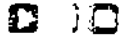


## GOING GREEN AND BEYOND: THE BIODESIGN INSTITUTE AT ARIZONA STATE UNIVERSITY

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by Phil Wirczek

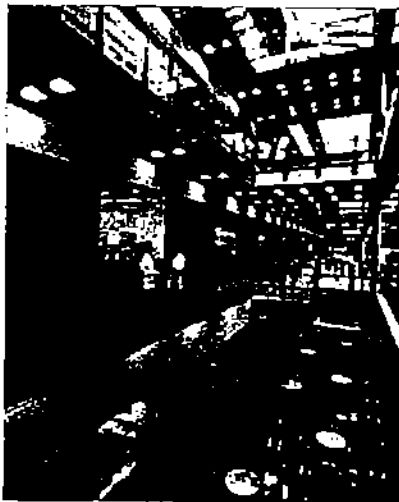


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Over the past 15 years, the green building movement has gained tremendous momentum in the United States. A wide variety of institutions - private, public, and federal - have become eager to reduce the environmental impact of new and existing facilities. As the movement progresses, it is becoming more evident that sustainable design benefits more than the environment. In fact, sustainable facilities reap numerous additional benefits, many of which are just beginning to be recognized as a by-product of green design.

In the US, green building design began to influence laboratory design in 1999, with the official launching of the Laboratories for the 21st Century (Labs21) program by the US Environmental Protection Agency (EPA) in cooperation with the US Department of Energy (DOE). Now with the co-sponsorship of the International Institute for Sustainable Laboratories (I2SL), Labs21 is gaining more recognition internationally and has broadened its mission to address other high performance facilities. Through partnerships within this industry, the EPA, DOE, and I2SL are promoting a new era in laboratory design across the United States. One product of this movement is the Biodesign Institute at Arizona State University. At the Institute, the term "sustainability" embodies a broad range of benefits associated with the green elements of its design.

### Getting to green



View of Daylit Atrium. (Courtesy of The Biodesign Institute / Art Mark Bosclair)

Located in Arizona's Sonoran Desert, the Biodesign Institute occupies a 13-acre site that serves as a gateway onto Arizona State University's Tempe campus. The Institute currently consists of two state-of-the-art scientific research buildings that house 14 centers focused on discoveries in areas ranging from applied nanobioscience and environmental biotechnology to infectious diseases and vaccinology.

The Institute is a first-rate demonstration of ecological laboratory design. Utilizing the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) certification criteria as a framework, the facility boasts a wide range of green features related to site selection and urban planning, as well as a variety of interior attributes.

During the creation of the Institute, 60 percent of the construction waste produced was recycled or reused. Now, in operation, the Institute receives diffuse natural light through the central atrium, and exterior windows feature blinds that respond to the intensity of the sun.

The Institute also irrigates its landscaping with condensate from the air conditioning system, and saves energy through occupancy sensors, energy-efficient lighting, and an advanced cooling system.

"The bar for excellence is high," said the Institute's communications project manager, Barb Backes, who explained that the Institute was proud to meet the standards required to receive a LEED Silver certification. Although some building occupants may be unaware of the facility's many sustainable features, those who work there have become part of the Institute's green agenda. With free passes

for public transit and an upcoming environmental education program, the leaders of the Institute are committed to ensuring that the green workplace culture is continuously reinforced.

#### **A welcoming workplace**

While the Institute is certainly an environmentally-friendly facility, its success in sustainability reaches beyond being green. It is also a top-notch research institution. In the first year of operation in the new building, the Biodesign Institute became the area's largest generator of federal biomedical research funding and established a prominent base of top scientific talent for its faculty. In addition, grants secured by the Institute rose 121 percent in the 2005 Fiscal year, while its researchers were catalysts for new biotechnology start-ups throughout the region, spawning three spin-off companies.

Tom Mason, building facilities manager, can easily list a number of simple ways the lab is designed to be user-friendly, including floor drains with special seals to reduce odors and surfaces specifically treated for easy cleaning. Possibly the most important design feature, however, is that the laboratories are entirely modular. In the past, modularity has sometimes been equated with a lack of individuality; however the flexibility allowed by the Institute's modular design supports maximum personalization. Every lab bench, gas line, and electrical outlet can be easily moved or adjusted to meet an individual researcher's needs. As Mason put it, "This building is just done right," pointing to the facility's obvious success in sustainability and usability.

Another indication of the Institute's sustainability is the connection of its interior, through the building's large glass windows and walls, to the natural beauty and landscaping surrounding it. The offices all face a Sonoran desert garden that was designed using native desert landscaping to reduce water dependency.

As a result of this design strategy, the people who work at the Institute take notice of the natural beauty surrounding them and profit daily from their connection to it. "There is no reason why good science should be divorced from beauty," explains Bruce Rittmann, director of the Center for Environmental Biotechnology. "When [my colleagues] walk into the facility, their first remarks are 'Wow!'" Rittmann's enthusiasm points to the success of the Institute in uniting first-rate research with ecological design to produce a community that is truly breathtaking.

#### **Collaboration and communication**

The Biodesign Institute was designed explicitly to facilitate interdisciplinary research. Many of its green features are intended not only to help protect the environment, but also to ease communication between the various research centers and their faculty.

The Labs21 supporter, Lord, Aeck & Sargent Architecture, worked with Gould Evans Associates to meet the goal of creating a collaborative, interdisciplinary atmosphere. Their inspired design concept, "Connection through Transparency," describes the qualities of the building that allow for enhanced communication within the facility. The lab design is completely open: there are no walls between research centers, almost all of the dividing surfaces that do exist are whiteboards or glass that can be written on, even the stairwells are extra-large to allow space for colleagues to chat. By eliminating the physical barriers between labs, the architects strove to remove the invisible barriers between academic fields. "As you walk in the building, you feel like it's a great building, and that you are around great people," explained Mason.

Students have varying opinions about the Biodesign Institute's open lab concept, but it has indisputably encouraged cross-disciplinary exchange and dialogue. As graduate student Quinn Spadola says, "The biggest asset to this place is talking to other people."

The Institute's events coordinator, Susan Quisenberry, says that the Institute is a great place to work, and that the open interior design enables visitors to rapidly obtain a full sense of the exciting work being done without disrupting faculty and staff.

### A new triple bottom line

The Biodesign Institute's accomplishments in ecological laboratory design and the enthusiastic response of the workers, who benefit daily from the added perks of this design, are indications of the Institute's successful embodiment of a green building that is more than energy efficient and environmentally friendly. Biodesign follows what could be described as its own triple bottom line: environmentally friendly, promoting top-quality research, and great for communication and collaboration. Recognized as Lab of the Year 2006 by *R&D Magazine*, the Biodesign Institute stands as proof to all laboratory designers, builders, and operators that laboratories can reduce their environmental impact while also improving the quality of the work space and encouraging retention of high quality researchers and staff.

With the encouragement of the Labs21 co-sponsors, other laboratory owners are finding it easier to make green improvements such as increasing their energy efficiency, decreasing their water usage, and providing a more suitable work environment, all of which help to reduce costs, increase productivity, and protect our environment.

Sustainability is the new cornerstone for the future, ensuring the operational success of laboratories and related high-performance facilities. Laboratories across the globe should embrace the energy and environmental goals of Labs21, which are contributing to the success of the Biodesign Institute.

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*About the author: Having an advanced diploma in industrial microbiology, the greater portion of Phil Wirdzek's professional career to date has been with the US Environmental Protection Agency. For many years, Mr. Wirdzek worked in several areas of regulatory development, toxicology, and health and environmental risk assessments.*

For more information on Labs21 please visit: <http://www.labs21century.gov> or learn about the Labs21 2006 Annual Conference at: <http://www.labs21century.gov/conf/upcoming/index.htm>

More information about I2SL can also be found online at: <http://www.i2sl.org>

Learn more about the Biodesign Institute at: <http://www.biodesign.asu.edu>

With nearly 35 partners, close to 150 supporter organizations, and over 4,000 individual members in the Labs21 Network, Labs21 and I<sup>2</sup>SL have become extremely successful in promoting their goals of achieving sustainability in laboratory facilities across the United States and beyond. Now in collaboration with I<sup>2</sup>SL, Labs21 Design Courses are offered throughout the year in various cities across the US and internationally, while the Labs21 Conference continues to attract speakers and attendees from countries such as Canada, Taiwan, Australia, Hong Kong, Japan, Belgium, and the UK.

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