Aircuity case study

Arizona State University

Initial Aircuity Implementation Helps Cut Energy Costs at Arizona State University's Biodesign Institute by More than $1 Million

With an enrollment of more than 70,000 students and a location in the nation's 5th largest and most rapidly growing city, Arizona State University (ASU) has long prided itself on being a cutting-edge institution that combines academic excellence, broad access and entrepreneurial energy to establish a new model for American higher education. As part of its university mission, ASU has become a leading hub of sustainable initiatives and innovation, becoming one of the greenest universities in the nation. During the past decade, ASU has undergone the most dramatic and rapid research and building expansion in its entire history, as it looks to ultimately serve a student population of almost 100,000 students by 2025 across its four campuses. As a key element of its wide-ranging facility energy use reduction plans, ASU turned to smart airside efficiency company Aircuity to optimize building ventilation and improve efficiency throughout its campus facilities.

ASU President Michael M. Crow was a founding member of the"President's Climate Commitment," a nation-wide initiative to reduce carbon emissions on college and university campuses (to date, over 650 institutions take part in the program). Ultimately, President Crow's ambitious goal is to become a carbon-neutral campus by 2025. The home of the Sun Devils decided to "walk the talk" and launched a major, campus-wide initiative aimed at reducing its carbon footprint, including comprehensive measures from recycling to the largest solar panel installation of any college campus in the country—supplying 12MW of solar power by 2012.

Given that buildings and facilities are often the largest culprits—typically accounting for more than *75 percent* of all emissions on a given campus—it seemed to be the logical place for ASU to start making a difference.

GETTING STARTED: ASU'S BIODESIGN INSTITUTE

The opening of the 350,000 sq.ft. Biodesign Institute on ASU's campus in 2006 was part of an ambitious plan by ASU President Michael Crow to boost research activity through the most rapid expansion of ASU's research facility capacity in its entire history. The Biodesign Institute is the largest bioscience facility in Arizona and its talented scientists are developing new technologies to solve some of the world's most urgent problems. These include issues affecting human health and the health of our planet, improving health care through more personalized medicine, outpacing the global threat of infectious diseases and improving the environment through renewable energy and bioremediation.

The Biodesign Institute was named "Lab of the Year" by R&D Magazine in 2006 and has been recognized by a number of organizations in the building industry as a truly state-of-the art facility for its green building achievements. The Institute's first phase achieved a LEED® Gold rating from the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) green building rating system, and a LEED Platinum rating for its second phase. The Biodesign Institute is a unique, one-of-a-kind facility and is the largest LEED Platinum certified bioscience facility in the world.

But along with this expansion, the Biodesign Institute and other research facilities brought with them a significant increase in total campus utility consumption. Increased utility consumption is to be expected when a large building is added to the portfolio—but the sheer magnitude of the increase (more than 1,000,000 sq. ft. of added research space) prompted ASU to look for new ways to reduce the overall consumption.

IMPROVING ENERGY CONSUMPTION THROUGH BETTER VENTILATION

The Biodesign Institute's facilities and operations unit pursued several strategies to reduce energy costs, including a 150MW solar panel installation, efficient lighting, water usage and air-handling issues related to Biosafety level 2 and 3 operations. After move-ins in 2004 for building A and 2006 for building B, it became evident that a more efficient air-handling system was needed.

After investigating several options, in 2007, ASU turned to the smart airside efficiency company Aircuity for a solution to its energy consumption issues. ASU selected Aircuity's OptiNet system, a comprehensive suite of intelligent ventilation measurement and optimization technologies to lower its

operating costs, improve safety and become more energy efficient. The system was initially rolled out in eleven zones in the Biodesign Institute. Through its Demand Control Ventilation (DCV) technology, Aircuity transformed ASU's operations from having a constant high volume of dilution airflow in all labs to one where the high volume was only provided when necessary—and only in the specific lab spaces which needed it.

The initial project was so successful that the Aircuity system was extended throughout both Biodesign Institute buildings. The end result was a ***67% reduction*** in the average volume of ventilation air used in the entire building. Not only was this a huge improvement in the efficiency of the Institute's ventilation system, the installation saved ASU well over ***$1 million per year*** from this building alone.

"Aircuity has been a critical part of helping Arizona State University move forward with its energy conservation initiatives and show real emission reductions," said Mike McLeod, Director of Facilities at the Biodesign Institute. "Their technology allowed us to make a real difference and see efficiency improvements right away."

MORE THAN JUST SCIENCE BUILDINGS

Based on the savings from the implementation in the Biodesign Institute, ASU has expanded the use of the Aircuity system to an additional twenty-one buildings on campus, including the Physical Science complex, the Computing Commons, the Student Union, several classroom buildings, the Hayden Library, student radio and television stations and the school's administrative offices. These additional implementations represent over 1.4 million square feet of the campus.

A TEAM EFFORT WITH ARIZONA PUBLIC SERVICE ENERGY SERVICES (APSES)

APSES has been retained by ASU to make a number of major energy improvements on the campus. These include an extensive renovation and modernization of the Heating, Ventilating, and Air Conditioning (HVAC) control systems in several of the buildings—and will include the implementation of Aircuity's OptiNet system for Demand Controlled Ventilation, Differential Enthalpy Control and Laboratory Ventilation Management as a part of the project. In addition to the HVAC upgrades, APSES and ASU are working together on lighting upgrades in a number of buildings and a major retrofit to the central plant. These green updates and improvements are all being paid for through the energy savings, of which Aircuity's airside efficiency program is leading the way.

A GREENER CAMPUS MAKES A BETTER LEARNING ENVIRONMENT

Beyond energy savings, Aircuity is making a significant contribution to ASU's goal to reduce greenhouse gasses and improve the university's carbon footprint. Implementing OptiNet in the Biodesign Institute alone has reduced emissions by ***7,149 metric tons***. Analysis of the rest of the campus buildings should take this number well above ***10,000 metric tons***—which adds yet another example of how Arizona State University is truly a cutting-edge institution.

"ASU is a perfect example of the right way to go green," said Patrick Romich, CEO of Aircuity. "The school is well-regarded for its sustainability initiatives and we are proud to have helped ASU become not only one of the nation's greenest campuses, but a model example for other colleges and universities to emulate."

BUILDING	BUILDING USE	SIZE (SQ. FT.)	APPLICATIONS
Biodesign Institute – Buildings A & B	Scientific Research	350,000	Lab DCV
Physical Science Complex (8 Buildings)	Scientific Education	129,000	Lab DCV
Computing Commons	Common Computer Lab for Student Use & Classrooms	119,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Business Administration	Classrooms and Administrative Offices	118,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Payne Hall	Classrooms	92,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Farmer's Hall	Classrooms	80,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Wells Fargo Arena	Sports and Event Center	320,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Memorial Student Union, Conference Area	General Conference Area of the Student Union	50,000	IEQ Monitoring
Hayden Library	Library	318,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Stauffer Hall / KAET Television	Classrooms, Television & Radio Stations	78,000	IEQ Monitoring, DCV, Differential Enthalpy Control
Goldwater Center	Multi-use Classrooms and Laboratories	195,000	IEQ Monitoring, DCV, Differential Enthalpy Control
College of Design	Classrooms	60,000	Differential Enthalpy Control

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