstration program to provide not more than 25 grants annually to State governments, local governments, metropolitan transportation authorities, or combinations thereof to carry out a project or projects for demonstration of plug-in hybrid electric vehicles.

(2) APPLICATIONS.—

(A) REQUIREMENTS.—The Secretary shall issue requirements for applying for grants

under the demonstration pilot program. The Secretary shall require that applications, at a minimum, include a description of how data will be—

(i) collected on the—

(I) performance of the vehicle or vehicles and the components, including the battery, energy management, and charging systems, under various driving speeds, trip ranges, traffic, and other driving conditions;

(II) costs of the vehicle or vehicles, including acquisition, operating, and maintenance costs, and how the project or projects will be self-sustaining after Federal assistance is completed; and

(III) emissions of the vehicle or vehicles, including greenhouse gases, and the amount of petroleum displaced as a result of the project or projects; and

(ii) summarized for dissemination to the Department, other grantees, and the public.

(B) PARTNERS.—An applicant under subparagraph (A) may carry out a project or projects under the pilot program in partnership with one or more private entities.

(3) SELECTION CRITERIA.—

(A) PREFERENCE.—When making awards under this subsection, the Secretary shall consider each applicant's previous experience involving plug-in hybrid electric vehicles and shall give preference to proposals that—

(i) provide the greatest demonstration per award dollar, with preference increasing as the number of miles that a plug-in hybrid electric vehicle can be propelled solely on electric power under city driving conditions increases; and

(ii) maximize the non-Federal share of project funding and demonstrate the greatest likelihood that each project proposed in the application will be maintained or expanded after Federal assistance under this subsection is completed.

(B) BREADTH OF DEMONSTRATIONS.—In awarding grants under this subsection, the Secretary shall ensure the program will dem-

onstrate plug-in hybrid electric vehicles under various circumstances, including—

(i) driving speeds;

(ii) trip ranges;

(iii) driving conditions;

(iv) climate conditions; and

(v) topography,

to optimize understanding and function of plug-in hybrid electric vehicles.

(4) PILOT PROJECT REQUIREMENTS.—

(A) SUBSEQUENT FUNDING.—An applicant that has received a grant in one year may apply for additional funds in subsequent years, but the Secretary shall not provide more than $10,000,000 in Federal assistance under the pilot program to any applicant for the period encompassing fiscal years 2007 through fiscal year 2011.

(B) INFORMATION.—The Secretary shall establish mechanisms to ensure that the information and knowledge gained by participants in the pilot program are shared among the pilot program participants and are available to other interested parties, including other applicants.

(5) AWARD AMOUNTS.—The Secretary shall determine grant amounts, but the maximum size of grants shall decline as the cost of producing plug-in hybrid electric vehicles declines or the cost of converting a hybrid electric vehicle to a plug-in hybrid electric vehicle declines.

(e) COST SHARING.—The Secretary shall carry out the program under this section in compliance with section 988(a) through (d) and section 989 of the Energy Policy Act of 2005 (42 U.S.C. 16352(a) through (d) and 16353).

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

(1) for carrying out subsection (c), $250,000,000 for each of fiscal years 2007 through 2011, of which up to $50,000,000 may be used for the program described in paragraph (5) of that subsection; and

(2) for carrying out subsection (d), $50,000,000 for each of fiscal years 2007 through 2011.

SEC. 11. PHOTOVOLTAIC DEMONSTRATION PROGRAM.

(a) SHORT TITLE.—This section may be cited as the "Solar Utilization Now Demonstration Act of 2006" or the "SUN Act of 2006".

(b) IN GENERAL.—The Secretary shall establish a program of grants to States to demonstrate advanced photovoltaic technology.

(c) REQUIREMENTS.—

(1) ABILITY TO MEET REQUIREMENTS.—To receive funding under the program under this section, a State must submit a proposal that demonstrates, to the satisfaction of the Secretary, that the State will meet the requirements of subsection (g).

(2) COMPLIANCE WITH REQUIREMENTS.—If a State has received funding under this section for the preceding year, the State must demonstrate, to the satisfaction of the Secretary, that it complied with the requirements of subsection (g) in carrying out the program during that preceding year, and that it will do so in the future, before it can receive further funding under this section.

(3) FUNDING ALLOCATION.—Except as provided in subsection (d), each State submitting a proposal that meets the requirements under subsection (c) shall receive funding under the program based on the proportion of United States population in the State according to the 2000 census. In each fiscal year, the portion of funds attributable under this paragraph to States that have not submitted pro-

posals that meet the requirements under subsection (c) in the time and manner specified by the Secretary shall be distributed pro rata to the States that have submitted proposals that meet the requirements under subsection (c) in the specified time and manner.

(d) COMPETITION.—If more than $80,000,000 is available for the program under this section for any fiscal year, the Secretary shall allocate 75 percent of the total amount of funds available according to subsection (c)(3), and shall award the remaining 25 percent on a competitive basis to the States with the proposals the Secretary considers most likely to encourage the widespread adoption of photovoltaic technologies. In awarding funds under this subsection, the Secretary may give preference to proposals that would demonstrate the use of newer materials or technologies.

(e) PROPOSALS.—Not later than 6 months after the date of enactment of this Act, and in each subsequent fiscal year for the life of the program, the Secretary shall solicit proposals from the States to participate in the program under this section.

(f) COMPETITIVE CRITERIA.—In awarding funds in a competitive allocation under subsection (d), the Secretary shall consider—

(1) the likelihood of a proposal to encourage the demonstration of, or lower the costs of, advanced photovoltaic technologies; and

(2) the extent to which a proposal is likely to—

(A) maximize the amount of photovoltaics demonstrated;

(B) maximize the proportion of non-Federal cost share; and

(C) limit State administrative costs.

(g) STATE PROGRAM.—A program operated by a State with funding under this section shall provide competitive awards for the demonstration of advanced photovoltaic technologies. Each State program shall—

(1) require a contribution of at least 60 percent per award from non-Federal sources, which may include any combination of State, local, and private funds, except that at least 10 percent of the funding must be supplied by the State;

(2) limit awards for any single project to a maximum of $1,000,000;

(3) prohibit any nongovernmental recipient from receiving more than $1,000,000 per year;

(4) endeavor to fund recipients in the commercial, industrial, institutional, governmental, and residential sectors;

(5) limit State administrative costs to no more than 10 percent of the grant;

(6) report annually to the Secretary on—

(A) the amount of funds disbursed;

(B) the amount of photovoltaics purchased; and

(C) the results of the monitoring under paragraph (7);

(7) provide for measurement and verification of the output of a representative sample of the photovoltaics systems demonstrated throughout the average working life of the systems, or at least 20 years; and

(8) require that applicant buildings must have received an independent energy efficiency audit during the 6-month period preceding the filing of the application.

(h) UNEXPENDED FUNDS.—If a State fails to expend any funds received under subsection (c) or (d) within 3 years of receipt, such remaining funds shall be returned to the Treasury.

(i) REPORTS.—The Secretary shall report to Congress 5 years after funds are first distributed to the States under this section—

(1) the amount of photovoltaics demonstrated;

(2) the number of projects undertaken;

(3) the administrative costs of the program;

(4) the amount of funds that each State has not received because of a failure to submit a qualifying proposal, as described in subsection (c)(3);

(5) the results of the monitoring under subsection (g)(7); and

(6) the total amount of funds distributed, including a breakdown by State.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for the purposes of carrying out this section—

(1) $50,000,000 for fiscal year 2007;

(2) $100,000,000 for fiscal year 2008;

(3) $150,000,000 for fiscal year 2009;

(4) $200,000,000 for fiscal year 2010; and

(5) $300,000,000 for fiscal year 2011.

SEC. 12. ENERGY EFFICIENT BUILDING GRANT PROGRAM.

(a) ENERGY EFFICIENT BUILDING PILOT GRANT PROGRAM.—

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Secretary shall establish a pilot program to award grants to businesses and organizations for new construction of energy efficient buildings, or major ren-

ovations of buildings that will result in energy efficient buildings, to demonstrate innovative energy efficiency technologies, especially those sponsored by the Department of Energy.

(2) AWARDS.—The Secretary shall award grants under this subsection competitively to those applicants whose proposals—

(A) best demonstrate—

(i) likelihood to meet or exceed the standards referred to in subsection (b)(2);

(ii) likelihood to maximize cost-effective energy efficiency opportunities; and

(iii) advanced energy efficiency technologies; and

(B) are least likely to be realized without Federal assistance.

(3) AMOUNT OF GRANTS.—Grants under this subsection shall be for up to 50 percent of design and energy modeling costs, not to exceed $50,000 per building. No single grantee may be eligible for more than 3 grants per year under this program.

(4) GRANT PAYMENTS.—

(A) INITIAL PAYMENT.—The Secretary shall pay 50 percent of the total amount of the grant to grant recipients upon selection.

(B) REMAINDER OF PAYMENT.—The Secretary shall pay the remaining 50 percent of the grant only after independent certification that operational buildings are energy efficient buildings as defined in subsection (b).

(C) FAILURE TO COMPLY.—The Secretary shall not provide the remainder of the payment unless the building is certified within 6 months after operation of the completed building to meet the requirements described in subparagraph (B), or in the case of major renovations the building is certified within 6 months of the completion of the renovations.

(5) REPORT TO CONGRESS.—Not later than 3 years after awarding the first grant under this subsection, the Secretary shall transmit to Congress a report containing—

(A) the total number and dollar amount of grants awarded under this subsection; and

(B) an estimate of aggregate cost and energy savings enabled by the pilot program under this subsection.

(6) ADMINISTRATIVE EXPENSES.—Administrative expenses for the program under this subsection shall not exceed 10 percent of appropriated funds.

(b) DEFINITION OF ENERGY EFFICIENT BUILDING.—For purposes of this section the term ''energy efficient building'' means a building that—

(1) achieves a reduction in energy consumption of—

(A) at least 25 percent for new construction, compared to the energy standards set by the 2004 International Energy Conservation Code (in the case of residential buildings) or ASHRAE Standard 90.1–2004; or

(B) at least 20 percent for major renovations, compared to energy consumption before renovations are begun; and

(2) is constructed or renovated in accordance with the most current, appropriate, and applicable voluntary consensus standards, as determined by the Secretary, such as those listed in the assessment under section 914(b), or revised or developed under section 914(c), of the Energy Policy Act of 2005.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $10,000,000 for each of the fiscal years 2008 through 2012.

SEC. 13. ENERGY EXTENSION.

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

(1) COOPERATIVE EXTENSION.—The term ''Cooperative Extension'' means the extension services established at the land-grant colleges and universities under the Smith-Lever Act of May 8, 1914.

(2) DEPARTMENT.—The term ''Department'' means the Department of Energy.

(3) ENERGY SUPPLY RESEARCH AND DEVELOPMENT PROGRAMS.—The term ''energy supply research and development programs'' means the research, development, demonstration, and commercial application programs in the Office of Energy Efficiency and Renewable Energy, the Office of Electricity Delivery and Energy Reliability, and the Office of Fossil Energy.

(4) INSTITUTION OF HIGHER EDUCATION.—The term ''institution of higher education'' has the meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(5) LAND-GRANT COLLEGES AND UNIVERSITIES.—The term ''land-grant colleges and universities'' means—

(A) 1862 Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601));

(B) 1890 Institutions (as defined in section 2 of that Act); and

(C) 1994 Institutions (as defined in section 2 of that Act).

(b) IN GENERAL.—

(1) GRANTS.—The Secretary, through the energy supply research and development programs of the Department, shall carry out a program to award competitive, merit-reviewed grants to Cooperative Extension services or offices, States, local governments, institutions of higher education, and nonprofit institutions with expertise in energy research or extension, or consortia thereof, to conduct activities to transfer knowledge and information about advanced energy technologies that increase efficiency of energy use, especially those developed at the National Laboratories and by the Department, to individuals, businesses, nonprofit entities, and public entities, including local governments and school districts.

(2) REQUIREMENT.—To receive funding under this section, a grant applicant must already operate an outreach program capable of transferring knowledge and information about advanced energy technologies that increase efficiency of energy use, or

must partner with an entity that has such an outreach program.

(c) USES OF FUNDS.—Funds awarded under this section may be used for the following activities:

(1) Developing and distributing informational materials on technologies that could use energy more efficiently.

(2) Carrying out small-scale projects to demonstrate technologies that could use energy more efficiently.

(3) Developing and conducting seminars, workshops, long-distance learning sessions, and other activities to aid in the dissemination of knowledge and information on technologies that could use energy more efficiently.

(4) Providing or coordinating onsite energy evaluations for a wide range of energy end-users.

(5) Examining the energy efficiency needs of energy end-users to develop recommended research projects for the Department.

(6) Hiring experts in energy efficient technologies to carry out activities described in paragraphs (1) through (5).

(7) Carrying out any other activities the Secretary believes will accomplish the purposes described in subsection (b)(1).

(d) SELECTION PROCESS APPLICATION.—An applicant seeking funding under this section shall submit an application to the Secretary at such time, in such manner, and containing such information as the Secretary may require. The application shall include, at a minimum—

(1) a description of the applicant's current outreach program and of why it would be capable of transferring knowledge and information about advanced energy technologies that increase efficiency of energy use;

(2) a description of the activities the applicant would carry out, of the technologies that would be transferred, and of who would be carrying out those activities;

(3) a description of how the proposed activities would be appropriate to the specific energy needs of the area to be served;

(4) an estimate of the number and types of energy end-users expected to be reached through such activities; and

(5) a description of how the applicant will assess the success of the program.

(e) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under this section, the Secretary shall consider, at a minimum—

(1) the ability of the applicant to effectively carry out the proposed program;

(2) the appropriateness of the applicant's outreach program for carrying out the program described in this section; and

(3) the likelihood that proposed activities could be expanded or used as a model for other areas.

(f) AWARDS.—

(1) DISTRIBUTION.—In making awards under this section, the Secretary shall ensure that, to the extent practicable, the program enables the transfer of knowledge and information about a variety of technologies and enables the transfer of knowledge and information in a variety of geographic areas.

(2) FOCUS.—In making awards under this section, the Secretary shall give priority to applicants that would significantly expand on or fill a gap in existing programs in a geographical region.

(g) COST SHARING.—The Secretary shall require cost-sharing in accordance with the requirements of section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352) for commercial application activities.

(h) DURATION.—

(1) INITIAL GRANT PERIOD.—A grant awarded under this section shall be for a period of 5 years.

(2) INITIAL EVALUATION.—Each grantee under this section shall be evaluated during its third year of operation under procedures established by the Secretary to determine if the grantee is accomplishing the purposes of this section described in subsection (b)(1). The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for 3 additional years beyond the original term of the grant.

(3) ADDITIONAL EXTENSION.—If a grantee receives an extension under paragraph (2), the grantee shall be evaluated again during the second year of the extension. The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for a final additional period of 3 additional years beyond the original extension.

(4) LIMITATION.—No grantee may receive more than 11 years of support under this section without reapplying for support and competing against all other applicants seeking a grant at that time.

(i) TECHNICAL ASSISTANCE.—The Secretary and the National Laboratories may provide technical assistance on advanced energy technologies and methods to grantees.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section—

(1) $25,000,000 for fiscal year 2008;

(2) $27,375,000 for fiscal year 2009;

(3) $30,000,000 for fiscal year 2010;

(4) $32,900,000 for fiscal year 2011; and

(5) $36,000,000 for fiscal year 2012.

SEC. 14. GREEN ENERGY EDUCATION.

(a) DEFINITION.—For the purposes of this section:

(1) DIRECTOR.—The term ''Director'' means the Director of the National Science Foundation.

(2) HIGH PERFORMANCE BUILDING.—The term ''high performance building'' has the meaning given that term in section 914(a) of the Energy Policy Act of 2005 (42 U.S.C. 16194(a)).

(b) GRADUATE TRAINING IN ENERGY RESEARCH AND DEVELOPMENT.—

(1) FUNDING.—In carrying out research, development, demonstration, and commercial application activities authorized for the Department of Energy, the Secretary may contribute funds to the National

Science Foundation for the Integrative Graduate Education and Research Traineeship program to support projects that enable graduate education related to such activities.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(c) CURRICULUM DEVELOPMENT FOR HIGH PERFORMANCE BUILDING DESIGN.—

(1) FUNDING.—In carrying out advanced energy technology research, development, demonstration, and commercial application activities authorized for the Department of Energy related to high performance buildings, the Secretary may contribute funds to curriculum development activities at the National Science Foundation for the purpose of improving undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings, including development of curricula, of laboratory activities, of training practicums, or of design projects. A primary goal of curriculum development activities supported under this section shall be to improve the ability of engineers, architects, and plan-

ners to work together on the incorporation of advanced energy technologies during the design and construction of high performance buildings.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(3) PRIORITY.—In awarding grants with respect to which the Secretary has contributed funds under this subsection, the Director shall give priority to applications from departments, programs, or centers of a school of engineering that are partnered with schools, departments, or programs of design, architecture, and city, regional, or urban planning.

SEC. 15. ARPA–E STUDY.

(a) IN GENERAL.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a detailed study of, and make further recommendations on, the October 2005 National Academy of Sciences recommendation to establish an Advanced Research Projects Agency-Energy (in this section referred to as ARPA–E).

(b) REPORT.—Not later than 12 months after the date of enactment of this Act, the Secretary shall transmit to Congress the study described in subsection (a) and the

Secretary's response to the findings, conclusions, and recommendations of that study.

(c) TERMS OF REFERENCE.—The Secretary shall ensure that the study described in subsection (a) addresses the following questions:

(1) What basic research related to new energy technologies is occurring now, what entities are funding it, and what is preventing the results of that research from reaching the market?

(2) What economic evidence indicates that the limiting factor in the market penetration of new energy technologies is a lack of basic research on pathbreaking new technologies? What barriers do those trying to develop new energy technologies face during later stages of research and development?

(3) To what extent is the Defense Advanced Research Projects Agency an appropriate model for an energy research agency, given that the Federal Government would not be the primary customer for its technology and where cost is an important concern?

(4) How would research and development sponsored by ARPA–E differ from research and development conducted by the National Laboratories or sponsored by the Department of Energy through the

Office of Science, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, the Office of Electricity Delivery and Energy Reliability, and the Office of Nuclear Energy?

(5) Should industry or National Laboratories be recipients of ARPA–E grants? What institutional or organizational arrangements would be required to ensure that ARPA–E sponsors transformational, rather than incremental, research and development?

○

SECTION-BY-SECTION ANALYSIS OF H.R. 5656,
ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION ACT OF 2006

The bill covers a wide range of energy technologies, including coal, nuclear, batteries, biofuels, hydrogen, solar, wind, and plug-in hybrid electric vehicles, as well as energy programs such as green buildings and green energy education. For these technologies and programs, H.R. 5656 specifically authorizes appropriations of approximately $4.7 billion over six years for energy research, development, demonstration, and commercial application; of this total, $485 million comes from existing authorizations for advanced biofuel technologies (see table for details).

Section 1—Short Title:

- "Energy Research, Development, Demonstration, and Commercial Application Act of 2006"

Section 2—Definitions:

- Defines terms used in the text.

Section 3—FutureGen:

- Authorizes $537 million for fiscal years 2007–2012 for FutureGen, a project to demonstrate the feasibility of the commercial application of advanced clean coal technology, including carbon capture and geological sequestration, for electricity generation.
- Requires the U.S. Department of Energy (DOE) to design FutureGen to meet specific emissions goals and to cost no more than 110 percent of the average cost of all commercial U.S. integrated coal gasification combined cycle electric generating plants.

Section 4—Advanced Fuel Cycle Technologies for Nuclear Power:

- Authorizes such sums as may be necessary to carry out this section for fiscal years 2007–2009 from sums already authorized to be appropriated for nuclear fuel cycle technology in the *Energy Policy Act of 2005* (EPACT) (P.L. 109–58).
- Authorizes additional appropriations of such sums as may be necessary to carry out this section for fiscal years 2010–2012 (since EPACT does not contain authorizations of appropriations for nuclear fuel cycle technology for these years).
- Requires DOE to carry out a program of research, development, demonstration, and commercial application on advanced nuclear power technologies with the goal of minimizing the production of nuclear waste to the extent that the Yucca Mountain waste repository would be sufficient for storing all of the nuclear waste generated by U.S. commercial nuclear power reactors during this century.
- Requires DOE to develop a comprehensive plan for advanced nuclear technology R&D and prohibits DOE from moving forward on some large-scale nuclear technology demonstration projects until the plan is reviewed by the National Academy of Sciences (NAS) and the plan and the NAS review are delivered to Congress.

Section 5—Advanced Battery Technologies:

- Authorizes approximately $144 million for fiscal years 2007–2010 to carry out a program of research, development, demonstration, and commercial application on advanced battery technologies for use in motor vehicles, particularly for plug-in hybrid electric vehicles.

Section 6—Advanced Biofuel Technologies:

- Authorizes $485 million for fiscal years 2007–2009, from sums already authorized to be appropriated for bioenergy programs in EPACT, to carry out a program of research, development, demonstration, and commercial application for production of liquid fuels from biomass.

Section 7—Advanced Hydrogen Storage Technologies:

- Authorizes $211 million for fiscal years 2007–2010 to carry out a program of research, development, demonstration, and commercial application for technologies to enable practical onboard storage of hydrogen for use as a fuel for light-duty motor vehicles.

Section 8—Advanced Solar Photovoltaic Technologies:

- Authorizes $648 million for fiscal years 2007–2010 to carry out a program of research, development, demonstration, and commercial application for advanced solar photovoltaic technologies.

Section 9—Advanced Wind Energy Technologies:

- Authorizes approximately $204 million for fiscal years 2007–2010 to carry out a program of research, development, demonstration, and commercial application for wind energy technologies.

Section 10—Plug-In Hybrid Electric Vehicle Technology Program:

- Authorizes $1.25 billion for fiscal years 2007–2011 to carry out a program of research, development, demonstration, and commercial application on technologies needed for the development of plug-in hybrid electric vehicles.
- Authorizes $250 million for fiscal years 2007–2011 to establish a competitive grant pilot program for demonstration of plug-in hybrid electric vehicles to State governments, local governments, and/or metropolitan transportation authorities.

Section 11—Photovoltaic Demonstration Program:

- Authorizes $800 million for fiscal years 2007–2011 to establish a grant program to States for the demonstration of advanced photovoltaic solar energy technology. States are required to award funds in a competitive allocation to eligible recipients and to require a contribution of at least 60 percent per award from non-federal sources, with at least ten percent provided by States.

Section 12—Energy Efficient Building Grant Program:

- Authorizes $50 million for fiscal years 2008–2012 to establish an energy efficient building pilot program to award grants to business and organizations for new construction of energy efficient buildings, or major renovations of buildings that will result in energy efficient buildings, and to demonstrate innovative energy efficiency technologies. Grants may be for up to 50 percent of design and energy modeling costs, not to exceed $50,000 per building.

Section 13—Energy Extension:

- Authorizes approximately $151 million to carry out a program to award competitive, merit-based grants to conduct activities to transfer knowledge and information about advanced energy technologies that increase efficiency of energy use to individuals, businesses, nonprofit entities and public entities; requires federal cost-sharing of 50 percent and allows for extension of grants beyond initial five-year period.

Section 14—Green Energy Education:

- Authorizes DOE's Office of Science and its applied energy technology programs to contribute funds to National Science Foundation's (NSF) Integrative Graduate Education and Research Traineeship (IGERT) program in support of projects related to the science and energy missions of the department.
- Authorizes DOE's high performance building technology programs to contribute to NSF's ongoing curriculum development activities for the purpose of improving undergraduate and graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings. Gives priority to applications from schools, departments or programs of engineering that are partnered with schools, departments or programs of design, architecture and city, regional, or urban planning.

Section 15—ARPA–E Study:

- Requires DOE to enter into an arrangement with NAS to conduct a detailed study of, and make further recommendations on, the October 2005 NAS recommendation to establish an Advanced Research Projects Agency–Energy (ARPA–E).
- Requires DOE to transmit a report to Congress containing the NAS study and DOE's response to the findings, conclusions, and recommendations of that study.

Authorization of Appropriations in H.R. 5656
The Energy Research, Development, Demonstration, and Commercial Application Act of 2006
($ in millions)

Section	Section Title	FY07	FY08	FY09	FY10	FY11	FY12	Total
3	FutureGen	54	112	130	95	75	71	**537**
4	Advanced Fuel Cycle Tech. for Nuclear Power	0	0	0	0	0	0	**0**
5	Advanced Battery Tech.	31	34	38	41			**144**
6	Advanced Biofuel Tech.	150	160	175	0	0	0	**485**
7	Advanced Hydrogen Storage Tech.	46	50	55	60			**211**
8	Advanced PV Tech.	148	155	165	180	0	0	**648**
9	Advanced Wind Energy Tech.	44	48	53	59	0	0	**204**
10	Plug-in Hybrid Electric Vehicles	300	300	300	300	300	0	**1,500**
11	PV Demonstration Program (SUN Act)	50	100	150	200	300	0	**800**
12	Energy Efficient Building Grant Program	0	10	10	10	10	10	**50**
13	Energy Extension	0	25	27	30	33	36	**151**
14	Green Energy Education	0	0	0	0	0	0	**0**
15	ARPA-E Study	0	0	0	0	0	0	**0**
	Total of H.R. 5656	**823**	**994**	**1,103**	**975**	**718**	**117**	**4,730**
	Existing Authorization (Section 6)	*150*	*160*	*175*	*0*	*0*	*0*	*485*
	Net New Authorizations	**673**	**834**	**928**	**975**	**718**	**117**	**4,245**

SUMMARY OF H.R. 5656, ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION ACT OF 2006

(INTRODUCED BY MRS. BIGGERT FOR HERSELF, MR. BOEHLERT, MR. HALL, MR. SMITH OF TEXAS, MR. CALVERT, MR. EHLERS, MR. INGLIS, AND MR. WAMP)

- This bill authorizes the President's Advanced Energy Initiative, a research and development (R&D) and technology demonstration initiative at the Department of Energy (DOE) to develop advanced clean energy technologies. The bill goes further and authorizes a plug-in hybrid electric vehicle R&D and demonstration program, a solar photovoltaic R&D and demonstration program, a cooperative extension program for energy technology and energy efficiency information, a program to provide incentives to design and construct energy efficient buildings, and energy technology and energy efficiency education and outreach programs.

Specifically, the bill:

- Endorses the President's vision of:
  - a near-zero emissions coal-fired power plant and stipulates environmental performance requirements for the FutureGen demonstration facility;
  - an advanced nuclear power technology R&D program, but slows development of some technologies proposed under the Global Nuclear Energy Partnership (GNEP) initiative until a more comprehensive R&D and demonstration plan is developed by DOE and reviewed by the National Academy of Sciences;
  - accelerated development of hybrid electric vehicles by authorizing research on advanced battery technology and an R&D and demonstration program for plug-in hybrid electric vehicles;
  - accelerated development of advanced solar photovoltaic power technology by authorizing photovoltaic R&D and demonstration;
  - accelerated development of advanced biofuel technologies by authorizing R&D and demonstration on ethanol production from cellulosic feedstocks;
- Establishes a cooperative extension program for energy and efficiency technologies;
- Provides incentives for the design and construction of energy efficient buildings; and
- Authorizes education and outreach relating to energy technologies that improve energy supply and improve the efficiency of energy utilization.

The bill is endorsed, in whole or in part, by:

Alliance to Save Energy, American Chemical Society, American Council for an Energy-Efficient Economy, American Honda Motor Company, American Institute of Architects, American Public Power Association, Association of American Universities, Dow Corning, DuPont, Johnson Controls, Inc., National Association of State Universities and Land-Grant Colleges, National Rural Electric Cooperative Association.

COMMITTEE ON SCIENCE
FULL COMMITTEE MARKUP

June 27, 2006

AMENDMENT ROSTER

H.R. 5656, Energy Research, Development, Demonstration, and Commercial Application Act of 2006
--Motion to adopt the bill, as amended: agreed to by a voice vote.
--Motion to report the bill, as amended: agreed to by a voice vote.

No.	Sponsor	Description	Results
1.	Ms. Biggert	Manager's amendment. See separate description.	--Adopted by a voice vote.
2.	Mr. Gordon	Amendment to authorize research and development (R&D) on materials to make biobased fuels and ultra low sulfur diesel fuels more compatible with existing fuel storage and delivery infrastructure, and R&D on methods to test sulfur content in fuels.	--Adopted by a voice vote.
3.	Ms. Matsui	Amendment to require the Secretary of Energy to continue to carry out R&D on geothermal energy, hydropower, co-generation, and distributed energy production authorized in the Energy Policy Act of 2005 (EPACT).	--Adopted by a voice vote.
4.	Ms. Woolsey	Amends the definition of an "energy efficient building" to require such a building meet a higher efficiency standard than that specified in H.R. 5656.	--Adopted by a voice vote.
5.	Ms. Jackson-Lee	Amendment to specify that, in awarding grants under the Green Energy Education provision, the Director of the National Science Foundation shall give due consideration to applications from Historically Black Colleges and Universities and other Minority Serving Institutions.	--Adopted by a voice vote.
6.	Mr. Green	Amends EPACT to include production of certain bio-products from biomass as an authorized activity of the bioenergy demonstration program.	--Adopted by a voice vote.
7.	Mr. Baird	Amends the definition of an "energy efficient building" to require such a building to use heating ventilation and air conditioning systems that meet or exceed Energy Star efficiency standards.	--Adopted by a voice vote.

8.	Mr. Gordon	Amendment to authorize a revolving loan fund for the purposes of improving the energy efficiency of federal buildings.	–Unanimous consent to withdraw the amendment: agreed to by a voice vote.
9.	Mr. Gordon	Amendment to establish an Advanced Research Projects Agency for Energy (ARPA-E) within the Department of Energy. Establishes a fund in the Department of the Treasury which shall be administered by the Director of ARPA-E to carry out the functions of the Agency. Authorizes appropriations of $3.375 billion to the Treasury fund over 6 years.	–Defeated by a voice vote.
10.	Mr. Costello	Amendment providing indemnification for private-sector participants in the FutureGen advanced clean coal technology demonstration project.	–Unanimous consent to withdraw the amendment: agreed to by a voice vote.
11.	Mr. Costello	Amendment authorizing a coal gasification demonstration project related to ethanol production.	–Defeated by a voice vote.
12.	Mr. Hall	Amendment on methane from coal.	–Adopted as part of the Manager's amendment by a voice vote, pursuant to unanimous consent request to include in Manager's amendment.

AMENDMENTS TO H.R. 5656

OFFERED BY MRS. BIGGERT OF ILLINOIS

Page 2, lines 10, 14, and 18, redesignate paragraphs (3), (4), and (5) as paragraphs (4), (6), and (7), respectively.

Page 2, after line 9, insert the following new paragraph:

(3) the term "Department" means the Department of Energy;

Page 2, after line 13, insert the following new paragraph:

(5) the term "institution of higher education" has the meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a));

Page 2, line 20, through page 5, line 3, amend section 3 to read as follows:

SEC. 3. FUTUREGEN.

(a) IN GENERAL.—The Secretary shall carry out a project of research, development, and demonstration designed to demonstrate the feasibility of the commercial application of advanced clean coal energy technology, includ-

ing carbon capture and geological sequestration, for electricity generation.

(b) INDUSTRY INVOLVEMENT.—The Secretary may conduct the project through a financial assistance cooperative agreement with a consortium of coal-fired power producers, coal companies, and others.

(c) REQUIREMENTS.—The Secretary shall ensure that—

(1) a FutureGen demonstration facility is operating by 2012;

(2) the FutureGen demonstration facility is designed to be able—

(A) to achieve at least a 99 percent reduction in sulfur dioxide emissions or, when burning coal containing 3 pounds or less of sulfur per million British thermal units, the project shall be able to emit no more than 0.03 pounds of sulfur dioxide emissions per million British thermal units;

(B) to emit no more than 0.05 pounds of nitrogen oxide emissions per million British thermal units;

(C) to achieve at least a 90 percent reduction in mercury emissions;

(D) to emit no more than 0.005 pounds of total particulate emissions in the flue gas per million British thermal units;

(E) to achieve at least a 90 percent reduction in carbon dioxide emissions;

(F) to demonstrate that the technology can be applied to a diversity of United States coal types; and

(G) to demonstrate the feasibility of electricity generation from coal using advanced clean coal technology with carbon capture and geological sequestration at a cost not greater than 10 percent higher than the average of all commercial integrated coal gasification combined cycle electric generating plants operating in the United States as of the date of enactment of this Act.

(d) SYSTEM INTEGRATION.—To reduce technical risk and focus development efforts on system integration, the Secretary shall, to the extent practicable, ensure that the FutureGen demonstration facility is designed to utilize available advanced clean coal technology, as well as first-of-a-kind technology components, as appropriate.

(e) DATA PROTECTION.—The Secretary may agree to protect FutureGen information to the same extent author-

ized for the Clean Coal Power Initiative pursuant to section 402(h) of the Energy Policy Act of 2005 (42 U.S.C. 16231(h)).

(f) CONTRIBUTIONS.—The Secretary may accept contributions from private and public sources, including foreign nations and international contributors, and use such contributions to offset a portion of the Federal share of the project costs.

Page 5, line 4, through page 11, line 4, amend section 4 to read as follows:

SEC. 4. ADVANCED NUCLEAR FUEL CYCLE TECHNOLOGIES RESEARCH, DEVELOPMENT, AND DEMONSTRATION PLAN.

(a) DEFINITION.—In this section, the term ''advanced recycling reactor'' means a nuclear reactor that is capable of significantly reducing the toxicity or radioactivity of spent nuclear fuel components.

(b) SYSTEMS ANALYSIS.—

(1) IN GENERAL.—The Secretary shall develop a comprehensive modeling and simulation capability to enable a thorough analysis of possible advanced nuclear fuel cycle systems. The modeling and simulation capability shall be capable of examining—

(A) all of the components of each advanced nuclear fuel cycle system analyzed, including—

(i) spent fuel separations technologies;

(ii) advanced recycling reactor technologies;

(iii) fuel fabrication technologies;

(iv) advanced thermal reactor technologies, including advanced thermal reactor designs that would be capable of reducing the toxicity or radioactivity of spent nuclear fuel components; and

(v) waste disposal technologies;

(B) the manner in which possible technology and engineering choices for individual components might affect the overall system, and how various system components would interact with one another;

(C) quantitative mass flows of nuclear fuel and spent nuclear fuel, including projected inventories and transportation requirements for nuclear fuel and spent nuclear fuel, for any examined system; and

(D) estimated costs associated with building and operating the examined fuel cycle system, including a comparison with the estimated costs of building and operating a more conventional future fuel cycle system that includes

geologic sequestration of high-level nuclear waste but that does not include recycling of spent fuel components.

(2) ADVANCED NUCLEAR FUEL CYCLE TECHNOLOGIES PLAN.—

(A) ANALYSIS.—The Secretary shall conduct a thorough analysis of more than 1 possible configuration of an advanced nuclear fuel cycle system using the analytical capability developed under paragraph (1). Each analysis of a possible configuration of an advanced nuclear fuel cycle system shall examine—

(i) the compatibility of fuel cycle system components, including each of the system component technologies described in paragraph (1)(A); and

(ii) the degree to which the examined system would—

(I) minimize the toxicity and radioactivity of spent nuclear fuel;

(II) increase the proliferation resistance of commercial nuclear power reactors and their associated fuel systems and infrastructure;

(III) maximize the amount of useful energy that can be extracted from nuclear fuel; and

(IV) minimize the costs of construction and operation of commercial nuclear power reactors and their associated fuel systems and infrastructure.

(B) PLAN.—Using the results of the analyses developed under subparagraph (A), and not later than June 30, 2007, the Secretary shall develop a detailed plan for research, development, and demonstration for advanced nuclear fuel cycle system technologies, including proposed technology options for each of the system component technologies described in paragraph (1)(A) and any proposed engineering-scale demonstrations of such system component technologies. The plan shall include an estimate of the design, engineering, construction, and lifetime operating costs of any proposed engineering-scale demonstration, including decontamination and decommissioning costs. In developing the plan, the Secretary shall consider the integration into an advanced nuclear fuel cycle system of advanced thermal reactors capa-

ble of reducing the toxicity or radioactivity of spent nuclear fuel components.

(C) CONSULTATION.—In developing the plan under subparagraph (B), the Secretary shall consult with—

(i) technical experts from United States and foreign companies that design or engineer nuclear power plants or nuclear fuel reprocessing facilities;

(ii) technical experts from United States electric utilities that operate nuclear power plants;

(iii) economists with expertise in nuclear power and electricity markets;

(iv) the Nuclear Energy Research Advisory Committee;

(v) the Chairman of the Nuclear Regulatory Commission; and

(vi) the Administrator of the Environmental Protection Agency.

(3) NATIONAL ACADEMY OF SCIENCES REVIEW.—The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a review of the plan developed under paragraph

(2)(B), including by reviewing the validity of the underlying analyses required under paragraph (2)(A).

(c) REPORT.—Not later than June 30, 2008, the Secretary shall transmit to Congress a report that includes—

(1) the research, development, and demonstration plan developed under subsection (b)(2)(B), and the report from the National Academy of Sciences on the review conducted under subsection (b)(3);

(2) a revised research, development, and demonstration plan that takes into account the findings, conclusions, and recommendations of the report from the National Academy of Sciences; and

(3) an explanation of any instances where the Secretary does not concur with the findings, conclusions, and recommendations of the report from the National Academy of Sciences.

(d) PROHIBITION.—The Secretary shall not initiate detailed design or construction of any demonstration facility that is capable of processing 750 kilograms or more per year of nuclear fuel or spent nuclear fuel and that is designed to demonstrate the advanced nuclear fuel system component technologies described in subsection (b)(1)(A)(ii) and (iii) until 90 days after the report under subsection (c) has been transmitted to Congress.

Page 11, lines 5 through 24, strike section 5 and redesignate the subsequent sections accordingly.

Page 12, line 4, strike "liquid" and insert "motor and other".

Page 12, line 19, redesignate subsection (c) as subsection (d).

Page 12, after line 18, insert the following new subsection:

(c) INSTITUTION OF HIGHER EDUCATION GRANTS.—The Secretary shall designate not less than 10 percent of the funds appropriated under subsection (d) for each fiscal year to carry out the program for grants to competitively selected institutions of higher education around the country focused on meeting the objectives stated in subsection (b).

Page 13, lines 12 through 19, strike subsection (c).

Page 16, line 2, strike "fuel cell vehicles,".

Page 16, lines 9 through 23, strike paragraphs (4) and (5) and insert the following:

(4) FLEXIBLE FUEL PLUG-IN HYBRID ELECTRIC VEHICLE.—The term "flexible fuel plug-in hybrid electric vehicle" means a plug-in hybrid electric vehicle warranted by its manufacturer as capable of

operating on any combination of gasoline or E85 for its onboard internal combustion or heat engine.

Page 16, line 24, and page 17, line 8, redesignate paragraphs (6) and (7) as paragraphs (5) and (6), respectively.

Page 17, line 18, insert "and electric drive transportation" after "hybrid electric vehicles".

Page 18, line 23, insert "and public entities" after "local governments".

Page 20, line 9, strike "entities" and insert "or nonprofit entities, which may include institutions of higher education, including Historically Black Colleges and Universities, Hispanic Serving Institutions, and other minority-serving institutions".

Page 26, line 16, strike "and".

Page 26, line 20, strike the period and insert "; and".

Page 26, after line 20, insert the following new paragraph:

(9) encourage Historically Black Colleges and Universities, Hispanic Serving Institutions, and other minority-serving institutions to apply for grants under this program.

Page 28, line 9, strike "of Energy".

Page 28, lines 20 and 21, amend subparagraph (B) to read as follows:

(B) maximize the leverage of private investment for costs related to increasing the energy efficiency of the building.

Page 28, after line 21, insert the following new paragraph (and redesignate the subsequent paragraphs accordingly):

(3) CONSIDERATION.—The Secretary shall give due consideration to proposals for buildings that are likely to serve low and moderate income populations.

Page 29, line 9, insert ", by a professional engineer or other qualified professional," after "independent certification".

Page 31, line 5, through page 37, line 19, amend section 13 to read as follows:

SEC. 13. ENERGY TECHNOLOGY TRANSFER.

Section 917 of the Energy Policy Act of 2005 (42 U.S.C. 16197) is amended to read as follows:

"SEC. 917. ADVANCED ENERGY EFFICIENCY TECHNOLOGY TRANSFER CENTERS.

"(a) GRANTS.—Not later than 18 months after the date of enactment of the Energy Research, Development,

Demonstration, and Commercial Application Act of 2006, the Secretary shall make grants to nonprofit institutions, State and local governments, cooperative extension services, or universities (or consortia thereof), to establish a geographically dispersed network of Advanced Energy Efficiency Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers. In establishing the network, the Secretary shall consider the special needs and opportunities for increased energy efficiency for manufactured and site-built housing, including construction, renovation, and retrofit. In making awards under this section, the Secretary shall—

"(1) give priority to applicants already operating or partnered with an outreach program capable of transferring knowledge and information about advanced energy efficiency methods and technologies;

"(2) ensure that, to the extent practicable, the program enables the transfer of knowledge and information—

"(A) about a variety of technologies and

"(B) in a variety of geographic areas; and

"(3) give preference to applicants that would significantly expand on or fill a gap in existing programs in a geographical region.

"(b) ACTIVITIES.—Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use. Funds awarded under this section may be used for the following activities:

"(1) Developing and distributing informational materials on technologies that could use energy more efficiently.

"(2) Carrying out demonstrations of advanced energy methods and technologies.

"(3) Developing and conducting seminars, workshops, long-distance learning sessions, and other activities to aid in the dissemination of knowledge and information on technologies that could use energy more efficiently.

"(4) Providing or coordinating onsite energy evaluations, including instruction on the commissioning of building heating and cooling systems, for a wide range of energy end-users.

"(5) Examining the energy efficiency needs of energy end-users to develop recommended research projects for the Department.

"(6) Hiring experts in energy efficient technologies to carry out activities described in paragraphs (1) through (5).

"(c) APPLICATION.—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section. The application shall include, at a minimum—

"(1) a description of the applicant's outreach program, and the geographic region it would serve, and of why the program would be capable of transferring knowledge and information about advanced energy technologies that increase efficiency of energy use;

"(2) a description of the activities the applicant would carry out, of the technologies that would be transferred, and of any other organizations that will help facilitate a regional approach to carrying out those activities;

"(3) a description of how the proposed activities would be appropriate to the specific energy needs of the geographic region to be served;

"(4) an estimate of the number and types of energy end-users expected to be reached through such activities; and

"(5) a description of how the applicant will assess the success of the program.

"(d) SELECTION CRITERIA.—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

"(1) The ability of the applicant to carry out the proposed activities.

"(2) The extent to which the applicant will coordinate the activities of the Center with other entities as appropriate, such as State and local governments, utilities, universities, and National Laboratories.

"(3) The appropriateness of the applicant's outreach program for carrying out the program described in this section.

"(4) The likelihood that proposed activities could be expanded or used as a model for other areas.

"(e) COST-SHARING.—In carrying out this section, the Secretary shall require cost-sharing in accordance with the requirements of section 988 for commercial application activities.

"(f) DURATION.—

"(1) INITIAL GRANT PERIOD.—A grant awarded under this section shall be for a period of 5 years.

"(2) INITIAL EVALUATION.—Each grantee under this section shall be evaluated during its third year of operation under procedures established by the Secretary to determine if the grantee is accomplishing the purposes of this section described in subsection (a). The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for 3 additional years beyond the original term of the grant.

"(3) ADDITIONAL EXTENSION.—If a grantee receives an extension under paragraph (2), the grantee shall be evaluated again during the second year of the extension. The Secretary shall terminate any grant that does not receive a positive evaluation. If an evaluation is positive, the Secretary may extend the grant for a final additional period of 3 additional years beyond the original extension.

"(4) LIMITATION.—No grantee may receive more than 11 years of support under this section without reapplying for support and competing against all other applicants seeking a grant at that time.

"(g) PROHIBITION.—None of the funds awarded under this section may be used for the construction of facilities.

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

"(1) ADVANCED ENERGY METHODS AND TECHNOLOGIES.—The term 'advanced energy methods and technologies' means all methods and technologies that promote energy efficiency and conservation, including distributed generation technologies, and life-cycle analysis of energy use.

"(2) CENTER.—The term 'Center' means an Advanced Energy Technology Transfer Center established pursuant to this section.

"(3) DISTRIBUTED GENERATION.—The term 'distributed generation' means an electric power generation technology, including photovoltaic, small wind and micro-combined heat and power, that is designed to serve retail electric consumers on-site.

"(4) COOPERATIVE EXTENSION.—The term 'Cooperative Extension' means the extension services

established at the land-grant colleges and universities under the Smith-Lever Act of May 8, 1914.

"(5) LAND-GRANT COLLEGES AND UNIVERSITIES.—The term 'land-grant colleges and universities' means—

"(A) 1862 Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601));

"(B) 1890 Institutions (as defined in section 2 of that Act); and

"(C) 1994 Institutions (as defined in section 2 of that Act).

"(i) AUTHORIZATION OF APPROPRIATIONS.—In addition to amounts otherwise authorized to be appropriated in section 911, there are authorized to be appropriated for the program under this section such sums as may be appropriated.".

Page 38, line 7, strike "of Energy".

Page 38, line 22, strike "of Energy".

Page 41, line 8, strike "of Energy".

AMENDMENT

OFFERED BY MR. GORDON OF TENNESSEE

At the end of the bill, add the following new section:

SEC. ___. ALTERNATIVE BIOBASED FUELS AND ULTRA LOW SULFUR DIESEL.

(a) ALTERNATIVE FUEL AND ULSD INFRASTRUCTURE AND ADDITIVES RESEARCH AND DEVELOPMENT.—The Secretary, in consultation with the National Institute of Standards and Technology, shall carry out a program of research, development, demonstration, and commercial application of materials to be added to alternative biobased fuels and Ultra Low Sulfur Diesel fuels to make them more compatible with existing infrastructure used to store and deliver petroleum-based fuels to the point of final sale. The program shall address—

(1) materials to prevent or mitigate—

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

(B) dissolving of storage tank sediments;

(C) clogging of filters;

(D) contamination from water or other adulterants or pollutants;

(E) poor flow properties related to low temperatures;

(F) oxidative and thermal instability in long-term storage and use;

(G) increased volatile emissions;

(H) microbial contamination;

(I) problems associated with electrical conductivity; and

(J) increased nitrogen oxide emissions;

(2) alternatives to conventional methods for refurbishment and cleaning of gasoline and diesel tanks, including tank lining applications; and

(3) other problems as identified by the Secretary in consultation with the National Institute of Standards and Technology.

(b) SULFUR TESTING FOR DIESEL FUELS.—

(1) PROGRAM.—The Secretary, in consultation with the National Institute of Standards and Technology, shall carry out a research, development, and demonstration program on portable, low-cost, and accurate methods and technologies for testing of sulfur content in fuel, including Ultra Low Sulfur Diesel and Low Sulfur Diesel.

(2) SCHEDULE OF DEMONSTRATIONS.—Not later than 1 year after the date of enactment of this

Act, the Secretary shall begin demonstrations of technologies under paragraph (1).

(c) STANDARD REFERENCE MATERIALS AND DATA BASE DEVELOPMENT.—Not later than 6 months after the date of enactment of this Act, the National Institute of Standards and Technology shall develop a physical properties data base and standard reference materials for alternative fuels. Such data base and standard reference materials shall be maintained and updated as appropriate as additional alternative fuels become available.

AMENDMENT TO H.R. 5656
OFFERED BY MS. MATSUI OF CALIFORNIA

Page 15, after line 9, insert the following new section (and redesignate the subsequent sections accordingly):

SEC. 10. CONTINUING PROGRAMS.

The Secretary shall continue to carry out the research, development, demonstration, and commercial application activities authorized in sections 921(b)(1) (for distributed energy), 923 (for micro-cogeneration technology), and 931(a)(2)(C), (D),and (E)(i) (for geothermal energy, hydropower, and ocean energy) of the Energy Policy Act of 2005.

AMENDMENT TO H.R. 5656

OFFERED BY MS. WOOLSEY OF CALIFORNIA

Page 30, line 12, strike "25 percent" and insert "30 percent".

AMENDMENT

OFFERED BY MS. JACKSON-LEE OF TEXAS

Page 39, line 22, insert ", and due consideration to applications from Historically Black Colleges and Universities and other minority serving institutions" after "or urban planning".

AMENDMENT TO H.R. 5656

OFFERED BY MR. AL GREEN OF TEXAS

At the end of the bill, insert the following new section:

SEC. 16. BIOENERGY.

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

(1) in subsection (c)(1), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)";

(2) in subsection (c)(2), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)"; and

(3) in subsection (c)(3), by inserting ", including $25,000,000 for section 932(d)(1)(B)(v)" after "section 932(d)".

(b) BIOENERGY PROGRAM.—Section 932(d)(1)(B) of the Energy Policy Act of 2005 (42 U.S.C. 16232(d)(1)(B)) is amended—

(1) by striking "and" at the end of clause (iii); and

(2) by adding after clause (iv) the following new clause:

"(v) biodegradable natural plastics from biomass; and".

AMENDMENT TO H.R. 5656

OFFERED BY MR. BAIRD OF WASHINGTON

Page 30, line 19, strike "and".

Page 30, line 25, strike the period and insert "; and".

Page 30, after line 25, insert the following new paragraph:

(3) after construction or renovation—

(A) uses heating, ventilating, and air conditioning systems that perform at no less than Energy Star standards; or

(B) if Energy Star standards are not applicable, uses Federal Energy Management Program recommended heating, ventilating, and air conditioning products.

AMENDMENT TO H.R. 5656

OFFERED BY MR. GORDON OF TENNESSEE

At the end of the bill, add the following new section:

SEC. 16. TECHNOLOGY DEVELOPMENT.

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

(1) COST-EFFECTIVE.—The term ''cost-effective'' means resulting in a simple payback of costs in 10 years or less.

(2) FUND.—The term ''Fund'' means the Innovative Energy Technologies Fund for Federal Buildings established in subsection (b).

(3) INNOVATIVE ENERGY TECHNOLOGY.—The term ''innovative energy technology'' means a technology, including an advanced energy conservation or renewable energy technology, that was developed with the support of the Department, or other similar technology.

(4) INNOVATIVE ENERGY TECHNOLOGY PROJECT.—The term ''innovative energy technology project'' means a project that—

(A) results in the cost-effective commercial application of an innovative energy technology; and

(B) assists a Federal agency in meeting or exceeding all Federal energy efficiency requirements then in effect, including applicable Executive orders such as Executive Order Nos. 12759 and 13123.

(b) ESTABLISHMENT OF FUND.—

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Secretary of Energy shall establish the Innovative Energy Technologies Fund for Federal Buildings. The Secretary of Energy shall administer the Fund to enable Federal agencies to demonstrate innovative energy technologies for retrofit or new construction of Federal buildings and facilities.

(2) CRITERIA AND GUIDELINES.—Not later than 6 months after the date of enactment of this Act, the Secretary shall establish criteria and guidelines for Federal agencies to borrow from and pay back to the Fund.

(c) LOANS FROM THE FUND.—

(1) GENERAL PROCEDURE.—Federal agencies may apply to the Secretary for a loan for financing the demonstration of innovative energy technology projects, and shall repay the Fund from savings in energy, water, and other costs attributable to actions

taken as a result of the project undertaken with the loan.

(2) PURPOSES OF LOAN.—In addition to financing an innovative energy technology project, a Federal agency may use the loan amount to pay the costs of administration and proposal development (including data collection and energy surveys), and to acquire and operate equipment necessary to monitor and verify associated energy savings.

(3) REPAYMENTS.—A Federal agency shall repay to the Fund the principal amount of the loan, plus interest at a rate determined by the Secretary. The repayment period shall be 15 years, or less as appropriate to the project.

(d) REPORTS AND AUDITS.—

(1) REPORTS TO THE SECRETARY.—Not later than 1 year after the installation of an innovative energy technology project for which a loan is provided under this section in an amount greater than $1,000,000, and each year thereafter until the date that final repayment of the loan is due, the Federal agency receiving the loan shall transmit to the Secretary a report that—

(A) states whether the project meets or fails to meet the energy savings projections for the project; and

(B) for each project that fails to meet the energy savings projections, states the reasons for the failure and describes proposed remedies.

(2) AUDITS.—The Secretary may audit any innovative energy technology project financed with a loan from the Fund to assess the project's performance.

(3) REPORTS TO CONGRESS.—At the end of each fiscal year, the Secretary shall transmit to Congress a report on the operations of the Fund, including a statement of the total receipts into the Fund, and the total expenditures from the Fund to each Federal agency.

(e) AUTHORIZATION OF APPROPRIATIONS.—

(1) ESTABLISHMENT OF FUND.—There are authorized to be appropriated to the Secretary for the establishment of the Fund, $100,000,000 for each of the fiscal years 2007 through 2016.

(2) OPERATION OF FUND.—There are authorized to be appropriated to the Secretary from the Fund, for carrying out the loan program under this section, such sums as may be necessary.

AMENDMENT TO H.R. 5656

OFFERED BY MR. GORDON OF TENNESSEE

Amend section 15 to read as follows:

SEC. 15. ARPA-E.

(a) FINDINGS.—The Congress finds the following:

(1) The United States faces a range of energy challenges that affect our economy, security, and environment. Fundamentally, these challenges involve science and technology.

(2) The Department of Energy already has some of the mechanisms necessary to promote long-term research, but it lacks the mechanisms for quickly transforming the results into technology that meets national needs.

(3) A recent report of the Secretary of Energy's Advisory Board's Task Force on the Future of Science Programs at the Department of Energy concluded that "America can meet its energy needs only if we make a strong and sustained investment in research in physical science, engineering, and applicable life sciences and if we translate advancing scientific knowledge into practice".

(4) The Department of Defense, since 1958, has used its Defense Advanced Projects Research Agency (DARPA) for aggressively addressing real-time defense problems through targeted programs of research and technology development that have improved our national defense through transformation technologies.

(5) The National Academy of Sciences' report entitled ''Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future'' recommends creating a new agency within the Department of Energy to sponsor ''creative, out-of-the-box, transformational, generic energy research in those areas where industry by itself cannot or will not undertake such sponsorship, where risks and pay-offs are high''. Such an organization would be able to accelerate the process by which research is transformed to address energy-related economic, environmental, and security issues to decrease dependence on foreign energy through targeted research and technology development.

(b) ADVANCED RESEARCH PROJECTS AGENCY-ENERGY.—

(1) ESTABLISHMENT.—There is established the Advanced Research Projects Agency-Energy (in this

section referred to as "ARPA–E") within the Department of Energy.

(2) GOAL.—The goal of ARPA–E is to reduce the amount of energy the United States imports from foreign sources by 20 percent over the next 10 years by—

(A) promoting revolutionary changes in the critical technologies that would promote energy independence;

(B) turning cutting-edge science and engineering into technologies for energy and environmental application; and

(C) accelerating innovation in energy and the environment for both traditional and alternative energy sources and in energy efficiency mechanisms to decrease the Nation's reliance on foreign energy sources.

(3) DIRECTOR.—ARPA–E shall be headed by a Director who shall be appointed by the Secretary of Energy. The Director shall report to the Secretary.

(4) RESPONSIBILITIES.—The Director shall administer the Fund established under subsection (c) to award competitive grants, cooperative agreements, or contracts to institutions of higher education, companies, or consortia of such entities which may in-

clude federally funded research and development centers, to achieve the goals stated in paragraph (2) through targeted acceleration of—

(A) energy-related research;

(B) development of resultant techniques, processes, and technologies, and related testing and evaluation; and

(C) demonstration and commercial application of the most promising technologies and research applications.

(5) PERSONNEL.—

(A) PROGRAM MANAGERS.—The Director shall designate employees to serve as program managers for each of the programs established pursuant to the responsibilities established for ARPA–E under paragraph (4). Program managers shall be responsible for—

(i) establishing research and development goals for the program, including through the convening of workshops and conferring with outside experts, as well as publicizing its goals to the public and private sectors;

(ii) soliciting applications for specific areas of particular promise, especially

those which the private sector cannot or will not provide funding;

(iii) selecting research projects for support under the program from among application submitted to ARPA–E, following consideration of—

(I) the novelty and scientific and technical merit of the proposed projects;

(II) the demonstrated capabilities of the applicants to successfully carry out the proposed research project; and

(III) such other criteria as are established by the Director; and

(iv) monitoring the progress of projects supported under the program.

(B) HIRING AND MANAGEMENT.—In hiring personnel for ARPA–E, the Secretary shall have the hiring and management authorities described in section 1101 of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (5 U.S.C. 3104 note). For purposes of subsection (c)(1) of that section, the term of appointments for employees may not exceed 5 years before the granting of any extension.

(6) COORDINATION.—The Director shall ensure that the activities of ARPA–E are coordinated with those of other relevant research agencies, and may carry out projects jointly with other agencies.

(c) FUND.—

(1) ESTABLISHMENT.—There is established in the Treasury the Energy Independence Acceleration Fund (in this section referred to as the ''Fund''), which shall be administered by the Director of ARPA–E for the purposes of carrying out this section.

(2) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of ARPA–E for deposit in the Fund $300,000,000 for fiscal year 2007, $375,000,000 for fiscal year 2008, $468,000,000 for fiscal year 2009, $585,000,000 for fiscal year 2010, $732,000,000 for fiscal year 2011, and $915,000,000 for fiscal year 2012, to remain available until expended.

(d) RECOUPMENT.—

(1) REQUIREMENT.—Not later than 180 days after the date of enactment of this Act, the Secretary shall establish procedures and criteria for the recoupment of the Federal share of each project supported under this section. Such recoupment shall

occur within a reasonable period of time following the date of the completion of such project, but not later than 20 years following such date, taking into account the effect of recoupment on—

(A) the commercial competitiveness of the entity carrying out the project;

(B) the profitability of the project; and

(C) the commercial viability of the technology utilized.

(2) WAIVER.—The Secretary may at any time waive or defer all or some portion of the recoupment requirement as necessary for the commercial viability of the project.

(3) AVAILABILITY OF FUNDS.—Revenue received by the Federal Government pursuant to this subsection shall be deposited into the Fund and shall be available with further appropriation to fund future grants, contracts, and cooperative agreement as authorized by the Director.

(4) DEFINITIONS.—For the purposes of this subsection—

(A) the term "for-profit entity" means a licensee or successor in interest to a venture member, or any other for-profit person or entity, or combination of such persons or entities,

that earns or accrues amounts subject to this subsection;

(B) the term "product or invention supported by or produced as a result of funding under this section" includes any product or invention of a venture member based on or using any technology or invention arising out of a venture funded under this section; and

(C) the term "revenue generated by or resulting from a product or invention" includes revenue derived from the sale or licensing of patents or other rights with respect to the product or invention.

(e) ADVICE.—

(1) ADVISORY COMMITTEES.—The Director may seek advice on any aspect of ARPA–E from—

(A) existing Department of Energy advisory committees; and

(B) new advisory committees organized to support the programs of ARPA–E and to provide advice and assistance on—

(i) specific program tasks; or

(ii) overall direction of ARPA–E.

(2) APPLICABILITY.—Section 14 of the Federal Advisory Committee Act shall not apply to advisory committees organized under paragraph (1)(B).

(3) ADDITIONAL SOURCES OF ADVICE.—The Director may seek advice and review from the National Academy of Sciences, the National Academy for Engineering, and any other professional or scientific organization with expertise in specific processes or technologies under development by ARPA–E.

(f) ARPA-E EVALUATION.— After ARPA–E has been in operation for 54 months, the President's Committee on Science and Technology shall begin an evaluation (to be completed within 12 months) of how well ARPA–E is achieving its goals and mission. The evaluation shall include the recommendation of such Committee on whether ARPA–E should be continued or terminated, as well as lessons-learned from its operation. The evaluation shall be made available to Congress and to the public upon completion.

AMENDMENT TO H.R. 5656

OFFERED BY MR. COSTELLO OF ILLINOIS

Page 2, line 20, through page 5, line 3, amend section 3 to read as follows:

SEC. 3. FUTUREGEN.

(a) IN GENERAL.—The Secretary shall carry out a project to determine the feasibility of the commercial application of advanced clean coal energy technology, including carbon capture and geological sequestration, for electricity generation.

(b) INDUSTRY INVOLVEMENT.—The Secretary may conduct the project through a financial assistance cooperative agreement with a consortium of coal-fueled power producers, coal companies, and others.

(c) REQUIREMENTS.—The Secretary shall ensure that—

(1) the project is operating by 2012;

(2) the project is designed—

(A) to achieve 99 percent sulfur dioxide removal or, with coals of 3 lbs/MMBtu sulfur or less, achieve an emission limit of 0.03 lb/MMBtu;

(B) to emit no more than 0.05 pounds of nitrogen oxide emissions per million British thermal units of energy;

(C) to achieve at least a 90 percent reduction in mercury emissions;

(D) to emit no more than 0.005 pounds of total particulate emissions in the flue gas per million British thermal units of energy;

(E) to achieve at least a 90 percent reduction in carbon dioxide emissions; and

(F) using a technology that can be applied to a diversity of United States coal types; and

(3) the project demonstrates the feasibility of electricity generation from coal using advanced clean coal technology with carbon capture and geological sequestration with commercial potential for future plants that will achieve a generation cost of not greater than 10 percent higher than the average of all commercial integrated coal gasification and combined cycle electric generating plants operating in the United States as of the date of enactment of this Act.

(d) USE OF ADVANCED CLEAN COAL TECHNOLOGY.—To effectively manage technical risk and focus research efforts on system integration, the Secretary shall,

to the extent practicable, ensure that the project appropriately balance the use of available advanced clean coal technology, such as coal handling and gasification technology, and first-of-a-kind technology;

(e) CONTRIBUTIONS.—The Secretary may, for the purposes of section 988 of the Energy Policy Act of 2005, define the project as "Research and Development", and may accept contributions from private and public sources, including foreign nations and international contributors, and use such contributions to offset a portion of the Federal share of the project costs.

(f) DATA PROTECTION.—The Secretary may agree to protect FutureGen information to the same extent authorized for the Clean Coal Power Initiative pursuant to section 402(h) of the Energy Policy Act of 2005.

(g) INDEMNIFICATION.—Recognizing that FutureGen is a first-of-a-kind research project to permanently sequester underground the emissions of a power plant and that the Secretary may enter into a partnership with an industry consortium to cost-share and manage the project, the Secretary may, on terms and conditions acceptable to the Secretary—

(1) indemnify the consortium and its member companies for liability associated with the first-of-a-kind sequestration component of the project with

such indemnity extending to any legal liability arising out of, or resulting from, the storage, or unintentional release, of sequestered emissions;

(2) the indemnity shall not extend to liability resulting from gross negligence or intentional misconduct of officers of the consortium;

(3) the indemnity shall be secondary to applicable insurances and other security established by Department and the consortium;

(4) the United States Government's aggregate liability for a single incident shall not exceed $500,000,000 including the reasonable costs of investigating and settling claims and defending suits for damage; and

(5) prior to incorporating indemnification provisions into any agreement with the industry consortium, the Secretary shall report to the Congress the terms of the indemnification clauses and an assessment of whether or not such clauses are in the best interest of the Government and the public.

(h) REAL AND PERSONAL PROPERTY.—The Secretary may vest fee title or other property interests acquired under the project in any entity, including the United States.

(i) TERMINATION.—The Secretary may agree to take title to the project's property, without compensation to the consortium, if the project is terminated due to an insufficiency of consortium funds to complete the project; and the Secretary may agree to reimburse the consortium for the consortium's share of the project costs, if the project is terminated due to an insufficiency of appropriated funds to complete the project.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section $442,000,000 for the period encompassing fiscal years 2007 through 2012.

AMENDMENT TO H.R. 5656

OFFERED BY MR. COSTELLO OF ILLINOIS

At the end of the bill, add the following new section:

SEC. 16. COAL AS A FUEL SOURCE FOR ETHANOL.

(a) GRANT PROGRAM.—The Secretary of Energy shall provide grants to States for the conduct of the research needed to remove barriers that limit the use of coal as a fuel source in fuel ethanol production. Such research assistance shall be provided—

(1) to develop the knowledge base that will be needed to expediently permit coal gasification fueled ethanol plants;

(2) to aid ethanol producers in the evaluation and inclusion of coal gasification technologies in existing or new ethanol plants;

(3) to understand how to reduce the capital costs of coal fueled ethanol production, including making use of byproducts from agricultural practice, and biomass material or blends, in the processing of ethanol; and

(4) to understand the applicability of carbon dioxide capture and sequestration technologies, includ-

ing adsorption and absorption techniques and chemical processes, to coal fueled ethanol plants.

(b) GRANT PROGRAM.—The Secretary of Energy shall provide grants to States for the conduct of the research needed to remove barriers that limit the use of coal as a fuel source in fuel ethanol production. Such research assistance shall be provided—

(1) to develop the knowledge base that will be needed to expediently permit coal gasification fueled ethanol plants;

(2) to aid ethanol producers in the evaluation and inclusion of coal gasification technologies in existing or new ethanol plants;

(3) to understand how to reduce the capital costs of coal fueled ethanol production, including making use of byproducts from agricultural practice, and biomass material or blends, in the processing of ethanol; and

(4) to understand the applicability of carbon dioxide capture and sequestration technologies, including adsorption and absorption techniques and chemical processes, to coal fueled ethanol plants.

(c) DEMONSTRATION PROJECT.—At least 1 pilot project receiving assistance under this section shall be

fueled by coal gasification and located in an area with high sulfur bituminous coal reserves.

(d) RESEARCH AND DEVELOPMENT AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out research and development activities under this section $5,000,000 for fiscal year 2007.

(e) DEMONSTRATION PROJECT AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out demonstration activities under this section $20,000,000 for fiscal year 2007.

AMENDMENT TO H.R. 5656
OFFERED BY MR. HALL OF TEXAS

At the end of the bill, insert the following new section:

SEC. 16. COAL METHANATION.

(a) PROGRAM.—The Secretary shall establish a program of research, development, demonstration, and commercial application of coal gasification facilities that convert coal into pipeline quality gaseous fuels for direct use or subsequent chemical or physical conversion.

(b) PROCEDURES.—The program established under subsection (a) shall be carried out using procedures described in title XVII of the Energy Policy Act of 2005.

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SECTION BY SECTION DESCRIPTION OF MANAGER'S AMENDMENT

Section	Pg/Line	Description	Rationale/Sponsorship
2	P2/L10	Adds definition for Department of Energy	Technical correction
2	P2/L14	Adds definition for Institution of Higher Education	Technical correction
3	P2/L21 through P5/L3	Revises FutureGen language, including striking authorization of appropriations and adding language on data protection and contributions from public and private sources.	Provision requested by Mr. Costello to address concerns raised by the FutureGen industry alliance. Appropriations for this project are already authorized in EPACT.
4	P5/L6 through P11/L4	Revises nuclear fuel cycle language, including striking "In General" language and authorization of appropriations and adding some additional language on cost analysis. Systems analysis requirement with associated reports and prohibitions remain intact.	Advanced fuel cycle R&D activities are already authorized under EPACT. Stripping out redundant language addresses some concerns raised by another House Committee without compromising on substance with respect to the systems analysis. Incorporates provisions requested by Mr. Honda on cost estimates of fuel cycle systems and decommissioning and decontamination of proposed demonstration projects.
5	P11/L5	Strikes all of Section 5 on Advanced Battery Technologies	Battery language in this section duplicative with Sec. 10 on plug-in hybrid vehicle technologies.
6	P12/L4	Changes "liquid fuels" to "motor and other fuels"	Broadens the scope of the R&D to include non-liquid motor fuels.
6	P12/L18	Minimum 10 percent allocation for university research in the biofuels section	Provision requested by Mr. Calvert

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SECTION BY SECTION DESCRIPTION OF MANAGER'S AMENDMENT

7	P13/L12	Strikes authorization of appropriations under hydrogen section	To avoid likely conflict over jurisdiction and avoid confusion over funding.
10	P16/L2 and P16/L17	Strikes all references to fuel-cell vehicles in section on plug-in hybrid vehicles	Fuel-cell plug-in hybrids are too long term to be included in this demo.
10	P17/L18	Broadens scope of R&D to include technologies for electric drive transportation.	Broader participation and support in R&D efforts.
10	P18/L23	Broaden eligible entities for PHEV demonstration to local public entities	To allow for participation of air pollution control districts and other public entities not included under "governments"
10	P20/L9	Broadens possible partnerships to include non-profits and institutions of higher education, including minority-serving institutions.	Provision requested by Ms. Johnson, included non-profits to capture such entities as EPRI that may want to participate.
11	P26/L20	Encouraging minority-serving institutions to apply for PV grants	Provision requested by Ms. Johnson.
12	P28/L9	Technical correction	
12	P28/L22	Under buildings grant program, include due consideration for buildings that are likely to serve low and moderate-income populations.	Provision requested by Ms. Johnson.
12	P28/L20	Replace "are least likely to be realized without federal assistance" with "maximize the leverage of private investment for costs related to increasing the energy efficiency of the building"	Provision requested by Mr. Baird to explicitly encourage private investment and not to disincentivize larger organizations.
12	P29/L9	Clarify that energy audit/certifications have to be carried out by a qualified professional.	Provision requested by Mr. Baird.
13	P31/L5 through P37/L19	Strikes entire section 13 and replaces with amendment to Section 917 of EPACT: Advanced Energy Efficiency Technology Transfer Centers. This was a Science Committee provision originally.	Provision requested by Mr. Miller. The goals of Sec.917 of EPACT and Sec. 13 of this Act are identical. Rather establishing competing

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SECTION BY SECTION DESCRIPTION OF MANAGER'S AMENDMENT

			programs, this amends 917 to clarify the existing statute, primarily by incorporating language from Sec. 13.
14	P38/L7& L22	Technical corrections	
15	P41/L8	Technical correction	

ADDITIONAL VIEWS OF H.R. 5656
SUBMITTED BY REPRESENTATIVE JERRY F. COSTELLO

In the Committee's markup of H.R. 5656, I offered two amendments to improve the bill. My first amendment replaces the existing FutureGen authorization language in Section 3 with new language supported by the FutureGen Alliance, to authorize the FutureGen Initiative according to the goals and objectives set forth by the Department of Energy's plan submitted to Congress.

The reason I offered my amendment is because the FutureGen authorization, including the corrections made in the manager's amendment, deviates from the plan DOE sets forth and attempts to side-track the performance and economic goals of the project. I have been closely involved with FutureGen since the project was first proposed in 2003, and it is progressing well. While we worked hard to reach an agreement, there is serious concern on behalf of those involved in the project that the current language will impede our ability to ensure FutureGen reaches its goals and objectives. Developing the technologies to burn coal as cleanly as natural gas is extremely important for our future energy independence, and we must get this right.

I realize there was a good faith effort from the beginning to work through this language. However, the changes incorporated from the manager's amendment did not go far enough. For example, the DOE and the Alliance encouraged this committee to include a section on insurance and indemnification because the DOE needs the authority to enter into contract agreements regarding the legal liability of the carbon sequestration portion of the project. This language was not accepted—not because there was disagreement over the policy—but instead, because it would trigger a referral to the Energy and Commerce Committee. Shying away from issues that are critical to the success of the project because of jurisdictional concerns does a disservice to those involved in trying to make this project succeed. Remaining silent and not taking any action, as this authorization does or even waiting for a period of time, increases the chances of schedule delays and confusion down the road. Given the goals and objectives FutureGen seeks to achieve and the potential benefits to consumers through cheaper energy and cleaner air, we should not be afraid to debate and discuss these tough issues.

The project is continuing along the roadmap DOE set forth, with the support of Congress, the FutureGen Alliance, and international contributors, and the benefit to the public stands to be significant. By eliminating environmental issues as barriers to coal use through the use of efficient generation technologies and carbon sequestration, FutureGen will enable the continued use of secure, domestic coal resources for our future energy needs. I remain committed to the FutureGen Initiative and am pleased with the progress in the past three years since President Bush proposed this initiative. I believe FutureGen will be a stepping stone toward a cleaner, more energy-secure future.

The second amendment I offered provides grants to States to research, develop, and demonstration the feasibility of using coal gasification technology as the fuel source for ethanol production. There has been record growth in the U.S. ethanol industry over the past several years. Currently, the bulk of energy used to produce ethanol comes from natural gas and electricity. Coal, however, has the potential to significantly contribute to the process and deliver a wide array of benefits. Right now, barriers exist that limit the use of coal gasification as a fuel source in ethanol production. Research is needed to develop the knowledge base that will be needed to use coal gasification technology to power ethanol plants. While several companies are using coal fired co-generation plants in ethanol production, no company in the U.S. is using coal gasification technology. There is a legitimate need for my amendment in the coal and ethanol industries, and I encourage the Committee to embrace opportunities to further the applications for coal gasification, and its use in powering ethanol plants is a great fit for this technology.

We must maintain our efforts in critical research and development and demonstration programs through continued support of the Federal Government. Advancements in clean coal technologies and renewable fuels, such as ethanol, will improve the environment and reduce our dependence on foreign oil.

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