FAQ's

AMERICAN SOLAR CHALLENGE 2003

Q: What is the American Solar Challenge?

A: The American Solar Challenge is an intercollegiate competition among student teams around the world to design, build and race solar-powered vehicles across the U.S. in the shortest elapsed time. The 10-day race follows America's "Mother Road," Route 66, from Chicago to Los Angeles.

Q: What is the distance of the American Solar Challenge?

A: At 2,300 miles, the American Solar Challenge is the longest solar car race in the world and is held every other year in the U.S.

Q: What time of day do the students race their cars?

A: To fully test a solar car's capability, the students race between 9 a.m. and 6 p.m. to see how far they can travel each day. In the 2001 race, a couple of the teams made it more than 300 miles in one day, setting a solar-racing record. The cars were traveling the speed limit of Route 66, 55 mph, and in some cases hit interstate speeds of 75 mph.

Q: Why is DOE supporting ASC?

A: First this race is one of the best ways we've found to inspire young people to pursue careers in science and engineering, and we will need many more scientists and engineers if this country is to remain competitive. Second, with each race, we make improvements in the cars, and some of those improvements make their way into solar and electric motors and cars as these young engineers go on to jobs. Finally, solar car racing helps demonstrate to the public that solar power is a viable option today to produce clean energy that can help reduce our use of energy derived from fossil fuels, an important step in enhancing our national security and protecting our environment.

Q: How much do these cars cost?

A: Some cars have been built for as little as $50,000. Some cost as much as $1 million. An average-cost competitive car costs around $200,000. It depends on the type of components and materials they use and how much time and effort they put into design. Advanced composite materials tend to be expensive. Computer-aided design and aerodynamic testing tend to be expensive. The more efficient, lightweight electric motors and efficient solar cells cost more.

Q: How much does a set of solar cells cost for one of these cars?

A: Anywhere from $3,800 to more than $1 million, but realistically, $125,000 is the most any team on this race is likely to spend.

Q: How about batteries? How much do they cost?

A: Anywhere from $2,500 for a set of lead-acid batteries to $10,000 for a set of lithium-ion.

Q: Where are the teams from? Any teams outside the U.S. competing?

A: Currently, besides the United States, we have teams registered from England, Canada and Australia. (Refer to list of teams for specific U. S. teams.)

Q: Are all the teams on the same competitive level?

A: No. There are two classes in this race – Open and Stock. The difference between the two is roughly the difference between amateur and professional. The Stock Class will pretty much be the college teams, who will be limited to lead acid batteries and solar cells from approved manufacturers. The intent is to ensure a roughly even playing field between those teams who raise a lot of money and those who don't, to limit the ability of any Stock Class team to buy their way to first place with the most expensive technology. In the Open Class, there are no limitations on the types of batteries or solar cells. The goal here is to attract the more professional teams, the ones who have the money to spend on the best technology.

Q: I notice some cars have three wheels and some four. What's the difference?

A: It is up to the teams to decide what design strategy to incorporate. Some think they can develop an advantage from the reduced weight of a three-wheeled car. Others see advantage in improved handling with four wheels.

Q: What criteria are used to select teams?

A: Basically, anyone can enter, but their vehicles must meet strict structural and safety requirements and the cars and drivers must pass a rigorous qualifier to be allowed to actually participate.

Q: Do teams receive financial assistance?

A: Not from the event, but they do solicit sponsors to cover their costs.

Q: What is a solar car made of?

A: It depends, but all are powered by solar cells (photovoltaic cells) that turn sunlight directly into electricity, then store that energy in batteries. The energy is then used, as needed, to power an electric motor to propel the car. The body can be made of simple fiberglass and wood or aluminum, or it can be made from advanced, lightweight composites, depending on the amount of money teams are able to raise and the design strategy they choose.

Q: What happens when it's cloudy?

A: The solar cars can still run from the energy that is collected and stored in the batteries. These batteries can be charged as needed (using the solar cells) to operate a car on a cloudy day or when the car needs extra power for acceleration or climbing a hill. How much teams use this stored energy is really up to them. Thus, the strategy for energy consumption becomes a big component of the race.

Q: What are the driver requirements?

A: Drivers must be 18 years old and have a valid driver's license from their home state/country, and all drivers must be ballasted to 85 kilograms if they weigh less than that.

Q: What purpose do the checkpoints serve?

A: Checkpoints serve several purposes – as a confirmation that a team followed the prescribed route, as an extra safety checkpoint, to force teams to stop for rest and refreshment, to enable the public to see the cars up close, and to provide the news media with an opportunity to see the cars and talk with team members.

Q: How do you win?

A: Winning is simple – the team that makes it to the finish point in the in the lowest total elapsed time, while following all the rules, wins. Points are also added for violation of rules.

Q: What types of academic disciplines does this race touch upon?

A: Solar car racing can use a wide range of disciplines, but it is up to each team to decide which disciplines they need, depending on their strategy. Some of the more typical are mechanical engineering, electrical engineering, electronics engineering, chemical engineering, automotive engineering, business management and marketing.

Q: Are these cars safe?

A: Safety is our first priority. All cars are required to meet strict standards for safety performance, including braking, wet braking, turning, avoiding rollovers and surviving crashes. All cars are inspected for safety, including their brakes, steering, tires and lights. The American Solar Challenge (previously named Sunrayce) has a good safety record.

Q: It seems that Route 66 is no longer accessible in some parts. What are the plans to drive through these areas?

A: Our plan is to use the original Route 66 whenever possible. However, in places where the original road no longer exists or is in such poor condition that it is unsafe, we use the interstate or other main highway.

Q: Will we ever see cars like this on the street?

A: You may never drive a solar car in your lifetime, but what you may see are electric cars in every town and on every street, powered by batteries charged by solar panels on the roof of your garage. This is possible today, but the technologies still need some refinement. It's not much different than the internal combustion engine. The first one was developed in 1884, but didn't become commonplace until almost 50 years later and took 75 years to reach a state of refinement. These races are just one of the ways DOE is working to make solar power and electric transportation commonplace.

Q: Why solar cars if you won't ever drive them then?

A: The American Solar Challenge demonstrates that if solar energy can provide enough electricity to power a car 2,300 miles at highway speeds, just think of the hundred other applications it can be used for. As the technology improves, solar technologies will become more commonplace to minimize the use of energy in our buildings, homes and cars all across the country.