109TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
109–456

H-PRIZE ACT OF 2006

MAY 9, 2006.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

R E P O R T

[To accompany H.R. 5143]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 5143) 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

49–006

I. AMENDMENT

The amendment is as follows:
Strike all after the enacting clause and insert the following:

SECTION. 1. SHORT TITLE.

This Act may be cited as the "H-Prize Act of 2006".

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 under section 4(b)(3); and

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

(d) FUNDING SOURCES.—Prizes under this Act may consist of Federal appropriated funds and 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, 2017.

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 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. 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 at least one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. To the extent permitted under section 3(e), the Secretary may announce additional prize competitions authorized under subsection (a)(3) as appropriate to accelerate the development and adoption of hydrogen technologies. 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 each prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward each 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.—Registered participants shall be required to agree to assume any and all risks, and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from their participation in a competition under this Act, whether such injury, death, damage, or loss arises through negligence or otherwise. For the purposes of this subsection, the term "related entity" means a contractor or subcontractor at any tier, and a supplier, user, customer, cooperating party, grantee, investigator, or detailee.

(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.—There are authorized to be appropriated to the Secretary for carrying out this Act $11,000,000 for each of the fiscal years 2007 through 2016, of which no more than $2,000,000 for any fiscal year may be used for administrative expenses.

(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.

II. PURPOSE OF THE BILL

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. Indeed, the American Physical Society in a 2004 report[1] stated that "no material exists today that can be used to construct a hydrogen fuel tank that can meet the consumer benchmarks" for affordably storing enough fuel on-board a car or truck to meet consumer expectations of time between refueling stops.

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[2] 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

[1] The Hydrogen Initiative, APS Panel on Public Affairs, Washington, DC: The American Physical Society (March 2004).

[2] Concerning Federally Sponsored Inducement Prizes in Engineering and Science, Steering Committee for the Workshop to Assess the Potential for Promoting Technological Advance Through Government-Sponsored Inducement Prizes in Engineering and Science, Washington, DC: National Academy of Engineering (1999).

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. Summary of Hearings

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 April 6, 2006, Research Subcommittee Chairman Bob Inglis, Rep. Daniel Lipinski, Science Committee Chairman Sherwood Boehlert, Environment, Technology and Standards Subcommittee Chairman Vernon Ehlers, Rep. Roscoe Bartlett, Rep. Michael McCaul and nine other co-sponsors introduced H.R. 5143, The H-Prize Act of 2006.

The Full Committee on Science met on Thursday, May 3, 2006, to consider the bill. An amendment in the nature of a substitute was offered by Chairman Inglis. The amendment reduced the size of the largest prize, capped at $10,000,000 the federal contribution to that prize and set a private fundraising goal of $40,000,000 for that prize; and delineated some of the duties of the administering entity. 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. Lipinski moved that the Full Committee favorably report the bill, H.R. 5143, 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, 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.
- Sunsets the ability to announce new prize contests in 2017.

VII. Section-by-Section Analysis (by Title and Section) of the Bill, as Reported

Section 1. Short title

The H-Prize Act of 2006.

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 prize category described in section 4, and selecting judges using criteria developed in consultation with the Secretary.

Authorizes the Secretary to use appropriated funds and private funds raised by the administering entity to fund the prize program.

Prohibits the announcement of any prize competition until sufficient funds are available. Sunsets the authority to announce prize competitions in 2017.

Sec. 4. Prize categories

Defines prize categories for:

(i) Components or Systems Advancements. Establishes up to four prizes of not more than $1 million 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 a prize of not more than $4 million for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards prototype prizes in years that alternate with the technology advancement prizes. 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. 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.

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 outside DOE, including from the private sector. Prevents individuals who have a personal or financial relationship with any contest participant from serving as judges.

Sec. 5. Eligibility

Requires participants to register through the process published in the Federal Register. To be eligible, private entities must be incorporated in and maintain a primary place of business in the U.S. and individuals must be a U.S. citizen or an alien lawfully admitted for permanent residence in the U.S. Excludes from participation any Federal entities or Federal or national laboratory employees acting within the scope of their employment.

Sec. 6. Intellectual property

Prevents the Federal Government from receiving intellectual property rights through the operation of the prize contests.

Sec. 7. Liability

Requires registered participants to waive certain claims against the Federal Government and related entities resulting from participation in prize competition activities. Requires registered partici-

pants 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 $11 million for each of fiscal years 2007 through 2016, and prevents funds from being used for any other purpose for at least 10 fiscal years after the fiscal year in which they were appropriated. Limits the use of appropriated funds for administrative expenses to no more than $2 million in any fiscal year.

Sec. 9. Nonsubstitution

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

VIII. COMMITTEE VIEWS

Appropriateness of prizes

The Committee believes that prizes can be a useful tool to help stimulate technological advancement. The language of this Act is based on the prize program created in the NASA Authorization Act of 2005 (P.L. 109–155).

Prizes can help accelerate the pace of technological advancement. For example, in 2004 and 2005, the Defense Advanced Research Projects Agency (DARPA) ran a prize competition in which teams designed and built an autonomous ground vehicle that had to navigate a 131-mile course through the Mojave Desert. In 2005, three of 23 entrants finished the course. Just one year prior, none of 15 entrants completed that year's course.

Prizes can also draw more private funds into solving key technological challenges. For example, the $10 million Ansari X Prize was awarded in 2004 after SpaceShipOne, a privately built three-person craft, made a required second flight 62 miles (100 km) above the surface of the Earth within a two-week period. The X Prize Foundation reports that the 26 teams from around the world that entered the competition collectively spent more than $100 million to win the $10 million prize.

Prizes can also help bring public attention to new technologies. The best example of this is probably the Orteig Prize, which was awarded to Charles Lindbergh in 1927 for the first non-stop trans-Atlantic airplane flight. Mobbed by crowds when he landed outside Paris, Lindbergh's flight changed the way the public thought about aviation. According to a witness at the Committee's April 27, 2006 hearing, the number of passengers increased 30-fold, the number of planes quadrupled, and the number of pilots tripled in the United States within 18 months of Lindbergh's historic flight.

Prize competitions can also help experts evaluate the state of technology development, enabling funding to be devoted to the most pressing questions. For example, the DARPA Grand Challenge Race, mentioned above, pointed out where the greatest weaknesses were in the design of autonomous vehicles.

Prize competitions also allow for many different technical solutions to be tried out as the prizes are awarded for achieving a specific goal, not for developing a particular, preordained technology. Prize competitions may also draw interest from a wide variety of

participants, including those who were initially working in other fields and those who do not have the desire or the means to participate in grant programs.

Design of prizes in H.R. 5143

The Act requires that the Secretary and the administering entity work together, in consultation with outside groups (including those named in section 4(c)), to develop the criteria for the prizes. The criteria are to be based on technical goals set by the Secretary to advance the development of hydrogen technologies. In setting those goals, the Committee expects the Secretary to take into account progress being made under DOE's research and development grant programs. Goals could be set, for example, to leap ahead of progress in the grant programs, to integrate advances achieved through the grant programs, or to determine what problems the grant programs should focus on. The Committee also expects the goals to include minimizing overall carbon emissions from hydrogen production, hydrogen storage, hydrogen distribution, or hydrogen utilization.

The prizes created by section 4(a)(1) are designed to ensure steady progress and ongoing interest in hydrogen technologies. The advancement prizes in this Act are best-entry contests that should recognize substantive performance improvements. The Secretary and the administering entity are to set criteria that are as objective as possible to determine the winners and should not award a prize in a contest if no registered participant in a category has significantly advanced the state of technology. Advancement prizes should do more than reward the barely better, the slightly faster, or the marginally cheaper.

Appropriately designed, the Committee believes that these advancement prizes have the potential to attract developers and manufacturers of hydrogen components or systems who may not otherwise see their products as applicable to the transportation sector. Best-entry contests of this type also have the potential to provide useful information to the ongoing DOE research program about the depth, breadth and technical strength of technologists beyond those who would normally participate in DOE research programs.

The Committee intends the advancement prizes for hydrogen utilization to include not only energy conversion technologies, such as fuel cells, but also "enabling technologies." These "enabling technologies" include, but are not limited to, power train systems, control system technologies, and batteries or technologies that allow integration of hydrogen-fueled components into plug-in hybrid electric vehicles.

The prizes created in section 4(a)(2) are designed to promote the integration of hydrogen technologies in prototypes. The Act requires that the prizes be awarded to prototypes that meet an objective contest goal established in advance, such as a race for a hydrogen-powered vehicle to go the farthest, go the fastest or operate in the coldest environment. The DARPA contest for autonomous vehicles is one model for this prize. Aside from the excitement of a race, a particular strength of prototype contests is their ability to reveal unexpected sources of failure when independently developed components are forced to operate together, facing unexpected conditions in the real world.

The prizes created in section 4(a)(3) are designed to promote transformational advances related to the distribution or production of hydrogen. With adequate publicity announcing such a prize and the societal benefits that its success would yield, the transformational changes prize may induce innovators to approach a new goal in radically different and wholly unexpected ways. The Committee expects this prize to be used to stimulate work on the most difficult hurdles blocking the path to a hydrogen economy such as finding an affordable way to store an adequate amount of hydrogen on-board a vehicle.

Announcing and advertising prizes

The Act makes clear that no prize competition can be announced until the full amount of the announced prize is in hand, whether from Federal appropriations or the administering entity, or both. DOE may subsequently increase the announced size of the prize, but again only if the additional amount is in hand. The Secretary must make sure that there is no quid pro quo, real or apparent, with regard to private contributions to the administering entity, i.e., that the contribution will not raise conflict of interest issues either in the prize program or any other DOE program.

The Committee expects that both DOE and the administering entity will fund and engage in efforts to publicize the competitions and the winners. DOE administrative funds authorized by the Act may be used for that purpose.

Administering entity

The Committee expects that DOE will carry out an open competition to select the private, non-profit entity to administer the prize competitions through standard procurement procedures.

While much of the day-to-day operation of the prize program will fall to the administering entity, the Secretary is ultimately responsible for the program, which is awarding a Federal prize. The Committee expects the Secretary to ensure that Federal funds are being used efficiently and effectively by the administering entity. The Secretary should encourage the administering entity to cover its administrative costs with privately raised funds.

The Act divides duties between the Secretary and administering entity to maximize the success of the program. For example, the Secretary and the administering entity are to work together to set the criteria for selecting judges to ensure that the public interest will be well served in the selection. But the actual selection is left to the administering entity to ensure independence from DOE so that the contest is not biased toward technologies in which DOE has an interest.

The Secretary may assign duties to the administering entity beyond those enumerated in the Act, but remains ultimately responsible for the prize competition and for adherence to the Act.

The Secretary must ensure that nothing about a contest—the way the technology or activity is described, the way winners will be judged, the way judges are selected—introduces a bias.

Funding sources

The administering entity may contribute funds to any of the prizes created by the Act, and any prize awarded under the Act

may commingle public and private funds. The administering entity and the Secretary should work together to determine the appropriate size for each award based on the nature of the challenge, the number of potential participants and the availability of funds. However, no prize may exceed the maximum amounts allowed by the Act or be less than the minimum amount required by the Act, regardless of the source of funds.

Eligibility

The Act, in keeping with past Committee practice, requires that companies participating be based in the U.S. That requirement allows the participation of U.S.-based subsidiaries of foreign companies if they are incorporated in and maintain a primary place of business in the U.S.

Under the Act, federal and National laboratory employees may participate in prize competitions in the same fashion as any other eligible party as long as they are not acting within the scope of their employment, and are abiding by all applicable regulations regarding outside activities.

Intellectual property

The Committee expects the administering entity to prevent the unauthorized use or disclosure of a registered participant's trade secrets, intellectual property, or other confidential information.

Authorization of appropriations

The Committee intends for the federal contribution to the $10,000,000 transformational changes prize to be provided over the first two years after enactment.

The Act makes clear that funds appropriated for the prize competition are "no year" funds. Such funds are absolutely unavailable for any other purpose, and may not be reprogrammed until at least 10 years have elapsed from the initial appropriation. Any funds reprogrammed after 10 years would continue to be "no year" funds.

The Committee expects the Department to make available to the Congress, on request, any information relating to the prize program.

Relationship to existing energy prizes

The Act requires that any prize program DOE operates relating to hydrogen be carried out in accordance with the Act. DOE may develop inducement prize programs in areas other than hydrogen under the authority provided in section 1008 of the Energy Policy Act of 2005 (P.L. 109–58) or other authorities. If DOE chooses to create additional new inducement prize programs, the Committee expects the Secretary to review the H-Prize program to determine the extent to which other prizes should be similarly administered.

IX. Cost Estimate

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3). H.R. 5143 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. 5143 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

MAY 5, 2006.

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

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed estimate for H.R. 5143, the H-Prize Act of 2006.

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

Sincerely,

DONALD B. MARRON,
Acting Director.

Enclosure.

H.R. 5143—H-Prize Act of 2006

Summary: H.R. 5143 would authorize the appropriation of $11 million a year over the 2007–2016 period for a new program at the Department of Energy (DOE) to award prize money for achievements in the development of hydrogen energy technologies could include advances in the production and storage of hydrogen, advancements in hydrogen-powered vehicles, or innovations that transform hydrogen distribution and production technologies for energy purposes. The bill would require DOE to enter into an agreement with a private, nonprofit entity to administer the prize competition. Such an entity may contribute its own funds toward the prices authorized in the bill.

Assuming the availability of appropriated funds, and based on information from DOE, CBO estimates that implementing the prize program would cost $2 million in 2007 and $39 million over the 2007–2011 period (with additional spending of the authorized amounts after 2011). We estimate that enacting the bill would have no effect on direct spending or revenues. H.R. 5143 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA); any costs to state, local, or tribal governments would be incurred voluntarily.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 5143 is shown in the following table. The bill would authorize the appropriation of $11 million a year over the 2007–2016 period to administer and award prizes for advancements in technologies using hydrogen. The costs of this legislation fall within budget function 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—				
	2007	2008	2009	2010	2011
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Authorization Level	11	11	11	11	11

	By fiscal year, in millions of dollars—				
	2007	2008	2009	2010	2011
Estimated Outlays	2	7	10	10	10

Intergovernmental and private-sector impact: H.R. 5143 contains no intergovernmental or private-sector mandates as defind in UMRA. Funding authorized in the bill may benefit institutions of higher education that compete for funds in connection with hydrogen research. Any costs they might incur to comply with the requirements of the competition would be incurred voluntarily.

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

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

XI. Compliance With Public Law 104–4 (Unfunded Mandates)

H.R. 5143 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

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

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 5143 are to establish a Program of inducement prizes to reward advancements in the development of components or systems, prototypes and transformational changes related to the production, distribution, storage and utilization of hydrogen as a transportation fuel; and, to authorize appropriations for DOE to carry out the Program.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 5143.

XV. Federal Advisory Committee Statement

H.R. 5143 does not create any advisory committees.

XVI. Congressional Accountability Act

The Committee finds that H.R. 5143 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. Statement on Preemption of State, Local, or Tribal Law

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

XVIII. Changes in Existing Law Made by the Bill, as Reported

This legislation does not amend any existing Federal statute.

XIX. Committee Recommendations

On May 3, 2006, the Committee on Science favorably reported H.R. 5143, The H-Prize Act of 2006, by a voice vote, and recommended its enactment.

XX. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 5143, THE H-PRIZE ACT OF 2006

WEDNESDAY, MAY 3, 2006

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

The Committee met, pursuant to call, at 3:34 p.m. in Room 2318, Rayburn House Office Building, Hon. Sherwood L. Boehlert [Chairman of the Committee] Presiding.

Chairman BOEHLERT. Good afternoon. The Science Committee will come to order. Pursuant to notice the Committee on Science meets to consider the following measure: H.R. 5143, *the H-Prize Act of 2006.*

I ask unanimous consent for the authority to recess the Committee at any point during consideration of these matters. And without objection, it is so ordered.

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

I want to welcome everyone to what I assume will be a very brief markup. I know how busy everyone is, and I appreciate the cooperation of all. This is on a bill to push a set of technologies that could turn out to be a key to the U.S. energy future.

Let me begin by thanking Chairman Inglis for bringing this idea forward and for Mr. Lipinski for introducing the bill with him, Chairman Biggert for her tireless efforts to improve the bill and for making sure we stay on course on our efforts to promote a comprehensive research and development agenda, Ms. Jackson Lee for her helpful amendment recognizing the role that could be played by minority education institutions and businesses, and all the Members of this committee who have co-sponsored this bill.

The bill before us today is one sensible element of a comprehensive strategy to give the American people more energy options than they have today. If—and admittedly it is a big if—if we can figure out ways to make hydrogen affordable using nuclear or renewable fuels, and if we can figure out how to—ways to make affordable, practical hydrogen storage tanks and fuel cells, then we will be able to tap a non-polluting fuel. The potential benefits are worth the effort.

And precisely before the technology is long-range, prizes are a logical way to get as many people working on hydrogen in as many ways as possible. This is a useful supplement to our ongoing Department of Energy research and development programs, all of

which must continue. So this is a simple, logical bill that builds on our past interests in prize programs. Guess what? When there is a prize, a lot of people want to get it, and we want to have it awarded.

The amendment that Mr. Inglis will offer improves the bill in response to last week's testimony and concerns expressed by Members, including me. The substitute will clarify the responsibilities of whatever private entity DOE contracts with to run the program. And the substitute reduces the financial exposure of the Federal Government by an order of magnitude.

So I think we are ready to move forward on this bill, which I expect to be on the House Floor this month, and I urge its adoption.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I want to welcome everyone to what I assume will be a very brief markup on a bill to push a set of technologies that could turn out to be a key to the U.S. energy future.

Let me begin by thanking Chairman Inglis for bringing this idea forward and Mr. Lipinski for introducing the bill with him; Chairman Biggert for her tireless efforts to improve the bill and for making sure we stay on course in our efforts to promote a comprehensive R&D agenda; Ms. Jackson-Lee for her helpful amendment recognizing the role that could be played by minority education institutions and businesses; and all the Members of this committee who have co-sponsored this bill.

The bill before us today is one sensible element of a comprehensive strategy to give the American people more energy options than they have today. If—and admittedly it's a big if—if we can figure out ways to make hydrogen affordably using nuclear or renewable fuels, and if we can figure out ways to make affordable, practical hydrogen storage tanks and fuel cells, then we will be able to tap a non-polluting fuel. The potential benefits are worth the effort.

And precisely because the technology is long-range, prizes are a logical way to get as many people working on hydrogen in as many ways as possible. This is a useful supplement to our ongoing Department of Energy (DOE) research and development (R&D) programs, which must and will continue.

So this is a simple, logical bill that builds on our past interest in prize programs. The amendment that Mr. Inglis will offer improves the bill in response to last week's testimony and concerns expressed by Members, including me. The substitute will clarify the responsibilities of whatever private entity DOE contracts with to run the program. And the substitute reduces the financial exposure of the Federal Government by an order of magnitude.

So I think we're ready to move forward on this bill, which I expect will be on the House Floor this month.

I urge its adoption.

Chairman BOEHLERT. And I am glad to yield to my distinguished colleague Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman.

What may be the brevity of this markup really belies the importance of this bill. And I would like to thank the Chairman for working so closely with us to make changes and make sure we can get this bill through the Committee and hopefully to the Floor very quickly.

I am pleased to be here today for the markup of H.R. 5143, *The H-Prize Act of 2006*. I would like to thank Mr. Inglis for taking leadership on this important issue, and I am proud to have joined with the gentleman from South Carolina in introducing this creative legislation.

It is obvious to all of us here the damage being caused by our current energy situation. Gas prices have skyrocketed over the last few weeks, inflicting pain on our constituents and on our economy.

But the costs not only affect our pocketbooks, they affect our health and our safety.

We cannot continue the pollution of our environment, and we cannot continue to rely on energy sources from unstable parts of the world. We must find a new solution to our energy needs.

Hydrogen has a great potential to be a solution, but the technical and economic barriers are significant. By focusing specifically on hydrogen, the H-Prize will help us confront and solve these challenges. This will be done by rewarding innovation for specific advances in storage, production, utilization and distribution; and also rewarding one grand prize for special breakthrough in hydrogen energy.

The environmental promise of hydrogen is great because it produces no emissions besides water when it is used as an energy source. Zero polluting emissions. But right now hydrogen is most efficiently created by using fossil fuels, which is not the most environmentally friendly or secure method. That is why the H-Prize rewards the development of more efficient ways to use renewable energy sources to create hydrogen so we can lessen or greenhouse gas emissions and improve our air quality.

America has been at the forefront of new technologies for more than a century because our society encourages creativity and imagination while protecting property rights and promoting entrepreneurship. As we heard from our four distinguished witnesses last week, prizes can have the potential to spur innovation and ingenuity.

It is important to emphasize that the H-Prize will not replace the scientific research that the Federal Government funds, but the H-Prize will tap into America's creativity and imagination to solve one of the greatest problems facing us today.

Breakthroughs in hydrogen R&D, which I believe this bill will induce, will unfortunately not lower energy prices this year or next, but it will help our country address our long-term energy needs in a unique way.

I would like to thank the Chairman again for the work on this bill. I look forward to working on more important energy legislation, working together on that in the future, and I urge my colleagues to vote for the H-Prize bill.

[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 on H.R. 5143, *The H-Prize Act of 2006*. I would like to thank Mr. Inglis for taking leadership on this important issue and I am proud to have introduced this creative legislation with the gentleman from South Carolina.

It is obvious to all of us here the damage being caused by our current energy situation. Gas prices have skyrocketed over the last few weeks, inflicting pain on our constituents and on our economy. But the costs not only affect our pocketbooks, they affect our health and safety. We cannot continue the pollution of our environment and we cannot continue to rely on energy sources from unstable parts of the world. We must find a new solution to our energy needs.

Hydrogen has great potential to be a solution. But the technical and economic barriers are significant. By focusing specifically on hydrogen, the H-Prize will help us confront and solve these challenges. This will be done by rewarding innovation for specific advances in storage, production, utilization, and distribution, and also awarding one grand prize for a special breakthrough in hydrogen energy.

The environmental promise of hydrogen is also great. Hydrogen produces no emission besides water as an energy source. Zero polluting emissions. But right now, hydrogen is most efficiently created by using fossil fuels, which is not the most environmentally-friendly or secure method. That is why the H-Prize rewards the development of more efficient ways to use renewable energy sources to create hydrogen, so we can lessen our greenhouse gas emissions and improve our air quality.

America has been at the forefront of new technologies for more than a century because our society encourages creativity and imagination, while protecting property rights and promoting entrepreneurship. As we heard from our four distinguished witnesses last week, prizes can have the potential to spur innovation and ingenuity. It is important to emphasize that the H-Prize will not replace the scientific research that the Federal Government funds. But the H-Prize will tap into American's creativity and imagination to solve one of the greatest problems facing us today.

Breakthroughs in hydrogen R&D, which I believe this bill will induce, unfortunately will not lower energy prices this year or next. But it will help our country address our long-term energy needs in a unique way.

Thank you, Mr. Chairman, and I encourage all of my colleagues to vote for the H-Prize bill. I yield back the balance of my time.

Chairman BOEHLERT. Thank you very much, Mr. Lipinski. And I want to thank you personally for your leadership in this issue. It is nice to have an engineer's perspective as we deal with some of these subjects.

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

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member.

A collective spirit of innovation has been one of America's greatest assets.

With gas prices soaring higher than ever before, the American public looks to its elected officials to devise a national plan to attain independence from foreign oil. My home state of Texas is an "energy-producing state." For many years, Texas has been in the business of drilling oil, refining petroleum, and producing energy.

Texas is also an enterprising state with the foresight and resources to invest in the future. From nanotechnology to agricultural research and development, my state has led the way.

Just this week, a Texas sugar grower came to my office and stated that they have made the sugar agricultural and refining process so efficient that the company actually produces energy from incinerating its cane solid waste. The incineration actually produces electricity, which they sell to the local grid and is enough power to fuel a town of two thousand people. Now that's innovation!

H.R. 5143, introduced by my colleague Representative Inglis, is a step in the right direction with regard to our hydrogen economy. I feel it is important to fund initiatives that spur innovation and encourages bright minds to address pressing problems facing our society.

Thank you, Mr. Chairman. I yield back.

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

PREPARED STATEMENT OF REPRESENTATIVE SHEILA JACKSON LEE

Thank you, Mr. Chairman and Members of the Committee. I appreciate all of the Members who agreed with me in considering my recommended provisions to be important and for incorporating my provisions into the bill.

The need for hydrogen energy research is vital in a time when our dependence on foreign oil is playing a heavy burden on our economy. I welcome such a program which will lead to advancements related to hydrogen production, storage, distribution, and utilization. Research in alternative energy sources is crucial for our nation to prosper. Fostering and providing incentives for such programs is a positive step in the right direction.

Many experts consider hydrogen gas to be a promising fuel, particularly in the transportation sector. Used as transportation fuel, Hydrogen has the potential in helping overcoming, reducing or eliminating air pollution generated by cars and trucks. The Hydrogen Prize Act will help promote potentially innovative results that will reduce technical and other barriers to the advancement of hydrogen technologies.

I was particularly concerned that the Hydrogen Prize program be widely advertised to historically black colleges and universities and other minority serving institutions. I am interested also in that the Hydrogen Prize program is advertised to women and disadvantaged small businesses. Minorities, women and disadvantaged enterprises can contribute significantly in these programs. That is why it is essential that these groups be informed about such projects.

Therefore, I am very pleased that the bill incorporates the requirement to advertise widely so minority, women and disadvantaged businesses learn about the opportunity.

With that, I can support the bill.

Thank you again, Mr. Chairman and Members of the Committee.

Chairman BOEHLERT. We will now consider H.R. 5143, *The H-Prize Act of 2006.* I ask unanimous consent that the bill is considered as read and open to amendment at any point, and that Members proceed with the amendments in the order of the roster.

Without objection, so ordered.

The first amendment on the roster is an amendment in the nature of a substitute offered by the gentleman from South Carolina Mr. Inglis. I ask unanimous consent that the amendment in the nature of a substitute be treated as the original text for purposes of amendment under the five-minute rule.

Without objection, so ordered.

Mr. Inglis, are you ready to proceed.

Mr. INGLIS. I am, Mr. Chairman.

Chairman BOEHLERT. The Clerk will report the amendment.

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

Chairman BOEHLERT. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

And the gentleman is recognized for five minutes to explain the substitute amendment.

Mr. INGLIS. First of all, Mr. Chairman, I want to thank you for moving this bill so quickly, and thank Mr. Lipinski for his work in being one of our prime co-sponsors, and very much appreciate the bipartisan way in which this is advancing.

We have here an amendment in the nature of a substitute that fixes some things that were revealed in the course of our hearing last week, really one of the most helpful hearings that I have been to in my time in Congress because we had excellent witnesses that made some helpful suggestions.

The substitute works to define "administering entity" and provides further clarity in the role of the Secretary of Energy and the duties that the Secretary will have in administrating or setting up the administrating entity. It will also—the substitute also addresses some advertising, fund-raising, criteria development and transformational prize amount, and judge selection issues.

In fact, I was just speaking with one of our colleagues about what we hope to improve even further by report language, and that is further direction to the Secretary to come up with the clearest metrics possible that we know when someone has clearly won the prize. As you recall from Peter Diamandis' testimony, that was an essential element of the X-Prize.

The substitute creates different prize amounts than the bill as original introduced. Originally we had $100 million grand prize offered within 10 years. Now that will be a $10 million grand prize,

but with the goal of $40 million being raised from private funds. It is important to note that that $40 million flows out in a dollar-for-dollar match to the venture capital that the winner has amassed.

So it is a test to make certain that the winner not just has a technology that can technically work, but rather one that the market is ready to embrace, which, of course, is the government's objective in this, which is to get all the way to the marketplace rather than simply have a technology that we can put on the shelf.

So the substitute sets up a $10 million prize—grand prize with the goal of raising $40 million in private funds that would be the matching portion of that grand prize. It is important to note that the federal contribution to the grand prize will be limited to $10 million in deference to a number of colleagues who expressed concern that $10 million was sufficient. So it is possible, I would point out, that the private fund-raising could outstrip that $40 million amount, which would be all the better, in my opinion.

The substitute also makes changes in the authorizing—authorized amounts. The substitute would authorize $11 million per year, which includes not more than $2 million for administration expenses—$2 million annually.

Another change in the substitute is that the funds would expire in 10 fiscal years after the fiscal year in which they were first appropriated, rather than remaining available until expended. The reason for that is to push toward a granting of a prize within 10 years.

Finally, the substitute incorporates helpful language suggested by Ms. Jackson Lee that ensures that the prize advertising efforts reach out to minority colleges, universities and institutions, and minority and disadvantaged businesses, and we were happy to receive her suggestion there.

And, Mr. Chairman, as a baseball fan that you are, I note that you see this as an opportunity for a triple play. It really is an opportunity for a great triple play for us. We can clean up the air if we can get to hydrogen, we can create a lot of new jobs and expand our economy, and we can also make a more secure country by ending our addiction to oil. So it really is an opportunity for a triple play, and I thank you for moving the bill so rapidly.

Chairman BOEHLERT. Mr. Inglis, if can you keep coming up with triple plays, I can guarantee you a spot in the Baseball Hall of Fame.

Mr. Miller.

Mr. MILLER. Thank you. Strike the last word, Mr. Chairman.

Chairman BOEHLERT. The gentleman is recognized for five minutes.

Mr. MILLER. Thank you. I will support this bill, but I hope we are back here sometime soon to create an E-Prize and perhaps a C-Prize. I think we should be proceeding on several fronts at one time, not putting all of our emphasis on hydrogen as a solution to our energy needs.

I agree with Mr. Inglis of what we need to accomplish. I think we need to find a source of energy that is sustainable, that does not make us dependent for 60 percent of our fuel on the most unstable parts of the world, and that we have an energy source that

does not produce greenhouse gases that may and probably is changing our climate, perhaps with cataclysmic results.

So I want all the same runners out that Mr. Inglis wants out, but I am not sure that we need to put all of our emphasis on hydrogen as the way to do it. Many who are expert in this area are skeptical that hydrogen is the best solution to our needs. And I would strongly recommend, Mr. Chairman, that we develop similar legislation to create an energy prize, an E-Prize, a conservation prize, a C-Prize.

One of the witnesses last week is trying to develop a prize for an automobile that will get 100 miles to the gallon and an automobile that is commercially feasible. One hundred miles a gallon; now we are talking. That would really, really make a difference in our economy, in our environment, and in our role in the world in not having to be as dependent as we are upon very frightening governments around the world.

So I will produce—I will support this legislation. But again, I hope that we will come back and continue to focus on all the potential solutions to our energy problem.

Chairman BOEHLERT. Thank you very much. And just let me say, I agree with the gentleman's observations. We don't need prizes for everything, but we need some good, sound policies for a lot of things that we don't have sound policies for. So I look forward to continuing to work productively and cooperatively with the gentleman.

Is there anyone else who seeks recognition?

Mr. Rohrabacher.

Mr. ROHRABACHER. Strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. ROHRABACHER. Mr. Chairman, I oppose H.R. 5143, *The H-Prize Act of 2006.* Energy policy, of course, is critically important to the United States of America for a number of reasons, as have already been stated. And I would like to congratulate Chairman Inglis and yourself and others who are trying to reach out and do something to further the cause of energy independence, et cetera. And I understand the leadership that you two are certainly demonstrating, and I appreciate that.

But this bill has several flaws which I would—which cause me to oppose it, and if they can be corrected, or if we can work out some of the details before it gets to the Floor, maybe there might be an amendment on the Floor that would permit me to support the legislation. But by its nature, we have just heard one criticism from someone who is going to support it. Mr. Miller mentioned we should have an E-Prize, an energy prize, rather than just a hydrogen prize, and I agree with that sentiment. That is, we should not just be singling out hydrogen from biomass, nuclear energy, solar energy, hydrocarbon extraction, or other types of ideas as a means of achieving our energy goals.

So this does just focus on hydrogen. However, this is a step forward. I mean, if we have some success in hydrogen, we recognize that is a step forward. That in and of itself would not warrant me opposing the legislation. But I do agree with the general concept. We should have an energy prize or a conservation prize, and maybe we should all just take this opportunity to commit ourselves to

coming up with that type of an approach. However, with that said, there are some specifics that I think need to be corrected in the bill.

We heard in testimony from Dr. Peter Diamandis, who established the prize which led to Space Ship 1 and is one of the most successful prizes in the history, as well as we know about the other prizes which led to Lindbergh's solo flight across the Atlantic; the DARPA Grand Challenge, which has helped tremendously in the creation of vehicle technology.

Well, these things had one thing in common. All of these prizes had very defined goals. The four biennial $1 million H-prizes in this bill will not—they do not have this specifically designed goal. Instead, they will be awarded every two years to the winners determined on points by a panel of judges.

Mr. Chairman, the prizes that succeeded are the ones for feats that are analogous for who is the first one to climb Mount Everest or the first one to go across this specific line. But this group of prizes are not the equivalent of winning a 100-yard dash or achieving something specifically. It is more like winning the hearts of judges at an ice skating competition. So, yes, the $4 million and $10 million prizes in the bill do seem to involve objective and specific criteria, but the others do not.

I think this needs to be dealt with. I will be happy to work with Chairman Inglis and others to try to see if we can find language that will correct that flaw. And if we can, I will be very happy to support it on the Floor and work—and look forward to working with everyone here, including you, Mr. Chairman, and Chairman Inglis, on these idea of other prizes that we can further the cause of energy independence and conservation of energy.

Chairman BOEHLERT. Thank you very much, Mr. Rohrabacher. And I always appreciate the spirit of cooperation that you evidence in your comments, and we look forward, Chairman Inglis and I, working with you. Maybe—maybe you should amend that from a triple play to a triple Axel. That would be appropriate.

Is there any—Mr. Gutknecht.

Mr. GUTKNECHT. Mr. Chairman, first of all, I think Mr. Inglis wanted to respond, and I would yield to him such time as he may need.

Mr. INGLIS. Thank the gentleman.

Two points. One is I agree, Mr. Rohrabacher, that we really do want to make these very defined goals. In other words, the metrics for the granting of the prize are left to the discretion of the Secretary of Energy as drafted here out of necessity. That is that we are not—I am not certainly an expert that would come up with the metrics that would work exactly right for this prize. And what we heard from Peter Diamandis is that you need to set the metrics very clearly and have a lot of thought from a lot of very helpful people that know the subject matter to set up the prize just right.

So the goal is to have very clear metrics, and that is part of the essence of having the prize. So if there are ways that we can improve our language between here and the Floor, I am happy to do that.

The other thing that I think is helpful from both Mr. Rohrabacher and Mr. Miller is there is some breakthroughs that are

needed in hydrogen. The difference between, I think, some of the technologies that Mr. Rohrabacher mentioned, like ethanol and biomass and things like that, is that they are pretty much here and now. There is a question of commercialization in some cases, but they are here and now. The challenge with hydrogen is there is some breakthroughs that are out there a little bit. And the beauty of a prize is you incentivize people, as we heard from the panel last week, incentivize people to go out and reach for those things without the oversight of the government, without the appropriations from the government, on their own dime breaking through.

And as the former Chairman of this committee reminded me earlier this week, he told me—Bob Walker told me to tell everybody: Remember, if nobody wins the prize, no money flows. So you have to win the prize in order for the money to flow.

So I yield back. I thank the gentleman for yielding.

Mr. GUTKNECHT. Mr. Chairman, reclaiming my time.

I just want to say, based on the objections we have heard so far today, I don't really think there is a reason to not move this bill out of this committee today. And I hope that the author and Congressman Rohrabacher will work together and with others who have concerns. But I think Mr. Inglis made the point exactly right in his last statement, and that is that nothing is going to happen unless somebody does something on this.

And in many respects I remain relatively skeptical about hydrogen, even though I also believe it is sort of the holy grail. I mean, if we ultimately figure out how to use hydrogen, it is so abundant, it is so cheap, that it really will present us with an unlimited energy future. So if nobody can break through, then we won't have to pay any money. And I really—if you wait until all the lights are on green, we will never leave the house.

And so I think we should move this bill out of Committee today. Between here and the Floor, and between here and the Senate, and between here and Conference Committee, obviously we can make some adjustments. But I don't think we should delay moving this bill forward today simply because we haven't answered every single question about the future of hydrogen, because those questions are going to be answered probably beyond our term here in this body.

Chairman BOEHLERT. Thank you very much.

Before moving on to a vote on the substitute, I would like to take a few minutes to engage in a colloquy with the gentleman from Illinois Mr. Lipinski concerning the issue of intellectual property rights with regard to the prizes.

Mr. LIPINSKI. Mr. Chairman, would the gentleman yield?

Chairman BOEHLERT. I am glad to yield to the gentleman.

Mr. LIPINSKI. Mr. Chairman, we do not have specific text of the amendment at this point, but I would like to raise two concerns with the current text of H.R. 5143 that have been raised by Democratic Members.

First, H.R. 5143 asks participants in the competition set up under this bill to entrust the private nonprofit entity chosen to administer the prize competitions with such trade secrets, intellectual property and other confidential information as are necessary to choose competition winners. In the case of individuals and small businesses, these assets may very well be their most important

ones. However, the intellectual property and liability sections of the bill are written in terms of responsibilities and waiver of claims against the Federal Government and related entities.

If we are to expect broad participation in these competitions, we need to be explicitly clear that after submission, the ideas remain those of the participant who submitted them, and that the nonprofit administrator has an affirmed duty to protect this property from public disclosure.

Secondly, it is my reading of the statute that American subsidiaries of foreign companies are eligible to participate in the competition. Is that your understanding of the Committee's intent?

Chairman BOEHLERT. I thank the gentleman for his comments.

We all want to make sure that a wide group of applicants are eligible for and actually apply under these prize competitions. You raise some serious concerns regarding the intellectual property and confidential information of the applicants, and I agree—I agree that we will need to address these issues in a bipartisan manner before the bill goes to the Floor.

Also, the gentleman is correct that American subsidiaries of foreign companies have the same eligibility to participate as other U.S.-based companies. This is the standard language we use to ensure that companies involved in federal programs are operating in the United States. So I think we are all set.

Are there any 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 those in favor, signify by saying aye.

Opposed, no.

In the opinion of the Chair, the ayes have it. And the amendment is agreed to.

Are there any other amendments?

Hearing none, the vote is on the bill, H.R. 5143, *The H-Prize Act of 2006,* as amended.

All those in favor, signify by saying aye.

Opposed, no.

In the opinion of the Chair, the ayes have it.

I recognize Mr. Lipinski to offer a motion.

Mr. LIPINSKI. Mr. Chairman, I move that the Committee favorably report H.R. 5143, as amended, to the House with the recommendation that the bill, as amended, do pass. Furthermore, I move that staff be instructed to prepare the legislative report and make necessary technical and conforming changes, and that the Chairman take all necessary steps to bring the bill before the House for consideration.

Chairman BOEHLERT. The question is the motion to report the bill as amended favorably. Those in favor of the motion will signify by saying aye.

Opposed, no.

The ayes have it, the and bill is favorably reported. Without objection, the motion to reconsider is laid upon the table.

I move that Members have two subsequent calendar days in which to submit supplemental minority or additional views on the measure. I further move pursuant to clause 1 of rule 22 of the House of Representatives that the Committee authorizes the Chair-

man to offer such motions as may be necessary in the House to adopt and pass H.R. 5143, *The H-Prize Act of 2006,* as amended. Without objection, so ordered.

I want to thank Members for their attention. And it lived up to its advance billing. We did not take too long.

Thank you. This markup is adjourned.

[Whereupon, at 4:00 p.m., the Committee was adjourned.]

Appendix

H.R. 5143, SUMMARY OF H.R. 5143, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER, SUMMARY OF MANAGER'S AMENDMENT TO H.R. 5143, SECTION-BY-SECTION ANALYSIS OF AMENDMENT, DESCRIPTION OF MAJOR CHANGES IN THE AMENDMENT IN THE NATURE OF A SUBSTITUTE COMPARED WITH H.R. 5143 AS INTRODUCED

I

109TH CONGRESS
2D SESSION

H. R. 5143

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

APRIL 6, 2006

Mr. INGLIS of South Carolina (for himself, Mr. LIPINSKI, Mr. KINGSTON, Mr. WAMP, Mr. WOLF, Mr. BOEHLERT, Mr. EHLERS, Mr. BARTLETT of Maryland, Mr. WYNN, Mr. DENT, Mr. LARSON of Connecticut, Mr. MCCAUL of Texas, Mr. BROWN of South Carolina, Mr. WILSON of South Carolina, and Mr. TERRY) introduced the following bill; which was referred to the Committee on Science

---

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 2006".

SEC. 2. DEFINITIONS.

In this Act:

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

(2) 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, and large and small businesses.

(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.

(d) FUNDING SOURCES.—Prizes under this Act may consist of Federal appropriated funds and funds provided by private entities or individuals 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.

(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 a private source. 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 a private source.

(f) SUNSET.—The authority to announce prize competitions under this Act shall terminate on September 30, 2017.

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 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. 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 at least one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. To the extent permitted under section 3(e), the Secretary may announce additional prize competitions authorized under subsection (a)(3) as appropriate to accelerate the development and adoption of hydrogen technologies. A prize offered under this paragraph shall be in the amount of $100,000,000. The Secretary may allow the winner of a prize under this paragraph to receive up to $10,000,000 of the prize in a lump sum as cash. Any portion of the prize not received as a lump sum in cash shall be paid to the winner as a Federal 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 Federal match amount paid to another entity that is continuing the development of the winning technology. The Secretary shall announce how much of

a prize will be available as a lump sum and the rules for receiving the Federal 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).

(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, through an agreement under section 3(c), 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.—Registered participants shall be required to agree to assume any and all risks, and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for, any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from their participation in a competition under this Act, whether such injury, death, damage, or loss arises through negligence or otherwise. For the purposes of this subsection, the term ''related entity'' means a contractor or subcontractor at any tier, and a supplier, user, customer, cooperating party, grantee, investigator, or detailee.

(b) LIABILITY INSURANCE.—

(1) REQUIREMENTS.—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.—There are authorized to be appropriated to the Secretary for carrying out this Act $55,000,000 for each of the fiscal years 2007 through 2016, of which no more than $1,000,000 for any fiscal year may be used for administrative expenses.

(b) CARRYOVER OF FUNDS.—Funds appropriated pursuant to this Act shall remain available until expended.

SEC. 9. NONSUBSTITUTION.

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

○

SUMMARY OF H.R. 5143

This bill is intended to create a new incentive to achieve scientific and technical breakthroughs required to accelerate the drive to a hydrogen economy. The following three prize programs are intended to draw new, entrepreneurial players to join the race to break down technical and other barriers to the advancement of hydrogen technologies.

First, four $1 million prizes are to be awarded every other year to the best technology advancements in components or systems related to hydrogen production, hydrogen storage, hydrogen distribution, and hydrogen utilization.

Next, one $4 million prize is to be awarded for prototypes of hydrogen-powered vehicles or hydrogen-based products that best meet or exceed objective performance criteria. Awards for prototype prizes alternate years with the technology advancements prize.

Finally, one $10 million prize is to be awarded for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. The Secretary of Energy is authorized to provide up to $90 million more in matching funds for every dollar of private funding raised by the winner for the continued development of their winning technology.

The bill also includes provisions to:

- Sunset the prize program in 2017;
- Require the Secretary to enter into an agreement with a private, non-profit entity to administer the prize competitions;
- Define contestant eligibility, waive intellectual property rights, waive federal liability, and require purchase of liability insurance by contestants;
- Authorize annual appropriations of $55,000,000 for fiscal years 2007 through 2016 for the Department of Energy.

SECTION-BY-SECTION ANALYSIS OF
H.R. 5143, THE H-PRIZE ACT OF 2006

Section 1. Short Title.

The H-Prize Act of 2006.

Sec. 2. Definitions.

Defines 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 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. 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 2017.

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 $10 million prize for transformational changes in technologies for the production and distribution of hydrogen that meet or exceed far-reaching objective criteria. Authorizes the Secretary to provide up to $90 million more in matching funds for every dollar of private funding raised by the winner for the continued development of their winning technology. Authorizes prize winners to accept these additional funds as cash or as a government contract equivalent to the prize amount. Limits the total award to $100 million.

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, or 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 $55 million for each of fiscal years 2007 through 2016. Limits the use of appropriated funds for administrative expenses to no more than $1 million in any fiscal year.

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.

COMMITTEE ON SCIENCE -- FULL COMMITTEE MARKUP

May 3, 2006

AMENDMENT ROSTER

H.R. 5143, H-Prize Act of 2006.

--Motion to adopt the bill, as amended: agreed to by a voice vote.
--Motion to report the bill, as amended, favorably: agreed to by a voice vote.

No.	Sponsor	Description	Results
1.	Mr. Inglis	Amendment in the Nature of A Substitute to H.R. 5143	--Adopted by a voice vote.

AMENDMENT IN THE NATURE OF A SUBSTITUTE

TO H.R. 5143

OFFERED BY MR. INGLIS OF SOUTH CAROLINA

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 2006".

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTERING AGENCY.—The term "administering agency" 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 under section 4(b)(3); and

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

(d) FUNDING SOURCES.—Prizes under this Act may consist of Federal appropriated funds and 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, 2017.

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 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. 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 sub-

section (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 at least one prize competition authorized under subsection (a)(3) as soon after the date of enactment of this Act as is practicable. To the extent permitted under section 3(e), the Secretary may announce additional prize competitions authorized under subsection (a)(3) as appropriate to accelerate the development and adoption of hydrogen technologies. 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 each prize award under this paragraph. The administering entity shall seek to raise $40,000,000 toward each 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 busi-

ness 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.—Registered participants shall be required to agree to assume any and all risks, and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for, any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from their participation in a competition under

this Act, whether such injury, death, damage, or loss arises through negligence or otherwise. For the purposes of this subsection, the term "related entity" means a contractor or subcontractor at any tier, and a supplier, user, customer, cooperating party, grantee, investigator, or detailee.

(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.—There are authorized to be appropriated to the Secretary for carrying out this Act $11,000,000 for each of the fiscal years 2007 through 2016, of which no more than $2,000,000 for any fiscal year may be used for administrative expenses.

(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.

SUMMARY OF THE MANAGER'S AMENDMENT TO H.R. 5143

This Manager's Amendment is offered as an Amendment in the Nature of a Substitute. The changes introduced to the bill by the Amendment are in response to Member and witness comments expressed during the April 27, 2006 hearing. The main changes are to set a private sector fund raising goal of $40,000,000 for the transformational technologies prize; reduce and cap the federal contribution to the transformational technologies prize of $10,000,000; and clearly delineate the duties of the administering entity.

Definitions: Defines the "administering entity."

Prize Authority: Adds language ensuring that prize advertising efforts reach out to historically black colleges and universities, other minority serving institutions, as well as large and small businesses, including minority and disadvantaged businesses.

Enumerates the duties of the "administering entity." These 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 prizes awarded under the transformational changes category described in section 4, and selecting judges using criteria developed in consultation with the Secretary.

Prize Categories: For transformational technologies, creates a minimum $10,000,000 lump sum prize award, limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000 for the matching funds portion of the transformational prize.

Authorization of Appropriations: Reduces the annual authorization of appropriations from $55,000,000 to $11,000,000. Increases the limitation on administrative expenses within the total authorization from $1,000,000 to $2,000,000.

Inserts a limitation on the carryover of funds. Funds expire 10 fiscal years after the fiscal year in which they were appropriated rather than remaining available until expended.

SECTION-BY-SECTION ANALYSIS OF THE
AMENDMENT IN THE NATURE OF A SUBSTITUTE TO
H.R. 5143, THE H-PRIZE ACT OF 2006

Section 1. Short Title.

The H-Prize Act of 2006.

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, and selecting judges using criteria developed in consultation with 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 2017.

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, or 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 $11 million for each of fiscal years 2007 through 2016, with funds expiring 10 fiscal years after the fiscal year in which they were appropriated. Limits the use of appropriated funds for administrative expenses to no more than $2 million in any fiscal year.

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.

Description of major changes included in the Amendment in the Nature of a Substitute
Compared with
H.R. 5143 as Introduced

Issue	H.R. 5143 as Introduced	Amendment in the Nature of a Substitute
Definitions	Defines Department and Secretary.	Adds a definition of the administering entity.
Prize Authority	Requires the Secretary of Energy to create a prize to advance hydrogen energy technologies. Requires the Secretary to advertise the prizes, including a specific direction to announce the prize competitions in a Federal Register notice. Requires the Secretary to enter into an agreement with a private, non-profit entity to administer the prizes. 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 2017.	Adds language ensuring that prize advertising efforts reach out to minority serving institutions and businesses. Enumerates the duties of the "administering entity."
Prize Categories	Requires the Secretary to establish contest criteria through consultation with the Hydrogen Technical Advisory Committee, other federal agencies including the National Science Foundation, and 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.	For transformational technologies, creates a minimum $10,000,000 lump sum prize award, limits the federal contribution to $10,000,000, and sets a private fundraising goal of $40,000,000 for the matching funds portion of the transformational prize.
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, or must be a U.S. citizen if an individual. Excludes from participation any Federal entities or Federal or national laboratory employees while on duty.	No change.

Issue	H.R. 5143 as Introduced	Amendment in the Nature of a Substitute
Intellectual Property	Waives claims by the Government to any intellectual property rights derived from participation in the prize competitions.	No change.
Liability	Requires waiver of claims against the 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 Government as an additional insured entity	No change.
Authorizations	Authorizes $55,000,000 for each of fiscal years 2007 through 2016. Limits the use of appropriated funds for administrative expenses to no more than $1,000,000 in any fiscal year.	Reduces annual authorization to $11,000,000. Increases the limitation on administrative expenses within the total authorization from $2,000,000. Inserts a limitation on the carryover of funds. Funds expire 10 fiscal years after the fiscal year in which they were appropriated rather than remaining available until expended.
Non-substitution	Expresses a sense of the Congress that the prize competitions shall not act as a substitute for any research and development programs.	No change.