FACT SHEET: JERRY YANG AND AKIKO YAMAZAKI ENVIRONMENT AND ENERGY BUILDING

“Y2E2 IS MUCH MORE THAN A BUILDING; IT IS A SYMBOL OF WHAT IS POSSIBLE. IT IS DESIGNED FOR PROBLEM-SOLVING, DESIGNED TO CONSERVE, DESIGNED TO INSPIRE, AND DESIGNED TO TEACH.” —Jeffrey Koseff, Perry L. McCarty Director of the Woods Institute

LEADERSHIP IN THE BUILT ENVIRONMENT

Stanford actively incorporates sustainability practices and innovation into every aspect of campus life, from operations and building to student life, teaching, and research. A premier example is the new Jerry Yang and Akiko Yamazaki Environment + Energy Building, built to conserve natural resources and offer a unique and extraordinary learning environment. Inaugurated in March 2008, this innovative building design is expected to deliver substantial efficiency gains over similar standard buildings, using an impressive 56 percent less energy and 90 percent less potable water. As President John Hennessey noted when commissioning the building, the design realizes state-of-the-art concepts in sustainability, flexibility, and a collaborative work environment, and it reflects the “critical role that cutting-edge research facilities play as hubs for dynamic intellectual exchange and innovative research in the ongoing search for knowledge that serves the public good.”

DESIGNED TO CONSERVE

ACHIEVING 56 PERCENT LESS ENERGY USE

Load Reduction
The Environment + Energy Building employs a wise east-west layout and four roof-to-basement atria that work all day long to bring in natural light and warmth, thereby reducing the building’s demand for power. The design also includes high performance windows, sun shades along its southern exposure, and efficient server rooms. Estimated energy savings: 25 percent.

Passive Systems
Whenever possible, the building capitalizes on the laws of nature for heating and cooling rather than using mechanical systems. Spaces on the north and east facades are naturally ventilated, and after hot summer days, the building opens itself up at night, using its four atria as chimneys that purge the hot air. Estimated energy savings: 2 to 4 percent.
Active Systems
Where passive systems aren’t enough to make a space comfortable, Y2E2 employs highly efficient active systems for heating and cooling. Active chilled beams were installed throughout the building, and radiant flooring was installed in the Social Entry. Both technologies use water to conduct heat rather than the less efficient yet conventional air. Estimated energy savings: 16 percent.

Energy Recovery
Y2E2 uses the conditioned air exiting the building to pre-cool or pre-warm the incoming air. Exiting air passes over a large coil of refrigerant located between the exhaust and supply ducts on the roof, essentially taking the edge off the outside air before it is conditioned. Estimated energy savings: 9 percent.

Onsite Generation
Y2E2 has three clusters of polycrystalline solar panels mounted along the south-facing roof. Estimated energy savings: 2 percent.

“Y2E2 is many things: a center for collaboration, a research facility, a sustainable building. The building is a vital symbol of Stanford’s commitment to sustainability and interdisciplinary study. It is also a center for campus life, and, given its abundant sustainable features, it is responsible to the natural systems of which it is necessarily a component. It is part of a global network of interdependent systems—academic, ecological, technological, and social—regardless of scale. This interconnectivity is a revelation. It declares that a building is a habitat; a human-made structure is part of a natural system; a campus is a community; and every system is cyclical, not linear.” —Jake Murray, the Felt Hat
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ENVIRONMENT AND ENERGY BUILDING

ACHIEVING 90 PERCENT LESS POTABLE WATER USE

Inside
The Environment + Energy Building led the charge to capture and reuse the thousands of gallons of high quality water being flushed daily at our Central Energy Facility (CEF). Upon completion of the CEF project, the building’s toilets and urinals will flush with this recycled water. As demand for the CEF water increases with other new buildings coming online, the Environment + Energy Building will also be using this water source efficiently, as it has waterless and efficient urinals, dual flush toilets, and efficient lavatories.

Outside
The Environment + Energy Building’s water story continues outdoors. Native and drought-tolerant plants are thriving. Grass was used, but only sparingly and to maximize the cool effects on the surrounding outdoor space. Like most of the campus, the Science and Engineering Quad waters itself with water from nearby Felt Lake, thereby eliminating its demand for potable water.

DESIGNED TO INSPIRE AND TEACH

• The Environment + Energy Building is the first of four that will make up Stanford’s new science and Engineering Quad 2 (SEQ2). It was designed and built according to the Sustainable Performance Criteria established within the SEQ2 Master Plan. The Criteria is made up of the best and most appropriate standards from existing rating systems such as LEED and Labs21, and sets the highest green targets ever for Stanford buildings. While originally targeted with the highest energy reduction criteria, the success of the Environment + Energy Building has resulted in higher targets for the remainder of the SEQ2 buildings and has been partially responsible for campus-wide reduction policy for all new construction.

• The building is a pioneering model for interdisciplinary organization. It provides space for faculty, staff, and students from more than ten departments, centers, programs, and institutes. In lieu of traditional departmental spaces, the building accommodates focal areas for environmental research. The spatial connections provided by the building’s atria and its interior and exterior transparency support the spirit of collaboration, connectedness and interdisciplinary solutions.

• By virtue of its reduced energy operational costs, it is anticipated that the Environment + Energy Building will take only six to ten years to recover the additional capital investment in the building’s energy systems.

• Fly ash, a byproduct of coal burning, was used as a replacement for cement in the building’s concrete construction (basement walls and floor slabs). Rapidly renewable resources were employed in building finishes. Examples include use of bamboo in handrails and furniture upholstery and reclaimed redwood in the building’s exterior trellises

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• Providing a simple finish on the structural concrete alleviated the need for literally tons of carpet in the building. Limited applications of the carpet have recycled content.

• The building’s structural design, particularly in regard to seismic safety, will enhance the performance of the building in a major earthquake. The seismic design is a sustainable feature because it will reduce the amount of reconstruction required.

• The university worked with local building authorities to modify existing codes, allowing the building to use recycled water for toilet flushing, as well as a novel use of fire doors in the atria.

• An enhanced metering system measures the performance of building systems. An extensive database on building performance, building energy use and photovoltaic performance will be available to students and faculty for use in their research and their classes.

MORE INFORMATION
SUSTAINABLE STANFORD
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