

University of Texas at Austin

The University of Texas at Austin team's guiding concept is "life in bloom," and thus the name BLOOMhouse. Team members sought to create a high-performance home that will help to change the way people think about energy, demonstrating ways to live life in better balance with the power of the sun. The team is committed to developing solar-powered housing that is energy efficient, approachable, accessible, and adaptable. The BLOOMhouse design is based on five principles of life: community, adaptability, harvest, endurance, and delight. The house also embodies the team's fun and playful personality with true Texas spirit.

What's Different?

- The BLOOMhouse is a prototype for prefabricated design of modular housing that is streamlined, energy efficient, and attractive. The design carefully considers the use of materials, colors, and apertures in a manner that broadens the perception of space and enhances visual continuity with adjacent outdoor spaces.
- The house has an exterior skin system that is customizable by the homeowner. The skin includes graphics and a dynamic polycarbonate cladding that creates an air space to ventilate the surface of the building.
- To make solar power fun, tactile, and accessible, the house features a solar-powered hot tub.
- The structural system includes a series of moment frames (an especially strong frame designed to mitigate earthquake damage, as in "moment-resisting frame") that allow for an open interior plan that benefits superior ventilation and efficient lighting.
- The photovoltaic system is mounted on a rack system designed to be quickly deployable and minimize the number of connections when the house arrives on site.

Architecture, Interior Comfort

- The house features an effectively open plan that is designed to maximize usable space, made structurally possible by the moment frames that wrap the building.
- Interior materials are both sustainable and Texas-influenced to create an inviting interior.
- The house offers a different way of living that becomes about occupying zones rather than rooms and about interaction rather than disconnection.
- While the interiors exaggerate the horizontality of the house, they also connect the various zones to create a single vessel for living.

Heating and Cooling Systems

- The team chose to apply innovative control logic to a system made of robust and time-tested components to ensure that the BLOOMhouse can stand up to the rigors of everyday use without the need for constant attention from a technician.
- Systems include a two-zone, split-system heat pump, heat recovery ventilator, hydronic radiant floor heating, and a residential dehumidifier.
- Annual energy consumption under typical conditions has been determined to be 4,060 kWh.

Lighting

- Various shading devices, including a scrim wall and decorative window boxes, have been designed to allow the occupants of the house to block out the sun or let in its warmth. These vernacular solutions have allowed the BLOOMhouse to have a large area of south-facing glazing, without heavily impacting the energy consumption of the house.
- Interior walls are painted in several shades of white to help reflect light around the space for greater energy efficiency
- A mix of LED lighting and fluorescent technology efficiently creates an inviting interior.

PV and Solar Thermal

- The photovoltaic array is composed of 40 BP Solar 7190 modules for a total of 7.6 kW. All of this electricity is converted to AC power by an SMA 7000U grid-tie inverter.

- Forty Apricus evacuated tubes provide solar thermal energy for domestic hot water for uses such as cooking and showers, as well as a radiant floor system and the solar thermal hot tub.
- An advanced control system from Tekmar intelligently controls the operation and flow of hot water to regulate temperature in the house and ensure an adequate supply of hot water.

Communications

- The team is dedicated to educating the public about the benefits of energy efficiency and solar power. They have visited area schools, presented at the Vans Warped Tour concert series, and attended numerous green building events to help get the word out.
- The Web site (utsolard.org) is the primary resource for information about the University of Texas at Austin's ongoing participation in the Solar Decathlon and the team's efforts for the 2007 competition.

Budget

- Project cost is estimated at \$450,000 for research and prototyping of the "concept car" version of the house presented at the Decathlon.
- The team has developed a marketable prototype, or "production car" version of the house, that would cost \$200,000–\$250,000 to build, depending on options.

Future Plans

- The team is currently conducting negotiations for the permanent location of the house. They would like to retain the ability to monitor the house, its usage, and the systems for a more long-term analysis and verification of their engineering simulations.
- Previous entries from the University of Texas have been donated to the Center for Maximum Potential Building Systems and the Blackland Neighborhood Community Development Corporation.

Kid's Corner

- The outside of the house has a large graphic based on cactus plant. It's actually a large 3M sticker applied to the exterior of the house. What would you paint on the side of your house?
- The hot tub isn't just for fun—it's powered by the sun! This team uses the sun to collect all the hot water they need and then pump it to where they want to use it—like the shower or the hot tub.

Team Information

Web site: www.utsolard.org

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