

Peter H. Diamandis, Chairman, X PRIZE Foundation
Remarks before the Select Committee on Energy Independence
and Global Warming - September 16, 2010

Chairman Markey, Representative Sensenbrenner and distinguished members of the Select Committee on Energy Independence and Global Warming.

As the founder and Chairman of the X PRIZE Foundation, I want to thank this Committee and especially you, Chairman Markey, for this opportunity to speak about the X PRIZE Foundation and our mission to bring about radical breakthroughs for the benefit of humanity. We do this by creating and managing prizes that drive innovators to solve some of the greatest challenges facing the world today.

Our belief is that a small group of people with passion for a cause can achieve that which has never been attained. This is why we stage competitions that drive innovation and challenge issues that matter most.

The X PRIZE Foundation is a non-profit educational prize institute. We conduct competitions in four major areas: 1) energy and environment – which we are here to talk about today, 2) exploration, 3) life sciences, and 4) education and global development.

The Progressive Insurance Automotive X PRIZE is the third major incentive prize we have awarded since the founding of the X PRIZE in 1996. In 2004, we awarded the \$10M Ansari X PRIZE for the first private suborbital spaceflight; last year, we awarded \$2.5M to the winners of NASA's Centennial Challenge for the development of private Lunar Lander capability, and today, we awarded \$10M to three classes of winners in the Progressive Automotive Insurance X PRIZE. In addition to these competitions, our other active prize competitions include the \$10M Archon Genome X PRIZE; the \$30M Google Lunar X PRIZE; and the \$1.4M Wendy Schmidt Oil Cleanup X Challenge we announced just this July to help mitigate the cleanup of oil spills in sea water.

\$10 million Progressive Insurance Automotive X PRIZE

The goal of the \$10 million Progressive Insurance Automotive X PRIZE was to inspire a new generation of viable, super-efficient vehicles that can achieve 100 miles per gallon or energy equivalent (MPGe). During this

competition, we have been able to highlight some of the world's most innovative technologies in fuel efficiency.

Since launching the competition with our title sponsor Progressive Insurance in April 2008, the competition attracted 111 teams with 136 different vehicle concepts. We then narrowed the field to seven teams with nine vehicle finalists, and today, we awarded three winners in the two main classes:

Half of the \$10M purse is for a Mainstream Class winner (name of winner). The remaining \$5M was split between the two winners in the Alternative Class – one vehicle with side-by-side seating, and one vehicle with tandem seating.

- **Mainstream vehicles** must carry four or more passengers, have four or more wheels, and offers at least 200 miles range.
- **Alternative vehicles** must carry two or more passengers, have no constraints on the number of wheels, and offers at least 100 miles range.

To win, the teams had to prove, through technical designs, business plans, and on-track testing, that their vehicle was fuel efficient, production capable, safe:

FUEL EFFICIENT:

- Achieve at least 100 MPGe fuel economy
- Emit less than 200 g/mi CO₂
- Meet EPA emissions requirements for criteria pollutants (200 g/mi CO₂e well-to-wheels greenhouse gas emissions and low tailpipe emissions)

PRODUCTION CAPABLE:

- Manufactured in at least 10,000 units/year by no later than by the end of 2014
- Meet minimum requirements for performance and features

SAFE:

- Meet key Federal Motor Vehicle Safety Standards (FMVSS)

AFFORDABLE:

- Offered at a price point consistent with historical examples of comparable vehicles manufactured in volumes of at least 10K units per year.

In summary, there are nine major achievements we believe we achieved through the Progressive Automotive Insurance X PRIZE competition:

- (1)**Opened up innovation** beyond the walls of any one company or industry, and showed that it is possible to achieve breakthrough efficiency in passenger vehicles while meeting consumer expectations for safety and performance, with technology available today.
- (2)**Attracted entrepreneurs and experts** from all walks of life, from automotive to aerospace and IT.
- (3)**Attracted investors** to the competing teams by verifying the viability of their technologies and provided avenues for raising capital.
- (4)Tapped the expertise of dozens of automotive experts and **put them to work** evaluating these vehicles and conducting the competition.
- (5)**Galvanized the supply base** to deliver cutting edge systems for prove-out in competing vehicles.
- (6)Reached millions of people to **raise awareness** of the importance of vehicle efficiency, the viability of the technology available today to deliver it, and to **stoke demand** for super efficient cars.
- (7)**Advanced MPGe** (Miles per Gallon or Energy Equivalent) as a new standard for measuring fuel economy that will allow consumers to make an apples-to-apples comparison of the next generation of vehicles that will likely use a variety of fuels and energy sources with the conventional cars they drive today.
- (8)Very importantly, **Inspired students and adults** to seek careers in the science and engineering professions.
- (9)Demonstrate a **very successful Public – Private Partnership** through our work with Department of Energy.

Importance of Public Private Partnerships

Regarding our DOE “Public-Private Partnership”, this relationship was a critical element in the success of the Progressive Automotive X PRIZE. DOE’s extensive facilities, resources and expertise that were made available

for testing, evaluation, validation were instrumental in the execution of the competition. We thank them profusely for their time, professionalism, invaluable contributions and partnership in driving innovation in next generation fuel efficient, clean energy vehicles.

Going forward, the X PRIZE Foundation hopes to create similar collaborations with multiple federal agencies and we look forward to cooperating with this committee as we forge those public, private, and academic relationships to advance these shared technical, social and environmental goals.

Again, thank you for the work being performed by this committee and the opportunity to present to you today.

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- 1. Tested a variety of real world solutions (not just ideas on a drawing board) at the same time and judged the best design on its merits
 - Retrofit/New, Big/Small; 2, 3, and 4 wheels
 - Gas, Ethanol, Batteries
 - Vehicles employing one electric motor, two motors, four motors
 - Vehicles with and without regenerative braking
- 2. Broke the paradigm of incremental improvements to the conventional automobile

- Notable innovations included:
 - Teams cited that meet competition requirements, design decisions were not optimized for the best possible MPGe; but for the most production-worthy, high-volume design while still meeting the 100MPGe target.
 - Pistol grip steering that could replace the steering wheel (TW4XP)
 - Automated retractable outriggers to stabilize two-wheel vehicles
 - Use of body panels with foam rubber padding (Spira) and fiberglass to reduce weight and potential for injury to pedestrians and animals
 - Vehicles that cost less than 2 cents per mile to drive and ¼ the cost of ownership of a Prius
 - Near zero maintenance, super-long life, dent resistant body, lightweight, 3x stronger than steel
 - ‘As evidenced by the Toyota Prius and others like it, the technology exists today to improve the efficiency of Internal Combustion Engines. To achieve breakthrough levels of efficiency, however, upwards of 100 MPGe, requires more radical approaches of the likes observed during this competition. In addition to battery chemistry and electrification, this includes novel approaches to aerodynamic design, light-weight materials, and engine down-sizing to name a few.’
- Notable Quotes:
 - "The X PRIZE accelerated the pace of Li-Ion’s safety systems, for example, the requirements for electrical shut-down in the case of an accident." – Ron Cerven, Li-Ion Motors Corp Team Lead

- “We’ve done a year’s worth of development in three months.” – Tom Reichenbach, Aptera
- “[After 26 years in the auto industry], to my knowledge no one in Detroit, or at least that I had worked with, had ever developed a vehicle really trying to maximize efficiency.” – Paul Wilbur, CEO, Aptera
- “[The PIAXP competition] was a great idea to push technology. It’s pushing lighter-weight materials and new technologies and power trains, new mindsets in the construction of vehicles, and you have to break some of the paradigms in order to get to 100-miles-per-gallon equivalent. You can’t just take the same old vehicle and try to tune it. It’s not gonna get there.” – Paul Wilbur, CEO, Aptera
- “The Automotive X-Prize is definitely a launching pad for us, but our whole business plan around our company is trying to really make a difference.” – Paul Wilbur, CEO, Aptera
- “The competition and the timing of the competition, and knowing that we’re competing against other teams, it’s raised our game.” – Paul Wilbur, CEO, Aptera
- “I think one of the best things the competition has done for our company is made us realize we have a vehicle that we need to get into the market place sooner than later.” – Gary Starr, CEO, ZAP

Official Messages:

- Working together, the X PRIZE Foundation and Progressive Insurance have strived to change the paradigm of “mainstream” vehicles by providing a global platform focused on efficiency, emissions, performance, capability, safety. The innovative technologies brought forth in this competition were astounding and further proved the purpose behind prize competitions – to make the impossible possible.
- The Progressive Insurance Automotive X PRIZE was designed to attract entrepreneurs and innovators from multiple domains, not just automotive. By putting new eyes on the problem of vehicle efficiency, the competition aims to encourage breakthrough thinking and to accelerate a wave of disruptive innovation that will transform and reinvigorate the auto industry.
- The competition format serves as an engaging platform to inspire innovators, capture public attention and attract capital investment to speed the pace of technology development, improve the odds

of commercial success and accelerate the timetable for achieving broad goals in the public interest. There are many more groundbreaking ideas that can come about because X PRIZES leverage media to attract public interest, investment, and competitors.

- It is clear that there are great innovations happening all around us. The Progressive Insurance Automotive X PRIZE has proven itself as a fair, balanced and objective way for manufacturers to showcase their technologies— one that Consumers Union stands behind.
- X PRIZES also serve as powerful education tools to engage the public, inform them of all of the options they may have in the near term, and stimulate demand for the products developed by competition participants. We believe the Progressive Insurance Automotive X PRIZE is positioned to make a significant impact on the automotive marketplace.
- The Progressive Insurance Automotive X PRIZE and its partner Consumer Reports will champion MPGe as a robust, transparent, and fuel neutral standard that consumers can use to make an apples-to-apples comparison of fuel economy as cars designed to use a variety of fuels and energy sources begin arriving at showrooms.