

North America's Premier Collegiate  
Automotive Engineering Competition

www.EcoCAR2.org



## EcoCAR 2 Plugging In to the Future

EcoCAR 2 is a three-year collegiate engineering competition and the only program of its kind. The competition's mission is a vital one: offer an unparalleled hands-on, real-world experience to educate the next generation of automotive engineers. The competition challenges 15 universities across North America to reduce the environmental impact of a Chevrolet Malibu without compromising the performance, safety and consumer acceptability.

Established by the U.S. Department of Energy (DOE) and General Motors (GM), EcoCAR 2 builds upon a successful 23-year history of DOE Advanced Vehicle Technology Competitions (AVTC) that exemplify the power of public/private partnerships in providing invaluable experience and training to promising, young minds entering the North American job market. EcoCAR 2 follows the widely acclaimed competition series EcoCAR: The NeXt Challenge.

Shaped by the greatest design change in the history of the automotive industry, EcoCAR 2 requires students to explore a variety of powertrain architectures focusing on electric drive vehicle technology. EcoCAR teams will utilize a 2013 Chevrolet Malibu donated by General Motors as the integration platform for their advanced vehicle design.



### Technical Goals

EcoCAR 2's technical goals are to construct and demonstrate vehicles and powertrains that, when compared to the production gasoline vehicle:

- Reduce petroleum energy consumption on the basis of a total fuel cycle analysis;
- Reduce fuel consumption;
- Reduce WTW and GHG emissions;
- Reduce criteria tailpipe emissions;
- Maintain consumer acceptability in the areas of performance, utility, and safety.



Participating universities will use electric powertrains, next generation control systems, and advanced battery technologies to reduce fuel consumption and greenhouse gas emissions (GHG). Student designs will consider the well-to-wheel (WTW) impact of fuel use and select renewable fuels such as hydrogen, E85 (85 percent ethanol), or B20 (20 percent biodiesel).

During the three-year program EcoCAR 2 teams will follow a real-world Vehicle Development Process (VDP) modeled after GM's VDP. Using the VDP enables students to design, build and refine their advanced technology vehicles. Throughout the program, students will focus on improving their vehicle's efficiency while retaining ride and handling, control and safety system performance. Year One begins with modeling and

simulation to develop their vehicle architecture. In Year Two teams incorporate their new powertrains, and in the final year, teams refine their vehicles to near-showroom quality. At the end of each academic year, teams compete in more than two dozen static and dynamic events for top honors and \$100,000 in cash prizes.

EcoCAR 2's unique combination of cutting edge engineering practices, hands-on experience, exposure to world-class organizations and knowledge sharing in a competitive and team-oriented environment makes it the perfect preamble to future job success and a catalyst for growing the North American automotive industry's competitiveness in the global marketplace.

### ADVANCED VEHICLE TECHNOLOGY COMPETITIONS HISTORY

For more than 23 years, the U.S. Department of Energy has sponsored 46 Advanced Vehicle Technology Competitions (AVTC) through Argonne National Laboratory. These competitions represent a unique coalition of government, industry and academic partners who join forces to explore sustainable vehicle solutions. Argonne manages these competitions to educate the next generation of automotive engineers and accelerate the development and demonstration of technologies of interest to the DOE and the automotive industry.

### CONTACT

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### EcoCAR 2 Teams

California State University, Los Angeles  
Colorado State University  
Embry-Riddle Aeronautical University  
Mississippi State University  
North Carolina State University  
The Ohio State University  
Pennsylvania State University  
Purdue University  
Rose-Hulman Institute of Technology  
University of Tennessee, Knoxville  
University of Victoria  
University of Washington  
University of Waterloo  
Virginia Tech  
Wayne State University



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