



CASE STUDY: THE UNIVERSITY OF ARIZONA, HOME OF THE WILDCATS

CAMPUS FACTS

LOCATION:
Tucson, Arizona

FOUNDED:
1885

TYPE:
Public

TOTAL STUDENT POPULATION:
38,057 (29,719 undergraduates)

STAFF:
12,164

PRIMARY ATHLETICS CONFERENCE:
Pacific 12 (Pac-12)

PRIMARY ATHLETICS DIVISION:
NCAA Division 1

NUMBER OF VARSITY TEAMS:
20 (12 women's, 8 men's)

NUMBER OF SPORTS FACILITIES:
24 (14 athletic, 10 recreational)

SUSTAINABILITY OFFICE FOUNDED:
2010

AASHE STARS RATING:
Gold, 2012

SPORTS GREENING WORK STARTED:
2007

SPORTS FACILITY LEED CERTIFICATIONS:
Student Recreation Center, LEED Platinum
Certification for New Construction, 2010;
Lowell-Stevens Football Facility, LEED Silver
(or greater) Certification for New Construction
(pending)

**“ONE REASON THE UA IS
INTEGRATING SUSTAINABILITY
INTO SPORTS PROGRAMS IS
BECAUSE IT MAKES BUSINESS
SENSE,” SAYS JOE ABRAHAM,
DIRECTOR OF THE UA OFFICE
OF SUSTAINABILITY.**

THE WILDCATS' GREENING STORY: MOTIVATIONS, CHALLENGES, AND LESSONS

In 2010, the University of Arizona (the UA) built the first university recreation center in the United States to be awarded LEED Platinum certification. This facility is also the first in the nation to use solar energy for both heating the Olympic-size pool and cooling the building's chiller systems. The UA athletics department boasts on-site solar at the Hillenbrand Aquatic Center and resource-saving artificial football turf, and is awaiting LEED certification of the Lowell-Stevens Football Facility. The UA is successfully integrating sustainability across all sports facilities and operations, reducing both resource use and operational costs.

WHY IS THE UA GREENING SPORTS?

According to Joe Abraham, director of the UA Office of Sustainability, there is often a financial case for greening sports. “One reason the UA is integrating sustainability into sports programs is because it makes business sense,” says Abraham. “Implementing new technologies and greening programs into our sports facilities helps reduce our energy and water use.”

Brand enhancement is another reason the UA is advancing sports greening. “As the country pivots toward sustainability, going green also enhances the UA's reputation,” explains Abraham. “For example, the UA was recently listed as one of the Princeton Review's Top Green Schools. This recognition is valuable for recruiting students.”

The UA is also greening sports to support its students' interests in sustainability. “By implementing new sustainability projects supported by our student-governed UA Green Fund, the UA increases its visibility as a place where exciting green things are happening,” Abraham explains.

WHERE DID THE UA START?

GREEN BUILDING LEADERSHIP

“In building a more sustainable campus, start with an institutional commitment to build green buildings,” says Peter Dourlein, assistant vice president of UA Planning, Design, and Construction. “The UA requires that all new buildings and major renovations achieve a LEED rating of Silver or better. University standards on how to maintain those buildings ensure that these facilities live up to their full potential.” UA Planning Design & Construction maintains these standards with UA Facilities Management and other Business Affairs units.

STUDENT RECREATION CENTER LEED PLATINUM FEATURES

SITING

- The Rec Center was built on a recovered brownfield site previously used as a parking lot.
- The facility is connected to environmentally preferable transportation (e.g. bicycling and walking access).
- A white roof was installed to reduce the heat island effect.
- The parking spots closest to the facility are reserved for electric and hybrid vehicles.

WATER EFFICIENCY

- High-efficiency plumbing fixtures have reduced the center's water use by 47.5 percent.
- Landscaped areas at the Rec Center were designed to promote passive stormwater harvesting, using filtration basins and increased permeability to reduce runoff.
- Water harvesting and stormwater management techniques include bioswales (which help remove pollution from stormwater runoff), a percolation bed beneath the volleyball court, and the capturing of HVAC condensation for irrigation.
- Plants surrounding the expansion were selected for their ability to thrive with minimal watering.

ENERGY AND ATMOSPHERE

- Synchronized energy systems save 50.4 percent of energy costs compared with costs prior to the 2009 expansion.
- Passive solar measures, such as the use of daylight and overhangs that shade glass and ground surfaces, promote energy efficiency.
- 54,000 square feet of white roofing reflects sunlight and remains cool while reducing the energy used for air conditioning.

MATERIALS AND RESOURCES

- More than 10 percent of all the materials used in construction were either manufactured or produced within 500 miles of Tucson.
- 28.75 percent of the Center's building materials were made with recycled content, including aluminum, steel, floor finishes and trim, roof insulation, and wall insulation.

INDOOR ENVIRONMENTAL QUALITY

- Rec Center users benefit from both 97.54 percent natural daylight and access to exterior views throughout 99.57 percent of all regularly occupied spaces.
- Added ventilation improves air quality.
- Interior materials and finishes have no or very low VOCs (volatile organic compounds).

The first major green building initiative at a UA sports facility, in 2009, was an \$18.6 million expansion of the Student Recreation Center. "The first place many students interact with when they arrive on campus is the Recreation Center," notes Lynn Zwaagstra, director of UA Campus Recreation. "With close to 25,000 students using the Student Recreation Center and almost 835,000 total visits last year, we are pleased to help advance our institutional sustainability goals."

The UA's department of Campus Recreation helped lead the design team for the 53,000-square-foot expansion, which doubled the amount of space for cardio-fitness, strength conditioning, and several new activities. Green building was prioritized from the outset of the design process in order to promote student health and wellness, minimize environmental impact, and conserve water, especially important in Tucson's arid climate.

Campus Recreation took advantage of on-campus experts in sustainable design, including faculty, students, and operations staff, to improve the green features of the building. For example, students and staff from the UA's College of Agriculture and Life Sciences assisted with the landscaping and water-harvesting aspects of the design. Students, along with faculty from the Department of Soil, Water, and Environmental Science, installed passive water harvesting basins to manage rainfall runoff adjacent to the facility. Facilities Management identified the efficient irrigation and mechanical systems. UA parking and transportation services dedicated prime parking spaces to low-emission vehicles.

Dourlein said that the interdepartmental collaboration was unique. "Various UA programs, students, faculty, and staff came together to make the LEED certification happen, and we couldn't be more proud." The expansion was originally designed to achieve LEED Silver certification, in accordance with UA construction policy. However, the university worked with its design firm to achieve LEED Platinum certification without affecting the original project budget," says Dourlein.

One notable design feature is the 346-vacuum-tube thermal solar collector that spans the facility's roof and produces almost 2 million kilowatt-hours of solar power each year. The solar energy drives an absorption chilling system that helps cool campus buildings. Heat, a by-product of this process, is captured and used to warm the Recreation Center's 55,000-gallon Olympic-size swimming pool. The thermal solar array provides one-third of the energy needed to heat the pool.

Another unique feature is the water retention basin built under the volleyball courts. This basin stores rainwater collected from the center's roof and allows the water to percolate into the ground, helping to minimize stormwater runoff. Dourlein also praises the UA's extensive outdoor space for helping to minimize the building's footprint. "The most sustainable building is the one you never have to build, so making the most of outdoor space—and therefore reducing the indoor conditioned space we build—is one of the greenest things we can do," he explains.

Student use of the recreation center has increased 91 percent since the building opened in January 2010. Myles Palmer, a desk assistant at the center, thinks that has something to do with the environmental quality of the new space. The previous interior "was really fluorescent, but now the windows bring in natural light that's easy on the eyes," he says. "And the old weight room didn't have the open, natural feel that the new one does." The new building uses natural daylight in 99 percent of all commonly occupied spaces and has improved indoor air quality with added ventilation.

The LEED Platinum Recreation Center isn't the only UA sports facility that features on-site solar. The Hillenbrand Aquatic Center, which has served as a training center for 45 Olympian and 61 NCAA champion swimmers, also installed a thermal solar system in 2010 to provide 20 percent of the pool's energy needs for heating, or about 400 million BTUs. Solar thermal water systems are particularly well suited to the University of Arizona, which benefits from more than 350 days of sunshine each year.



Photos courtesy of The University of Arizona.

In 2012, the UA began another green building expansion to accommodate the growing student population, this time led by the athletics department. The university expanded Arizona Stadium, home to the Wildcats since 1929, by constructing the Lowell-Stevens Football Facility, currently awaiting LEED certification (anticipated to be Silver or higher). Financed through private donations, the Lowell-Stevens Football Facility houses coaches' offices, an equipment room, a medical treatment center, team meeting rooms, and weight and locker rooms, as well as a cafeteria open to the campus and public. This construction project builds on ongoing energy efficiency measures at Arizona Stadium, including the 2010 installation of outdoor lighting fixtures that direct light more precisely inside the stadium and reduce light pollution by 75 percent.

STUDENT ENGAGEMENT

"In addition to building a green campus, the UA is working to build a student body that's engaged in sustainability," says Abraham. "One mechanism for this is the UA Green Fund." The Green Fund, created in 2010, offers financial support for students and employees who create innovative projects in areas such as renewable energy; energy efficiency; water efficiency; waste reduction; and environmental sustainability education, research, and outreach.

The Green Fund is financed with a \$24 annual fee per student per year, paid as part of tuition. The 10-student Green Fund Committee allocates its \$400,000 yearly budget to multiple projects across the university system, basing decisions on a review of project proposals submitted by students, faculty, and staff. Since 2010, the Green Fund has allocated over \$1.5 million to more than 50 projects, including projects greening UA sports events.

For example, the Green Fund Committee has provided funding to the student-run "Greening the Game" program that partners with UA Facilities Management to increase waste diversion at home football games. The student team encourages tailgaters to sort their waste, provides tailgaters with green tips and other educational materials and, with UA Facilities Management, analyzes ways to increase recycling rates. "Thanks to our partnership with students we were able to divert over 25 tons of recyclables from the landfill over the course of six home football games during the 2011 season," says Chris Kopach, assistant vice president for Facilities Management.

"UA students have led the campus on green initiatives and continue to be catalysts for sustainable change at the UA, particularly in relation to sports events," says Abraham. "Along with UA Facilities Management, students are leading the way to increase our recycling rates across the campus. In the fall of 2012, students worked with Facilities Management to install new recycling bins in over 100 campus buildings and worked with the Office of Sustainability to promote the more visible and informative bins to students and employees."

NEW STADIUM TURF

In February 2013, Arizona Athletics announced plans to install synthetic turf at Arizona Stadium to replace the natural grass. Arizona Stadium is now just the second major stadium in the country to install FieldTurf's CoolPlay, an artificial turf system that is made of recycled materials and is 100 percent recyclable, thanks to a take-back program with FieldTurf. This CoolPlay system reduces on-field temperatures by 15 to 20 degrees—an important benefit in a city as hot as Tucson—while significantly reducing the water consumption previously required to maintain the hybrid Bermuda grass.

ACCORDING TO FIELDTURF, THE "COOLPLAY ARTIFICIAL TURF":

- Can save up to 1 million gallons of water each year in avoided watering
- Is made using approximately 20,000 recycled tires for its infill layer
- Is 100 percent recyclable
- Needs no ongoing maintenance, chemicals, or other products that are typically required for natural turf management
- Can contribute toward LEED credits



“A CAMPUS-WIDE COMMITMENT TO SUSTAINABILITY THAT INCLUDES OUR SPORTS PROGRAMS INCREASES THE UA’S VISIBILITY AND REPUTATION,” SAYS ABRAHAM. “AS A RESULT, WE THINK WE’LL INCREASE STUDENT AND STAFF PRIDE, ALUMNI AND DONOR ENGAGEMENT, FAN LOYALTY, AND EVEN CONNECT WITH BUSINESSES AND CORPORATIONS THAT SHARE OUR GOAL OF REDUCING OUR ENVIRONMENTAL FOOTPRINT.”



GREEN CLEANING

“Although the UA has been recognized for its commitment to building sustainable facilities, an important component in the university’s long-term sustainability is maintaining these facilities,” says Kopach. Across the UA main campus, including in the Student Recreation Center and in all Arizona Athletics facilities, the UA has switched from potentially harmful cleaning products to environmentally preferable formulations. “Over 75 percent of traditional cleaning supplies were replaced with products developed not only for high performance but also for a reduced environmental impact and enhanced safety,” says Kopach.

These green custodial practices earned the Facilities Management custodial team a Green Guard Certification, a recognition given to only a handful of campuses nationwide. “This certificate is a formal recognition of the UA’s commitment to maintain clean, safe, and attractive facilities by procuring and properly using environmentally preferable cleaning products,” says Kopach.

CHALLENGES: OVERCOME AND ONGOING

MAKING THE CASE FOR SPORTS GREENING

“One initial challenge facing many universities is the presumption that sustainability and sports aren’t a natural fit and that green initiatives don’t advance the goals of sports programs,” says Abraham. “But a campus-wide commitment to sustainability that includes our sports programs increases the UA’s visibility and reputation. As a result, we think we’ll increase student and staff pride, alumni and donor engagement, fan loyalty, and even connect with businesses and corporations that share our goal of reducing our environmental footprint.”

For example, in 2013, Campus Recreation worked with Facilities Management personnel to add a water bottle refilling station at the Student Recreation Center. This simple investment encourages students and employees to drink free, filtered tap water from reusable water bottles rather than purchasing environmentally costly bottled water. This move has been hugely popular among students, staff, and other recreation center visitors. With strong positive response, the initiative is spreading to many other parts of campus.



Photos courtesy of The University of Arizona.

ONGOING BUY-IN

“Moving sustainability forward at the UA also means eliminating silo walls between departments, an issue that many other large universities face. Finding out what motivates each group is important, as is creating a vision that serves everyone’s goals,” explains Abraham. “Taking the time to understand the different priorities and constraints of the UA units responsible for our sports facilities, programs, and events has given us a clearer way forward and a better foundation to collaborate on our institutional sustainability goals.”

Next steps at the UA include creating a mixed undergraduate and graduate-level environmental course in which students will identify sustainability opportunities and solutions at the UA, including in sports facilities. Supported by the Green Fund, the College of Engineering, and the Office of Sustainability, this course will teach students assessment methods and directly engage more students in the greening of the UA campus. “As a large research university with strong campus recreation and FBS Division I intercollegiate athletics programs, the UA is positioned to contribute to the intersection of sports and sustainability in collaboration with the Green Sports Alliance, NRDC, NCAA, NIRSA, AASHE, and other organizations,” says Abraham.

In 2013, the UA joined the Green Sports Alliance to learn from and support other professional and collegiate sports greening programs. “In addition to continuing to walk the walk, we look forward to working with the Green Sports Alliance to refine best practices and contribute to their adoption by other universities and venues,” UA athletics director Greg Byrne said after the move was announced.

ENVIRONMENTAL ASSESSMENTS FOR EVENT GREENING

“In recent years, many universities have invested significant resources to reduce the environmental impacts associated with large events. But in most cases, the majority of impact reduction focuses on ‘zero waste’ campaigns that divert waste from landfills by means of recycling and compost programs,” says Abraham. “By comparison, UA is employing a life-cycle assessment (LCA) approach that takes into account all upstream and downstream impacts of its annual homecoming event.”

According to Abraham, the UA is the first to use aspects of an LCA approach to assess the environmental impacts of a so-called “mega” event like their annual Homecoming. “With over 60,000 attendees over three days, Homecoming is the UA’s largest long-running annual event, offering a unique opportunity to engage students, employees, and alumni in sustainability,” says Abraham. In 2012, the UA used LCA methodology to evaluate some of the environmental impacts associated with attendee travel and accommodations, 25 major events, game-day festivities, and the football game, with the goal of understanding how to reduce impacts of homecoming and other large UA events as well as developing a transferable assessment method.

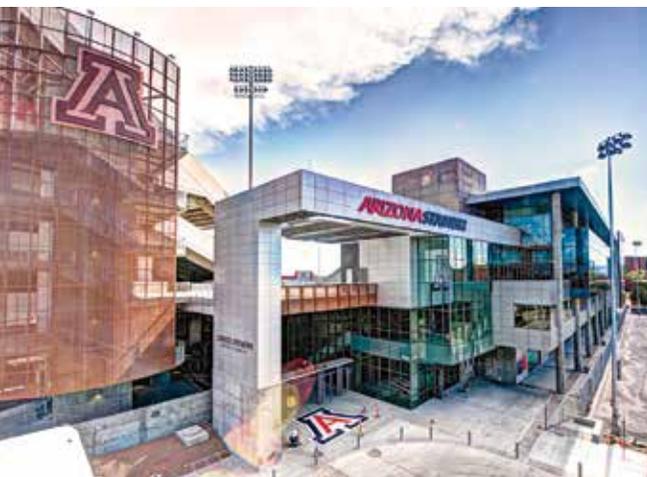
For this project, the UA Office of Sustainability and several campus departments assembled a team dedicated to collecting and analyzing some of the available environmental impacts data related to Homecoming. This team included a graduate assistant, two NASA Space Grant undergraduate interns, and four engineering management undergraduates. This team worked to evaluate some of the environmental data associated with the raw material extraction, material processing, manufacturing, assembly, transportation, product use, and end of life for the products used during Homecoming with the “SimaPro LCA Software” system. The team used LCA methodology based on EPA’s Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI). On game day and throughout the weekend, 120 honors students collected data from attendees at a diverse array of events.

“The assessment will be conducted again in 2013, with a number of strategies based on the 2012 assessment in place to improve the environmental performance of the 2013 Homecoming celebration in a meaningful and verifiable way,” says Abraham. “Based on our findings the Office of Sustainability will assemble an environmental better practices guide for hosting large events.”



Photos courtesy of The University of Arizona.

“IN ADDITION TO CONTINUING TO WALK THE WALK, WE LOOK FORWARD TO WORKING WITH THE GREEN SPORTS ALLIANCE TO REFINE BEST PRACTICES AND CONTRIBUTE TO THEIR ADOPTION BY OTHER UNIVERSITIES AND VENUES,” SAID GREG BYRNE, THE UNIVERSITY OF ARIZONA’S ATHLETICS DIRECTOR.



Photos courtesy of The University of Arizona.

“TAKING THE TIME TO UNDERSTAND THE DIFFERENT PRIORITIES OF THE SEVERAL UA UNITS RESPONSIBLE FOR OUR SPORTS PROGRAMS, FACILITIES, AND EVENTS HAS GIVEN US A CLEARER WAY FORWARD,” SAYS ABRAHAM.

LESSONS FROM THE FIELD

ENSURE INITIATIVES ARE SIMPLE

“To ensure buy-in, sustainability initiatives should be cost-effective and easy to implement,” advises Abraham. He suggests piloting new efforts on a small scale first, to demonstrate feasibility, gather feedback, and build confidence, before rolling them out on a larger scale.

TAKE INTO ACCOUNT SPORTS DEPARTMENT INTERESTS

“Taking the time to understand the different priorities of the several UA units responsible for our sports programs, facilities, and events has given us a clearer way forward,” says Abraham. He notes that the business angle can provide common incentives across departments, as well as concrete benchmarks for green initiatives. “Although the UA is fortunate to enjoy a campus culture that supports sustainability, going green requires much more tangible commitments and achievable goals.” One reason the UA supports sustainability is because it makes business sense. “Implementing new technologies and greening programs into our sports facilities helps reduce our energy and water use. It helps lower the UA’s bottom line.” says Abraham.

RECOGNIZE THAT DEPARTMENTS HAVE DIFFERENT CAPABILITIES

Athletics, Campus Recreation, Facilities Management, Planning Design & Construction, and other campus departments each have different budgets, staff, expertise, incentives, stakeholders, and funders. These factors influence green project feasibility and timelines. “It’s important to recognize the challenges that different departments across the university may encounter as they attempt to implement sustainable practices,” says Abraham, “especially given that universities often do not function as top-down as a business might.”

JOIN THE GREEN SPORTS ALLIANCE FOR ONGOING ADVICE AND SUPPORT

UA joined the Green Sports Alliance to learn from and support other professional and collegiate sports greening programs. “We are proud to contribute to and learn from the Green Sports Alliance to help refine industry best practices and advance our programs,” says Abraham.