U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON

Solar Decathlon 2002

Virginia Polytechnic Institute and State University

Final Overall Points: 777.901
Final Overall Standing: 5
Winner, **Design Presentation and Simulation Contest**
Winner, **Getting Around Contest**

We took a significant stance to celebrate PV and not try to hide it. It's a benevolent umbrella, both a collector of energy and a shading device. It gives the building a strong identity not normally associated with residential buildings.

—Robert Dunay, project team advisor

About the Home

The 2002 home designed by Virginia Tech epitomized multifunctionality. Every aspect of the house had more than one purpose, including the solar-electric panels, which produced electrical energy and shaded the home, too. The student-designed Skywall panels, using a translucent aerogel material, insulated the home and let light into the interior. Along the structural south wall, the panels also acted as active solar collectors for domestic hot water and under-floor radiant heating.

Inside the home, the appliances were grouped together on the north wall, and they served as a thermal buffer, retaining extra heat in the winter and venting it to the outside in the summer. A microprism light, typically used for billboards, helped to transfer light evenly throughout the home.

About the Team

The team of architecture, engineering, and industrial design students created a 2002 Solar Decathlon house that successfully combined the three disciplines. The decathletes came to realize that "communication is fundamental," saying that, with different teams in different departments in different colleges, "we could have done a better job at keeping the team informed. If a change took place, we really needed to communicate it to all team members. We came to value the importance of good communication," Robert Schubert, team advisor, reported. After all, one of the hallmarks of a successful union-whether between individuals or among disciplines-is good communication!

The students report that interacting with the sponsors was one of the best parts of their Solar Decathlon experience. Schubert summed up the students' thoughts by saying, "The sponsors have been excellent to work with. We've learned from them and hopefully they've learned from us."

Key Home Features

Item	Specifics
PV kilowatts (standard test condition rating)	6.00
PV modules	80 BP Solar BP-275
Charge controllers	4 Solar Boost 3048
Inverters	2 Trace SW4048
Battery bank	1275 ampere-hour, 48 volt
Battery type	20 Concorde PVX-6225 sealed absorbed glass mat
Water heating	140 ft2 (13 m2) of SunEarth absorber plates in custom-built vertical collectors
Construction	South, east, and west walls = R15 (RSI 3), north wall = R23 (RSI 4), roof = R31 (RSI 5)
Space heating	Ground source heat pump and solar thermal
Space cooling	Ground source heat pump

Manufacturers' Web Sites

- **BP Solar**
- **Alternative Energy Systems Co.** (Solar Boost)
- **Xantrex** (formerly Trace; Trace charge controllers)
- **Concorde**
- **SunEarth, Inc.**

Source: These details have been adapted with permission from Home Power #94, April/May 2003

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