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## MISSISSIPPI STATE UNIVERSITY STUDENTS WIN GM AND DOE CHALLENGE X 2008 COMPETITION

*Engineering Students Design "Green" Hybrid-powered Vehicle  
University of Wisconsin and Ohio State University Finish Second and Third*

**Washington, D.C.** – Mississippi State University, for the second consecutive year, has earned top honors in General Motors (GM) and the U.S. Department of Energy's (DOE) Challenge X student engineering competition. Over the past nine months, the 2008 Challenge X: Crossover to Sustainability competition challenged 17 university teams from the U.S. and Canada to reengineer a Chevrolet Equinox that employs advanced powertrain technologies. The goal is to produce a vehicle that has improved fuel economy and lower emissions, all while maintaining driver comfort and vehicle performance. University teams have followed a real world vehicle development process and integrated their advanced technology solutions into their Equinox vehicles. GM and DOE, lead sponsors for the competition, congratulated students from the 17 participating universities at a finish line ceremony this morning.

The Mississippi State team designed a through-the-road parallel hybrid electric vehicle powered by a 1.9L GM direct injection turbo diesel engine fueled by bio diesel (B20). It achieved a 38 percent increase in fuel economy over the production vehicle on a modified urban test cycle.

The second place vehicle, engineered by students at the University of Wisconsin is a through-the-road parallel hybrid electric vehicle with a 1.9L GM direct injection turbo diesel engine fueled by B20. Ohio State University was awarded third place for its power-split hybrid electric vehicle powered by a 1.9L GM direct injection turbo diesel engine and fueled by B20.

"I want to congratulate this year's Challenge X champion, Mississippi State University, and all of the other participants for their innovative designs and applications of advanced clean vehicle technologies," U.S. Secretary of Energy Samuel W. Bodman said. "This competition is a unique demonstration of how tremendous technological advancements that are occurring at universities across North America can help us achieve a new energy future -- one that is cleaner, more sustainable, more affordable, more secure and less reliant on carbon-based fossil fuels."

Beth Lowery, GM Vice President, Environment, Energy, and Safety Policy said advanced powertrain technologies and alternative fuels play a key role in GM's overall strategy to help decrease the nation's dependence on petroleum and reduce greenhouse gas emissions.

"From colleges across North America, Challenge X students have developed vehicles that are right in line with GM's strategy and thinking," said Lowery. "At GM we're excited about the real-world training and experience Challenge X students have received."

Other Challenge X sponsors, including The MathWorks National Instruments, Freescale Semiconductor, Johnson Controls, Caterpillar and MotoTron, also have hired students from the program.



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“The Government of Canada is proud to support the Challenge X competition,” said Canada's Ambassador to the United States, Michael Wilson, on behalf of the Honourable Gary Lunn, Minister of Natural Resources. “Forums like Challenge X give our engineers of tomorrow a chance to prove that they can design emissions-free vehicles that function optimally. Today, more than ever, we need to make clean and innovative vehicles a reality.”

Challenge X is a unique engineering competition that provided 17 university teams from across North America the opportunity to follow the GM Global Vehicle Development process and develop advanced propulsion technology solutions that will increase energy efficiency and reduce environmental impact. The teams used a variety of alternative fuels including biodiesel (B20), ethanol (E85), reformulated gasoline and hydrogen.

Here are some additional highlights of the Challenge X vehicles:

- **Plug-in Hybrid** – **The University of California at Davis** is the only team to use plug-in hybrid technology for the energy source for its Challenge X vehicle.
- **Biodiesel Fuel Source** – Twelve teams used biodiesel fuel (B20).
- **Hydrogen Fuel Cell** – **The University of Waterloo** has a dedicated hydrogen fuel cell for its primary propulsion source, and as a result, its vehicle emits zero emissions from the tailpipe.
- **Hydrogen Fuel Source** – **Pennsylvania State University, Texas Tech University** and the **University of Tulsa** used hydrogen as a supplementary or secondary propulsion source. Penn State injected hydrogen into its vehicle's diesel engine as an emissions abatement strategy.
- **Belt Alternator/Starter Technology** – Five teams, including **Ohio State University** and **Virginia Tech**, used belt alternator/starter technology for an electric performance assist in their vehicles.
- **Ultracapacitors** – **West Virginia University** and the **University of Akron** used ultracapacitors to source high levels of power for short periods of time and recapture energy from braking.

The first year of the program, which began in 2004, focused on vehicle simulation, modeling and subsystem development, and testing. In years Two and Three, students integrated their advanced powertrains and subsystems into the Chevrolet Equinox. In the fourth year, students focused on customer acceptability and over-the-road reliability and durability of their advanced propulsion systems with real-world evaluation outside of the laboratory and proving ground environments.

The 17 teams that participated in Challenge X are: Michigan Technological University; Mississippi State University, The Ohio State University; Pennsylvania State University; Rose-Hulman Institute of Technology, San Diego State University, Texas Tech University; University of Akron; University of California, Davis; University of Michigan; University of Tennessee; University of Texas at Austin, University of Tulsa, University of Waterloo, University of Wisconsin; Virginia Tech; and West Virginia University.

DOE and GM are the headline sponsors for Challenge X. Other sponsors include Natural Resources Canada; The MathWorks; National Instruments; Freescale Semiconductor; AVL Powertrain Engineering, Inc.; National Science Foundation; Sensors, Inc.; Cobasys; Johnson Controls-SAFT Advanced Power Solutions; Ballard Power Systems, Inc.; Renewable Fuels Association; Caterpillar, Inc.; MotoTron Corporation; XM Radio, OnStar and Siemens PLM Software.

Additional information about the Challenge X competition is available on the Web at:  
<http://www.challengex.org>

**EcoCAR: The Next Competition from DOE and GM**

*EcoCAR: The NeXt Challenge* is a new national collegiate competition series that kicks off in the Fall of 2008. Sponsored by the DOE and GM as well as Natural Resources Canada and others, EcoCAR will challenge university engineering students across North America to design and build advanced propulsion solutions that are based on the vehicle categories from the California Air Resources Board (CARB) zero emissions vehicle (ZEV) regulations. Students will be encouraged to explore a variety of solutions including electric, hybrid, plug-in hybrid and fuel cells. In addition, they will incorporate lightweight materials, improve aerodynamics and utilize alternative fuels such as ethanol, biodiesel and hydrogen.

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**High-resolution photos of this event are available online at <http://www.digitalrailroad.net/challengex>**

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