Solar Decathlon

Energy We Can Live With

April/May 2002

Director's Note

Before entering its construction phase, the University of Virginia (UVA) team hosted sessions on building safety. Here, local builders demonstrate safe practices to the UVA team, as they prepare for the construction of their solar home.

I want to thank all the teams for participating in the Solar Decathlon. This competition is one of the hardest challenges ever devised, and yet you are undaunted. You see clearly that the benefits and personal rewards far outweigh the hard work. For that I am truly thankful.

When I first had the idea for this competition in November 1998, I had much trepidation. How could such a complex competition be successful? Would anyone raise their hand and volunteer to participate? Almost a year passed before I had the concept well defined. Telling my colleagues at the Department of Energy and the National Renewable Energy Laboratory about the idea took courage and confidence. Courage because nothing like it has ever been done before and confidence because, before I set forth in earnest, I had to believe we could do this.

Three years later, I have the privilege of seeing the same kind of courage and confidence at work in the 14 schools of architecture and engineering that are totally committed to the success of this historic event. On April 25–26, 2002, I met with the University of Puerto Rico's "advance" team here in Washington, D.C. They were checking out logistics, transportation, and housing. I enjoyed their enthusiasm and excitement. They have the hardest journey—crossing ocean waters to get here! Their house must be finished by August 1, when they will pack it in five shipping containers, ship it to New Jersey, pass it through customs, and transport it on five trucks to Washington, D.C.—all before September 19. When they arrive, we all must stop by to congratulate them on their achievement!

I also recently met with two of the Auburn faculty, who were here taking photographs of the site and checking into logistics. I bring this up because I encourage all teams to visit Washington, D.C., to check out things in the city. I would like the chance to meet with you and answer your questions, so please let me know if you are planning to visit.

Last week I attended a groundbreaking ceremony at UVA. Yes, they are building their house now, as are several others—something by which to gauge your team's progress.

Each and every Solar Decathlon team is made up of true visionaries. I commend your energy and involvement. Thanks to you, the pioneering spirit is alive and well in America!

Richard King

NREL

bp solar

AIA

EDS

The Home Depot

News from the Crowder Campus: a Design Event and a House on e-Bay

On February 11, the Crowder College Solar Decathlon team proudly presented their solar house design at a press conference and reception on campus. Team sponsors were in attendance, including representatives from their major sponsors—All-American Kanbuild and Infinity Lighting (which donated more than $10,000 each). Students and members of the community, and local media were also in attendance. A reporter from the local paper, the *Neosho Post*, and a writer from the student paper, the *Crowder Sentry*, covered the event. The Crowder team and their design even appeared on the local TV evening news!

At the event, student team leaders Joel Lamson, Monty Pugh-Towe, and Kelly Gossett presented the design of the house with blueprints of the floor plan and a 3-D model of the house. Using Microsoft® PowerPoint® and a SMART Board®, they explained the technology used in the house. The Crowder team also announced an innovative fundraising technique during the presentation: the Crowder Decathlon house will be offered for sale to the public through an on-line eBay® auction. Although the first official bid on the house was cast during the reception, the auction will continue until April 18. The fortunate highest bidder can expect a novel Christmas present this year; the house will be delivered in December 2002. Information about bidding on the solar home is available at http://www.crowder.edu/solar.

Several days later, the team gave an encore presentation for the Governor of Missouri, Bob Holden, while he was visiting the college campus. The governor was intrigued by the team's ideas and became very interested in energy self-sufficient housing. Although he initially stopped by for 15 minutes, he ended up staying for over an hour, meeting exclusively with the team members. Following the governor's visit, the team presented to the Crowder Board of Trustees, to the Missouri state legislators, and at a news conference sponsored by MoPIRG (Missouri State Public Interest Research Group).

The Crowder College Solar Decathlon team is a diverse group of 12 individuals from Crowder College and the surrounding community of Neosho, Missouri. This team of students and community members truly resembles the spirit of this community college. While Crowder College does not have an architecture or engineering school, it has other unique and diverse strengths. The Crowder team includes an engineering major with alternative energy emphasis (Team Captain, Joel Lamson), a computer science major (Webmaster, Kelly Gossett), and several drafting majors. They use their diverse talents to come up with innovative ideas and then seek expertise from the community. They have received consulting expertise from solar, architectural, and modular home advisors in the community, in the form of both volunteered time and material donations. Art Boyt, instructor of Alternative Energy and a veteran of the solar car race (the American Solar Challenge), leads the team. In 2000, Boyt received the Association of Community Colleges National Teacher of the Year Award.

Kelly Gossett
Crowder College

University of Virginia Students Hold Construction Kick-off

On April 4, more than 250 people gathered to join the University of Virginia (UVA) Solar Decathlon Team in kicking off the construction of their solar home. This event was held at the team's construction site near Charlottesville, Virginia, set against the backdrop of the Blue Ridge Mountains. The team members include 53 students from the University of Virginia's School of Architecture, 26 students from the School of Engineering and Applied Science, as well as a few students from the College of Arts and Sciences.

The event attracted local politicians; representatives from local businesses that support the project; students, staff, and faculty from the university; as well as members of the team and their families. Speakers at the event included student project managers Adam Ruffin and Dave Click, Richard King, Charlottesville Mayor Blake Caravati, Architecture Dean Karen Van Lengen, and Engineering Dean Richard Miksad. The local and state media covered the event, and a segment was broadcast on the local NBC-TV affiliate during their 11 p.m. news.

The UVA team has risen to the Solar Decathlon challenge and designed a climate-responsive home that will adapt to a variety of environments and serve as an example of sustainable design principles. The collaborative venture between UVA's School of Architecture and the School of Engineering and Applied Science is a natural pairing—both schools stress environmental concerns as an integral part of their curricula and research.

Since spring 2001, architecture, landscape architecture, and planning students have been collaborating with mechanical, electrical, civil, systems, computer science, and chemical engineering students. They are using 3-D computer modeling and thermal dynamic simulation to determine the house design and intend to finish their construction drawings and details soon. Construction will continue through the summer—right up to September.

For Adam Ruffin, participating in this project provides more than design experience: "In school, we have a limited amount of time to complete projects so we

don't get to fully experience the different phases of construction. This project gives us the opportunity to work with engineers and adapt our knowledge to the realities of the built environment."

The students are enthusiastic and inspired by the practical aspects of the project. "This is real-life stuff. The process of doing this house would be hard to simulate in the lab," said Ben Dorrier, a fourth-year mechanical engineering major and project manager.

After the Solar Decathlon competition, UVA's entry will be permanently installed on university grounds as a guesthouse for visiting faculty. The team also intends to use the house as a working laboratory for sustainable design and renewable energies and will offer tours to K-12 students from around the state of Virginia.

The team's architecture project managers include graduate student Adam Ruffin, with undergraduate students Charlotte Barrows and Josh Dannenberg. The engineering project managers are graduate student Dave Click, with undergraduates Ben Dorrier and Tim Sweeney. The team's advisors are Assistant Professor of Architecture John Quale, Associate Professor of Electrical Engineering Paxton Marshall, and Engineering Research Scientist Dan Pearce.

Additional information on the project is available on the Web at http://solarhome.lib.virginia.edu.

University of Virginia Team

Is Your House Ready for the Journey? Auburn University Offers Advice

At Auburn University, our team has been busy thinking about how we will move our entry to the National Mall and then assemble it in just four days. While the Solar Decathlon presents significant challenges, this is one of its most significant challenges.

We want to reliably transport and assemble our house without disturbing or affecting the installation of those houses around us. Because the sites are close together, the order of installation is an issue. We are the center lot in a three-lot string, so it's a little tricky. Our team has studied a number of options and has come up with our current plan of action.

With all constraints in mind, the Auburn team is planning to use an alteration of modular-house-type construction for the competition. This approach allows for complete construction of the house prior to the competition.

A modular house is constructed in such a way that it can be placed on a chassis and moved along highways and roadways. The chassis system can either be an integral part of the construction (thereby providing structural integrity) or it can be separable and removed later to allow the house to be set on a foundation. With this brief background, let's proceed to a better explanation of our plans.

Here's how it works:

- The chassis for our application will be a twin I-beam configuration with a removable hitch and axle assembly for transport.
- A lag-bolt system will secure the house to the chassis and lock in the top flange of the I-beam.
- The wheels on the chassis, of course, allow translation in one direction. However, with a jack and dolly system we will be able to roll the house sideways onto the site without damaging the Mall.
- The frame system allows us to roll a complete house onto the Mall in two sections, then mate them for blocking and leveling. This leaves (ideally) a minimal amount of finish work during the assembly process before the competition.

This description is somewhat brief, but presents the essential elements of our approach. We want all of the Solar Decathlon teams to be successful in this competition and not be limited by transportation and assembly difficulties.

Auburn University Team

Team Timeline Checklist

At what point in the preparation stages of the competition is your team? If you're wondering where you should be in this process, here are a few tips from the organizers.

Competition starts September 19th

By May 1

1. Teams should have finalized the design of their entry and begun production of the final construction documents. These construction documents, a requirement of the Final Design Report, are due on June 12. Construction documents must be delivered on this date so the National Park Service will have adequate time to review your design and to provide feedback if changes are necessary.

2. You should be contacting transportation companies to develop transportation plans. This planning may bring to light issues or travel limitations that may affect your house design. Plan the logistics of transportation to the Mall before you begin construction.

3. Teams should provide Solar Decathlon organizers and the transport company with estimates on the weights of the house and the tractor-trailers that will be used to get the house and its associated equipment onto the Mall for the construction process.

Updates and Reminders

ASKO and IALD Sponsorship

We would like to welcome two new team sponsors: ASKO and the International Association of Lighting Designers (IALD). These sponsors are working closely with the teams; ASKO is providing sponsorship through material donations and IALD is providing sponsorship through volunteer expertise.

ASKO manufactures energy- and water-efficient machines, such as high-performance washers, dryers, and dishwashers. The company has offered each team the following set of appliances: one washer (model #W6221), one dryer (model #T701), and one dishwasher (model #D1716). For more information about ASKO, as well as performance and specifications, visit their Web site at http://www.askousa.com/. You may also read about performance and specifications at http://www.energystar.gov/default.shtml. If you would like more information, please contact Beth Ahlquist at the AM Appliance Group (BethAhlquist@amappliancegroup.com).

IALD (http://www.iald.org/) is offering consulting services and lighting expertise to the teams. A panel of 21 volunteers from this professional organization will provide consulting on lighting design, daylighting design, solar power system design, energy-efficient design, lighting fixture and control technologies, and emerging products. They will also provide suggestions for fixture and components solutions. These 21 volunteers represent award-winning lighting firms from Portland, Oregon, to Kansas City, to New York City. These volunteers offer extensive experience with an impressive lighting design portfolio, including the Emory University Performing Arts Center in Atlanta, Georgia; the Sodexho Museum of Science, Boston, Massachusetts; the American Express Financial Advisors Headquarters, Minneapolis, Minnesota; and the Grande Lakes Resort, Orlando, Florida. For more information about this sponsorship and how to request design assistance, contact Samantha E. Hollomon, Hayden McKay Lighting Design, Inc., at samantha@hmldi.com.

Solar Decathlon Bulletin

On April 4, the organizers introduced and posted the first *Solar Decathlon Bulletin*. Please read these bulletins when they are provided; they will reflect the latest updates and concerns from the organizers. The organizers believe that additional correspondence with the teams will keep all participants up to date on the latest information. These bulletins are in addition to the bi-monthly newsletter. They will be provided on an as-needed basis. The first bulletin, *Transporting Your Entry to the National Mall*, discusses transportation concerns and moving logistics. The bulletins will be posted on the "For the Decathletes" page at http://www.eren.doe.gov/solar_decathlon/for_the.html.

PE Stamps for Construction Drawings

We have located an architect in Washington, D.C., who has agreed to stamp your construction drawings (a National Park Service requirement). Be on the lookout for details, which we will provide as soon as possible.

Ford TH!NK

Your "neighbor" vehicles will soon be on the way! As soon as you hand in the required documents for your Final Design Report, you will get your car. (The sooner you send the documents, the sooner you get your car—we'll accept documents at any time.) There aren't many dealerships set up around the country yet, so some of you will have to drive some distance to pick up your vehicle. More information will be sent to you soon.

The Home Depot

If you haven't talked to Home Depot about their sponsorship yet, please do.

New Sponsor Logos

Visit the Solar Decathlon sub Web site at http://www.eren.doe.gov/solar_decathlon/communications.html to download new sponsor logos. You can use these logos on your Web sites and in the printed materials you produce. Contact Ruby Nahan with questions (ruby_nahan@nrel.gov).

New Jury Member

We have added a sixth member to our Design and Livability contest jury. He is Steve Badanes from Jersey Devil and the Architecture Department at the University of Washington. Jersey Devil is a well-known design build architecture firm, one of the few firms in the country that bridge the ethical and aesthetic divide of sustainable living. We will have a profile of Steve in an upcoming newsletter.

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