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Wheels

The Nuts and Bolts of Whatever Moves You



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Watch Out, X Prize Contestants, These High School Kids Are Winners

By [Jim Motavalli](#)



West Philly Hybrid X team at the Harley-Davidson Museum. The student team, led by physics teacher Simon Hauger, second from left, is using a Buell motorcycle engine for its hybrid entrant in the Automotive X Prize. (West Philly Hybrid X Team)

The [Automotive X Prize](#) has a rich \$10 million purse, and that may be a powerful draw for many of the entrants, some of whom appear to be operating on a shoestring. All they have to do is come up with something that has so far eluded all the major automakers — a vehicle that can achieve the equivalent of [100 miles a gallon](#). Then they simply need to make their car or truck safe and low-emission, and devise a business plan so it can be “production capable.”

So far, 120 teams from 17 countries and 28 states have said they intend to compete. Some vehicles, like Neil Young’s [1959 Lincoln Continental Mark IV convertible](#) (the “Linc-Volt,” a biodiesel-based plug-in hybrid) don’t have much hope of winning the prize, but make excellent copy.

Others are considered leading contenders because they have major industry support.

Less heralded is [the entry](#) from the Academy for Automotive and Mechanical Engineering, at West Philadelphia High School. Yes, it's a high school team, and they're very serious.

“This is a wonderful opportunity to empower students in Philadelphia to have a voice in the most important issue of our time,” said Ann Cohen, the volunteer chairperson of the board of governors for the academy, and a retired union leader.

All this would be heartwarming and probably the basis of a great movie script, but the students, now operating under the name West Philly Hybrid X team, have an impressive track record. Under the tutelage of Simon Hauger, who teaches physics at the school and directs its electric vehicle program, various generations of the team since its conception in 1998 have had three first-place finishes with battery-electric and hybrid entries in the 2002, 2005 and 2006 Tour de Sol competitions. (This long-running and colorful event, now on hiatus, was run by the Northeast Sustainable Energy Association.)

“We build better vehicles, that's the bottom line,” Mr. Hauger said. The [electric 1993 Saturn SL2](#) that Hybrid X entered in the 2002 Tour de Sol did well in part because one of the students, Harvey Wood, got interested in aerodynamics.

“He changed the orientation of the window wipers, covered up the front lights, took off the side mirrors and added a new front bumper,” Mr. Hauger added.

Over the past 10 years, Hybrid X has fielded an interesting group of vehicles, from the 50-m.p.g. [K1 Attack](#) (a turbodiesel hybrid based on a kit car) to a 37-m.p.g. propane-based Jeep [Wrangler hybrid](#) (later rebodied as the Hybrid Hippo). For Ford's [Model T Challenge](#), the team built what some called the Green Machine, a three-wheel battery-electric with an original chassis put together with the help of two Drexel University students versed in computer-aided design.



was entered in Ford' Model T Challenge. (West Philly Hybrid X Team)

“The Green Machine”

“It’s really funny,” said a team veteran, Lawrence Jones-Mahoney, 18, who, as a Drexel University freshmen studying computer science, is still a volunteer. “Our team has built four cars, including a hybrid Jeep that gets double the mileage it’s supposed to get. If we can do it as high school students, why can’t the major auto companies? The best mainstream car is the Prius, but to be blunt, it’s kind of ugly. Our aim with the X Prize is to build a 100-mile per gallon car that is environmentally friendly and also has a lot of youth appeal.”

The West Philly team’s Automotive X Prize car, the EVX, will be a hybrid Ford Focus with a 90-horsepower, two-cylinder Buell motorcycle engine and an Azure Dynamics AC electric motor, adding 63 peak horsepower.

“We’re trying to find someone to donate a Focus, but if not I think we’ll probably have to bite the bullet and buy one,” says Ms. Cohen. She adds that the Focus will probably be lightened with some body parts made from bamboo composites — sourced from “a guy in northeast Philadelphia who makes bamboo surfboards. The basic procedure is a foam core covered with bamboo fabric and a resin coating that is very low in volatile organic compounds,” she said. “It’s very light and very strong.”

Jim Motavalli posts regularly about fuel economy, green cars and alternative fuels. He is the author of “Forward Drive: The Race to Build ‘Clean’ Cars for the Future,” among other books. He is also a contributor to E/The Environmental Magazine and a radio host on WPKN-FM in Connecticut. Read his previous posts [here](#).

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