Texas A&M University
Solar Powered Vehicle Interdisciplinary Project
American Solar Challenge

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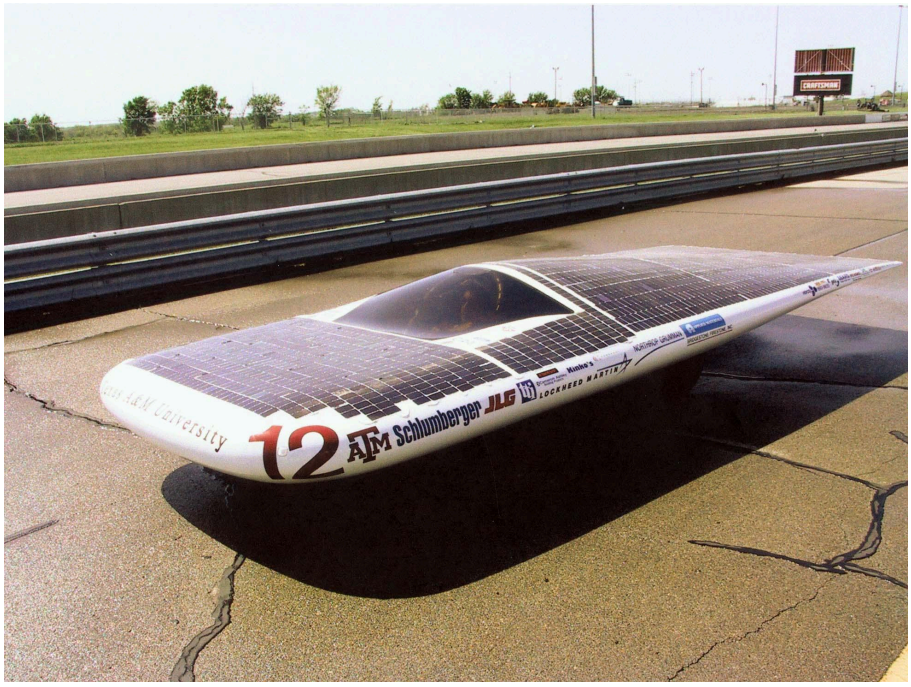

Background Information

The Texas A&M University Solar Motorsports Team will compete in the American Solar Challenge (ASC) in July of 2003. Texas A&M University has been participating in the ASC, formerly known as Sunrayce, since 1995. The ASC race is held every two years and has evolved into a 2,300-mile race across the United States from Chicago, Illinois to Los Angeles, California. The ASC gives engineering schools and other groups a chance to test their design skills as they build a solar car that meets the ASC specifications for the race. The ASC competition also gives students the chance to develop leadership skills, work in a team environment, make industry contacts, and broaden their knowledge base. The interdisciplinary nature of building a solar-powered vehicle and the real-world aspect of working on a project outside of the classroom helps students to develop a wide array of valuable skills even before they graduate. For further information related specifically to the race, the ASC maintains a website at http://www.formulasun.org/.

Project Details

Goals

The goal of building and racing a solar car in the ASC is to promote learning in a variety of disciplines. By competing in the ASC, students have an opportunity to refine their design, teamwork, and management skills, helping them to better serve their employers after graduation.

Objectives

The objective of participating in the ASC is to test our team and our design against other teams to see who can complete the racecourse in the shortest possible time. The following are milestones to accomplishing that objective.

- Design, build, and test a solar car according to ASC guidelines.
- Gather resources we will need to travel on the race.
- Qualify our car for the race.
- Race the car.

Methods

Our team consists of five separate sub-teams that must work together to build a successful car: the solar array team, battery team, the body team, the mechanical systems team, and the logistics team. Each team has a team leader and several members who are responsible for making sure their part of the car gets designed and built. All work on the car is voluntary and is done by anyone who wants to come and help. There is also a logistics branch, which is responsible for gathering resources, travel plans, financial matters and other things not directly related to building the car. There are approximately twenty to twenty-five students involved in designing and

building the car on a regular basis, and there are as many as twenty to thirty additional students who work on the team for only one semester for class credit in a senior design course.

Staff/Administration

We have one faculty advisor, Dr. Tom Pollock, who is the official representative of the university. We also draw on the knowledge of professors here at the university to help with our design and building problems. We have several officers who lead the different teams associated with the car.

List of officers and titles:

David Hoelscher – Team Manager
Laura Smiley – Logistics Director
Josh Seifert- Energy Management Engineer
Paul Blakeney - Solar Array Engineer
Scott Malone - Mechanical Systems Engineer
Grady Hanz - Body Engineer

Available Resources

Currently we have some shop space approximately 15' x 30' dedicated to our team by the department of Engineering Technology and Industrial Distribution. We have also used resources donated to us by Vought Aircraft Industries, Inc. These resources include shop space, equipment, ovens, and their experience.

Needed Resources

Resources for Car

Batteries (Approx $9,000)
Tires (Approx $2,000)
Maximum Point Power Trackers (Approx $2,000)
Race Entry Fee ($2,000)
Solar Array ($18,000)
Race Logistic Expenses (Approx $7,000, outlined below)

Resources for Travel

Equipment

- Enclosed trailer to haul tools, repair equipment, and the car to the qualifier and the race.
- Travel trailer for living/cooking space during the qualifier and race.
- Gas powered generator.
- Vans and Trucks to pull trailers

Supplies

- Fuel for vehicles

- Food supplies
- Camp ground rentals

Budget

We currently have approximately $9,000 in our account. This falls $31,000 short of our projected expenses of $40,000.

Timeline

January 2003	Body Completed
February 2003	Solar Array Completed
March 2003	Batteries Completed
March 2003	Commence Testing
May 12 – 16	Preliminary Qualifier
July 7 – 11	Final Scrutineering and Qualifier
July 13	Race Begins in Chicago
July 23	Race Finish in Claremont, California

Benefits

There are several benefits of sponsoring our car. We are a non-profit organization so a donation of either money or materials qualifies as a tax write-off. We will proudly display your company/organization logo on all of our team material, including our web page, the team shirts we wear during the race and while showing the car, on the car itself, and on any signs, brochures or vehicles owned by the team.

Fast Facts: ASC 2001 Race Trivia

Distances and Speeds

In the 2001 American Solar Challenge, thirty teams competed with twenty-eight of them crossing the finish line. The entire race was 2247.39 miles long, and the fastest team finished in 56 hours and 10 minutes with an average speed of 40 miles per hour. The average team finished in 91 hours and 43 minutes, with an average speed of 24.5 miles per hour.

Weights and Wheels

Sixteen of the cars had three wheels, and fourteen of the cars had four wheels for a total of 104 wheels on the ground while all cars are driving. Riding on those 104

wheels is 23837 lbs. of force, with the average car weight of 795 lbs. The lightest car weighed in at 543 lbs. and the heaviest was 1300 lbs.

Power Generation and Storage

Collectively, all the solar arrays on the vehicles produced 26,000 watts of power from 236.5 square meters of surface area, averaging 875 watts per car. Two of the cars had arrays that produced over 1,500 watts, yet neither of those teams placed in the top five. Fifteen of the teams used lithium batteries as their primary storage device, and all top five finishers had lithium batteries.

American Solar Challenge 2003 Race Route

The following map shows the route and media stops for the Summer 2003 ASC.