Federally Funded Innovation Inducement Prizes

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Summary

Since at least the 18th century, philanthropic organizations, industry, governments, and nongovernmental organizations throughout the world have offered many different kinds of prizes with a variety of objectives to reward accomplishments in science and technology. In the United States, Congress authorized most of today's federally-funded innovation inducement prizes beginning with the 108th Congress (2003). This analysis focuses on federally-funded "innovation inducement prizes," which are sponsored by federal organizations and designed to encourage scientists and engineers to pursue scientific and technical societal goals not yet reached.

The objectives of such prizes are generally to identify new or unorthodox ideas or approaches to particular challenges; demonstrate the feasibility or potential of particular technologies; promote development and diffusion of specific technologies; address intractable or neglected societal challenges; and educate the public about the excitement and usefulness of research and innovation. They differ from "recognition prizes" such as the National Medal of Science, National Medal of Technology, and the Nobel prizes, which reward past S&T accomplishments.

The scientific and technological goals for federally-funded innovation inducement prizes include the full spectrum of research, development, testing, demonstration, and deployment. They are an alternative to more traditional ways of achieving societal objectives with S&T such as grants, contracts, fees, patents, and human or physical infrastructure investments that some think are too costly, risk-averse, and bureaucratic. Some believe that prizes, if designed well, can enhance the ability of science and technology to solve societal problems, by reaching a wider community of problem solvers, encouraging risk-taking, and focusing the attention of policymakers, entrepreneurs, the public, and researchers on the goals of an innovation program. Concerns about prizes are that they may inhibit the exchange of information among researchers and innovators due to the very nature of competitions, be challenging to design and finance, and result in duplicative work which may not be the best use of limited intellectual and financial resources.

Prizes differ in their intentions, objectives, sources of funding, competition mechanisms, reward structure, and other variables. The prizes themselves may take the form of recognition and publicity, cash, marketing monopolies, or other means. When a cash award is provided, most range from $250,000 to $2 million, can go up as high as $10 million, and have exceeded $500 million when the winner provides a service such as a vaccine. Some experts view the non-compensation portion of prizes such as recognition and publicity, as important, and sometimes more important, than the potential financial reward.

Members of Congress interested in federally-funded innovation inducement prizes may wish to consider several policy options including creating new prizes, and modifying or increasing oversight of current prize programs. In the 111th Congress, policymakers may make decisions that influence whether or not current prize programs will be funded, and existing programs modified. Some policymakers have proposed new prizes on technologies such as self-powered farms, voting systems designed for persons with disabilities, energy technologies, nanotechnology, cybersecurity, and automotive energy efficiency.

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National governments throughout the world have offered prizes to encourage innovation since at least the late 1700s. For example, Napoleon's government offered a 12,000 franc prize for technologies that would enhance the preservation of food to better feed advancing military troops. This lead to the process of preserving food in bottles, which shortly thereafter led to the process of canned foods, and then broad use by consumers.[1]

In the United States, Congress authorized most of today's federally-funded innovation inducement prizes beginning with the 108th Congress (2003). The purpose of this report is to gain a better understanding of these prizes to provide guidance for Members of Congress who are interested in creating new prizes, modifying current prize programs, or increasing oversight of current prizes.

This report discusses the status of current federally-funded innovation inducement prizes, addresses the different types of prizes, analyzes when prizes may be appropriate and effective, and summarizes assessments that have been made of their effectiveness. The report also provides the lessons that may be learned from completed competitions, and policy options for those Members of Congress interested in taking action regarding federally-funded innovation inducement prizes. The report concludes with an overview of 111th congressional activities regarding prizes.

This report does not discuss prizes funded by non-federal organizations nor does it discuss recognition prizes that reward past accomplishments other than to distinguish them from innovation inducement prizes (see discussion of this issue in the following section, "What Are the Different Kinds of Prizes?").

What Are the Different Kinds of Prizes?

Philanthropic organizations, industry, governments, and nongovernmental organizations offer many different kinds of prizes with a variety of objectives to reward accomplishments in science and technology (S&T).[2] Some prizes, such as the Nobel prizes and U.S. National Medal of Science and National Medal of Technology, reward past accomplishments and do not have a specific scientific or technological goal. These have been called "recognition prizes." Other prizes, called "innovation inducement prizes," are designed to attain scientific and technical goals not yet reached, often in response to perceived market failures.

Objectives of these prizes include both technological and non-technological goals:

- Identify new or unorthodox ideas or approaches to particular challenges;
- Demonstrate the feasibility or potential of particular technologies;
- Promote development and diffusion of specific technologies;

[1] Dale Blumenthal, "The Canning Process: Old Preservation Technique Goes Modern," *Food and Drug Administration Consumer Magazine*, September 1, 1990, at http://www.fda.gov/bbs/topics/CONSUMER/CON00043.html.

[2] For lists of some existing prizes, see Knowledge Ecology International, *Selected Innovation Prizes and Reward Programs*, KEI Research Note 2008:1 at http://www.keionline.org/misc-docs/research_notes/kei_rn_2008_1.pdf; and McKinsey & Company, *And the Winner is ... Capturing the Promise of Philanthropic Prizes*, 2009 at http://www.mckinsey.com/clientservice/socialsector/And_the_winner_is.pdf.

- Address intractable or neglected societal challenges; and
- Educate the public about the excitement and usefulness of research and innovation.[3]

This report focuses upon federally-funded "innovation inducement" prizes that have these goals.

The scientific and technological goals for prizes include the full spectrum of research, development, testing, demonstration, and deployment. They are an alternative to more traditional ways of achieving societal objectives with science and technology such as grants, contracts, fees, patents, and human or physical infrastructure investments that some think are too costly, risk-averse, and bureaucratic. Some believe that prizes, if designed well, can enhance the ability of science and technology to solve societal problems, by reaching a wider community of problem solvers, encouraging risk-taking, and focusing the attention of policymakers, entrepreneurs, the public, and researchers on the goals of an innovation program. Concerns about prizes are that they may inhibit the exchange of information among researchers and innovators due to the very nature of competitions, be challenging to design and finance, and result in duplicative work which may not be the best use of limited intellectual and financial resources.[4]

Prizes differ in their intentions, objectives, sources of funding, competition mechanisms, reward structures, and other variables. There is also a wide spectrum of participants in prize competitions from individual citizens with and without scientific or technical expertise, school districts, governments, universities and other nonprofit organizations, and small and large companies. The prizes themselves may take the form of recognition and publicity, cash, marketing monopolies, or other means.[5] Some experts view the non-compensation portion of prizes as important, and sometimes more important, than the potential financial reward. From a competitor standpoint, key considerations are the degree of flexibility in the competition rules, and the financial and nonfinancial risks and incentives.[6]

[3] National Academy of Engineering, *Concerning Federally Sponsored Inducement Prizes in Engineering and Science* (Washington, DC: National Academy Press, 1999).

[4] National Academy of Engineering, *Concerning Federally Sponsored Inducement Prizes in Engineering and Science* (Washington, DC: National Academy Press, 1999) at http://www.nap.edu/catalog.php?record_id=9724; National Research Council, *Innovation Inducement Prizes at the National Science Foundation* (Washington, DC: National Academy Press, 2007); Richard G. Newell and Nathan E. Wilson, *Technology Prizes for Climate Change Mitigation*, RFF DP 05-33, Resources for the Future, June 2005 at http://www.rff.org/documents/RFF-DP-05-33.pdf; McKinsey & Company, *And the Winner is ... Capturing the Promise of Philanthropic Prizes*, 2009, at http://www.mckinsey.com/clientservice/socialsector/And_the_winner_is.pdf; Thomas Kalil, *Prizes for Technological Innovation*, The Brookings Institution, December 2006 at http://www.brookings.edu/views/papers/200612kalil.pdf; Liam Brunt, Josh Lerner, and Tom Nicholas, *Inducement Prizes and Innovation*, CEPR Discussion Paper No. DP6917, July 2008 at http://ssrn.com/abstract=1307507.

[5] Knowledge Ecology International, *Selected Innovation Prizes and Reward Programs*, KEI Research Note 2008:1 at http://www.keionline.org/misc-docs/research_notes/kei_rn_2008_1.pdf.

[6] Barry J. Nalebuff and Joseph E. Stiglitz, "Prizes and Incentives: Towards a General Theory of Compensation and Competition," *The Bell Journal of Economics* 14(1): 21-43, Spring 1983.

What Is the Status of Federally-Funded Innovation Inducement Prizes?

The following federal agencies have science and technology (S&T) programs that conduct prize competitions: the Department of Energy (DOE), the Department of Defense (DOD) including the Defense Advanced Research Projects Agency (DARPA), the Department of Health and Human Services' (HHS) Biomedical Advanced Research and Development Authority (BARDA), and the National Aeronautics and Space Administration (NASA). Each of these agencies have the statutory authority to offer prizes. **Table 1** provides an initial overview, and the text that follows provides more in-depth information.

Table 1. Federally-Funded Innovation Inducement Prizes

Agency	Competition	Technological Target	Total Prize	Status
Department of Defense (DOD)	DOD Wearable Power Prize[a]	Long-endurance, lightweight power pack for warfighters in the field.	$1.75 million.	Prizes awarded. A new competition is being considered.
	DARPA Grand Challenges[b]	Autonomous operation of unmanned ground combat vehicles	$3.5 million.	Competitions held in 2004, 2005, 2007. Awards given in 2005 and 2007. No future competitions are planned.
Department of Energy (DOE)	DOE Grand Challenges	Breakthrough achievements in research, development, and commercial application that have potential for application to performance of DOEs mission.	$1-10 million.	The three DOE Grand Challenge competitions, the Freedom Prize, H-Prize, and L-prize, are described in the following rows.
	• Freedom Prize[c]	Reduce country's dependence on foreign oil.	$1.5 million.	Competition expected to begin in 2009.
	• Hydrogen Prize (H-Prize)[d]	• Hydrogen storage, and advancements in technologies, components or systems related to hydrogen storage.	$1 million.	Competition expected to begin in 2009.
	• Bright Tomorrow Lighting Prize (L-Prize) e	Three competitions: Replacements for 60 watt (W) incandescent light and parabolic aluminized reflector (PAR) 38 Halogen lighting; and a 150 lumens/watt (lm/W) "21st Century Lamp."	$10 million for 60W incandescent lamp category; $5 million each for PAR 38 and 21st Century Lamp categories.	Ongoing 2009 competition for 60W and PAR 38 replacements. Future competition expected for 21st century lamp.

Agency	Competition	Technological Target	Total Prize	Status
	Progressive Automotive X PRIZE[f]	Clean, production-capable and super fuel efficient vehicles that exceed 100 MPG equivalent fuel economy. (MPGe)	$10 million from private sponsors; DOE provided $3.5 million for education activities.	Over 100 teams have registered for competition scheduled for 2010.
DOE and Environmental Protection Agency (EPA)	American Le Mans Series (ALMS) Green Challenge Race[g]	Encourage manufacturers to develop and introduce green technologies.	No financial prize. EPA and DOE provide in-kind support.	Two winners in 2008. In 2009, competition renamed Michelin Green X Challenge.
NASA	NASA Centennial Challenge[h]	Drive progress in aerospace technology of value to NASA's missions, and find the most innovative solutions to technical challenges.	$300,000 to $2 million.	Six ongoing competitions (described in rows below). Future competitions on other topics are planned.
	• Astronaut Glove Challenge[i]	Improve glove design to reduce effort needed to perform tasks in space and improve the durability of the glove.	$250,000.	One competition held and won. Second competition in 2009.
	• General Aviation Technology[j]	Demonstrate the performance of light aircraft that incorporate improvements to maximize fuel efficiency, reduce noise, and improve safety.	$300,000.	NASA awarded a total of $97,000 in prizes in 2008. Competition scheduled for 2011 announced in 2009.
	• Lunar Regolith Challenge[k]	Design and build robotic machines to excavate simulated lunar soil.	$750,000.	Competition held in 2008 with no winner. New competition scheduled for 2009.
	• Northrop Grumman Lunar Lander Challenge[l]	Build and fly a rocket-powered vehicle to perform simulated Lunar flight.	$2 million.	Level One of the competition completed in 2008, and $350,000 in prize money awarded. Level Two competition in 2009.
	• Power Beaming and Tether ("Space Elevator")[m]	Two competitions: Power Beaming - Wireless power transmission; Tether - Exceed current tether strength.	$2 million.	Competitions held in 2006-2008 with no winner. Competitions scheduled for 2009.
	• Lunar Oxygen Production or MoonROx[n]	Generate breathable oxygen from simulated lunar soil.	$1 million	Competition held in 2008 with no winner. Competition scheduled for October 2009.

Agency	Competition	Technological Target	Total Prize	Status
HHS	BARDA Project Bioshield[o]	Effective medical countermeasures (e.g., diagnostic tests, drugs, vaccines, and other treatments) against chemical, biological, radiological, and nuclear (CBRN) agents.	Contract that guarantees government will purchase results of research and development proposed.	Ongoing competition with annual awards of contracts beginning in 2005. Awards thus far have ranged from less than $1 million to almost $900 million.

Source: Congressional Research Service based on information cited for each competition.

a. For more information, see http://www.dod.mil/ddre/prize/topic.html. Personal communication, CRS with Karen Burrows, DOD Prize Manager, March 27, 2009.

b. For more information, see http://www.darpa.mil/grandchallenge04/sponsor_toolkit/congress_lang.pdf; DARPA, DARPA Grand Challenge 2005:Rules, October 8, 2004 at http://www.darpa.mil/grandchallenge05/Rules_8oct04.pdf; http://www.darpa.mil/grandchallenge04; http://www.darpa.mil/grandchallenge05/; http://www.darpa.mil/grandchallenge/index.asp; and Personal communication, CRS with John Jennings, DARPA, on March 26, 2009.

c. For more information, see http://www.freedomprize.org/prizes/history.php. Personal communication, CRS with Karen Hanson, Executive Director, Freedom Prize, March 27, 2009.

d. For more information, see http://www.hydrogen.energy.gov/news_hprize_foundation.html. Personal communication, CRS with Jerry Hinkle, Technical Director, H-Prize, Technology Transition Corporation, March 31, 2009.

e. For more information, see http://www.lightingprize.org/index.stm.

f. For more information, see http://www.progressiveautoxprize.org/;

g. For more information, see http://www.epa.gov/OTAQ/ld-hwy/420f08031.htm; and http://www.americanlemans.com/index_green.php

h. For more information, see http://centennialchallenges.nasa.gov/; NASA FY2009 and FY2010 Budget Requests.

i. For more information, see http://astronaut-glove.tripod.com/.

j. For more information, see http://cafefoundation.org/v2/pav_home.php.

k. For more information, see http://regolith.csewi.org/.

l. For more information, see http://space.xprize.org/lunar-lander-challenge.

m. For more information, see http://www.spaceward.org/elevator2010-pb and http://www.spacelightamerica.org/.

n. For more information, see http://moonrox.csewi.org/.

o. For more information, see CRS Report RL33907, Project BioShield: Appropriations, Acquisitions, and Policy Implementation Issues for Congress, by Frank Gottron.

Department of Defense (DOD) Wearable Power Prize

The DOD Wearable prize was authorized by the John Warner National Defense Authorization Act of 2007 (P.L. 110-36), which stated that

> The Secretary of Defense, acting through the Director of Defense Research and Engineering and the service acquisition executive for each military department, may carry out programs to award cash prizes in recognition of outstanding achievements in basic, advanced, and applied research, technology development, and prototype development that have the

> potential for application to the performance of the military missions of the Department of Defense.

In response to this general authorization, DOD decided its first competition would be development of a long-endurance, lightweight power pack for warfighters in the field.

Competition Goals

The prize competition sought to inspire the use of ground-breaking and inventive approaches to solve technical problems; reach non-traditional DOD performers by lowering the barriers for participation; inspire students, academia, private inventors, and industry alike to leverage resources and compete using innovative ideas and approaches.[7] The winner of the contest was the lightest weight system weighing 4 kg or less at the weigh-in and meeting the total energy requirement as demonstrated in the competitive demonstration (bench plus field tests). **Figure 1** provides an overview of the prize's timeline, and may be illustrative of a typical prize timetable.

Of the completed competitions, the DOD Wearable Power Prize (which was managed by DOD with contractor support as needed) appears to have been the most successful in reaching a specific technological target for the federal government as well as enhancing its network of those interested in the topic, both internally within the services, and externally among possible contractors. DOD officials are discussing the next steps to advance the technology, not only with the winners, but the other participants as well.

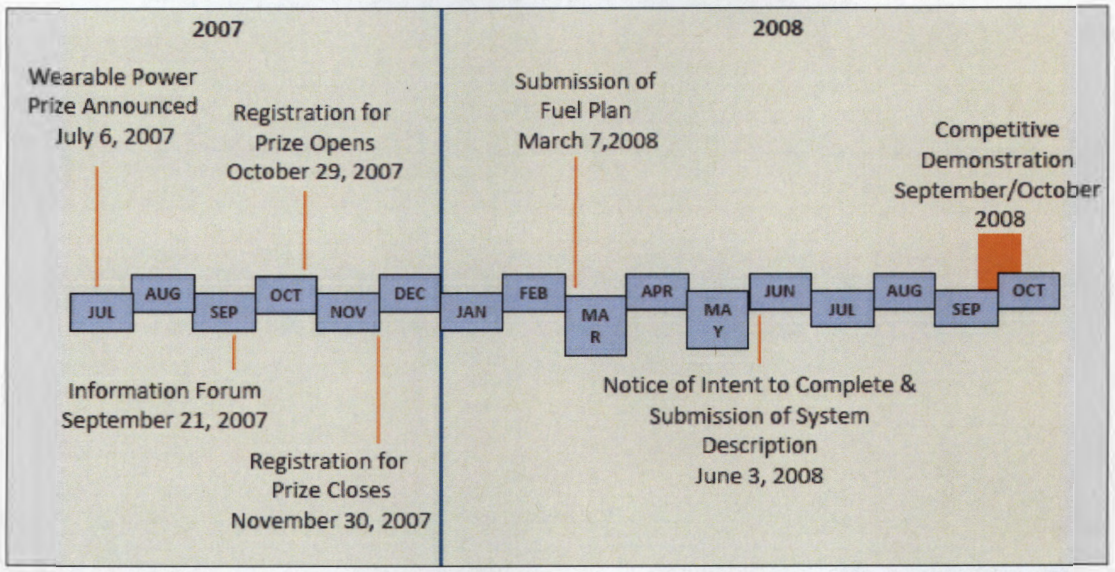
DOD Assessment of Program

DOD has assessed the benefits of the program for itself and to prize competitors, and found that the competition provided several benefits. It helped validate the status and appropriateness of DOD investments, identify new approaches, create a national awareness of the importance of wearable power, facilitated the Pentagon and military Services working together to identify a joint direction for this technology before and after the competition, and identified seven organizations and groups new to working with DOD.[8]

[7] For more information, see http://www.dod.mil/ddre/prize/topic.html.

[8] John W. Hopkins, Project Manger, Army Research Laboratory and Karen S. Burrows, Defense Research & Engineering Prize Manager, Wearable Power Prize Competition, "Wearable Power Prize Competition," powerpoint presentation, December 11, 2008.

Figure 1. DOD Wearable Power Prize Timeline



Source: DOD Wearable Power Prize Information Forum, powerpoint presentation, September 21, 2007 at http://www.dod.mil/ddre/prize/doc/WPP_IF_Brief9_21_07.pdf.

DOD's assessment concluded that there were benefits to competitors, such as those participating in the competition were able to have access to DOD-paid and validated laboratory grade testing in close-to-operational conditions, and to DOD civilian and military professionals who provided direct feedback and real-time technical assessments. Competitors were also able to interact with other teams, which enhanced collaborative discussions and networking opportunities on topics of common interest. In addition, competitors received heightened national and international publicity through news reports and web activities.

Lessons for Future

DOD analyzed its competition to identify lessons learned for future competitions. According to DOD staff, among these lessons are—

- Choosing a topic or a competition goal that will attract the broadest public interest and ability to participate;
- Involving stakeholders (e.g., possible customers and competitors) from the beginning;
- Recognizing that setting competition metrics is critical;
- Deciding if topic addresses joint-service need (or not) and executing accordingly;
- Lowering competition entry and participation barriers to enable broadest involvement;
- Deciding if screening to determine whether concepts not deemed worthy of further consideration is prudent;
- Dedicating resources for media campaign and competitor communications (from program start to finish);

- Recognizing that a final public event requires significant resources; and
- Developing a post-competition plan that addresses expectations after the competition.[9]

This competition is concluded, but DOD is currently discussing at least one additional competition on a different technological challenge as part of its overall DOD prize program.[10]

Defense Advanced Research Projects Agency (DARPA) Grand Challenges

The DARPA[11] Grand Challenges were authorized in the Bob Stump National Defense Authorization Act for Fiscal Year 2003 (H.R. 4546, Sec. 2374b), which stated

> The Secretaries of the military departments and the heads of defense agencies may each carry out a program to award cash prizes in recognition of outstanding achievements that are designed to promote science, mathematics, engineering, or technology education in support of the missions of the U.S. Department of Defense.[12]

In response to the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (S. 2549, Sec. 217), which stated, "It shall be a goal of the Armed Forces to achieve the fielding of unmanned, remotely controlled technology such that by 2015, one-third of the operational ground combat vehicles of the Armed Forces are unmanned," DARPA decided to focus on autonomous robotic ground vehicles.[13]

Competition Goals

According to DARPA, the Grand Challenges sought to promote innovative technical approaches that would enable the autonomous operation of unmanned ground combat vehicles. These autonomous ground vehicles were to navigate from point to point in an intelligent manner to avoid or accommodate obstacles including nearby vehicles and other impediments. For the contest, DARPA held field tests of autonomous ground vehicles over realistic terrain and set specific performance goals for distance and speed. DOD planned to make three awards, first place for $2 million, second place for $1 million, and $500,000 for third place.[14]

The intent of the Grand Challenge program was to encourage participation by nontraditional partners so they might offer new, innovative ways of thinking that can lead to breakthroughs in various scientific or technological challenges. The cost of developing, fielding, and insuring entered vehicles was the sole responsibility of the individual teams. DARPA did not provide

[9] Ibid.

[10] Personal communication, CRS with Karen Burrows, DOD Prize Manager, March 27, 2009.

[11] DARPA is located at the Department of Defense. For more information, see CRS Report RL34497, *Advanced Research Projects Agency - Energy (ARPA-E): Background, Status, and Selected Issues for Congress*, by Deborah D. Stine.

[12] For more information, see http://www.darpa.mil/grandchallenge04/sponsor_toolkit/congress_lang.pdf.

[13] Autonomous vehicles are "driverless vehicles," where a human does not need to be inside the vehicle to operate it.

[14] DARPA, DARPA Grand Challenge 2005:Rules, October 8, 2004 at http://www.darpa.mil/grandchallenge05/Rules_8oct04.pdf.

funding for the purpose of Grand Challenge entry or participation. Teams underwent a qualification process that included submission of the application, submission of an acceptable vehicle specification sheet and video demonstration, successful performance at the site visit, selection for the National Qualification Event (NQE), submission of an appropriate technical paper and successful performance at the NQE. The NQE was the final qualification featuring a course that measures and tests vehicle capabilities where semifinalists vie for selection for the Grand Challenge Event.

Competitions

In 2004 and 2005, DARPA held Grand Challenges, and in 2007, DARPA hosted the Urban Challenge—an autonomous vehicle race through traffic. In 2004, participants were to develop vehicles that will navigate a course. No team entry successfully completed the designated route, and no award was made.[15]

In 2005, the DARPA Grand Challenge was similar to that in 2004. However, the test was in a different location that included 132 miles in desert terrain. Five teams completed the course, and first, second, and third place were awarded.[16]

In 2007, the DARPA Urban required teams to build an autonomous vehicle capable of driving in traffic, performing complex maneuvers such as merging, passing, parking and negotiating intersections. Eleven teams qualified and there were three winners.[17]

DARPA currently has no plans to hold an additional Grand Challenge event at this time. Should an additional challenge be held, it would likely focus on a different topic.[18]

DARPA Assessment of Program

According to DARPA, its Urban Challenge showed "breakthrough advances in autonomous vehicle capability and demonstrated for the first time autonomous vehicle operation in traffic," which is "being absorbed by the community, as expectations have been raised regarding autonomous vehicle capability and performance."[19] Teams that participated in the competition have begun identifying transition targets and partners. For example,

> Oshkosh Truck, which fielded Team Oshkosh Truck, has planned logistics demonstrations for the U.S. Army and U.S. Navy on vehicle platforms such as the Medium Tactical Vehicle Replacement, Palletized Load System, and Heavy Expanded Mobility Tactical Truck, and will demonstrate their vehicle for U.S. Army's Tank-Automotive Command Life Cycle Management Command.[20]

DARPA made the following overall assessment of its program:

[15] Personal communication, CRS with John Jennings, DARPA, on March 26, 2009.

[16] For more information, see http://www.darpa.mil/grandchallenge04/.

[17] For more information, see http://www.darpa.mil/grandchallenge05/.

[18] For more information, see http://www.darpa.mil/grandchallenge/index.asp.

[19] DARPA, *Prizes For Advanced Technology Achievements: Fiscal Year 2007 Annual Report*, January 2008 at http://www.darpa.mil/GRANDCHALLENGE/docs/DDRE_Prize_Report_FY07.pdf.

[20] Ibid.

> The Urban Challenge program achieved its program goals and stimulated interest in the programs and projects of interest to the DoD Science and Technology (S&T) community. It was successful in attracting considerable joint investment by the participants and their sponsors, effectively leveraging Government investment in the program. The technical challenge was carefully defined and staged to bring coherence to the community and increase the chance for cross-fertilization among competing groups. The solicitation and qualification process was successful in attracting a large pool of strong teams with participation from the defense industry, automotive industry, academia, as well as a number of smaller organizations. This investment in expanding the community will continue to pay dividends as DoD benefits from a strengthened commercial sector autonomous vehicle technical community. The program has been successful in attracting many young people to work on S&T problems in areas affecting national security, and benefits are expected to accrue for many years as this group enters the work force.
>
> The DARPA Grand Challenges in 2004 and 2005 made significant strides toward a day when autonomous robotic vehicles will perform hazardous tasks on the battlefield that today put America's fighting force in harm's way. In addition to saving lives, the technology will reduce stress on manpower requirements by requiring fewer support people. The DARPA Urban Challenge continued the acceleration of autonomous ground vehicle technology, making possible deployment on the battlefield within the timelines established by Congress.[21]

Department of Energy (DOE) Grand Challenges

The DOE Grand Challenges were authorized by the Energy Policy Act of 2005 (P.L. 109-58, Title X, Sec. 1008; EPACT 2005), in a section entitled "Prizes for Achievement in Grand Challenges of Science and Technology." This act states that "The Secretary may carry out a program to award cash prizes in recognition of breakthrough achievements in research, development, demonstration, and commercial application that have the potential for application to the performance of the mission of the Department." The Freedom Prize was created in the same act. The Energy Independence and Security Act (EISA) amended EPACT 2005 to create two additional prizes, the Hydrogen Prize (H-Prize) and the Lighting Prize (L-Prize). These prizes are scheduled to begin their activities in 2009.

Freedom Prize

The purpose of the Freedom Prize, authorized in EPACT 2005, is to encourage and recognize the development and deployment of processes and technologies that will improve America's national security, economic prosperity, and health by reducing the country's dependence on foreign oil.[22] The prize is to reward innovative deployment of existing technologies in five broad categories which include industry, military, schools, government and community. The first Freedom Prize competition, focused on school districts, is scheduled to begin in 2009. The Freedom Prize Foundation plans to give several awards, with total of $1.5 million in prizes.[23]

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[21] DARPA, *Prizes For Advanced Technology Achievements: Fiscal Year 2007 Annual Report*, January 2008 at http://www.darpa.mil/GRANDCHALLENGE/docs/DDRE_Prize_Report_FY07.pdf.

[22] For more information, see http://www.freedomprize.org/prizes/history.php.

[23] Personal communication, CRS with Karen Hanson, Executive Director, Freedom Prize, March 27, 2009..