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HOUSE OF REPRESENTATIVES
REPORT
110–171

H-PRIZE ACT OF 2007

JUNE 5, 2007.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

R E P O R T

[To accompany H.R. 632]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 632) to authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

I. AMENDMENT

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "H-Prize Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTERING ENTITY.—The term "administering entity" means the entity with which the Secretary enters into an agreement under section 3(c).

(2) DEPARTMENT.—The term "Department" means the Department of Energy.

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

SEC. 3. PRIZE AUTHORITY.

(a) IN GENERAL.—The Secretary shall carry out a program to competitively award cash prizes in conformity with this Act to advance the research, development, demonstration, and commercial application of hydrogen energy technologies.

(b) ADVERTISING AND SOLICITATION OF COMPETITORS.—

(1) ADVERTISING.—The Secretary shall widely advertise prize competitions to encourage broad participation, including by individuals, universities (including historically Black colleges and universities and other minority serving institutions), and large and small businesses (including businesses owned or controlled by socially and economically disadvantaged persons).

(2) ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.—The Secretary shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include essential elements of the competition such as the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize.

(c) ADMINISTERING THE COMPETITIONS.—The Secretary shall enter into an agreement with a private, nonprofit entity to administer the prize competitions, subject to the provisions of this Act. The duties of the administering entity under the agreement shall include—

(1) advertising prize competitions and their results;

(2) raising funds from private entities and individuals to pay for administrative costs and to contribute to cash prizes, including funds provided in exchange for the right to name a prize awarded under this section;

(3) developing, in consultation with and subject to the final approval of the Secretary, the criteria for selecting winners in prize competitions, based on goals provided by the Secretary;

(4) determining, in consultation with the Secretary, the appropriate amount and funding sources for each prize to be awarded, subject to the final approval of the Secretary with respect to Federal funding;

(5) providing advice and consultation to the Secretary on the selection of judges in accordance with section 4(d), using criteria developed in consultation with and subject to the final approval of the Secretary; and

(6) protecting against the entity's unauthorized use or disclosure of a registered participant's trade secrets and confidential business information. Any information properly identified as trade secrets or confidential business information that is submitted by a participant as part of a competitive program under this Act may be withheld from public disclosure.

(d) FUNDING SOURCES.—Prizes under this Act shall consist of Federal appropriated funds and any funds provided by the administering entity (including funds raised pursuant to subsection (c)(2)) for such cash prize programs. The Secretary may accept funds from other Federal agencies for such cash prizes and, notwithstanding section 3302(b) of title 31, United States Code, may use such funds for the cash prize program. Other than publication of the names of prize sponsors, the Secretary may not give any special consideration to any private sector entity or individual in return for a donation to the Secretary or administering entity.

(e) ANNOUNCEMENT OF PRIZES.—The Secretary may not issue a notice required by subsection (b)(2) until all the funds needed to pay out the announced amount of the prize have been appropriated or committed in writing by the administering entity. The Secretary may increase the amount of a prize after an initial announcement is made under subsection (b)(2) if—

(1) notice of the increase is provided in the same manner as the initial notice of the prize; and

(2) the funds needed to pay out the announced amount of the increase have been appropriated or committed in writing by the administering entity.

(f) SUNSET.—The authority to announce prize competitions under this Act shall terminate on September 30, 2018.

SEC. 4. PRIZE CATEGORIES.

(a) CATEGORIES.—The Secretary shall establish prizes for—

(1) advancements in technologies, components, or systems related to—

(A) hydrogen production;

(B) hydrogen storage;

(C) hydrogen distribution; and

(D) hydrogen utilization;

(2) prototypes of hydrogen-powered vehicles or other hydrogen-based products that best meet or exceed objective performance criteria, such as completion of a race over a certain distance or terrain or generation of energy at certain levels of efficiency; and

(3) transformational changes in technologies for the distribution or production of hydrogen that meet or exceed far-reaching objective criteria, which shall include minimal carbon emissions and which may include cost criteria designed to facilitate the eventual market success of a winning technology.

(b) AWARDS.—

(1) ADVANCEMENTS.—To the extent permitted under section 3(e), the prizes authorized under subsection (a)(1) shall be awarded biennially to the most significant advance made in each of the four subcategories described in subparagraphs (A) through (D) of subsection (a)(1) since the submission deadline of the previous prize competition in the same category under subsection (a)(1) or the date of enactment of this Act, whichever is later, unless no such advance is significant enough to merit an award. No one such prize may exceed $1,000,000. If less than $4,000,000 is available for a prize competition under subsection (a)(1), the Secretary may omit one or more subcategories, reduce the amount of the prizes, or not hold a prize competition.

(2) PROTOTYPES.—To the extent permitted under section 3(e), prizes authorized under subsection (a)(2) shall be awarded biennially in alternate years from the prizes authorized under subsection (a)(1). The Secretary is authorized to award up to one prize in this category in each 2-year period. No such prize may exceed $4,000,000. If no registered participants meet the objective performance criteria established pursuant to subsection (c) for a competition under this paragraph, the Secretary shall not award a prize.

(3) TRANSFORMATIONAL TECHNOLOGIES.—To the extent permitted under section 3(e), the Secretary shall announce one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. A prize offered under this paragraph shall be not less than $10,000,000, paid to the winner in a lump sum, and an additional amount paid to the winner as a match for each dollar of private funding raised by the winner for the hydrogen technology beginning on the date the winner was named. The match shall be provided for 3 years after the date the prize winner is named or until the full amount of the prize has been paid out, whichever occurs first. A prize winner may elect to have the match amount paid to another entity that is continuing the development of the winning technology. The Secretary shall announce the rules for receiving the match in the notice required by section 3(b)(2). The Secretary shall award a prize under this paragraph only when a registered participant has met the objective criteria established for the prize pursuant to subsection (c) and announced pursuant to section 3(b)(2). Not more than $10,000,000 in Federal funds may be used for the prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward the matching award under this paragraph.

(c) CRITERIA.—In establishing the criteria required by this Act, the Secretary—

(1) shall consult with the Department's Hydrogen Technical and Fuel Cell Advisory Committee;

(2) shall consult with other Federal agencies, including the National Science Foundation; and

(3) may consult with other experts such as private organizations, including professional societies, industry associations, and the National Academy of Sciences and the National Academy of Engineering.

(d) JUDGES.—For each prize competition, the Secretary in consultation with the administering entity shall assemble a panel of qualified judges to select the winner or winners on the basis of the criteria established under subsection (c). Judges for each prize competition shall include individuals from outside the Department, including from the private sector. A judge, spouse, minor children, and members of the judge's household may not—

(1) have personal or financial interests in, or be an employee, officer, director, or agent of, any entity that is a registered participant in the prize competition for which he or she will serve as a judge; or

(2) have a familial or financial relationship with an individual who is a registered participant in the prize competition for which he or she will serve as a judge.

SEC. 5. ELIGIBILITY.

To be eligible to win a prize under this Act, an individual or entity—

(1) shall have complied with all the requirements in accordance with the Federal Register notice required under section 3(b)(2);

(2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen of, or an alien lawfully admitted for permanent residence in, the United States; and

(3) shall not be a Federal entity, a Federal employee acting within the scope of his employment, or an employee of a national laboratory acting within the scope of his employment.

SEC. 6. INTELLECTUAL PROPERTY.

The Federal Government shall not, by virtue of offering or awarding a prize under this Act, be entitled to any intellectual property rights derived as a consequence of, or direct relation to, the participation by a registered participant in a competition authorized by this Act. This section shall not be construed to prevent the Federal Government from negotiating a license for the use of intellectual property developed for a prize competition under this Act.

SEC. 7. LIABILITY.

(a) WAIVER OF LIABILITY.—The Secretary may require registered participants to waive claims against the Federal Government and the administering entity (except claims for willful misconduct) for any injury, death, damage, or loss of property, revenue, or profits arising from the registered participants' participation in a competition under this Act. The Secretary shall give notice of any waiver required under this subsection in the notice required by section 3(b)(2). The Secretary may not require a registered participant to waive claims against the administering entity arising out of the unauthorized use or disclosure by the administering entity of the registered participant's trade secrets or confidential business information.

(b) LIABILITY INSURANCE.—

(1) REQUIREMENTS.—Registered participants shall be required to obtain liability insurance or demonstrate financial responsibility, in amounts determined by the Secretary, for claims by—

(A) a third party for death, bodily injury, or property damage or loss resulting from an activity carried out in connection with participation in a competition under this Act; and

(B) the Federal Government for damage or loss to Government property resulting from such an activity.

(2) FEDERAL GOVERNMENT INSURED.—The Federal Government shall be named as an additional insured under a registered participant's insurance policy required under paragraph (1)(A), and registered participants shall be required to agree to indemnify the Federal Government against third party claims for damages arising from or related to competition activities.

SEC. 8. REPORT TO CONGRESS.

Not later than 60 days after the awarding of the first prize under this Act, and annually thereafter, the Secretary shall transmit to the Congress a report that—

(1) identifies each award recipient;

(2) describes the technologies developed by each award recipient; and

(3) specifies actions being taken toward commercial application of all technologies with respect to which a prize has been awarded under this Act.

SEC. 9. AUTHORIZATION OF APPROPRIATIONS.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) AWARDS.—There are authorized to be appropriated to the Secretary for the period encompassing fiscal years 2008 through 2017 for carrying out this Act—

(A) $20,000,000 for awards described in section (4)(a)(1);

(B) $20,000,000 for awards described in section 4(a)(2); and

(C) $10,000,000 for the award described in section 4(a)(3).

(2) ADMINISTRATION.—In addition to the amounts authorized in paragraph (1), there are authorized to be appropriated to the Secretary for each of fiscal years 2008 and 2009 $2,000,000 for the administrative costs of carrying out this Act.

(b) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this Act shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes only after the expiration of 10 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this Act

permits obligation or payment of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

SEC. 10. NONSUBSTITUTION.

The programs created under this Act shall not be considered a substitute for Federal research and development programs.

II. PURPOSE

The purpose of the bill is to authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

III. BACKGROUND AND NEED FOR THE LEGISLATION

Hydrogen gas is considered by many experts to be a promising fuel, particularly in the transportation sector. When used as a fuel, its only combustion byproduct is water vapor. The widespread adoption of hydrogen as a transportation fuel has the potential to reduce or eliminate air pollution generated by cars and trucks.

However, unlike coal or oil, the hydrogen gas used as a fuel is not a naturally occurring energy resource. Hydrogen must be produced from hydrogen-bearing compounds, like water or natural gas, and that requires energy—and, unlike gasoline or biofuels, more energy is always required to produce it than is recovered when hydrogen is burned in a fuel cell. Hydrogen has the potential to reduce America's dependence on foreign oil, but the degree to which hydrogen will displace foreign energy supplies depends on what energy source is used to generate hydrogen gas in the first place.

If hydrogen can be produced economically from energy sources that do not release carbon dioxide into the atmosphere—from renewable sources such as wind power or solar power, from nuclear power, or possibly from coal with carbon sequestration, then the widespread use of hydrogen as a fuel could make a major contribution to reducing the emission of greenhouse gases.

While the promise of hydrogen is great, so are the technical challenges. Experts suggest that major advances will be required across a wide range of technologies for hydrogen to be affordable, safe, cleanly produced, and readily distributed. The production, storage, and use of hydrogen all present significant technical challenges. While Department of Energy (DOE) research programs have produced promising advances, much work must still be done to meet the goal of developing economically viable hydrogen technologies.

Prizes are one tool the Federal government can employ to stimulate efforts to overcome such technical hurdles. A 1999 National Academy of Engineering (NAE) panel examining the use of prizes by federal agencies suggested the following design principles for prize programs:

1. Treatment of intellectual property resulting from prize contests should be properly aligned with the objectives and incentive structure of the prize contest.

2. Contest rules should be seen as transparent, simple, fair, and unbiased.

3. Prizes should be commensurate with the effort required and goals sought.

The Act establishes three types of prizes that are in keeping with the principles laid out by the NAE:

1. Biennial prizes for advancements in each of hydrogen storage, hydrogen production, hydrogen use and hydrogen distribution;

2. A goal-oriented, biennial contest for prototypes that meet objective contest criteria established in advance; and

3. A prize of at least $10 million for a goal-oriented contest for the best invention that leads to transformational changes in the distribution or production of hydrogen. Winners of this prize could also receive matching funds for every dollar of private funding raised by the winner for commercialization of their winning technology.

IV. HEARING SUMMARY

On February 7, 2002, the House Committee on Science held a hearing titled The Future of DOE's Automotive Research Programs. The hearing addressed the Administration's newly announced FreedomCAR program, and examined how it compared with the Partnership for a New Generation of Vehicles (PNGV) program. The Committee heard testimony from the Hon. David K. Garman, Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; Dr. Vernon P. Roan, Vice Chair, National Research Council Panel on the Partnership for a New Generation of Vehicles and Professor and Director, Fuel Cell Laboratory, Mechanical Engineering Department, University of Florida at Gainesville; Dr. Daniel Sperling, Director, Institute of Transportation Studies and Professor of Civil & Environmental Engineering, University of California at Davis; and Mr. Ross Witschonke, Vice President of Electrics and Power Electronics, Ballard Power.

On June 24, 2002, the Energy Subcommittee of the House Committee on Science held a hearing titled Fuel Cells: The Key to Energy Independence? The hearing focused on developments in hydrogen fuel cell R&D and in the fuel cell business, and provided a broad overview of fuel cells for all applications, not just transportation. The Subcommittee heard testimony from Dr. Hermann Grunder, Director, Argonne National Laboratory; Mr. Robert Culver, Executive Director, United States Council for Automotive Research; Mr. Stan Borys, Executive Vice President and Chief Operating Officer, Gas Technology Institute; Mr. Jeff Serfass, President, National Hydrogen Association; Mr. James Uihlein, Fuels Project Manager, BP; and Mr. Elias (Lee) Camara, Vice President, H2Fuels.

On June 26, 2002, the Energy Subcommittee of the House Committee on Science held a hearing titled FreedomCAR: Getting New Technology into the Marketplace, which primarily solicited views on the best ways to proceed with automotive research and development (R&D) and how to integrate advanced technologies into production vehicles that can gain customer acceptance. One of the recurring questions was the 'chicken and egg' problem with hydrogen fuel cells, i.e., how can you establish an effective hydrogen infrastructure before there are great numbers of fuel cell vehicles? The Subcommittee heard testimony from Mr. Amory B. Lovins, Chief Executive Officer, Rocky Mountain Institute; Dr. Byron McCormick, Executive Director, Fuel Cell Activities, General Motors Corporation; Mr. Doug Rothwell, President and Chief Executive Officer, the Michigan Economic Development Corporation; Mr. Roger

Saillant, President, Plug Power, Inc.; Mr. Robert Templin, Member of the Board of Directors, PAICE Corporation.

On March 5, 2003, the House Committee on Science held a hearing titled The Path to a Hydrogen Economy on the President's Hydrogen Initiative, which is intended to enable the transition to an economy powered by hydrogen. Witnesses testified that, if the widespread use of hydrogen is to become a reality, significant advances must be made, not only in vehicle technology, but also in hydrogen production and the infrastructure necessary to deliver it. The hearing focused on the barriers to a hydrogen economy, and how the President's initiative might address those barriers. The Committee heard testimony from the Hon. David K. Garman, Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; Dr. Alan C. Lloyd, 2003 Chairman, California Fuel Cell Partnership; Dr. Joan Ogden, Research Scientist, Princeton Environmental Institute; Dr. Larry Burns, Vice President, Research, Development and Planning, General Motors Corporation; and Mr. Don Huberts, Chief Executive Officer, Shell Hydrogen.

On March 3, 2004, the House Committee on Science held a hearing titled Reviewing the Hydrogen Fuels and FreedomCar Initiatives. Specifically, the hearing focused on two recent reports from the National Academy of Sciences (NAS) and the American Physical Society (APS) on DOE's hydrogen initiatives, and the Administration's response to the reports' recommendations for changes to the Administration's programs. The Committee heard testimony from the Hon. David K. Garman, Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; Dr. Michael Ramage, Chair of the NAS Committee on Alternatives and Strategies for Future Hydrogen Production and Use; and Dr. Peter Eisenberger, Chair of the APS Panel on Public Affairs Energy Subcommittee.

On July 20, 2005, the Energy and Research Subcommittees of the House Committee on Science held a joint hearing titled Funding the Future: On the Road to a Hydrogen Economy to examine the progress that had been made in hydrogen research since the launch of the President's Hydrogen Initiative and the next steps the Federal government should take to best advance a hydrogen economy. The Subcommittees heard testimony from Mr. Douglas Faulkner, Acting Assistant Secretary for Energy Efficiency and Renewable Energy, DOE; Dr. David Bodde, Director of Innovation and Public Policy, Clemson University International Center for Automotive Research; Mr. Mark Chernoby, Vice President for Advanced Vehicle Engineering, DaimlerChrysler Corporation; Dr. George Crabtree, Director, Materials Science Division, Argonne National Laboratory; and Dr. John Heywood, Director, Sloan Automotive Laboratory, Massachusetts Institute of Technology.

On April 27, 2006, the House Committee on Science held a hearing titled H.R. 5143, the H-Prize Act of 2006. The Committee heard testimony from Mr. Phillip Baxley, President, Shell Hydrogen; Dr. David Bodde, Director of Innovation and Public Policy, Clemson University International Center for Automotive Research; Dr. Peter Diamandis, Chairman, X Prize Foundation, a non-profit organization dedicated to fostering innovation through the use of competitions; and Dr. David L. Greene, Corporate Fellow, Oak Ridge National Laboratory. All four witnesses expressed support for the creation of a hydrogen prize. Dr. Diamandis emphasized the ability of

prizes to attract many times the value of the purse in private investment by generating excitement and publicity. He noted that it is important to formulate the goals and the size of each prize carefully, and that a prize needs to be properly sized to both attract attention and to efficiently employ the resources available. Dr. Bodde testified that the H-Prize program should operate with several principles in mind: the prizes must be offered reliably and for a period long enough to bring in new participants; funds must supplement rather than compete with the core hydrogen research funding; and administration of the prize program must carefully document its experience, learn from that experience, and adapt accordingly. Dr. Greene testified that creating the H-Prize cannot substitute for adequately funding research, development and demonstration. Mr. Baxley testified that prizes could bring additional participants into efforts to use hydrogen more widely and that finding the most efficient and marketable way to develop a prize is something the government is in the position to promote. Both Dr. Diamandis and Dr. Greene suggested that amendments to the bill could help clarify the division of duties between the Secretary and the private entity that would administer the prize. Several witnesses, in response to questions, also indicated that the prize program could be successful with a prize of less than $100 million.

V. COMMITTEE ACTIONS

On January 23, 2007, Science and Technology Committee Vice Chairman Daniel Lipinski, for himself and Energy and Environment Subcommittee Ranking Member Robert Inglis, Research and Science Education Subcommittee Ranking Member Vernon Ehlers, Rep. Eddie Bernice Johnson, Rep. Michael McCaul, Rep. David Reichert and 20 other co-sponsors introduced H.R. 632, The H-Prize Act of 2007.

The Energy and Environment Subcommittee met on Thursday, May 10, 2007, to consider the bill. Mr. Inglis moved that the Subcommittee favorably report the bill, H.R. 632, to the Full Committee. The motion was agreed to by a voice vote.

The Full Committee on Science and Technology met on Wednesday, May 23, 2007 to consider the bill. An amendment in the nature of a substitute was offered by Ranking Member Inglis. The amendment clarified duties of the Secretary and the administering entity, required a report to Congress about award recipients and the technologies developed, and made other clarifying, minor, and technical changes to the bill. The amendment was agreed to by a voice vote.

The motion to adopt the bill, as amended, was agreed to by a voice vote. Mr. Hall moved that the Full Committee favorably report the bill, H.R. 632, as amended, to the House with the recommendation that the bill, as amended, do pass, and 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 a voice vote.

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

Creates a prize program at DOE for advances in hydrogen technologies to be administered through a private, non-profit entity

("the administering entity"). DOE is to award three types of prizes (described below).

Establishes prizes of not more than $1 million to be awarded every other year to the best technology advancements in components or systems related to each of hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization.

Establishes a prize of not more than $4 million to be awarded for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards for the prototype prize are to be given in alternate years from the technology advancement prizes.

Establishes a prize of at least $10 million to be awarded for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000. Prize money over $10,000,000 may be provided as matching funds for every dollar of private funding raised by the winner for the continued development and commercialization of their winning technology.

Enumerates duties of the "administering entity." These include broad advertising of the prizes and their results, fundraising for administrative costs and cash prizes (which may include the sale of naming rights to the prizes), working with the Secretary to develop prize criteria based on goals provided by the Secretary; working with the Secretary to determine the appropriate prize amounts to be awarded under the transformational changes prize category; and selecting judges using criteria developed in consultation with the Secretary. Prize criteria, Federal funding, and judge selection are subject to final approval by the Secretary.

Requires a report to Congress identifying award recipients, the technologies developed by each award recipient, and actions being taken toward commercial application of these technologies.

Authorizes $20 million for advancements in components, $20 million for advancements in prototypes, and $10 million for transformational changes for the period encompassing fiscal years 2008 through 2017, with funds expiring 10 fiscal years after the fiscal year in which they were appropriated. Also authorizes $2 million for administrative costs for each of fiscal years 2008 and 2009.

VII. SECTION-BY-SECTION ANALYSIS

Section 1. Short title

The H-Prize Act of 2007

Sec. 2. Definitions

Defines Administering Entity, Department and Secretary.

Sec. 3. Prize authority

Requires the Secretary of Energy to create a prize to advance the research, development, demonstration and commercial application of hydrogen energy technologies.

Requires the Secretary to advertise the prize competitions widely to encourage broad participation, including outreach to historically black colleges and universities, other minority serving institutions, as well as large and small businesses, including minority and dis-

advantaged businesses. Includes a specific direction to announce the prize competitions through publication of a Federal Register notice.

Requires the Secretary to enter into an agreement with a private, non-profit entity to administer the prize competitions. Enumerates the duties of the administering entity to include advertising the prizes and their results, fundraising for administrative costs and cash prizes (which may include the sale of naming rights to the prizes), working with the Secretary to develop prize criteria based upon goals provided by the Secretary, working with the Secretary to determine the appropriate amounts for prizes awarded under the transformational changes category described in section 4, selecting judges using criteria developed in consultation with the Secretary, and preventing the unauthorized use or disclosure of a registered participant's trade secrets and confidential business information. Clarifies that prize criteria, Federal funding, and judge selection are subject to final approval by the Secretary.

Authorizes the Secretary to use funding directly appropriated for such purposes to the Department of Energy (DOE) or other agencies and to accept funds provided by private entities or individuals. Prohibits the announcement of any prize competition until sufficient funds are available. Sunsets the authority to award prizes in 2018.

Sec. 4. Prize categories

Defines prize categories for:

(i) Components or Systems. Establishes up to four $1 million prizes awarded every other year to the best advancements in technologies, components, or systems related to hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization. Provides the Secretary the discretion to reduce the amount or number of prizes based upon the availability of funds.

(ii) Prototypes. Establishes one $4 million prize for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards prototype prizes in years alternate with the technology advancements prize. Prohibits the Secretary from awarding the prize if no entrant meets the objectively defined performance criteria.

(iii) Transformational Changes. Establishes a minimum $10,000,000 lump sum prize award for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000 for prize money provided as matching funds for every dollar of private funding raised by the winner for the continued development of their winning technology.

Requires the Secretary to establish contest criteria through consultation with the Hydrogen Technical Advisory Committee and other federal agencies including the National Science Foundation. States that the Secretary also may consult with private organizations including the National Academy of Sciences and National Academy of Engineering. Requires the Secretary, in consultation with the administering entity, to appoint contest judges from the private sector and agencies outside DOE. Excludes judges, their spouses, minor children, or other members of their household who

may have a personal or financial relationship with any contest participant.

Sec. 5. Eligibility

Requires contestants to register through the process published in the Federal Register. Requires contestants be incorporated and maintain a primary place of business in the U.S. if a private entity, and must be a U.S. citizen if an individual. Excludes from participation any Federal entities or Federal or national laboratory employees while on duty.

Sec. 6. Intellectual property

Waives claims by the Federal government to any intellectual property rights derived from participation in the prize competitions.

Sec. 7. Liability

Requires contestants to waive claims against the Federal Government resulting from participation in prize competition activities. Requires contestants to have liability insurance against damages resulting from participation in any prize competition activity and to name the Federal Government as an additional insured entity.

Sec. 8. Report to Congress

Requires the Secretary to submit a report to Congress, no later than 60 days after awarding the first prize, which identifies each award recipient, describes the technologies developed, and specifies actions taken toward commercial application of the technologies for which a prize has been awarded.

Sec. 9. Authorization of Appropriations

Authorizes $20 million for advancements in components, $20 million for advancements in prototypes, and $10 million for transformational changes for the period encompassing fiscal years 2008 through 2017, with funds expiring 10 fiscal years after the fiscal year in which they were appropriated. Authorizes $2 million for administrative costs for each of fiscal years 2008 and 2009.

Sec. 10. Nonsubstitution

Expresses a sense of the Congress that the prize competitions shall not act as a substitute for any research and development programs.

VIII. COMMITTEE VIEW

Commercialization of awarding winning technologies

While Section 6 of this Act prohibits the Department of Energy from requiring participants to surrender intellectual property rights as a condition of participating or winning an award in a competition, the Department has an interest in making sure that technologies that win awards are commercialized. Section 3(a) explains that the awards program shall advance commercial application of hydrogen energy technologies and in Section 3(b)(2) the Secretary has the duty to establish the eligibility requirements for participation in the contest including those that advance commercial

application. These may include commercialization plans and attestations by contestants that if they win a prize they will take specific actions to assure their best efforts towards achieving the projected application of the award-winning technologies within a reasonable time. Furthermore, nothing in this Act precludes any agency of the Federal Government, which is otherwise so empowered, from furthering commercialization of hydrogen technologies, by negotiating for licenses for the use of intellectual property developed for a prize competition under this Act.

IX. COST ESTIMATE

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 632 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 632 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

H.R. 632—H-Prize Act of 2007

Summary: H.R. 632 would authorize the appropriation of $54 million over the 2008–2017 period to the Department of Energy (DOE) to award cash prizes to individuals, universities, and businesses that make significant advances in the field of hydrogen energy. Based on goals set forth by DOE, prizes would be awarded every two years for the most significant advancements in hydrogen production, storage, distribution, and utilization as well as the development of a prototype for a hydrogen-powered vehicle or hydrogen-based product. CBO estimates that implementing H.R. 632 would cost $30 million over the 2008–2012 period, assuming the appropriation of the necessary funds. An additional $24 million would be spent after 2012. Enacting H.R. 632 would have no effect on direct spending or revenues.

H.R. 632 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA); any costs to public institutions of higher education would be incurred voluntarily.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 632 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—				
	2008	2009	2010	2011	2012
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Estimated Authorization Level	16	6	4	4	4
Estimated Outlays	2	16	4	4	4

Basis of estimate: H.R. 632 would authorize the appropriation of $54 million over the 2008–2017 period for the Department of Energy (DOE) to award cash prizes for achievements in the development of hydrogen energy technologies. Such amounts include $50 million for cash prizes, and $4 million for DOE to enter into an agreement with a private, nonprofit entity to administer the program. For this estimate, CBO assumes that the bill will be enacted in fiscal year 2007 and that the amounts authorized by the bill will be appropriated over 10 years, beginning with fiscal year 2008.

Under the bill, prize competitions would be held over the next 10 years to encourage hydrogen energy research and development. Individuals, private, nonprofit organizations, and businesses would be eligible to compete for separate prizes of up to $1 million for demonstrating a significant advancement in hydrogen production, storage, distribution, or utilization, or up to $4 million for developing a prototype of a hydrogen-powered vehicle or hydrogen-based product. Competitions in these areas would be held every two years up until 2018, when the authority to make such awards would expire. A separate one-time competition would be held to award $10 million for an innovation that transforms the distribution or production of hydrogen.

For this estimate, CBO expects that prize announcements would be made in the year funds are appropriated and that final awards would be made in the following year. We expect that $2 million in administrative costs would be incurred in each of fiscal years 2008 and 2009. This estimate also assumes that the $10 million prize will be awarded in 2009. CBO estimates that implementing H.R. 632 would cost $2 million in 2008 and $30 million over the 2008–2012 period, assuming the appropriation of the necessary funds. An additional $24 million would be spent after 2012.

Intergovernmental and private-sector impact: H.R. 632 contains no intergovernmental or private-sector mandates as defined in UMRA. Funding authorized in the bill may benefit public institutions of higher education that compete for funds in connection with hydrogen research. Any costs to comply with the requirements of the competition, including obtaining liability insurance, would be incurred voluntarily.

Estimate prepared by: Federal Costs: Daniel Hoople; Impact on State, Local, and Tribal Governments: Lisa Ramirez-Branum; Impact on the Private Sector: Amy Petz.

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

XI. COMPLIANCE WITH PUBLIC LAW 104–4

H.R. 632 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

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

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 632 are to create a prize program at DOE that awards three types of prizes for advances in hydrogen technologies to be administered

through a private, non-profit entity ("the administering entity") and through the prize program to accelerate the movement within the United States towards the commercial availability of hydrogen-based fuel.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 632.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 632 does not establish nor authorize the establishment of any advisory committee.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 632 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. EARMARK IDENTIFICATION

H.R. 632 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9(d), 9(e), or 9(f) of rule XXI.

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

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

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

The bill does not change existing law.

XX. COMMITTEE RECOMMENDATIONS

On May 23, 2007, the Committee on Science and Technology favorably reported H.R. 632, as amended, by a voice vote and recommended its enactment.

XXI. PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 632, THE H–PRIZE ACT OF 2007

THURSDAY, MAY 10, 2007

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

The Subcommittee met, pursuant to call, at 10:15 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Nick Lampson [Chairman of the Subcommittee] presiding.

Chairman LAMPSON. The Subcommittee on Energy and Environment will come to order. Pursuant to notice, the Subcommittee on Energy and Environment needs to consider the following measures: H.R. 364, *To provide for the establishment of the Advanced Research Projects Agency-Energy,* and H.R. 632, the *H–Prize Act of 2007.*

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

Today we will consider two bills that represent another step of the Committee's effort to push the envelope of technological possibility and provide the American people a future with cheaper, cleaner and better energy options.

For decades my district has been synonymous with oil and gas or energy generally. To a large extent it has been the economic foundation for that area, for the great State of Texas and even for the Nation. And the truth is that we should expect that oil, gas and other traditional sources of energy such as coal and nuclear will provide much of our nation's energy for decades to come.

But the winds of change are indeed blowing. And the folks in my district know as well as anyone the predicament that we face in sky-high energy prices, the environmental impacts of our energy use and the critical need for maintaining jobs in the energy sector.

In this respect, the Nation faces a challenge like none we have encountered before. Unlike the Apollo and Manhattan Projects which galvanized our nation's scientists to win a global race to put a man on the Moon or create a "weapon to end all wars" there is no finish line in this race. We are attempting to transform a national and to some extent global economy which is based on only a handful of unsustainable energy resources. Resources that we know will simply not last.

Despite their remarkable technological advances, we cannot expect the energy industry and the current programs at the Department of Energy to tackle these problems on their own. Only through ground-breaking research and the development of truly transformational technologies can we begin to match up to the scale and the complexity of these challenges.

Now this requires from us a rock solid commitment to innovative energy R&D and a leap of faith that somewhere on the shelves of our national labs or in the garages in our nation's inventors or in the halls of research universities there are discoveries and technologies waiting to be exploited by a new energy industry.

The two bills that we are here to mark up today represent the kind of bold efforts that are needed in advancing energy research and ensuring that the United States maintains a lead in these emerging technology fields. Therefore, I urge their passage and look forward to getting them to the House Floor.

[The prepared statement of Chairman Lampson follows:]

PREPARED STATEMENT OF CHAIRMAN NICK LAMPSON

Today we will consider two bills that represent another step in this committee's efforts to push the envelope of technological possibility, and provide the American people a future with cheaper, cleaner, better energy options.

For decades my district has been synonymous with oil and gas (or Energy, generally). To a large extent it has been the economic foundation for this area, for the great State of Texas, and even for the Nation.

And the truth is that we should expect that oil, gas and other more traditional sources of energy, such as coal and nuclear, will provide much of our nation's energy for decades to come.

But the winds of change are blowing, and the folks in my district know as well as anyone the predicament we face in sky-high energy prices, the environmental impacts of our energy use, and the critical need for maintaining jobs in the energy sector.

In this respect, the Nation faces a challenge like none we have encountered before. Unlike the Apollo and Manhattan projects, which galvanized our nation's scientist to win a global race to put a man on the Moon, or create a "weapon to end all wars," there is no finish line in this race.

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Despite their remarkable technological advances, we can't expect the energy industry, and the current programs at the Department of Energy to tackle these problems on their own.

Only through ground-breaking research, and the development of truly transformational technologies, can we begin to match up to the scale and complexity of these challenges.

This requires from us a rock-solid commitment to innovative energy R&D, and a leap of faith that somewhere on the shelves of our national labs, in the garages of our nation's inventors, and in the halls of our research universities, there are discoveries and technologies waiting to be exploited by a new energy industry.

The two bills that we are here to markup today represent the kind of bold efforts that are needed in advancing energy research, and ensuring the U.S. maintains a lead in these emerging technology fields.

Therefore I urge their passage, and look forward to getting them to the House Floor.

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

Mr. INGLIS. And I thank the Chairman for yielding. First of all, we are very happy to have you back in the Chair, Mr. Lampson. It is——

Chairman LAMPSON. Thank you very——

Mr. INGLIS.—great to——

Chairman LAMPSON.—very much.

Mr. INGLIS.—have you back. You are looking great and——

Chairman LAMPSON. Thank you.

Mr. INGLIS.—healthy and all of that, so we are—now you had some capable folks filling in for you, you understand. But we are——

Chairman LAMPSON. I am very appreciative——

Mr. INGLIS.—but we are happy to have you back, so——

Chairman LAMPSON. Thank you very much.

Mr. INGLIS.—and, you know, it is helpful to be here today talking about energy and two different bills that can help us achieve some of the objectives that we have got.

Sometimes people wonder about those objectives. My wife was at a gathering a couple of months ago and a lady told her Bob has got to stop talking about energy so much. We are tired of hearing from him about energy. And I would note that as the price of gasoline is now above three dollars a gallon that probably Marianne would have a different message coming from that lady now and that it is good to focus a lot on energy. So it depends on what the price at the pump is as to whether we think it is a great thing to focus on.

But the objective of these bills today is to look long-term and not to the gas prices that fluctuate up and down based on the month. I do hope that we take the message from those gas prices, that they are volatile. They will go up and down. But the long-term trajectory has to be up. And so therefore we are looking for energy sources besides those.

And so today two bills that help us get to there—to that place of energy independence we hope one is, ARPA–E which is designed to create breakthrough technology opportunities and the other, the H–Prize Bill, which is even a little bit longer term proposition but something that can hopefully lead us to a new source of energy. So we are happy to be here marking up these bills, Mr. Chairman. And I have got the more complete opening statement that I would like to submit for the record.

Chairman LAMPSON. With no—without objection.

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Thank you, Mr. Chairman, for holding this markup on the establishment of the H–Prize and ARPA–E. The bills we discuss today represent a common goal: harnessing American innovation to meet our need for energy and improve our energy security.

One hundred years ago, the space travel concept was madness. Forty years ago, only a select group of elite astronauts could visit the Moon. Ten years ago, just a handful of visionaries thought that the highway to space would soon open to all travelers. Today, paying customers can pre-book flights to space, and in two years, from their seat on a space plane, they will take digital pictures of the Earth to share with their friends and family back home.

Twelve short years mark the gap between science fiction and commercial space flight. Imagination and innovation bridged the gap. In 1996, Peter Diamandis joined forces with the Ansari family of investors and created the X–Prize, offering $10 million to the first reusable sub-orbital space vehicle. Eight years later, Burt Rutan's SpaceshipOne won the prize, launching into sub-orbital space flight twice in two weeks. Shortly after, Richard Branson teamed up with Rutan, and Virgin Galactic will soon convert a space-age science project into a new tourist industry.

The energy industry in 2007 looks a lot like the space flight sector did in 1996. We've seen important incremental gains, but overall innovation has slowed. We de-

pend on volatile fossil fuels, scratch our head at how to deal with carbon emissions, and get more and more frustrated with each cent increase in the cost of gasoline. We know that there has to be a better way to do energy.

Taking a prize approach to the energy problem allows our imagination to run with the prospects of coupling a pioneering vision with a hydrogen prize, or H–Prize, incentive for innovation in hydrogen energy. Our history tells us that what starts with an imaginative dream or vision typically finishes in a legacy of American innovation. There's a multi-billion, if not trillion, dollar industry that we can create from a hydrogen energy source free of emissions, renewable, cost-effective, and American-made.

Imagine an inventor in Spartanburg, SC and an entrepreneur in Greenville teaming up to work on the challenge of hydrogen storage. The entrepreneur secures a license for metal hydride storage material from the Hydrogen Research Center at the Savannah River National Lab. The inventor is a retiree from the Oak Ridge National Lab, with a lifetime of experience in alternative fuels. They've heard about the H–Prize, and it's provided the spark to light the fuse of their imagination. The Discovery Channel has a new idea for a show on alternative fuels, and has agreed to follow their progress.

They set to work improving the material to store more hydrogen at lower weight, and a year later they submit their work to the H–Prize judging panel for best incremental gain in storage technology. Their careful work wins the prize, and they've got $1 million to show for it. They use part of the money to pay their investors, but they convince their investors that they could win even bigger in the prototype competition. They assemble a small team and get to work.

After a year of all-nighters and Ramen noodles, they have their prototype for a storage subsystem. The Discovery Channel has the beginnings of a new reality show (who knew scientists could be so caddy?). Their metal hydride dust could fill the frame of a car, safely providing the hydrogen fuel and eliminating the need for a fuel tank. BMW loves the idea and before their team even won the $4 million prize for best prototype, BMW is competing to license their technology for the next version of the Hydrogen 7 sedan.

Now the team's investors are really buzzing. They've partnered with automotive engineering departments at several universities and are hard at work designing a new mass-producible vehicle at Clemson University's International Center for Automotive Research in Greenville. They've got their eyes on the grand prize for transformational technologies. Duke Power has become a partner to provide economical, carbon-free hydrogen from nuclear power. A local gasoline marketer has jumped in to help with distribution, offering modified fuel trucks running on biodiesel and pump space for hydrogen. Corporate investors from around the world are pitching in to get their logo—NASCARstyle—on the car, fueling station, and everything in between.

The South Carolina team is only one of many around the country, but the Discovery Channel cameras testify that their hearts are in it to win. Over the course of five years, Team Palmetto assembles, jimmy-rigs, and invents the technologies to take them to the top. The judges deem them the best, and they receive the $10 million cash prize for their hard work. Of course, at this point their investors see that more gains lie ahead, so the team easily raises $40 million in venture capital, which is matched by other private money for corporate sponsorship of the H–Prize. Within three years, their emission-free HyFlyer cars zipping along the East and West Coast Hydrogen Highways, in Europe, and even Japan and China.

It's not so farfetched. The prize idea has worked in the past, from the Transcontinental Railroad, to Lindbergh and the Orteig Prize, to Burt Rutan and the X–Prize. Others see the prize working in the future: the Automotive X–Prize, Rep. Frank Wolf's NSF prize, Rep. Dan Lungren's Automotive Prize. H–Prize has the advantage of focusing on a far reaching technology where breakthroughs are needed and harnessing the American innovative and entrepreneurial spirit to tackle those challenges.

Prize money is one seed from which energy technology and industry can grow. But it will not be the only source for energy breakthroughs. There is still a need for research and development funding for our nation's scientists, labs, and universities. The ARPA–E bill that we will markup today addresses a need to sponsor exploration in high-risk endeavors.

ARPA–E research could offer a big payoff in the commercial energy market. At the same time, I already see real payoffs coming from existing DOE research, especially hydrogen, nuclear, wind, and solar programs. I'm concerned that the ARPA–E fund will divert funds away from these existing programs and jeopardize the advances we're already seeing in these areas. I hope that we can find a way to ensure this doesn't happen.

Thank you again, Mr. Chairman, I look forward to working with you on these two bills.

Mr. INGLIS. Thank you. I look forward to the markup here.

Chairman LAMPSON. Thank you very much, Ranking Member Inglis.

We will now consider H.R. 632, the *H–Prize Act of 2007.*

And I yield to Mr. Lipinski, five minutes, to describe this bill.

Mr. LIPINSKI. Thank you, Mr. Chairman. We have to be here today for the markup of H.R. 632, the *H–Prize Act of 2007,* a bill that I introduced along with Ranking Member Inglis as one step in addressing global climate change and spurring national energy independence.

This is the bill that we moved out of the Science Committee last year and we passed it on the House Floor by a vote of 416 to six. It wound up being stalled in the other chamber last year, as many things are. This year we believe that this bill can be successfully steered through both chambers and sent to the President. So today we have the first step.

It is obvious to all of us the damage being caused by our current energy economy. Gas prices have skyrocketed over the last few weeks. They continue to hit record highs, averaging over three dollars a gallon nationwide. But back home in my district it is around $3.50 a gallon. But then again, when I left last week, I was gone for three days and it went up about 20 cents, so I am not sure where those prices are now. And the situation is inflicting pain on our constituents and our economy.

But the cost of our addiction to oil not only affects our pocketbooks. It affects our environment and national security. We cannot continue to pollute our air and alter our climate with greenhouse gas emissions and we cannot continue to rely on energy sources from unstable parts of the world. We must find new solutions. And hydrogen has great potential to be a solution.

Environmental promise is great. Using hydrogen as an energy source produces no emissions besides water. And hydrogen-fueled cars already exist. But the technical barriers and the economic barriers are significant. I believe the—one of the cars that I drove—hydrogen-fueled cars cost a couple million dollars, I think they said, to produce. Now what we have here in the H–Prize Act, we are seeking to inspire researchers, entrepreneurs and the competitive spirit of others towards the surmount the barriers that we face right now and find specific solutions that will facilitate development and commercialization of hydrogen fuel. The H–Prize would help expand the possibility of hydrogen research, promoting people not normally involved in federal research and development, explore one of the greatest challenges facing us today.

Specifically, this legislation would establish competitively awarded cash prizes to spur innovations that advance the use of hydrogen as a fuel for transportation. Every two years four one-million dollar prizes would be given for advances in production, storage, distribution, and utilization of hydrogen. And one four-million dollar prize would be awarded for advances in prototype hydrogen vehicles. And at the end of 10 years, one grand prize of 10 million dollars would be given for a transformational advance in hydrogen energy technology.

This prize will help us to take advantage of America's greatest resource: our ingenuity and creativity. We have some of the best and brightest minds in the world in the United States as well as an economy that supports and encourages entrepreneurship. And each prize will focus this inventiveness to address the greatest challenge that our country faces today.

Energy independence is essential to national security. It is reducing the price at the pump. And investing in an alternative to fossil fuels such as hydrogen is a strong step in the right direction. I believe that the ARPA–E program which we just passed the bill on is also an important part of this. There is not one solution. There is not one bill that we are going to pass that we know is going to be the silver bullet. But there is much that we must do so that we can move ahead and move beyond the current energy economy that we have.

And hydrogen, for one, holds enormous potential as a base of a future economy. And this is a potential that we should not ignore. Thank you, Mr. Chairman. And I yield back the balance of my time.

[The prepared statement of Mr. Lipinski follows:]

PREPARED STATEMENT OF REPRESENTATIVE DANIEL LIPINSKI

Thank you, Mr. Chairman; I am pleased to be here today for the markup of H.R. 632, the *H–Prize Act of 2007,* a bill I introduced—along with Ranking Member Inglis—as one step in addressing global climate change and spurring national energy independence.

This is a bill that we moved out of the Science Committee last year and we passed on the House Floor by a vote of 416 to 6. Unfortunately the bill stalled in the other chamber last year. This year we believe that this bill can be successfully steered through both chambers and be sent to the President. Today we have the first step.

It is obvious to all of us the damage being caused by our current energy situation. Gas prices have skyrocketed over the last few weeks and continue to hit record highs, averaging over $3 a gallon nationwide and in my district in the Chicago area around $3.50 per gallon. This situation is inflicting pain on our constituents and on our economy. But the costs of our addiction to oil not only affect our pocketbooks, they affect our environment and national security. We cannot continue to pollute our air and alter our climate with greenhouse gases emissions, and we cannot continue to rely on energy sources from unstable parts of the world. We *must* find new solutions and hydrogen has great potential to be a solution. The environmental promise is great. Using hydrogen as an energy source produces no emissions besides water. Zero polluting emissions. And hydrogen-fueled cars already exist. But the technical barriers and the economic barriers are significant.

H.R. 632 seeks to inspire researchers, entrepreneurs, and others' competitive spirits to work to surmount these barriers and find specific solutions that will facilitate development and commercialization of hydrogen fuel. The H–Prize will help expand the possibilities of hydrogen research, promoting people not normally involved in federal research and development to explore one of the greatest challenges facing us today.

Specifically, this legislation would establish competitively awarded cash prizes to spur innovations that advance the use of hydrogen as a fuel for transportation. Every two years, four $1 million prizes would be given for advances in the production, storage, distribution, and utilization of hydrogen, and one $4 million prize would be awarded for advances in prototype hydrogen vehicles. And at the end of ten years one grand prize of $10 million would be given for a transformational advance in hydrogen energy technology.

This prize will help us take advantage of America's great resource—our ingenuity and creativity. We have some of the best and brightest minds in the world in the United States, as well as an economy that supports and encourages entrepreneurship, and the H–Prize will focus this inventiveness to address the greatest challenge that our country faces today.

Energy independence is essential to national security and to reducing the price at the pump and investing in an alternative to fossil fuels such as hydrogen is a

strong step in the right direction. Hydrogen holds enormous potential as the base of our future economy—a potential we cannot and must not ignore.

Thank you, Mr. Chairman, and I encourage all of my colleagues to support the H–Prize Act.

Chairman LAMPSON. Thank you very much. And I recognize Mr. Inglis for any remarks on this bill.

Mr. INGLIS. Thank you, Mr. Chairman. I would simply say this. We were able to get 416 votes for this bill in the last Congress. 416 to 6. And so hopefully we can do something like that again this Congress and it can pass the House and then get some action over in the Senate. I will anticipate some objections to it, that hydrogen is a ways away, perhaps. But as I think is clear, we did not get to the moon by waiting for it to come close. So we will not get to a hydrogen economy waiting for it to just sort of happen. We have to figure out ways to work toward it and employ the creative capacity of inventors and entrepreneurs out there similar to what we saw done in the X–Prize.

And of course, the X–Prize is the foundation of the concept here. That is what—we borrowed heavily from them. And the last Congress had a very helpful hearing with Dr. Diamandis, of the X–Prize Foundation, who told us that what you have got to do is basically make sure that this does not become a middling U.S. Department of Energy kind of program. It must be a separate kind of prize that creates lift—media lift and attention and the opportunity to win a prize because the reality is we all work real hard to win prizes.

United Way holds out, you know, a T-shirt and whoever can raise a certain amount gets this T-shirt—well, you could go buy the T-shirt for less than the money that you are going to spend trying to raise the money but you do it anyway because you want to win the prize. And that is what Diamandis told us. There is a real desire to win prizes and there is money and creative capacity that we unleashed out there, around the world really, in order to try to win the X–Prize. And hopefully we can do that with the H–Prize. So I am happy to be supportive of the bill. And I yield back.

Chairman LAMPSON. Thank you very much. Who else seeks——

Mr. BARTLETT. Mr. Chairman?

Chairman LAMPSON. Yes, Mr. Bartlett.

Mr. BARTLETT. I——

Chairman LAMPSON. You are recognized for five minutes.

Mr. BARTLETT. Thank you. I strongly support this bill. Not because I think that hydrogen is going to play any big role in our energy future. Hydrogen, of course, is not an energy source. We have to make hydrogen from some other energy source and hydrogen will always contain less energy than the source that we made it from. It is either natural gas or electricity. And there may be other sources but those are two today.

The attractiveness of hydrogen is that it does not pollute when you burn it. You just get water. After all, water is the oxide of hydrogen. But depending on how you made the hydrogen you may have polluted as much as you would pollute driving a gasoline car. So we have to be careful. But then it is all in one big place and you can control it better.

The real attractiveness of hydrogen is it is a great candidate for a fuel cell if we ever get a fuel cell. But we are probably 20 years away from a fuel cell. Just burning hydrogen in a reciprocating engine does not make much sense. Because if you start out with electricity electroizing water you could have used the electricity to fill a battery and you could drive your car on the battery. As a matter of fact, in one of our Science Committee hearings three experts were there. And of the three ways that you might transport hydrogen—these are the lightest element in the universe that we know of. These molecules do not like their own company. They try to get as far apart as possible. So you have to really press real hard on them to get them close together. So if it is pressurized, it is really high pressure vessel to carry much hydrogen at all. The hydrogen airplane, by the way, would have the plane full of hydrogen and a couple of passengers hanging on the wings because the energy density is so low. But it is a great candidate for a fuel cell when we get a fuel cell.

But the reason I am so strongly in support of this, I think this is a fantastic idea to give this award. And you know, the Romans would practice for how long to run in those races. And look at our people that go to the Olympics. I mean, it is a life goal. And what do they get from it? A silly little ribbon and a gold or silver or brass thing hanging around their neck. But look how they work for that. And I think the leverage of this is just incredible.

If I added up the numbers right we are committing, what, $28 million to this or $18 million. $18 million. Four, four, four, four, four, and 10, right? 18 million dollars. I cannot imagine any better way to spend 18 million dollars. And I hope this is just the beginning of a lot of bills for prizes. There are a whole lot of things that we could give prizes for. And you pointed out very correctly, Mr. Inglis, that people work a heck of a lot harder for a prize than they will for their paycheck. So I think this is a great idea. And—not because I think hydrogen is going to be playing any meaningful role in our energy future. If we get fuel cells it will play a meaningful role in transportation.

Oh, the three ways you can transport it. Push the molecules close together. Liquefy it. But then you have to have a big insulation that boils off at night. And the third way, which they said was going to be the way that if we ever had a hydrogen economy would work. And that is in solid state as a battery. And I see Counsel shaking his head in agreement. This is what they said. And I asked them is a hydrogen battery inherently more efficient than an electron battery and they did not know the answer. But I am still a big fan of this legislation because I think this is the kind of thing we need to be doing over and over again. Not just paying people to do something but challenge them to do something. This award will mean a whole lot more to them than a big paycheck would mean. So it is a great bill. Thank you very much.

Chairman LAMPSON. Thank you, Mr. Bartlett. Who else seeks recognition? I have enjoyed the comments that everyone has made. And obviously it is critically important for us to be doing these kinds of things. Texas even was involved a little bit, trying to take a stand on—in a belief that a major facet of energy independence

lies largely in hydrogen production. Hopefully we can find ways to do that.

We recently had the National Hydrogen Convention in Texas and it was followed by a coalition sponsored by Ride and Drive of hydrogen powered vehicles. A lot of people doing different work. And the Canadians I think are more advanced with what they have been doing with—in comparison to the United States. I believe firmly that when we invest in these kinds of programs we get huge returns back.

Who else seeks recognition? Anyone?

Mr. LIPINSKI. I just want to quickly say I think I thank Dr. Bartlett for his support. I was not sure with all that he said and I have—I am certainly not going to argue with the good doctor here on—about the prospects for hydrogen. But I am a little more hopeful, maybe, but I thank you.

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

Are there any amendments? Hearing none, the vote is on the bill, H.R. 632, the *H–Prize Act of 2007*. All those in favor say aye. All those opposed will say no.

In the opinion of the Chair the ayes have it. I recognize Mr. Inglis to offer a motion.

Mr. INGLIS. Chairman, I move that the Subcommittee favorably report H.R. 632 as amended to the Full Committee. Furthermore, I move that the staff be instructed to prepare the Subcommittee legislative report and make necessary technical and conforming changes to the bill in accordance with the recommendations of the Subcommittee. And actually, there is no amendment to the bill so we are happy to have it as it was and present it.

Chairman LAMPSON. Very good. I thank the Ranking Member. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Those opposed no.

The ayes have it. The bill is favorably reported. Without objection the motion to reconsider is laid upon the table. Subcommittee Members may submit additional and minority views on the measure. I would like to thank the Members for their attendance, everyone who stayed all the way through this thing. And this concludes our Subcommittee markup. We are adjourned. Thank you.

[Whereupon, at 1:00 p.m., the Subcommittee was adjourned.]

Appendix:

H.R. 632, Section-by-Section Analysis

I

110TH CONGRESS
1ST SESSION

H. R. 632

To authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 23, 2007

Mr. LIPINSKI (for himself, Mr. INGLIS of South Carolina, Mr. DOYLE, Mr. BROWN of South Carolina, Mr. DENT, Mr. EHLERS, Ms. LORETTA SANCHEZ of California, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. TERRY, Mr. MCCAUL of Texas, Mr. GERLACH, Mr. CAMP of Michigan, Mr. BARRETT of South Carolina, Mr. WILSON of South Carolina, Mr. REICHERT, Mr. WOLF, Mr. WICKER, Mr. JOHNSON of Illinois, Mr. SOUDER, Mr. KUHL of New York, Mr. WYNN, Mr. LARSON of Connecticut, Mr. KINGSTON, Mr. LINCOLN DAVIS of Tennessee, Mr. ARCURI, and Mr. WAMP) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

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 "H-Prize Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTERING ENTITY.—The term ''administering entity'' means the entity with which the Secretary enters into an agreement under section 3(c).

(2) DEPARTMENT.—The term ''Department'' means the Department of Energy.

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

SEC. 3. PRIZE AUTHORITY.

(a) IN GENERAL.—The Secretary shall carry out a program to competitively award cash prizes only in conformity with this Act to advance the research, development, demonstration, and commercial application of hydrogen energy technologies.

(b) ADVERTISING AND SOLICITATION OF COMPETITORS.—

(1) ADVERTISING.—The Secretary shall widely advertise prize competitions to encourage broad participation, including by individuals, universities (including historically Black colleges and universities and other minority serving institutions), and large and small businesses (including businesses owned or controlled by socially and economically disadvantaged persons).

(2) ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.—The Secretary shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize.

(c) ADMINISTERING THE COMPETITIONS.—The Secretary shall enter into an agreement with a private, nonprofit entity to administer the prize competitions, subject to the provisions of this Act. The duties of the administering entity under the agreement shall include—

(1) advertising prize competitions and their results;

(2) raising funds from private entities and individuals to pay for administrative costs and to contribute to cash prizes;

(3) working with the Secretary to develop the criteria for selecting winners in prize competitions, based on goals provided by the Secretary;

(4) determining, in consultation with the Secretary, the appropriate amount for each prize to be awarded;

(5) selecting judges in accordance with section 4(d), using criteria developed in consultation with the Secretary; and

(6) preventing the unauthorized use or disclosure of a registered participant's intellectual property, trade secrets, and confidential business information.

(d) FUNDING SOURCES.—Prizes under this Act shall consist of Federal appropriated funds and any funds provided by the administering entity (including funds raised pursuant to subsection (c)(2)) for such cash prizes. The Secretary may accept funds from other Federal agencies for such cash prizes. The Secretary may not give any special consideration to any private sector entity or individual in return for a donation to the administering entity.

(e) ANNOUNCEMENT OF PRIZES.—The Secretary may not issue a notice required by subsection (b)(2) until all the funds needed to pay out the announced amount of the prize have been appropriated or committed in writing by the administering entity. The Secretary may increase the amount of a prize after an initial announcement is made under subsection (b)(2) if—

(1) notice of the increase is provided in the same manner as the initial notice of the prize; and

(2) the funds needed to pay out the announced amount of the increase have been appropriated or committed in writing by the administering entity.

(f) SUNSET.—The authority to announce prize competitions under this Act shall terminate on September 30, 2018.

SEC. 4. PRIZE CATEGORIES.

(a) CATEGORIES.—The Secretary shall establish prizes for—

(1) advancements in components or systems related to—

(A) hydrogen production;

(B) hydrogen storage;

(C) hydrogen distribution; and

(D) hydrogen utilization;

(2) prototypes of hydrogen-powered vehicles or other hydrogen-based products that best meet or exceed objective performance criteria, such as completion of a race over a certain distance or terrain or generation of energy at certain levels of efficiency; and

(3) transformational changes in technologies for the distribution or production of hydrogen that meet or exceed far-reaching objective criteria, which shall include minimal carbon emissions and which may in-

clude cost criteria designed to facilitate the eventual market success of a winning technology.

(b) AWARDS.—

(1) ADVANCEMENTS.—To the extent permitted under section 3(e), the prizes authorized under subsection (a)(1) shall be awarded biennially to the most significant advance made in each of the four subcategories described in subparagraphs (A) through (D) of subsection (a)(1) since the submission deadline of the previous prize competition in the same category under subsection (a)(1) or the date of enactment of this Act, whichever is later, unless no such advance is significant enough to merit an award. No one such prize may exceed $1,000,000. If less than $4,000,000 is available for a prize competition under subsection (a)(1), the Secretary may omit one or more subcategories, reduce the amount of the prizes, or not hold a prize competition.

(2) PROTOTYPES.—To the extent permitted under section 3(e), prizes authorized under subsection (a)(2) shall be awarded biennially in alternate years from the prizes authorized under subsection (a)(1). The Secretary is authorized to award up to one prize in this category in each 2-year period. No such prize may exceed $4,000,000. If no

registered participants meet the objective performance criteria established pursuant to subsection (c) for a competition under this paragraph, the Secretary shall not award a prize.

(3) TRANSFORMATIONAL TECHNOLOGIES.—To the extent permitted under section 3(e), the Secretary shall announce one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. A prize offered under this paragraph shall be not less than $10,000,000, paid to the winner in a lump sum, and an additional amount paid to the winner as a match for each dollar of private funding raised by the winner for the hydrogen technology beginning on the date the winner was named. The match shall be provided for 3 years after the date the prize winner is named or until the full amount of the prize has been paid out, whichever occurs first. A prize winner may elect to have the match amount paid to another entity that is continuing the development of the winning technology. The Secretary shall announce the rules for receiving the match in the notice required by section 3(b)(2). The Secretary shall award a prize under this paragraph only when a registered participant has met the objective criteria established for

the prize pursuant to subsection (c) and announced pursuant to section 3(b)(2). Not more than $10,000,000 in Federal funds may be used for the prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward the matching award under this paragraph.

(c) CRITERIA.—In establishing the criteria required by this Act, the Secretary shall consult with—

(1) the Department's Hydrogen Technical and Fuel Cell Advisory Committee;

(2) other Federal agencies, including the National Science Foundation; and

(3) private organizations, including professional societies, industry associations, and the National Academy of Sciences and the National Academy of Engineering.

(d) JUDGES.—For each prize competition, the Secretary shall assemble a panel of qualified judges to select the winner or winners on the basis of the criteria established under subsection (c). Judges for each prize competition shall include individuals from outside the Department, including from the private sector. A judge may not—

(1) have personal or financial interests in, or be an employee, officer, director, or agent of, any entity

that is a registered participant in the prize competition for which he or she will serve as a judge; or

(2) have a familial or financial relationship with an individual who is a registered participant in the prize competition for which he or she will serve as a judge.

SEC. 5. ELIGIBILITY.

To be eligible to win a prize under this Act, an individual or entity—

(1) shall have complied with all the requirements in accordance with the Federal Register notice required under section 3(b)(2);

(2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen of, or an alien lawfully admitted for permanent residence in, the United States; and

(3) shall not be a Federal entity, a Federal employee acting within the scope of his employment, or an employee of a national laboratory acting within the scope of his employment.

SEC. 6. INTELLECTUAL PROPERTY.

The Federal Government shall not, by virtue of offering or awarding a prize under this Act, be entitled to any

intellectual property rights derived as a consequence of, or direct relation to, the participation by a registered participant in a competition authorized by this Act. This section shall not be construed to prevent the Federal Government from negotiating a license for the use of intellectual property developed for a prize competition under this Act.

SEC. 7. LIABILITY.

(a) WAIVER OF LIABILITY.—The Secretary may require registered participants to waive claims against the Federal Government and the administering entity (except claims for willful misconduct) for any injury, death, damage, or loss of property, revenue, or profits arising from the registered participants' participation in a competition under this Act. The Secretary shall give notice of any waiver required under this subsection in the notice required by section 3(b)(2). The Secretary may not require a registered participant to waive claims against the administering entity arising out of the unauthorized use or disclosure by the administering entity of the registered participant's intellectual property, trade secrets, or confidential business information.

(b) LIABILITY INSURANCE.—

(1) REQUIREMENTS.—Registered participants shall be required to obtain liability insurance or

demonstrate financial responsibility, in amounts determined by the Secretary, for claims by—

(A) a third party for death, bodily injury, or property damage or loss resulting from an activity carried out in connection with participation in a competition under this Act; and

(B) the Federal Government for damage or loss to Government property resulting from such an activity.

(2) FEDERAL GOVERNMENT INSURED.—The Federal Government shall be named as an additional insured under a registered participant's insurance policy required under paragraph (1)(A), and registered participants shall be required to agree to indemnify the Federal Government against third party claims for damages arising from or related to competition activities.

SEC. 8. AUTHORIZATION OF APPROPRIATIONS.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) AWARDS.—There are authorized to be appropriated to the Secretary for the period encompassing fiscal years 2008 through 2017 for carrying out this Act—

(A) $20,000,000 for awards described in section (4)(a)(1);

(B) $20,000,000 for awards described in section 4(a)(2); and

(C) $10,000,000 for the award described in section 4(a)(3).

(2) ADMINISTRATION.—In addition to the amounts authorized in paragraph (1), there are authorized to be appropriated to the Secretary for each of fiscal years 2008 through 2017 $2,000,000 for the administrative costs of carrying out this Act.

(b) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this Act shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes only after the expiration of 10 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this Act permits obligation or payment of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

SEC. 9. NONSUBSTITUTION.

The programs created under this Act shall not be considered a substitute for Federal research and development programs.

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SECTION-BY-SECTION ANALYSIS OF H.R. 632,
THE H–PRIZE ACT OF 2007

Section 1. Short Title.

The H–Prize Act of 2007

Sec. 2. Definitions

Defines Administering Entity, Department and Secretary.

Sec. 3. Prize Authority.

Requires the Secretary of Energy to create a prize to advance the research, development, demonstration and commercial application of hydrogen energy technologies.

Requires the Secretary to advertise the prize competitions widely to encourage broad participation, including outreach to historically black colleges and universities, other minority serving institutions, as well as large and small businesses, including minority and disadvantaged businesses. Includes a specific direction to announce the prize competitions through publication of a *Federal Register* notice.

Requires the Secretary to enter into an agreement with a private, non-profit entity to administer the prize competitions. Enumerates the duties of the administering entity to include advertising the prizes and their results, fund-raising for administrative costs and cash prizes, working with the Secretary to develop prize criteria based upon goals provided by the Secretary, working with the Secretary to determine the appropriate amounts for prizes awarded under the transformational changes category described in section 4, selecting judges using criteria developed in consultation with the Secretary, and preventing the unauthorized use or disclosure of a registered participant's intellectual property, trade secrets, and confidential business information.

Authorizes the Secretary to use funding directly appropriated for such purposes to the Department of Energy (DOE) or other agencies and to accept funds provided by private entities or individuals. Prohibits the announcement of any prize competition until sufficient funds are available. Sunsets the authority to award prizes in 2018.

Sec. 4. Prize Categories.

Defines prize categories for:

(i) **Components or Systems.** Establishes up to four $1 million prizes awarded every other year to the best technology advancements in components or systems related to hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization. Provides the Secretary the discretion to reduce the amount or number of prizes based upon the availability of funds.

(ii) **Prototypes.** Establishes one $4 million prize for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards prototype prizes in years alternate with the technology advancements prize. Prohibits the Secretary from awarding the prize if no entrant meets the objectively defined performance criteria.

(iii) **Transformational Changes.** Establishes a minimum $10,000,000 lump sum prize award for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Limits the federal contribution to $10,000,000, and sets a private fund-raising goal of $40,000,000 for prize money provided as matching funds for every dollar of private funding raised by the winner for the continued development of their winning technology.

Requires the Secretary to establish contest criteria through consultation with the Hydrogen Technical Advisory Committee, other federal agencies including the National Science Foundation, and private organizations including the National Academy of Sciences. Requires the Secretary to appoint contest judges from the private sector and agencies outside DOE. Excludes judges who may have a personal or financial relationship with any contest participant.

Sec. 5. Eligibility.

Requires contestants to register through the process published in the *Federal Register*. Requires contestants be incorporated and maintain a primary place of business in the U.S. if a private entity, and must be a U.S. citizen if an individual. Excludes from participation any federal entities or Federal or national laboratory employees while on duty.

Sec. 6. Intellectual Property.

Waives claims by the Federal Government to any intellectual property rights derived from participation in the prize competitions.

Sec. 7. Liability.

Requires contestants to waive claims against the Federal Government resulting from participation in prize competition activities. Requires contestants to have liability insurance against damages resulting from participation in any prize competition activity and to name the Federal Government as an additional insured entity.

Sec. 8. Authorization of Appropriations.

Authorizes $20 million for advancements in components, $20 million for advancements in prototypes, and $10 million for transformational changes for the period encompassing fiscal years 2008 through 2017, with funds expiring 10 fiscal years after the fiscal year in which they were appropriated. Authorizes $2 million for administrative costs for each of fiscal years 2008 through 2017.

Sec. 9. Non-substitution.

Expresses a sense of the Congress that the prize competitions shall not act as a substitute for any research and development programs.

XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 632, THE H–PRIZE ACT OF 2007

WEDNESDAY, MAY 23, 2007

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

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

Chairman GORDON. Good morning everyone. The Committee on Science and Technology will come to order. Pursuant to notice, the Committee meets to consider the following measures: H.R. 364, *To provide for the establishment of the Advanced Research Projects Agency–Energy;* H.R. 1467, the *10,000 Trained by 2010 Act;* H.R. 1716, the *Green Energy Education of 2007;* and H.R. 632, the *H–Prize Act of 2007.*

Before we get started with this markup though, we have one quick piece of Committee business to attend to. The distinguished Member from California, Mr. Calvert, recently took a leave of absence from the Committee to serve on Appropriations. This left the Space and Aeronautics Subcommittee without a Ranking Member. Last week Mr. Hall announced that Representative Feeney would take over as Ranking Member of the Subcommittee, and I now ask unanimous consent that the Committee on Science and Technology ratify the selection of Mr. Feeney as Ranking Member of the Space and Aeronautics Subcommittee. Without objection——

Mr. HALL. Mr. Chairman, do you have to be present to be proposed or——

Chairman GORDON. Well, I am considering that no objection and—or may I say, I consider that a slight objection and it is so ordered. I want to congratulate Mr. Feeney.

Let me also say that Ken Calvert—I was Ranking Member of this committee and Ken did much more than I did. He made an effort to go to every facility all across the country and became very knowledgeable and we hope that he will be a continuing asset and I am sure that Mr. Feeney will also do a good job, but Ken did a particularly good job and hopefully he will be there on Appropriations to understand these issues.

We now begin with the markup and I will begin with a brief statement. Today the Committee is marking up four bills. The first bill we will consider is a bill that I introduced, H.R. 364, which establishes the Advanced Research Project Agency for Energy, and in

the Subcommittee hearing and in the markup we had a very healthy discussion that I believe pointed to the critical need for such an entity. We have worked hard with our friends from across the aisle, and while there are still a few differences, it has resulted in a better bill. It is my understanding that this discussion will continue today with a number of amendments, and I look forward to addressing those concerns.

The next bill we will take up is H.R. 1467, the *10,000 Trained by 2010 Act,* introduced by Chairman Wu. This is a good bill which I support. There has been a lot of talking in Washington about the need to push health care IT forward. Our medical system is far behind other sectors in the use of information technology. However, it is common knowledge that information technology could significantly improve patient care and reduce health care costs, and let me just collaterally say that I have just introduced H.R. 2406. It is a health care IT bill that will be in the jurisdiction of this committee. As I think Mr. Gingerich can tell you, it is going to be wildly popular within the health care area, doctors, physicians, everyone. Health care IT or IT in the health care area is one of the few areas that hasn't really matured. It is so popular that Newt Gingerich and Hillary Clinton are supporting this concept and so I would suggest to all of you to take a look at it. Don't get involved if you don't want to but I think you will find that it will be something that is going to be a good bill and will be popular for you.

And we also have H.R. 1716, the *Green Energy Education Act of 2007.* It was introduced by Mr. McCaul, and H.R. 1716 raises the profile of a very important issue, university research and education on clean energy including energy efficiency and green building design and technologies. It would bring together the Department of Energy, a emission agency, and the National Science Foundation, which has a long history with science and technological education, in a common goal to help educate the next generation of energy technology experts and green building professionals. This bill helps meet a very important need, and I thank Mr. McCaul for bringing it to the Committee, and who would have known he would have been such a greenie. But we thank you. This is a good bill.

We also will consider Mr. Lipinski's and Mr. Inglis' H.R. 362, the *H–Prize Act of 2007.* Hydrogen technology represents just the type of transformational possibilities that we are hoping to achieve with ARPA–E and may some day make an important piece of our energy puzzle, and I commend our colleagues, Mr. Inglis and Mr. Lipinski, for working together to make this a good bipartisan bill and I look forward to moving it through the Committee today.

So these are the four good bills that we have before us and I now would like to recognize Mr. Hall to present his opening remarks.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Today the Committee is meeting to markup four bills.

The first bill we will consider today is a bill that I introduced, H.R. 364, which establishes an Advanced Research Projects Agency for Energy. In the Subcommittee hearing and markup we had a very healthy discussion that, I believe, pointed to the critical need for such an entity.

We have worked hard with our friends across the aisle. And, while there are still substantial differences, it has resulted in a better bill. It is my understanding that

this discussion will continue today with a number of amendments, and I look forward to addressing your concerns.

The next bill we will take up is H. R. 1467, the *10,000 Trained by 2010 Act* introduced by Chairman Wu. This is a good bill which I support.

There has been a lot of talk in Washington about the need to push health care IT forward. Our medical system is far behind other sectors in the use of information technology. However, it is common knowledge that information technology could significantly improve patient care and reduce health care costs.

While there has been a lot of discussion on the issue in Congress, not much has actually been done. In this case, Chairman Wu and other Members of the Committee have identified one component of the issue and how the Science and Technology Committee could make a real and positive contribution in this area.

I strongly support this legislation and would urge everyone on the Committee to do so as well.

H.R. 1716, the *Green Energy Education Act of 2007,* was reintroduced by Mr. McCaul this year after having passed the House as part of a broader bipartisan Science Committee Energy R&D bill at the end of the 109th Congress.

H.R. 1716 raises the profile of a very important issue—university research and education on clean energy, including energy efficiency and green building design and technologies. It would bring together the Department of Energy, a mission agency, and the National Science Foundation, which has a long history with science and technology education, in a common goal to help educate the next generation of energy technology experts and green building professionals.

This bill helps meet a very important need and I thank Mr. McCaul for bringing it to the Committee.

We will also consider by Mr. Lipinski, H.R. 632, the *H–Prize Act of 2007.* Hydrogen technologies represent just the type of transformational possibilities that we are hoping to achieve with ARPA–E, and may some day make up an important piece of our energy puzzle.

I commend my colleagues Mr. Inglis and Mr. Lipinski for working together and for working hard to make this a good, bipartisan bill. I look forward to moving it through Committee today.

These are four good bills, and I strongly encourage my colleagues to support all of them.

Mr. HALL. Mr. Chairman, you and I have been working together now for over 22 years and on the same side of the aisle for most of that time, and if it weren't for me switching parties you might not even be Chairman right now, and I have been talked to by 4/5 of you bunch asking me to switch back. A good group on both sides. I appreciate everybody on both sides of the Chairman here, and you can thank me later if you would like.

When you work with someone as long as we have, not only on this committee but also on the Commerce Committee—we are on that Committee together—there are bound to be some times when we are going to disagree, and as much as I dislike going against my friend from Tennessee, sometimes it just happens. As it turns out, today is one of those days. While I commend you, Bart, for your efforts on behalf of boosting energy R&D, I disagree with the way H.R. 364 does it. I have to say that I have a problem with the idea of creating a new bureaucracy within the Department of Energy that will regardless of intention fight for money with existing and future programs at DOE. With the tight budget parameters we are working with, I am not comfortable authorizing the creation of ARPA–E based on a vague recommendation that was in the *Gathering Storm* report. The facts are that DOE currently has the authority to do ARPA-type projects but DOE is woefully under-funded. I am concerned that we could be faced with the problem of having both the Office of Science and ARPA–E underfunded so that neither of them is operating at full potential if we go forward with the creation of this new agency, and before we go forward with any ARPA-type projects, I would like the Section 1821 study in EPAct

to be completed that looks at the applicability of the DARPA management practices and the advisability of creating a DARPA-type agency within DOE before we move toward this legislation, and to that end, I will be introducing an amendment that without creating a new bureaucracy would require the Secretary of Energy to identify and accelerate advanced research projects at the DOE that will address our energy needs. I along with several of my colleagues have sent a letter to the Secretary urging him to complete the study as mandated by law so that we all might benefit from its recommendations.

In addition to the letter, we also ask the Secretary to appoint a technology transfer coordinator and establish the technology transfer working group. As several of our witnesses testified to in our committee hearing, technology transfer plays a very integral part in the process from basic research to widespread commercialization. I don't think anyone would dispute that our country needs clean, affordable, reliable energy that is generated through research and development. This committee should continue to advance legislation that addresses our most critical energy needs in a fiscally responsible manner. To that end, I will be introducing legislation by the end of the week that will help accomplish these goals.

In addition to the ARPA–E legislation, we will also be marking up H.R. 1467, H.R. 1716 and H.R. 632. I am an original co-sponsor of H.R. 1467, the *10,000 Trained by 2010 Act,* and I am supportive of the primary goal it seeks to achieve. If implemented correctly and efficiently, health information technology can revolutionize our health care system but we have to have an educated workforce properly trained in health IT in order for it to be successful, and this is what H.R. 1467 is about. NSF is already doing work, yeoman's work in the IT arena but this measure will increase the focus on health IT. I encourage my colleagues to support it.

I urge my colleagues to support H.R. 1716, the *Green Energy Education Act of 2007,* introduced by my fellow Texan, Mr. McCaul. This is a good piece of legislation. It was voted out of this committee in the last Congress. The fact that it has also been included in larger packages on both sides of the aisle in this Congress indicates its overwhelming support. Simply put, this measure encourages the Department of Energy to work with the National Science Foundation to help develop the next generation of engineers and architects to work effectively together to produce buildings that will incorporate the latest in energy-efficient technologies. I commend Mr. McCaul for his fine work on this bill.

Finally, I urge my colleagues to support H.R. 632, the *H–Prize Act,* sponsored by Inglis and Lipinski. This legislation was introduced in the last Congress and passed overwhelmingly by the House of Representatives. This bill directs the Secretary of Energy to award competitive cash prizes biannually to advance the research, development, demonstration and commercial applications of hydrogen energy technologies. Categories eligible for prizes include advancements in certain hydrogen components or systems, prototypes of hydrogen-powered vehicles and transformational changes in the technologies for hydrogen distribution or production. I com-

mend Mr. Inglis and Mr. Lipinski for introducing this legislation and I encourage my colleagues to support it.

Once again, Mr. Chairman, I am happy to be supportive of these three bipartisan pieces of legislation. I look forward to working with you to advance these bills.

I yield back my time, sir.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Mr. Chairman, you and I have been working together for over 22 years now—and on the same side of the aisle for most of that time. Why, if it weren't for me switching parties, you might not be the chairman right now! You can thank me later. . .. When you work with someone as long as we have, not only on this committee, but also on the Commerce Committee, there are bound to be times when we're going to disagree, and as much as I dislike going against my good friend from Tennessee, sometimes it just happens. As it turns out, today is one of those days. While I commend my friend for his efforts on behalf of boosting energy R&D, I disagree with the way H.R. 364 does it. I have to say that I have a problem with the idea of creating a new bureaucracy within the Department of Energy that will, regardless of intention, fight for money with existing and future programs at DOE. With the tight budget parameters we are working with, I am not comfortable authorizing the creation of ARPA–E based on a vague recommendation that was in the *Gathering Storm* report.

The facts are that DOE currently has the authority to do ARPA-type projects, but DOE is woefully under funded. I am concerned that we could be faced with the problem of having both the Office of Science and ARPA–E under funded so that neither of them is operating at its full potential if we go forward with creating this new agency. Before we go forward with any ARPA-type projects, I would like the Section 1821 study in EPACT to be completed that looks at the applicability of the DARPA management

practices and the advisability of creating a DARPA-type agency within DOE before moving forward with legislation. To that end I will be introducing an amendment that, without creating a new bureaucracy, would require the Secretary of Energy to identify and accelerate advanced research projects at the DOE that will address our energy needs. I, along with several of my colleagues, have sent a letter to the Secretary urging him to complete the study as mandated by law so that we all may benefit from its recommendations. In addition, in the letter we also ask the Secretary to appoint the Technology Transfer Coordinator and establish the Technology Transfer Working Group. As several of our witnesses testified to in our Subcommittee hearing, technology transfer plays an integral part in the process from basic research to widespread commercialization.

I don't think anyone would dispute that our country needs clean, affordable, reliable energy that is generated through research and development. This committee should continue to advance legislation that addresses our most critical energy needs in a fiscally responsible manner. To that end, I will be introducing legislation by the end of this week that will help accomplish these goals.

In addition to the ARPA–E legislation we will also be marking up H.R. 1467, H.R. 1716, and H.R. 632. I am an original co-sponsor of H.R. 1467, the *10,000 Trained by 2010 Act,* and am supportive of the primary goal it seeks to achieve. If implemented correctly and efficiently, health information technology (IT) can revolutionize our health care system. But, we must have an educated workforce, properly trained in health IT, in order for it to be successful. This is what H.R. 1467 is about. NSF is already doing work yeoman's work in the IT arena, but this measure will increase the focus on health IT. I encourage my colleagues to support it.

I urge my colleagues to support H.R. 1716, the *Green Energy Education Act of 2007,* introduced my fellow Texan, Mr. McCaul. This is a good piece of legislation that was voted out of this committee in the last Congress. The fact that it is also being included in larger energy packages on both sides of the aisle in this Congress indicates its overwhelming support. Simply put, this measure encourages the Department of Energy to work with the National Science Foundation to help develop the next generation of engineers and architects to work effectively together to produce buildings that incorporate the latest in energy efficient technologies. I commend Mr. McCaul for his fine work on this bill.

Finally, I also urge my colleagues to support H.R. 632, the *H–Prize Act* sponsored by Inglis and Lipinski. This legislation was introduced in the last Congress and

passed overwhelmingly by the House of Representatives. The bill directs the Secretary of Energy to award competitive cash prizes biennially to advance the research, development, demonstration, and commercial application of hydrogen energy technologies. Categories eligible for prizes include advancements in certain hydrogen components or systems, prototypes of hydrogen-powered vehicles, and transformational changes in technologies for hydrogen distribution or production. I commend Mr. Inglis and Mr. Lipinski for introducing this legislation, and I encourage my colleagues to support it.

Once again, Mr. Chairman, I am happy to be supportive of these three bipartisan pieces of legislation and look forward to working with you to advance these bills. I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Hall. As you have pointed out, we have had a good working relationship and I will point out that every bill that has come out of this committee has been unanimous and the only—one bill received 21 negative votes on the Floor. That is the worst we have done on the Floor. We are going to have I hope three unanimous bills today and I think the reason that we have been able to do this is, we have started with good bills. We have had extensive consultation and by making better bills. At the end of the day we are going to have our first disagreement but I think two things will happen: We are going to have amendments today that will make the bill even better and I think at the end of the day that it will be a bipartisan bill but it won't be a unanimous bill, and we will try to proceed without kicking or scratching and we will get this done. So without objection, Members may place statements in the record at this point.

[The prepared statement of Mr. Mitchell follows:]

PREPARED STATEMENT OF REPRESENTATIVE HARRY E. MITCHELL

Thank you, Mr. Chairman.

Today we are considering several bills to decrease our dependence on foreign oil and encourage renewable sources of energy.

As the world leader in emissions of greenhouse gasses, it is imperative that we as a nation actively pursue the means to reduce those emissions. We have an obligation to lead the world toward a solution. One way to accomplish this is to invest in alternative energy sources.

The bills before us today would put in place necessary components to take us where we need to be as a nation including education and training, monetary incentives, and fast acting, responsive research programs.

The United States must lead by example and invest in clean, renewable energy sources.

Today, we are considering several bills to address this issue and I look forward to working on them.

Sustainable energy is an issue that affects our environment, our economy, and our national security, and we cannot leave this problem for future generations of Americans to solve.

I yield back the balance of my time.

Chairman GORDON. We will now consider H.R. 632, the *H–Prize Act of 2007*.

I yield to the Vice Chairman of the Committee, Mr. Lipinski five minutes to describe his bill.

Mr. LIPINSKI. I thank you, Mr. Chairman. We have been here quite awhile. I will move quickly through this.

This is a bill that is one more step in addressing global climate change in spurring national energy independence. It is a bill I have worked on closely with Mr. Inglis. Many people are familiar with this bill last year. We passed to the Science Committee, passed on the Floor of the House by a vote of 416 to six. Unfortunately, it stalled in the Senate last year. This year we have made some

minor changes. Mr. Inglis is going to offer an amendment in a few minutes, and I think that these changes are going to help us to successfully get this bill through the Senate and signed by the President.

It is obvious now that with gasoline prices that are so high, everyone is asking us what are we going to do about this. It is not only the high cost of gasoline hitting in the pocketbooks, but the cost of our addiction to oil also affects our environment and National security.

We need to find a solution, and ARPA–E, I believe is on big way towards a solution, but here is another way of looking at one particular possible solution in hydrogen. Hydrogen, when it is used as an energy source, produces no emissions besides water, and hydrogen-fueled cars already exist, but they are very expensive. We need to make some breakthroughs in order to be able to put a hydrogen car in every American's driveway.

This legislation would establish prizes, specifically every two years, four $1 million prizes will be given for advances in production, storage, distribution, and utilization of hydrogen. One $4 million prize will be awarded for advances in prototype hydrogen vehicles. At the end of 10 years a grand prize of $10 million will be given for transformational advance in hydrogen energy technology.

The purpose of this is to go about it with the H–Prize is to really take advantage of America's greatest resource, her ingenuity and creativity. No one is being told exactly what to do. They are just being given the goal. They work on figuring out how to get there. It is just like the X prize did.

We have some of the best and brightest minds in the U.S., as well as an economy that supports and encourages entrepreneurship. Each prize will help focus this inventiveness to address the greatest challenge that our country faces today; our addiction to oil and other fossil fuels. And we have to address global climate change and energy independence is essential to our national security and also to reducing the prices that we pay at the gas pump today. Investing in an alternative to fossil fuels such as hydrogen is a strong step in the right direction, holds tremendous potential.

And I encourage all my colleagues to support the *H–Prize Act.*

I yield back.

[The prepared statement of Mr. Lipinski follows:]

PREPARED STATEMENT OF REPRESENTATIVE DANIEL LIPINSKI

Thank you, Mr. Chairman; I am pleased to be here today for the markup of H.R. 632, the *H–Prize Act of 2007,* a bill I introduced—along with Ranking Member Inglis—as one step in addressing global climate change and spurring national energy independence.

This is a bill that we moved out of the Science Committee last year and we passed on the House Floor by a vote of 416 to six. Unfortunately the bill stalled in the other chamber last year.

This year, Mr. Inglis and I will be making some technical changes to the bill in the form of an amendment. We believe these changes will improve both the bill and its chances of passage in both chambers, with a final signature by the President. The Energy and Environment Subcommittee unanimously approved the bill earlier this month and we look forward to its swift passage in Full Committee today.

It is obvious to all of us the damage being caused by our current energy situation. Gas prices have skyrocketed over the last few weeks and continue to hit record highs, averaging over $3 a gallon nationwide and in my district in the Chicago area around $3.50 per gallon. This situation is inflicting pain on our constituents and on

our economy. But the costs of our addiction to oil not only affect our pocketbooks, they affect our environment and national security. We cannot continue to pollute our air and alter our climate with greenhouse gas emissions, and we cannot continue to rely on energy sources from unstable parts of the world. We must find new solutions and hydrogen has great potential to be a solution. The environmental promise is great. Using hydrogen as an energy source produces no emissions besides water. Zero polluting emissions. And hydrogen-fueled cars already exist. But the technical barriers and the economic barriers are significant.

H.R. 632 seeks to inspire researchers, entrepreneurs, and others' competitive spirits to work to surmount these barriers and find specific solutions that will facilitate development and commercialization of hydrogen fuel. The H–Prize will help expand the possibilities of hydrogen research, promoting people not normally involved in federal research and development to explore one of the greatest challenges facing us today.

Specifically, this legislation would establish competitively awarded cash prizes to spur innovations that advance the use of hydrogen as a fuel for transportation. Every two years, four $1 million prizes would be given for advances in the production, storage, distribution, and utilization of hydrogen, and one $4 million prize would be awarded for advances in prototype hydrogen vehicles. And at the end of ten years one grand prize of $10 million would be given for a transformational advance in hydrogen energy technology.

This prize will help us take advantage of America's great resource—our ingenuity and creativity. The United States has some of the best and brightest minds in the world, as well as an economy that supports and encourages entrepreneurship, and the H–Prize will focus this inventiveness to address the greatest challenge that our country faces today.

Energy independence is essential to national security and to reducing the price at the pump and investing in an alternative to fossil fuels such as hydrogen is a strong step in the right direction. Hydrogen holds enormous potential as the base of our future economy—a potential we cannot and must not ignore.

Thank you, Mr. Chairman, and I encourage all of my colleagues to support the *H–Prize Act.* I yield back the balance of my time.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I yield to Mr. Inglis my time.

Mr. INGLIS. I thank the gentleman for yielding. The bill comes well recommended at a 416 to six vote the last time through the House, so hopefully we can pass it through the House again and get it all the way to the Senate.

The concept is patterned after the Ansari X Prize, which improvised space flight, entrepreneurial space flight. So this H–Prize is designed to do for hydrogen what the X Prize did for space flight, and that is to create an opportunity for entrepreneurs and inventors to come together and form teams that could help us break through to a hydrogen future.

There are a number of technological challenges we face, and this is a non-bureaucratic, non-Governmental way of breaking through some of those barriers.

So I am happy to be supporting it and urging its adoption here in the Committee.

Chairman GORDON. Does anyone else wish to be recognized?

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

The first amendment on the roster is the gentleman from South Carolina's amendment offered in the nature of a substitute. I ask unanimous consent that the amendment in the nature of a substitute be treated as original text for purposes of amendment under the five minute rule. Without objection, so ordered.

Are you ready to proceed with your amendment?

Mr. INGLIS. Yes, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment in the nature of a substitute to H.R. 632 offered by Mr. Inglis of South Carolina.

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

I recognize Mr. Inglis for five or less minutes to explain the substitute amendment.

Mr. INGLIS. Hopefully less, Mr. Chairman.

This amendment incorporates several technical corrections as well as some suggestions from the Department of Energy general counsel and from Mr. Lipinski's office. Essentially the changes are these.

Removes provision that required all future hydrogen prizes to be modeled after the H–Prize, clarifies the Secretary of Energy has the final say over prize criteria, federal funding, and judge selection, clarifies that the administering entity can sell naming rights to the prizes, changes the term, 'intellectual property' to 'trade secrets' or 'confidential business information' to protect the Department of Energy from claims about violating patents and trademarks, allows the Secretary of Energy to withhold such proprietary information from public disclosure. It also provides accountability by requiring an annual report to Congress identifying each award recipient and their developed technologies.

So these are, I think that Mr. Lipinski may want to add some description here.

Chairman GORDON. Is there further discussion on the amendment?

Mr. LIPINSKI. Chairman.

Chairman GORDON. Mr. Lipinski is recognized.

Mr. LIPINSKI. For this amendment, it contains some improvements to the bill. Special importance are it helps to insure accountability and promote commercialization of the prize, requires the Department of Energy to submit an annual report to Congress that identifies each award recipient and their technology, and also encourages commercialization by specifying the actions being taken by the recipients towards commercialization.

So I fully support this amendment.

[The prepared statement of Mr. Lipinski follows:]

PREPARED STATEMENT OF REPRESENTATIVE DANIEL LIPINSKI

Thank you, Mr. Chairman. This amendment contains a few improvements to the underlying bill, and is offered both by Mr. Inglis and myself. Of special importance to me is that this amendment helps to ensure accountability and promote commercialization of the prize-winning new technologies, both of which are important for the goals of this bill.

First, our amendment provides accountability by requiring the Department of Energy to submit an annual report to Congress that identifies each award recipient and their prize-winning technologies.

Second, the amendment encourages commercialization of the new technologies by requiring the DOE, also in their report to Congress, to specify actions being taken by the recipients toward commercialization.

This amendment was developed in cooperation with Committee staff, and I thank them for their help. I believe these changes improve the *H–Prize Act,* and I encourage my colleagues to support this amendment.

Chairman GORDON. Are there other amendments to the amendment in the nature of a substitute? If not, the vote occurs on the amendment in the nature of a substitute. All in favor say aye. Opposed, no. The ayes have it, and the amendment is agreed to.

Now, is there any other amendment? Hearing none, the vote is on H.R. 632 as amended. All those in favor say aye. All those opposed will say no. In the opinion of the Chair the ayes have it.

I recognize Mr. Hall to offer a motion.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 632 as amended to the House with the recommendation that the bill do pass. Furthermore, I move that staff be instructed to make necessary technical and conforming changes and that the Chairman take all the necessary steps to bring the bill before the House for consideration.

I yield back.

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

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 or minority views, and I move pursuant to Clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 632, the *H–Prize Act of 2007,* as amended.

Without objection, so ordered.

Many thanks to everyone, and I want to conclude this markup.

[Whereupon, at 1:00 p.m., the Committee was adjourned.]

Appendix:

SUBCOMMITTEE MARKUP REPORT, H.R. 632, AMENDMENT ROSTER

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
REPORT FROM SUBCOMMITTEE MARKUP

MAY 10, 2007

H.R. 632, H–Prize Act of 2007

I. Purpose

The purpose of the bill is to authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

II. Background and Need for Legislation

Hydrogen gas is considered by many experts to be a promising fuel, particularly in the transportation sector. When used as a fuel, its only combustion byproduct is water vapor. The widespread adoption of hydrogen as a transportation fuel has the potential to reduce or eliminate air pollution generated by cars and trucks.

However, unlike coal or oil, the hydrogen gas used as a fuel is not a naturally occurring energy resource. Hydrogen must be produced from hydrogen-bearing compounds, like water or natural gas, and that requires energy—and, unlike gasoline or biofuels, more energy is always required to produce it than is recovered when hydrogen is burned in a fuel cell. Hydrogen has the potential to reduce America's dependence on foreign oil, but the degree to which hydrogen will displace foreign energy supplies depends on what energy source is used to generate hydrogen gas in the first place.

If hydrogen can be produced economically from energy sources that do not release carbon dioxide into the atmosphere—from renewable sources such as wind power or solar power, from nuclear power, or possibly from coal with carbon sequestration, then the widespread use of hydrogen as a fuel could make a major contribution to reducing the emission of greenhouse gases.

While the promise of hydrogen is great, so are the technical challenges. Experts suggest that major advances will be required across a wide range of technologies for hydrogen to be affordable, safe, cleanly produced, and readily distributed. The production, storage, and use of hydrogen all present significant technical challenges. While Department of Energy (DOE) research programs have produced promising advances, much work must still be done to meet the goal of developing economically viable hydrogen technologies.

Prizes are one tool the Federal Government can employ to stimulate efforts to overcome such technical hurdles. A 1999 National Academy of Engineering (NAE) panel examining the use of prizes by federal agencies suggested the following design principles for prize programs:

1. Treatment of intellectual property resulting from prize contests should be properly aligned with the objectives and incentive structure of the prize contest.
2. Contest rules should be seen as transparent, simple, fair, and unbiased.
3. Prizes should be commensurate with the effort required and goals sought.

The Act establishes three types of prizes that are in keeping with the principles laid out by the NAE:

1. Biennial prizes for advancements in each of hydrogen storage, hydrogen production, hydrogen use and hydrogen distribution;
2. A goal-oriented, biennial contest for prototypes that meet objective contest criteria established in advance; and
3. A prize of at least $10 million for a goal-oriented contest for the best invention that leads to transformational changes in the distribution or production of hydrogen. Winners of this prize could also receive matching funds for every dollar of private funding raised by the winner for commercialization of their winning technology.

III. Subcommittee Actions

On January 23, 2007, Science and Technology Committee Vice Chairman Daniel Lipinski, for himself and Energy and Environment Subcommittee Ranking Member Robert Inglis, Research and Science Education Subcommittee Ranking Member Vernon Ehlers, Rep. Eddie Bernice Johnson, Rep. Michael McCaul, Rep. David Reichert and 20 other co-sponsors introduced H.R. 632, the *H–Prize Act of 2007.*

The Energy and Environment Subcommittee met on Thursday, May 10, 2007, to consider the bill. Mr. Inglis moved that the Subcommittee favorably report the bill, H.R. 632, to the Full Committee. The motion was agreed to by a voice vote.

IV. Summary of Major Provisions of the Bill

Creates a prize program at DOE for advances in hydrogen technologies to be administered through a private, non-profit entity ('the administering entity'). DOE is to award three types of prizes (described below).

Establishes prizes of not more than $1 million to be awarded every other year to the best technology advancements in components or systems related to each of hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization.

Establishes a prize of not more than $4 million to be awarded for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards for the prototype prize are to be given in alternate years from the technology advancement prizes.

Establishes a prize of at least $10 million to be awarded for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000. Prize money over $10,000,000 may be provided as matching funds for every dollar of private funding raised by the winner for the continued development and commercialization of their winning technology.

Enumerates duties of the 'administering entity.' These include broad advertising of the prizes and their results, fundraising for administrative costs and cash prizes, working with the Secretary to develop prize criteria based on goals provided by the Secretary; working with the Secretary to determine the appropriate prize amounts to be awarded under the transformational changes prize category; and selecting judges using criteria developed in consultation with the Secretary.

Authorizes $11,000,000 for each of fiscal years 2007 through 2016, of which not more than $2,000,000 each year may be spent on administrative costs.

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

Section 1. Short Title.

The H–Prize Act of 2007

Sec. 2. Definitions

Defines Administering Entity, Department and Secretary.

Sec. 3. Prize Authority.

Requires the Secretary of Energy to create a prize to advance the research, development, demonstration and commercial application of hydrogen energy technologies.

Requires the Secretary to advertise the prize competitions widely to encourage broad participation, including outreach to historically black colleges and universities, other minority serving institutions, as well as large and small businesses, including minority and disadvantaged businesses. Includes a specific direction to announce the prize competitions through publication of a *Federal Register* notice.

Requires the Secretary to enter into an agreement with a private, non-profit entity to administer the prize competitions. Enumerates the duties of the administering entity to include advertising the prizes and their results, fundraising for administrative costs and cash prizes, working with the Secretary to develop prize criteria based upon goals provided by the Secretary, working with the Secretary to determine the appropriate amounts for prizes awarded under the transformational changes category described in section 4, selecting judges using criteria developed in consultation with the Secretary, and preventing the unauthorized use or disclosure of a registered participant's intellectual property, trade secrets, and confidential business information.

Authorizes the Secretary to use funding directly appropriated for such purposes to the Department of Energy (DOE) or other agencies and to accept funds provided by private entities or individuals. Prohibits the announcement of any prize competition until sufficient funds are available. Sunsets the authority to award prizes in 2018.

Sec. 4. Prize Categories.

Defines prize categories for:

(i) **Components or Systems.** Establishes up to four $1 million prizes awarded every other year to the best technology advancements in components

or systems related to hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization. Provides the Secretary the discretion to reduce the amount or number of prizes based upon the availability of funds.

(ii) **Prototypes.** Establishes one $4 million prize for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards prototype prizes in years alternate with the technology advancements prize. Prohibits the Secretary from awarding the prize if no entrant meets the objectively defined performance criteria.

(iii) **Transformational Changes.** Establishes a minimum $10,000,000 lump sum prize award for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000 for prize money provided as matching funds for every dollar of private funding raised by the winner for the continued development of their winning technology.

Requires the Secretary to establish contest criteria through consultation with the Hydrogen Technical Advisory Committee, other federal agencies including the National Science Foundation, and private organizations including the National Academy of Sciences. Requires the Secretary to appoint contest judges from the private sector and agencies outside DOE. Excludes judges who may have a personal or financial relationship with any contest participant.

Sec. 5. Eligibility.

Requires contestants to register through the process published in the Federal Register. Requires contestants be incorporated and maintain a primary place of business in the U.S. if a private entity, and must be a U.S. citizen if an individual. Excludes from participation any federal entities or federal or national laboratory employees while on duty.

Sec. 6. Intellectual Property.

Waives claims by the Federal Government to any intellectual property rights derived from participation in the prize competitions.

Sec. 7. Liability.

Requires contestants to waive claims against the Federal Government resulting from participation in prize competition activities. Requires contestants to have liability insurance against damages resulting from participation in any prize competition activity and to name the Federal Government as an additional insured entity.

Sec. 8. Authorization of Appropriations.

Authorizes $20 million for advancements in components, $20 million for advancements in prototypes, and $10 million for transformational changes for the period encompassing fiscal years 2008 through 2017, with funds expiring 10 fiscal years after the fiscal year in which they were appropriated. Authorizes $2 million for administrative costs for each of fiscal years 2008 through 2017.

Sec. 9. Nonsubstitution.

Expresses a sense of the Congress that the prize competitions shall not act as a substitute for any research and development programs.

I

110TH CONGRESS
1ST SESSION

H. R. 632

To authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 23, 2007

Mr. LIPINSKI (for himself, Mr. INGLIS of South Carolina, Mr. DOYLE, Mr. BROWN of South Carolina, Mr. DENT, Mr. EHLERS, Ms. LORETTA SANCHEZ of California, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. TERRY, Mr. MCCAUL of Texas, Mr. GERLACH, Mr. CAMP of Michigan, Mr. BARRETT of South Carolina, Mr. WILSON of South Carolina, Mr. REICHERT, Mr. WOLF, Mr. WICKER, Mr. JOHNSON of Illinois, Mr. SOUDER, Mr. KUHL of New York, Mr. WYNN, Mr. LARSON of Connecticut, Mr. KINGSTON, Mr. LINCOLN DAVIS of Tennessee, Mr. ARCURI, and Mr. WAMP) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To authorize the Secretary of Energy to establish monetary prizes for achievements in overcoming scientific and technical barriers associated with hydrogen energy.

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 "H-Prize Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTERING ENTITY.—The term ''administering entity'' means the entity with which the Secretary enters into an agreement under section 3(c).

(2) DEPARTMENT.—The term ''Department'' means the Department of Energy.

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

SEC. 3. PRIZE AUTHORITY.

(a) IN GENERAL.—The Secretary shall carry out a program to competitively award cash prizes only in conformity with this Act to advance the research, development, demonstration, and commercial application of hydrogen energy technologies.

(b) ADVERTISING AND SOLICITATION OF COMPETITORS.—

(1) ADVERTISING.—The Secretary shall widely advertise prize competitions to encourage broad participation, including by individuals, universities (including historically Black colleges and universities and other minority serving institutions), and large and small businesses (including businesses owned or controlled by socially and economically disadvantaged persons).

(2) ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.—The Secretary shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize.

(c) ADMINISTERING THE COMPETITIONS.—The Secretary shall enter into an agreement with a private, nonprofit entity to administer the prize competitions, subject to the provisions of this Act. The duties of the administering entity under the agreement shall include—

(1) advertising prize competitions and their results;

(2) raising funds from private entities and individuals to pay for administrative costs and to contribute to cash prizes;

(3) working with the Secretary to develop the criteria for selecting winners in prize competitions, based on goals provided by the Secretary;

(4) determining, in consultation with the Secretary, the appropriate amount for each prize to be awarded;

(5) selecting judges in accordance with section 4(d), using criteria developed in consultation with the Secretary; and

(6) preventing the unauthorized use or disclosure of a registered participant's intellectual property, trade secrets, and confidential business information.

(d) FUNDING SOURCES.—Prizes under this Act shall consist of Federal appropriated funds and any funds provided by the administering entity (including funds raised pursuant to subsection (c)(2)) for such cash prizes. The Secretary may accept funds from other Federal agencies for such cash prizes. The Secretary may not give any special consideration to any private sector entity or individual in return for a donation to the administering entity.

(e) ANNOUNCEMENT OF PRIZES.—The Secretary may not issue a notice required by subsection (b)(2) until all the funds needed to pay out the announced amount of the prize have been appropriated or committed in writing by the administering entity. The Secretary may increase the amount of a prize after an initial announcement is made under subsection (b)(2) if—

(1) notice of the increase is provided in the same manner as the initial notice of the prize; and

(2) the funds needed to pay out the announced amount of the increase have been appropriated or committed in writing by the administering entity.

(f) SUNSET.—The authority to announce prize competitions under this Act shall terminate on September 30, 2018.

SEC. 4. PRIZE CATEGORIES.

(a) CATEGORIES.—The Secretary shall establish prizes for—

(1) advancements in components or systems related to—

(A) hydrogen production;

(B) hydrogen storage;

(C) hydrogen distribution; and

(D) hydrogen utilization;

(2) prototypes of hydrogen-powered vehicles or other hydrogen-based products that best meet or exceed objective performance criteria, such as completion of a race over a certain distance or terrain or generation of energy at certain levels of efficiency; and

(3) transformational changes in technologies for the distribution or production of hydrogen that meet or exceed far-reaching objective criteria, which shall include minimal carbon emissions and which may in-

clude cost criteria designed to facilitate the eventual market success of a winning technology.

(b) AWARDS.—

(1) ADVANCEMENTS.—To the extent permitted under section 3(e), the prizes authorized under subsection (a)(1) shall be awarded biennially to the most significant advance made in each of the four subcategories described in subparagraphs (A) through (D) of subsection (a)(1) since the submission deadline of the previous prize competition in the same category under subsection (a)(1) or the date of enactment of this Act, whichever is later, unless no such advance is significant enough to merit an award. No one such prize may exceed $1,000,000. If less than $4,000,000 is available for a prize competition under subsection (a)(1), the Secretary may omit one or more subcategories, reduce the amount of the prizes, or not hold a prize competition.

(2) PROTOTYPES.—To the extent permitted under section 3(e), prizes authorized under subsection (a)(2) shall be awarded biennially in alternate years from the prizes authorized under subsection (a)(1). The Secretary is authorized to award up to one prize in this category in each 2-year period. No such prize may exceed $4,000,000. If no

registered participants meet the objective performance criteria established pursuant to subsection (c) for a competition under this paragraph, the Secretary shall not award a prize.

(3) TRANSFORMATIONAL TECHNOLOGIES.—To the extent permitted under section 3(e), the Secretary shall announce one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. A prize offered under this paragraph shall be not less than $10,000,000, paid to the winner in a lump sum, and an additional amount paid to the winner as a match for each dollar of private funding raised by the winner for the hydrogen technology beginning on the date the winner was named. The match shall be provided for 3 years after the date the prize winner is named or until the full amount of the prize has been paid out, whichever occurs first. A prize winner may elect to have the match amount paid to another entity that is continuing the development of the winning technology. The Secretary shall announce the rules for receiving the match in the notice required by section 3(b)(2). The Secretary shall award a prize under this paragraph only when a registered participant has met the objective criteria established for

the prize pursuant to subsection (c) and announced pursuant to section 3(b)(2). Not more than $10,000,000 in Federal funds may be used for the prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward the matching award under this paragraph.

(c) CRITERIA.—In establishing the criteria required by this Act, the Secretary shall consult with—

(1) the Department's Hydrogen Technical and Fuel Cell Advisory Committee;

(2) other Federal agencies, including the National Science Foundation; and

(3) private organizations, including professional societies, industry associations, and the National Academy of Sciences and the National Academy of Engineering.

(d) JUDGES.—For each prize competition, the Secretary shall assemble a panel of qualified judges to select the winner or winners on the basis of the criteria established under subsection (c). Judges for each prize competition shall include individuals from outside the Department, including from the private sector. A judge may not—

(1) have personal or financial interests in, or be an employee, officer, director, or agent of, any entity

that is a registered participant in the prize competition for which he or she will serve as a judge; or

(2) have a familial or financial relationship with an individual who is a registered participant in the prize competition for which he or she will serve as a judge.

SEC. 5. ELIGIBILITY.

To be eligible to win a prize under this Act, an individual or entity—

(1) shall have complied with all the requirements in accordance with the Federal Register notice required under section 3(b)(2);

(2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen of, or an alien lawfully admitted for permanent residence in, the United States; and

(3) shall not be a Federal entity, a Federal employee acting within the scope of his employment, or an employee of a national laboratory acting within the scope of his employment.

SEC. 6. INTELLECTUAL PROPERTY.

The Federal Government shall not, by virtue of offering or awarding a prize under this Act, be entitled to any

intellectual property rights derived as a consequence of, or direct relation to, the participation by a registered participant in a competition authorized by this Act. This section shall not be construed to prevent the Federal Government from negotiating a license for the use of intellectual property developed for a prize competition under this Act.

SEC. 7. LIABILITY.

(a) WAIVER OF LIABILITY.—The Secretary may require registered participants to waive claims against the Federal Government and the administering entity (except claims for willful misconduct) for any injury, death, damage, or loss of property, revenue, or profits arising from the registered participants' participation in a competition under this Act. The Secretary shall give notice of any waiver required under this subsection in the notice required by section 3(b)(2). The Secretary may not require a registered participant to waive claims against the administering entity arising out of the unauthorized use or disclosure by the administering entity of the registered participant's intellectual property, trade secrets, or confidential business information.

(b) LIABILITY INSURANCE.—

(1) REQUIREMENTS.—Registered participants shall be required to obtain liability insurance or

demonstrate financial responsibility, in amounts determined by the Secretary, for claims by—

(A) a third party for death, bodily injury, or property damage or loss resulting from an activity carried out in connection with participation in a competition under this Act; and

(B) the Federal Government for damage or loss to Government property resulting from such an activity.

(2) FEDERAL GOVERNMENT INSURED.—The Federal Government shall be named as an additional insured under a registered participant's insurance policy required under paragraph (1)(A), and registered participants shall be required to agree to indemnify the Federal Government against third party claims for damages arising from or related to competition activities.

SEC. 8. AUTHORIZATION OF APPROPRIATIONS.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) AWARDS.—There are authorized to be appropriated to the Secretary for the period encompassing fiscal years 2008 through 2017 for carrying out this Act—

(A) $20,000,000 for awards described in section (4)(a)(1);

(B) $20,000,000 for awards described in section 4(a)(2); and

(C) $10,000,000 for the award described in section 4(a)(3).

(2) ADMINISTRATION.—In addition to the amounts authorized in paragraph (1), there are authorized to be appropriated to the Secretary for each of fiscal years 2008 through 2017 $2,000,000 for the administrative costs of carrying out this Act.

(b) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this Act shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes only after the expiration of 10 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this Act permits obligation or payment of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

SEC. 9. NONSUBSTITUTION.

The programs created under this Act shall not be considered a substitute for Federal research and development programs.

○

COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
MAY 23, 2007

AMENDMENT ROSTER

H.R. 632 – The H-Prize Act of 2007

No.	Sponsor	Description	Results
1	Mr. Inglis with Mr. Lipinski	Amendment in the nature of a substitute making technical and substantive changes to the bill.	Agreed to by voice vote.

AMENDMENT IN THE NATURE OF A SUBSTITUTE

TO H.R. 632

OFFERED BY MR. INGLIS OF SOUTH CAROLINA

AND MR. LIPINSKI OF ILLINOIS

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "H-Prize Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTERING ENTITY.—The term "administering entity" means the entity with which the Secretary enters into an agreement under section 3(c).

(2) DEPARTMENT.—The term "Department" means the Department of Energy.

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

SEC. 3. PRIZE AUTHORITY.

(a) IN GENERAL.—The Secretary shall carry out a program to competitively award cash prizes in conformity with this Act to advance the research, development, dem-

onstration, and commercial application of hydrogen energy technologies.

(b) ADVERTISING AND SOLICITATION OF COMPETITORS.—

(1) ADVERTISING.—The Secretary shall widely advertise prize competitions to encourage broad participation, including by individuals, universities (including historically Black colleges and universities and other minority serving institutions), and large and small businesses (including businesses owned or controlled by socially and economically disadvantaged persons).

(2) ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.—The Secretary shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include essential elements of the competition such as the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize.

(c) ADMINISTERING THE COMPETITIONS.—The Secretary shall enter into an agreement with a private, nonprofit entity to administer the prize competitions, subject

to the provisions of this Act. The duties of the administering entity under the agreement shall include—

(1) advertising prize competitions and their results;

(2) raising funds from private entities and individuals to pay for administrative costs and to contribute to cash prizes, including funds provided in exchange for the right to name a prize awarded under this section;

(3) developing, in consultation with and subject to the final approval of the Secretary, the criteria for selecting winners in prize competitions, based on goals provided by the Secretary;

(4) determining, in consultation with the Secretary, the appropriate amount and funding sources for each prize to be awarded, subject to the final approval of the Secretary with respect to Federal funding;

(5) providing advice and consultation to the Secretary on the selection of judges in accordance with section 4(d), using criteria developed in consultation with and subject to the final approval of the Secretary; and

(6) protecting against the entity's unauthorized use or disclosure of a registered participant's trade

secrets and confidential business information. Any information properly identified as trade secrets or confidential business information that is submitted by a participant as part of a competitive program under this Act may be withheld from public disclosure.

(d) FUNDING SOURCES.—Prizes under this Act shall consist of Federal appropriated funds and any funds provided by the administering entity (including funds raised pursuant to subsection (c)(2)) for such cash prize programs. The Secretary may accept funds from other Federal agencies for such cash prizes and, notwithstanding section 3302(b) of title 31, United States Code, may use such funds for the cash prize program. Other than publication of the names of prize sponsors, the Secretary may not give any special consideration to any private sector entity or individual in return for a donation to the Secretary or administering entity.

(e) ANNOUNCEMENT OF PRIZES.—The Secretary may not issue a notice required by subsection (b)(2) until all the funds needed to pay out the announced amount of the prize have been appropriated or committed in writing by the administering entity. The Secretary may increase the amount of a prize after an initial announcement is made under subsection (b)(2) if—

(1) notice of the increase is provided in the same manner as the initial notice of the prize; and

(2) the funds needed to pay out the announced amount of the increase have been appropriated or committed in writing by the administering entity.

(f) SUNSET.—The authority to announce prize competitions under this Act shall terminate on September 30, 2018.

SEC. 4. PRIZE CATEGORIES.

(a) CATEGORIES.—The Secretary shall establish prizes for—

(1) advancements in technologies, components, or systems related to—

(A) hydrogen production;

(B) hydrogen storage;

(C) hydrogen distribution; and

(D) hydrogen utilization;

(2) prototypes of hydrogen-powered vehicles or other hydrogen-based products that best meet or exceed objective performance criteria, such as completion of a race over a certain distance or terrain or generation of energy at certain levels of efficiency; and

(3) transformational changes in technologies for the distribution or production of hydrogen that meet

or exceed far-reaching objective criteria, which shall include minimal carbon emissions and which may include cost criteria designed to facilitate the eventual market success of a winning technology.

(b) AWARDS.—

(1) ADVANCEMENTS.—To the extent permitted under section 3(e), the prizes authorized under subsection (a)(1) shall be awarded biennially to the most significant advance made in each of the four subcategories described in subparagraphs (A) through (D) of subsection (a)(1) since the submission deadline of the previous prize competition in the same category under subsection (a)(1) or the date of enactment of this Act, whichever is later, unless no such advance is significant enough to merit an award. No one such prize may exceed $1,000,000. If less than $4,000,000 is available for a prize competition under subsection (a)(1), the Secretary may omit one or more subcategories, reduce the amount of the prizes, or not hold a prize competition.

(2) PROTOTYPES.—To the extent permitted under section 3(e), prizes authorized under subsection (a)(2) shall be awarded biennially in alternate years from the prizes authorized under subsection (a)(1). The Secretary is authorized to award

up to one prize in this category in each 2-year period. No such prize may exceed $4,000,000. If no registered participants meet the objective performance criteria established pursuant to subsection (c) for a competition under this paragraph, the Secretary shall not award a prize.

(3) TRANSFORMATIONAL TECHNOLOGIES.—To the extent permitted under section 3(e), the Secretary shall announce one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. A prize offered under this paragraph shall be not less than $10,000,000, paid to the winner in a lump sum, and an additional amount paid to the winner as a match for each dollar of private funding raised by the winner for the hydrogen technology beginning on the date the winner was named. The match shall be provided for 3 years after the date the prize winner is named or until the full amount of the prize has been paid out, whichever occurs first. A prize winner may elect to have the match amount paid to another entity that is continuing the development of the winning technology. The Secretary shall announce the rules for receiving the match in the notice required by section 3(b)(2). The Secretary shall award a prize

under this paragraph only when a registered participant has met the objective criteria established for the prize pursuant to subsection (c) and announced pursuant to section 3(b)(2). Not more than $10,000,000 in Federal funds may be used for the prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward the matching award under this paragraph.

(c) CRITERIA.—In establishing the criteria required by this Act, the Secretary—

(1) shall consult with the Department's Hydrogen Technical and Fuel Cell Advisory Committee;

(2) shall consult with other Federal agencies, including the National Science Foundation; and

(3) may consult with other experts such as private organizations, including professional societies, industry associations, and the National Academy of Sciences and the National Academy of Engineering.

(d) JUDGES.—For each prize competition, the Secretary in consultation with the administering entity shall assemble a panel of qualified judges to select the winner or winners on the basis of the criteria established under subsection (c). Judges for each prize competition shall include individuals from outside the Department, including

from the private sector. A judge, spouse, minor children, and members of the judge's household may not—

(1) have personal or financial interests in, or be an employee, officer, director, or agent of, any entity that is a registered participant in the prize competition for which he or she will serve as a judge; or

(2) have a familial or financial relationship with an individual who is a registered participant in the prize competition for which he or she will serve as a judge.

SEC. 5. ELIGIBILITY.

To be eligible to win a prize under this Act, an individual or entity—

(1) shall have complied with all the requirements in accordance with the Federal Register notice required under section 3(b)(2);

(2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen of, or an alien lawfully admitted for permanent residence in, the United States; and

(3) shall not be a Federal entity, a Federal employee acting within the scope of his employment, or

an employee of a national laboratory acting within the scope of his employment.

SEC. 6. INTELLECTUAL PROPERTY.

The Federal Government shall not, by virtue of offering or awarding a prize under this Act, be entitled to any intellectual property rights derived as a consequence of, or direct relation to, the participation by a registered participant in a competition authorized by this Act. This section shall not be construed to prevent the Federal Government from negotiating a license for the use of intellectual property developed for a prize competition under this Act.

SEC. 7. LIABILITY.

(a) WAIVER OF LIABILITY.—The Secretary may require registered participants to waive claims against the Federal Government and the administering entity (except claims for willful misconduct) for any injury, death, damage, or loss of property, revenue, or profits arising from the registered participants' participation in a competition under this Act. The Secretary shall give notice of any waiver required under this subsection in the notice required by section 3(b)(2). The Secretary may not require a registered participant to waive claims against the administering entity arising out of the unauthorized use or disclosure by the administering entity of the registered par-

ticipant's trade secrets or confidential business information.

(b) LIABILITY INSURANCE.—

(1) REQUIREMENTS.—Registered participants shall be required to obtain liability insurance or demonstrate financial responsibility, in amounts determined by the Secretary, for claims by—

(A) a third party for death, bodily injury, or property damage or loss resulting from an activity carried out in connection with participation in a competition under this Act; and

(B) the Federal Government for damage or loss to Government property resulting from such an activity.

(2) FEDERAL GOVERNMENT INSURED.—The Federal Government shall be named as an additional insured under a registered participant's insurance policy required under paragraph (1)(A), and registered participants shall be required to agree to indemnify the Federal Government against third party claims for damages arising from or related to competition activities.

SEC. 8. REPORT TO CONGRESS.

Not later than 60 days after the awarding of the first prize under this Act, and annually thereafter, the Secretary shall transmit to the Congress a report that—

(1) identifies each award recipient;

(2) describes the technologies developed by each award recipient; and

(3) specifies actions being taken toward commercial application of all technologies with respect to which a prize has been awarded under this Act.

SEC. 9. AUTHORIZATION OF APPROPRIATIONS.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) AWARDS.—There are authorized to be appropriated to the Secretary for the period encompassing fiscal years 2008 through 2017 for carrying out this Act—

(A) $20,000,000 for awards described in section (4)(a)(1);

(B) $20,000,000 for awards described in section 4(a)(2); and

(C) $10,000,000 for the award described in section 4(a)(3).

(2) ADMINISTRATION.—In addition to the amounts authorized in paragraph (1), there are authorized to be appropriated to the Secretary for each

of fiscal years 2008 and 2009 $2,000,000 for the administrative costs of carrying out this Act.

(b) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this Act shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes only after the expiration of 10 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this Act permits obligation or payment of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

SEC. 10. NONSUBSTITUTION.

The programs created under this Act shall not be considered a substitute for Federal research and development programs.