Freescale Semiconductor, Inc. is a global leader in the design and manufacture of embedded semiconductors for the automotive, consumer, industrial, networking, and wireless markets. Freescale became a public traded company in July 2004 after more than 50 years as part of Motorola, Inc. The company is based in Austin, Texas, and has design, research and development, manufacturing or sales operations in more than 30 countries. Freescale, a member of the S&P 500®, is one of the world’s largest semiconductor companies with 2005 sales of $5.8 billion (USD).

Challenge X design teams will receive Freescale hardware development tools, software, and training based on our industry-leading PowerPC® microcontrollers. Using the same products designed into General Motors powertrain engine control systems around the world, the Challenge X teams will gain real-world experience in real-time engine management applications, from fuel and spark control to emissions and vehicle diagnostics. Freescale is also providing each team with our CodeWarrior development studio, which provides state-of-the-art debugging technology with a highly visual and automated framework that accelerates design development.

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AVL

Austria, headquartered in Graz, Austria, is the world’s largest privately owned and independent company for the development of gasoline, diesel, and alternative fuel powertrain systems, as well as fuel cell and hybrid technologies. The company, which also manufactures powertrain instrumentation and test systems, guarantees close cooperation with customers by affiliates and local offices worldwide. AVL’s North American Headquarters is located in the Detroit suburb of Plymouth, Michigan.

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BP

BP has transformed: growing from a local oil company into a global energy group, employing over 100,000 people and operating in over 100 countries worldwide. In addition, the company is committed to making a positive contribution and has taken a leadership role toward a cleaner environment. BP delivers cleaner-burning and lower-emissions fuels to more than 115 cities worldwide that have serious air quality problems. As vehicle technology continues to advance, fuels and lubricants must also change to keep pace with the new technology. Several years ago, BP introduced ECD® an emissions control (ultra-low sulfur) diesel fuel that helps sulfur-sensitive control systems operate effectively. BP is supplying a wide spectrum of fuels to the Challenge X teams, including biodiesel (B20), a fuel that helps sulfur-sensitive control systems operate effectively. BP is supplying a wide spectrum of fuels to the Challenge X teams, including biodiesel (B20), ethanol (E85), and Hydrogen.

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The MathWorks is the leading developer and supplier of technical computing software. Employing more than 1,000 people, The MathWorks was founded in 1984 and is headquartered in Natick, Massachusetts, with offices and representatives throughout the world. The MathWorks customers are over 500,000 of the world’s leading technical people, in over 100 countries, on all seven continents. They work at innovative companies, government research labs, financial institutions, and at more than 3,500 universities. They rely on us because MATLAB® and Simulink® have become the fundamental tools for their engineering and scientific work. By sponsoring Challenge X, The MathWorks realizes its mission of support for math and science education endeavors, fostering growth opportunities for those who will make contributions and discoveries in the future.

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The National Science Foundation (NSF) has been a long-time supporter of the U.S. Department of Energy’s advanced vehicle technology competitions. In addition to providing financial support to Challenge X, each year the NSF provides two $15,000 awards to faculty members who have made significant contributions to the goals of the Challenge X program and to engineering education. This year the will be eight $100,000 awards for the outstanding faculty advisor(s) award sponsored by NSF. NSF is an independent federal agency that supports fundamental research and education across all fields of science and engineering, with an annual budget of nearly $5.58 billion. NSF funds reach all 50 states through grants to nearly 2,000 universities and institutions. Each year, NSF receives about 42,000 competitive requests for funding and makes about 9,800 new funding awards. The NSF also awards over $425 million in professional and service contracts yearly.

SPONSOR WEB SITE www.nsf.gov

Cobasys

Cobasys is a joint venture between Chevron Technology Ventures LLC, a subsidiary of Chevron Corporation and Energy Conversion Devices. Cobasys is committed to bringing advanced, integrated energy storage system solutions into widespread commercial production for transportation and stationary applications. Our vision is to be recognized as the world’s most admired energy storage solutions company.

Cobasys offers complete plug-and-play NiMhax® system solutions for Hybrid Electric Vehicles (HEV), Electric Vehicles (EV), Heavy Duty Vehicles (HDV), and 42-volt applications. Our patented Nickel Metal Hydride (NiMH) technology and NiMhax® battery systems have been proven over millions of miles of real-world use in cars, trucks, and buses. Cobasys is also developing battery solutions for Uninterruptible Power Supply (UPS), Telecom stationary power systems, and Distributed Generation Systems. NiMHar®, NiCopt®, and NiGed® battery systems can be easily configured to provide the power and energy you require. Our NiGed® solutions offer owners a durable, reliable back-up power system that provides long life over a wide range of environmental conditions and in one-third the space of conventional lead acid batteries.

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Chevron is an integrated global energy company participating in virtually all aspects of the global energy business. It is the second largest U.S.-based energy company and the fifth largest in the world. Chevron’s 47,000 employees work in approximately 180 countries around the world, producing oil and natural gas and marketing fuels and other advanced energy products. Chevron, through Chevron Technology Ventures, is involved with identifying, developing, and commercializing new and emerging technologies and new energy systems that promise to play an increasingly important role in the world’s energy mix and environmental stewardship. Such activities include fuel processing, hydrogen infrastructure, and advanced batteries. Technology Ventures is actively engaged in developing and commercializing several key enabling technologies through internal development, joint ventures, and equity investments to create new market opportunities for the next generation of clean, efficient energy systems.

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PLATINUM SPONSORS

Natural Resources Natural Resources Canada (NRCan) has been a long-time supporter of the U.S. Department of Energy’s advanced vehicle technology competition program, providing technical and program support for more than 20 competitions over 16 years. Challenge X underscores NRCan’s commitment to addressing greenhouse gas reductions and supporting sustainable energy policies and advanced automotive technologies. NRCan provides knowledge, expertise, and program activities for the sustainable development and use of Canada’s natural resources and to support the global competitiveness of its resource and related sectors. This includes energy activities that encompasses policy development, market development programs, and international activities in energy efficiency, renewables, transportation technologies, alternative fuels, and conventional fuels.

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The MathWorks

For 30 years, National Instruments has been a technology pioneer and leader in virtual instrumentation—a revolution concept that has changed the way engineers and scientists in industry, government and academia approach measurement and automation. Leveraging PCs and commercial technologies, virtual instrumentation increases productivity and lowers costs for test, control, and design applications through easy-to-integrate software, such as NI LabVIEW, and modular measurement and control hardware for PXI, PCI, PCI Express, USB and Ethernet. Headquartered in Austin, Texas, NI has more than 3,800 employees and direct operations in nearly 40 countries. For the past seven years, FORTUNE magazine has ranked NI one of the 100 best companies to work for in America.

In addition to providing an NI Application Engineer advisor to each team for product support and expertise, throughout all phases of the competition, NI will also donate more than $700,000 in software, hardware, and training products to participating teams.

Through its support of the Challenge X competition, NI continues its commitment to education by providing tomorrow’s engineering leaders with tools to be successful today and in the future.

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Gold sponsors

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Cobasys is a joint venture between Chevron Technology Ventures LLC, a subsidiary of Chevron Corporation and Energy Conversion Devices. Cobasys is committed to bringing advanced, integrated energy storage system solutions into widespread commercial production for transportation and stationary applications. Our vision is to be recognized as the world’s most admired energy storage solutions company.

Cobasys offers complete plug-and-play NiMhax® system solutions for Hybrid Electric Vehicles (HEV), Electric Vehicles (EV), Heavy Duty Vehicles (HDV), and 42-volt applications. Our patented Nickel Metal Hydride (NiMH) technology and NiMhax® battery systems have been proven over millions of miles of real-world use in cars, trucks, and buses. Cobasys is also developing battery solutions for Uninterruptible Power Supply (UPS), Telecom stationary power systems, and Distributed Generation Systems. NiMHar®, NiCopt®, and NiGed® battery systems can be easily configured to provide the power and energy you require. Our NiGed® solutions offer owners a durable, reliable back-up power system that provides long life over a wide range of environmental conditions and in one-third the space of conventional lead acid batteries.

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At Ballard Power Systems, our vision is Power to Change the World. 

Ballard Power Systems, Inc. (TSX:BLDP) is a leading developer of zero-emissions fuel cell powertrains for transportation, stationary, and portable applications. The Ballard family of PEM fuel cell products includes solutions for transit buses, automobiles, and trucks using Ballard fuel cell engines, and electric drives to form complete fuel cell power trains. With Ballard, you can:

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**dSPACE**

dSPACE is a market innovator and leading producer of engineering tools for embedded controller development. We provide integrated systems for prototyping/control algorithms, automatic production code generation, controller testing, controller calibration, and engineering support services. We look forward to participating in the Challenge X competition as an opportunity to empower student engineers to quickly develop innovative solutions to the challenges of reduced emissions, increased performance, and driver satisfaction. Our robust and comprehensive ECU development environment can dramatically reduce development time and costs while providing increased flexibility for continuous modifications throughout the process. Today, more than 12,000 dSPACE systems are in wide use, serving customers in the automotive, aerospace, agricultural, educational, engineering, robotics, and noise & vibration industries.

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**SEMTech**

SEMTech sensors, Inc., is the leading manufacturer of portable emissions test systems for real-world applications. Our products reflect an engineering focus on innovation, timeliness, and quality, as well as the latest manufacturing techniques. Sensors, Inc., also provides solutions for engine test cells, end-of-line testing, and comparison studies of after-treatment devices and fuel additives. Technologies include NOxR, NOxV, and FID for gaseous measurements; pressure differential for total exhaust flow and mass measurement of particulate using a quartz crystal microbalance technique; and partial dilution sampling systems. The SEMTECH product line includes in-use diesel and gasoline engine test systems (SEMTECH-D, SEMTECH-G, and SEMTECH EFM). Sensors’ headquarters houses administrative, engineering, and manufacturing facilities and is located in Saline, Michigan.

**SPONSOR WEB SITE** www.sensors-inc.com

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**Dana Corporation**

Dana Corporation is a global leader in the design, engineering, and manufacture of value-added products and systems for automotive, commercial, and off-highway vehicle manufacturers and their related aftermarkets. Delivering on a century of innovation, the company’s continuing operations employ approximately 45,000 people worldwide dedicated to advancing the science of mobility. Founded in 1914 and based in Toledo, Ohio, Dana operates hundreds of technology, manufacturing, and customer service facilities in 30 countries. The company reported sales from continuing operations totaling $7.9 billion in 2003.

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**Vector**

Vector is a recognized pioneer in the development of CAN, FlexRay, and LIN development tools and embedded software components. Our tool suite includes CANoe for network development through testing, CANalyzer for network analysis; and CANape Graph for measurement, calibration, and diagnostics. Vector is also the official software provider of GMLAN, DC Embedded, and FNOS. With over 15 years of experience, Vector provides an international presence with offices in Europe, North America, and Japan.

vector is proud to be a sponsor of the ChallengeX program. Universities use Vector tools throughout the world to educate the future engineering leaders for the industry challenges today and the future.

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**CAT®**

For more than 80 years, Caterpillar, Inc., has been building the world’s infrastructure and, in partnership with its worldwide dealer network, is driving positive and sustainable change on every continent. With 2005 sales and revenues of $36.3 billion, Caterpillar is a technology leader and the world’s leading manufacturer of construction and mining equipment, diesel and natural gas engines, and industrial gas turbines.

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**UGS**

UGS is a leading global provider of product lifecycle management (PLM) software and services with nearly 4 million licensed seats and 46,000 customers worldwide. UGS is the leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams. UGS is a leading provider of product lifecycle management software development to many of the Challenge X teams.
OnStar, a wholly owned subsidiary of General Motors, is the nation’s leading provider of in-vehicle safety, security, and communication services using wireless technology and the Global Positioning System (GPS) satellite network. OnStar is available on more than 50 GM models for 2006. By the end of 2007, OnStar will be a standard feature for GM’s retail customers in the United States and Canada, covering all segments and prices except for some commercial vehicles. OnStar safety and security services include automatic notification of air bag deployment, stolen vehicle location assistance, emergency services, roadside assistance, remote door unlock, and GM Goodwrench remote vehicle diagnostics. OnStar Hands-Free Calling allows drivers to make and receive hands-free, voice-activated calls from their vehicle. More information about OnStar can be found at www.onstar.com.

OnStar by GM

**CHALLENGE X SPONSORS**

- **DTE Energy** promotes the clean and efficient development of energy technologies. DTE Energy is the nation’s leading provider of in-vehicle safety, security, and information services. More information on DTE Energy can be found at www.dteenergy.com.

- **HVACR** is a leading developer of high-voltage capacitors for electric utility switchgear, CVT, and laboratory radiation-intensive environments.

- **Igus, Inc.** develops and manufactures industry-leading, plastic-based cable carriers, continuous-flex cables, and plain and linear bearings. With more than 28,000 products, the company markets to Energy Chain Systems® to guide and protect moving cables and hoses; Chaintite® cables designed specifically for use in Energy Chain Systems; iglid® self-lubricating, oil-free, plastic bearings; DryLin® linear guide systems; and igus® spherical bearings worldwide. Igus fosters the mechanical design ideas of students by offering free product donations in conjunction with its Y.E.S. (Young Engineers Support) Program. The program aims to not only support students and engineers, but also to educate them on the merits and benefits of plastic components. For more information about the Y.E.S. Program, please visit www.igus.com/yesprogram.

- **Hydrogenics** is a world leading developer and manufacturer of hydrogen and fuel cell systems and test equipment for fuel cells. Hydrogenics Power Systems group currently maintains an early market focus, offering high-performance HyPM® fuel cell power products for a range of applications that today target light mobility and backup and auxiliary power. As a pathway to tomorrow’s larger commercial power markets, these early niche markets have the potential to develop into substantially larger commercial markets, these early niche markets have the potential to change the way the world makes and uses energy for the benefit of future generations—offering clean and sustainable solutions that don’t compromise the performance and reliability that our growing energy needs demand.

- **Maxwell** is a leading developer and manufacturer of high-voltage capacitors and multi-cell modules and POWERCAGE® backup power systems provide safe and reliable power solutions for applications in consumer and industrial electronics, transportation, and telecommunications. Our CONDIS® high-voltage grading and coupling capacitors help to ensure the safety and reliability of electric utility infrastructure and other applications involving transport, distribution, and measurement of high-voltage electrical energy. Our radiation-mitigated microelectronic products include power modules, memory modules, and single-board computers that incorporate powerful commercial-silicon for superior performance and high reliability in aerospace applications.

**PRODUCTS**

- Ultracapacitors for energy storage and delivery of rapid bursts of power for applications ranging from consumer and industrial electronics to hybrid electric buses, trucks, and buses
- Microelectronics for space and military applications requiring high reliability in radiation-intensive environments
- High Voltage Capacitors for electric utility switchgear, CVT, and laboratory applications

**SPONSOR WEB SITE** www.maxwell.com

The U.S. Department of Energy (DOE), through Argonne National Laboratory, provides overall competition management, team evaluation, and technical and logistical support. Challenge X is the premier DOE-sponsored student vehicle competition.

DOE launched its student vehicle competition program in 1989 to demonstrate and test technologies developed in laboratories. By combining the next generation of technical innovation with emerging advanced transportation technologies, the Challenge X competition helps ensure a sustainable, environmentally responsible transportation future. DOE and its network of national laboratories maintain an aggressive research and development program in advanced vehicle technologies, including fuel cells, energy storage, hybrid systems, advanced materials, alternative fuels, and heat engines. The Challenge X mirrors much of this research and demonstration activity.

DOE works to develop new technology to improve vehicle efficiency and lessen our dependence on foreign oil. Close to 20,000 students have received hands-on engineering experience in these competions. Many of them have moved on to take jobs in the automotive industry, bringing with them an understanding of and enthusiasm for advanced vehicle technologies.


**Argonne National Laboratory Transportation Technology R&D Center – www.transportation.anl.gov**

Maxwell

Over the past fifteen years, General Motors (GM) has joined the U.S. Department of Energy (DOE) to sponsor several successful student engineering competition programs. Recently, GM and DOE have teamed up as headline sponsors of Challenge X: Crossover to Sustainable Mobility, the latest advanced vehicle technology competition program.

The three-year competition, modeled after the General Motors global vehicle development process, brings students into the real world of vehicle development and better prepares to make a faster contribution to the engineering profession and the automotive industry. Each participating university team will design a new 2005 Chevrolet Equinox, with three basic goals: reduce energy consumption, decrease emissions, and maintain the performance and utility features of the stock vehicle.

GM donated a new 2005 Chevy Equinox crossover vehicle to each of the university teams at the end of the first year of the competition, plus two control vehicles. GM also provided each university team $10,000 in seed money and has donated use of its engineering, testing, and proving ground facilities for student workshops and competitions. Finally, GM has provided highly controlled access to its intellectual property, staff support (including a program manager, team mentors, and event judges) and communications support for the competition series.

General Motors Corp. (NYSE: GM), the world’s largest automaker, has been the global industry sales leader for 75 years. Founded in 1908, GM today employs about 372,000 people around the world. With global headquarters in Detroit, GM manufactures its cars and trucks in 33 countries. In 2005, 9.1 million GM cars and trucks were sold globally under the following brands: Buick, Cadillac, Chevrolet, GMC, GM Daewoo, Holden, Hummer, Opel, Pontiac, Saturn, and Vauxhall. GM operates one of the world’s leading finance companies, GMAC Financial Services, which offers automotive, residential, and commercial financing and insurance. GM’s OnStar subsidiary is the industry leader in vehicle safety, security, and information services. More information on GM can be found at www.gm.com