

# Sustainability Operations

Arizona State University

Fiscal Year 2016 Review

**Sixth in Sierra Magazine Cool Schools** rankings

**Climate Leadership Award** from **Second Nature** and the **Center for Green Schools** at the **U.S. Green Building Council**

**Top Performer** in Purchasing category for **AASHE's 2016 Sustainable Campus Index** for the second consecutive year

**Volunteers harvested 6 tons of Seville oranges on the Tempe campus**



**Arizona State University** focuses on sustainability as one of its core values. The university is a leader in sustainability operations and practices among its peers across the country and continues to find innovative ways to serve as a living laboratory – one at the leading edge of impact in higher education.

This annual review summarizes ASU's continued efforts for the period July 1, 2015 – June 30, 2016 (FY 2016) to achieve its sustainability goals: climate neutrality, zero solid and water waste, active engagement, and principled practice. The reporting period was changed this year to align with ASU's greenhouse gas inventory and other sustainability reporting periods.

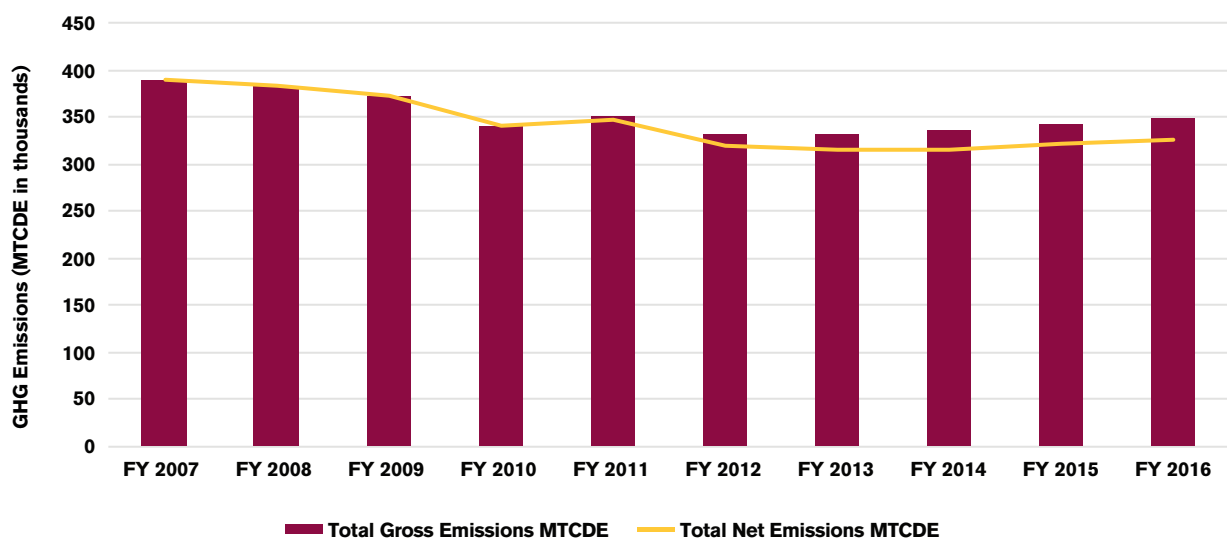
## Climate Neutrality

ASU is committed to becoming a climate-neutral institution by 2025 related to greenhouse gas emissions (GHG) from building energy sources, and completely climate neutral, including the elimination of emissions related to travel and other sources, by 2035.

ASU undertook a major effort in 2016 to develop a much more comprehensive definition of its institutional boundaries and then recalculated its GHG emissions retroactively to its 2007 baseline year.

FY 2016 Emissions	MTCDE
Gross Emissions	348,805
Carbon Offsets <sup>1</sup>	(22,009)
Net Emissions	326,796

**ASU Gross and Net Greenhouse Gas Emissions  
FY 2007 - FY 2016**



<sup>1</sup> ASU sells most of the renewable energy credits (RECs) associated with its on-campus solar projects to help third parties meet their renewable energy goals and to help finance the construction of these projects. However, to meet its sustainability goals, ASU purchases an approximately equivalent number of RECs from various renewable energy sources. "Carbon offsets" here refers to the 21,756 MTCDE of avoided emissions associated with those RECs, as well as 253 MTCDE sequestered through composting.



## Climate Neutrality

FY 2016 gross emissions increased by 5,600 metric tons (1.6 percent) of carbon dioxide equivalent over FY 2015. During the same time frame, ASU added 3 percent more building space and 9.4 percent more students attended ASU. Four percent more students attended on campus.

More students biked, which reduced emissions, but the biggest contributor to the university's increase in gross emissions was an increase in students who drove to campus. Additional contributors to increased campus emissions included:

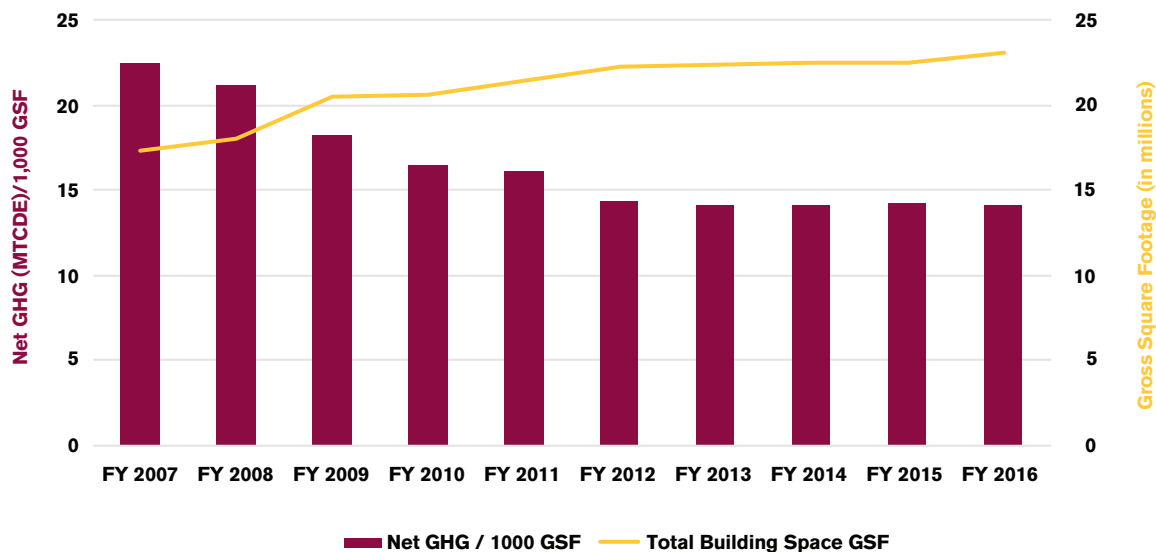
- **Air travel** – Although employee air travel dropped, more ASU students joined study abroad programs.
- **Operations** – Repair work in the ASU combined heat and power plant shifted some air conditioning load to the central plant, which generates more carbon emissions.

ASU's emissions grew in FY 2016 by 1.6 percent. However, emissions per student declined by 2.4 percent and per gross square foot by 1.3 percent.

Since the FY 2007 baseline year, ASU has reduced net emissions by 16.1 percent while also increasing ASU community population by 25.4 percent and space by 33.2 percent.

**Net emissions reduction**  
**16.1%**  
 since  
 FY 2007

**ASU Net Greenhouse Gas Emissions and Building Space  
 FY 2007 – FY 2016**



## Climate Neutrality

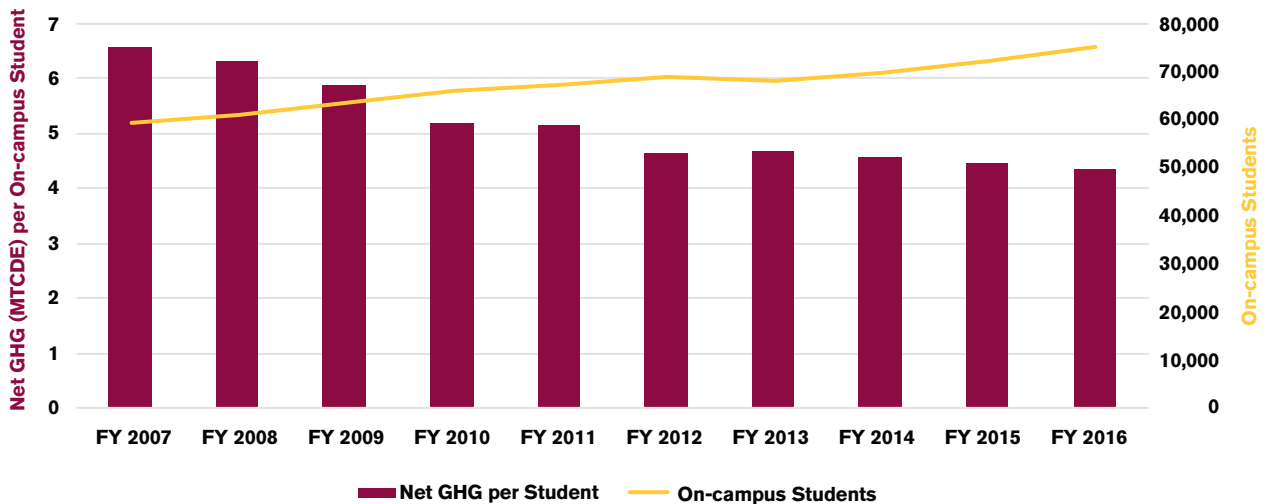
Through June 30, 2016, the projected investments by **Sustainability Initiatives Revolving Fund, SIRF**, totaled \$17 million. Most projects repay the fund within three to five years from the time of their approvals. The FY 2016 return on investment was \$1.4 million. Due to SIRF projects funded in FY 2016, 4,172 MTCDE (Metric Tons of Carbon Dioxide Equivalent) emissions will be eliminated.

**Red Rock solar plant** construction began in spring 2016 to meet a Jan. 1, 2017 generation date. The power supplied by the plant will increase ASU's renewable energy supply by more than 150 percent per year. As a result of the Arizona Public Service-ASU collaboration, more than 90,000 panels were installed on approximately 180 acres, avoiding an estimated 26,000 MTCDE in annual emissions.

ASU also initiated **Central Plant improvements** that will increase the overall efficiency of this largest electricity use on the Tempe campus.

ASU has reduced its net emissions by 16.1 percent since FY 2007 despite serving 50.2 percent more FTE students overall, and 26.9 percent more students physically on campus. **That is a reduction in emissions of 44.1 percent per student and 33.9 percent per on-campus student.**

**ASU On-campus Students and Net Greenhouse Gas Emissions per On-campus Students (FTE)**  
FY 2007 – FY 2016



**Red Rock solar plant will increase ASU's renewable energy supply by more than 150 percent per year**

# Zero Waste

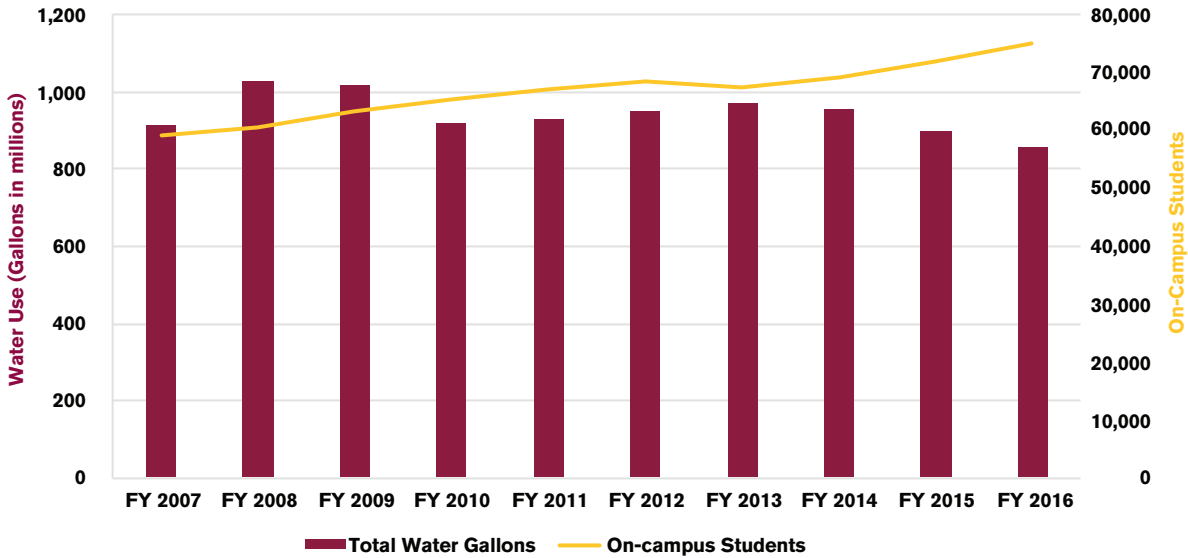
## Water and Wastewater

The university's water-waste goal includes a 50-percent water-use reduction and the elimination of wastewater by 2020.

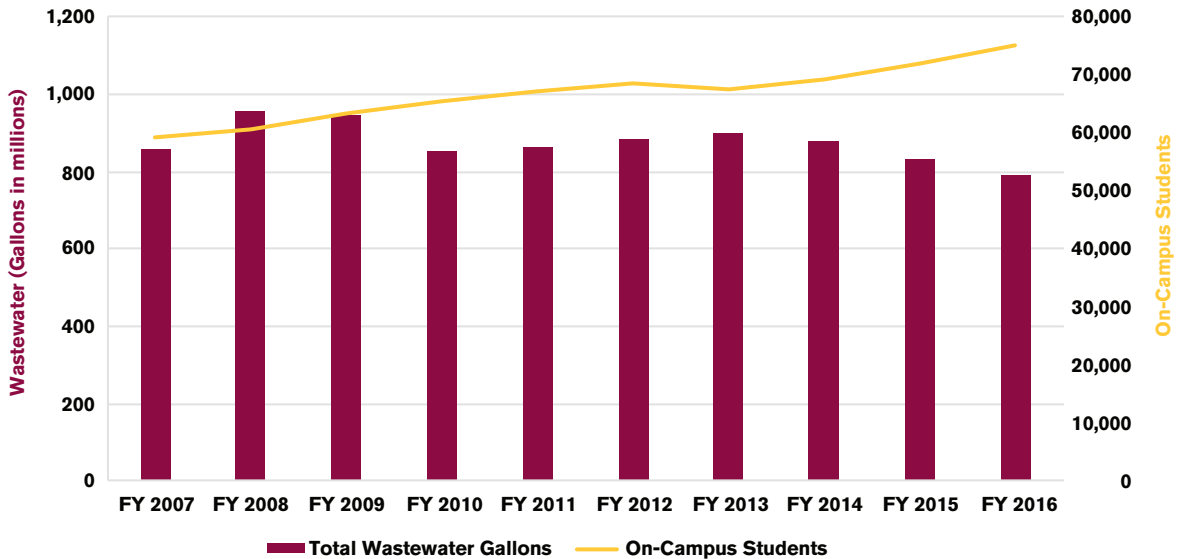
ASU continued to progress in both its water and wastewater sub-goals in FY 2016, but not at the pace necessary to reach its target date. Water use declined by 5.1 percent in FY 2016 and wastewater generated declined by 4.9 percent.

**Water use declined**  
**5.1%**  
 in  
 FY 2016

**ASU Total Water Use and On-campus Students (FTE)**  
 FY 2007 – FY 2016



**ASU Wastewater and On-campus Students (FTE)**  
 FY 2007 – FY 2016



# Zero Waste

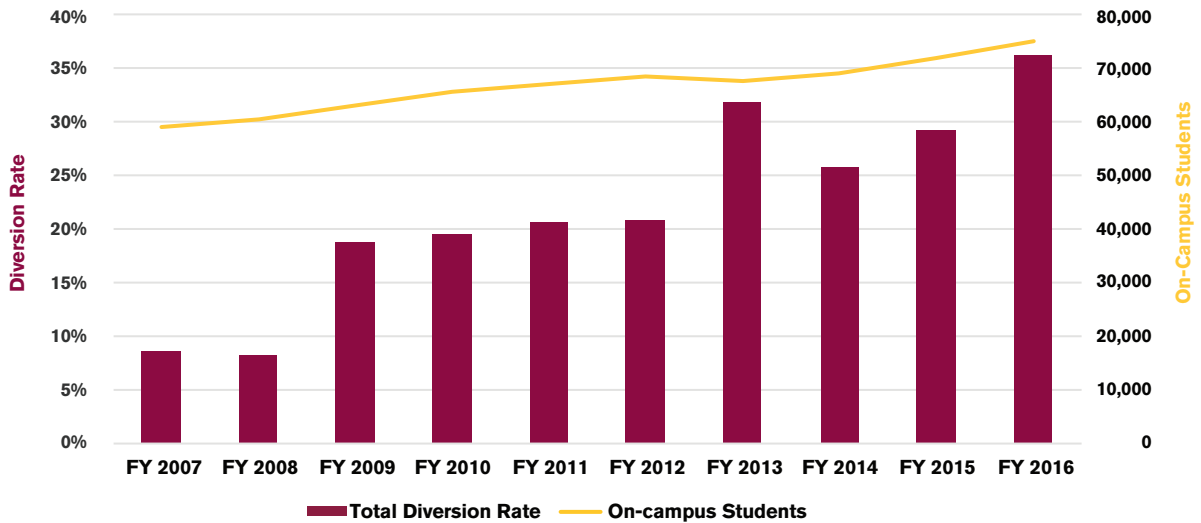
## Solid Waste

ASU continued to make significant progress in landfill waste reduction. In FY 2016, ASU diverted 36.5 percent and averted 28.6 percent of landfill waste – over the FY 2007 baseline.

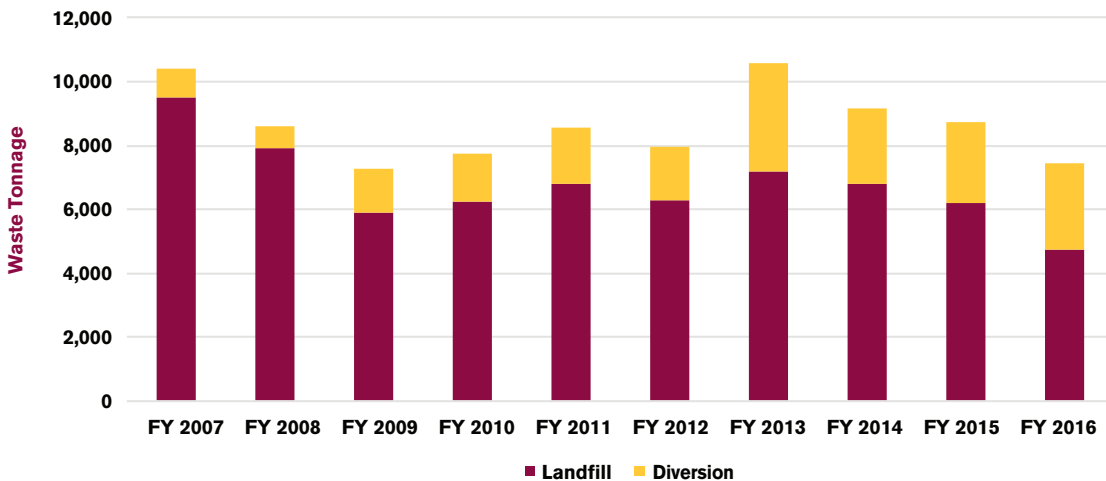
The annual sums of landfill and diversion in the charts below illustrate “aversion” – the reduction of the total amount of materials brought onto campuses in recent years. Aversion is a significant strategy to achieve zero waste when combined with behavior change and a broad portfolio of diversion infrastructure.

Per Full-Time Equivalent (FTE) person, ASU community members produced an average of 175 pounds of waste; 63 pounds was (36 percent) diverted and 111 pounds (64 percent) was landfilled.

**ASU Waste Diversion Rate and On-campus Students (FTE)  
FY 2007 - FY 2016**



**Diversion/Landfill Tonnage per Year  
FY 2007 - FY 2016**



## Zero Waste

### Notable Zero Waste achievements include:

Multiple partners collaborated to achieve a 99.7 percent construction demolition diversion rate on the new **Student Pavilion** construction site. Diversion hierarchy and processes also were developed to repeat similar outstanding diversion rates in future demolition projects.

With a diversion rate of 92.4 percent, ASU placed First in the PAC-12 **RecycleMania Game Day Basketball Challenge**.

**ASU Zero Waste** partnered with **Residential Life**, Goodwill of Central Arizona and Big Brothers Big Sisters of Central Arizona to collect more than 52 tons of clothing, food, furniture and other reusable or recyclable items during the annual **Ditch the Dumpster** residence hall move-out collection drive.

In FY 2016, 419 tons of food waste generated from **athletics events, dining halls** and **campus events** was diverted, up from 315 tons in FY 2015. Nearly 5 tons went to local food banks and community kitchens and 414 tons were composted.



The **ASU Zero Waste** department, the **Memorial Union**, **New Student and Family Programs** and **Sun Devil Dining** transformed 49 new student orientation lunches into zero waste events. At the beginning of their ASU experience, 7,746 students and 5,375 guests were engaged in sustainable practices and diverted 5,784 pounds of recyclable and 5,880 pounds of compostable materials from the landfill.

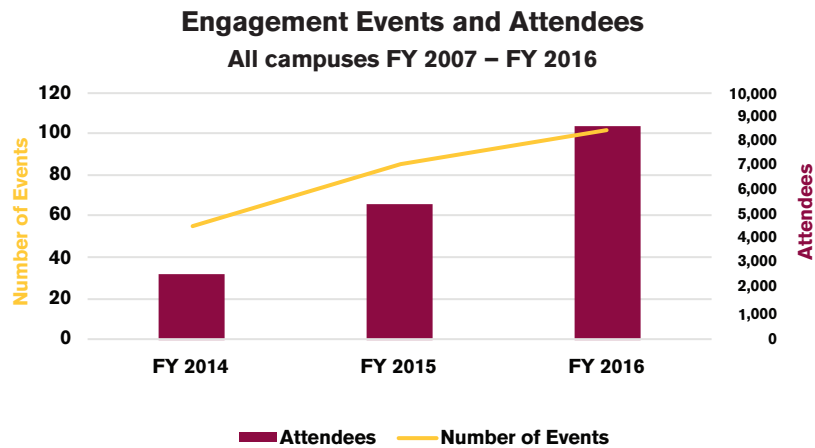


**A student participates in Ditch the Dumpster effort**

## Active Engagement

Active Engagement educates and encourages students, faculty and staff to adopt sustainable behaviors in their daily campus actions and beyond.

**University Sustainability Practices** engaged 8,597 students, faculty and staff through 102 sustainability-related events, an increase of 57.1 percent over FY 2015.



The **ASU Cycling Club** and **Parking and Transit Services** organized the **Sun Devil Criterium**. The one-day event featured approximately 15 different bicycling races for different audiences, engaged 497 race entries and about 500 spectators. The Sun Devil Criterium was the largest single-day USA Cycling-sanctioned event in both 2015 and 2016.

## Sun Devil Criterium



## Active Engagement

Three science classes from the **ASU Polytechnic Preparatory Academy** and the **ASU Preparatory High School** cultivated three of the 12 garden plots in the Polytechnic campus community garden to grow organic vegetables. Gardeners logged more than 2,820 hours. Over 150 students, faculty and staff participated and donated more than 80 pounds of produce from their plots to local food banks.

Two hundred forty-three volunteers harvested 6 tons of Seville oranges on the Tempe campus. **Grounds Services** partnered with **Sun Orchard Juicery** and **Aramark** to harvest, juice and serve the 176 gallons of juice on campus. One hundred twenty-eight volunteers pollinated, bagged and harvested 3,151 pounds of dates across ASU's campuses, which were sold or used for promotional events.

ASU boasts 21 sustainability-focused student organizations, including the **Barrett Sustainability Club**, **Campus Student Sustainability Initiatives**, the **Green Devils**, **Greenlight Solutions** and **Zero Waste partners**.

One-hundred-five **Zero Waste Ambassadors** from five student organizations and staff engaged 10,116 students, staff and visitors about the role every individual can take to achieve zero waste at ASU.

The **Green Devil Network** graduated 56 faculty and staff members to promote a culture of sustainability at ASU. Twenty of those graduates committed to participate in the Distinguished Green Devils program and chose to expand their sustainability leadership and learning for FY 2017.

**Polytechnic campus garden**

## Principled Practice

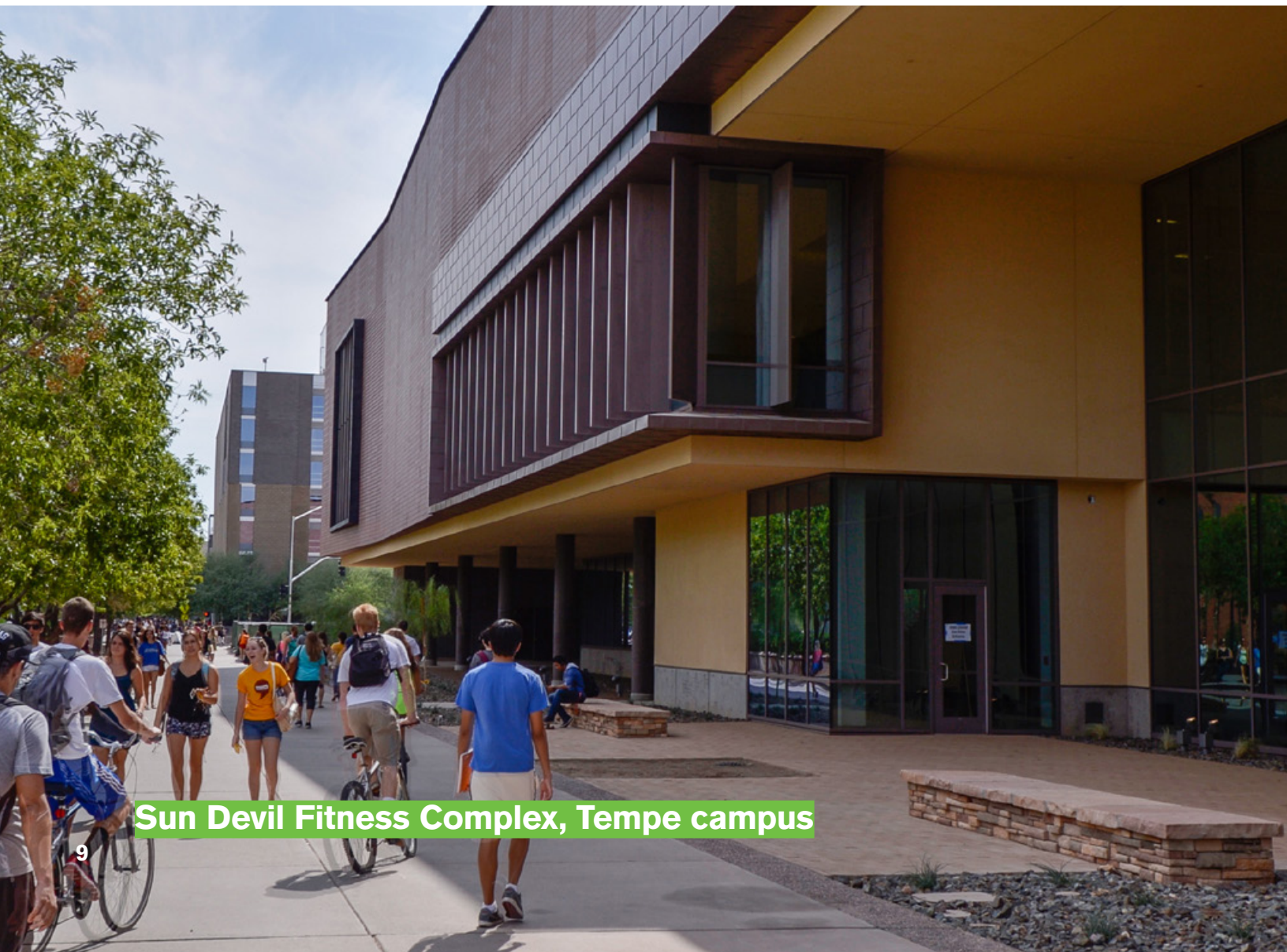
Principled Practice involves the incorporation of sustainability into the functional processes and goals throughout university departments. In ASU daily operations, this means “walking the talk.”

The U.S. Green Building Council awarded ASU two LEED certifications for Tempe campus buildings. The **Sun Devil Fitness Complex** received **Platinum** certification and **College Avenue Commons** received **Gold** certification. ASU has 46 LEED-certified buildings comprising **4,247,448 gross square feet**.

**46**

LEED-  
certified  
buildings

ASU **Parking and Transit Services** partnered with the **Office of the University Architect** to make improvements that increased the number of bicycles parked at free campus bicycle valets from 8,905 in FY 2014 to 35,493 in FY 2016. The number of registered bicycles increased from 3,023 in FY 2015 to 6,467 in FY 2016.



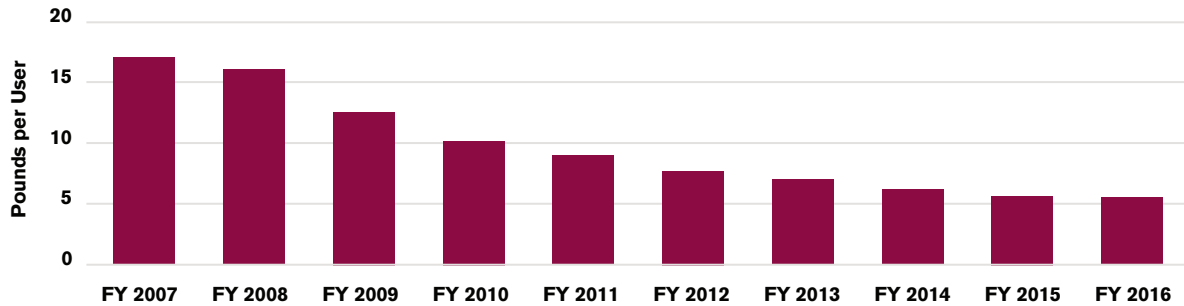
Sun Devil Fitness Complex, Tempe campus

## Principled Practice

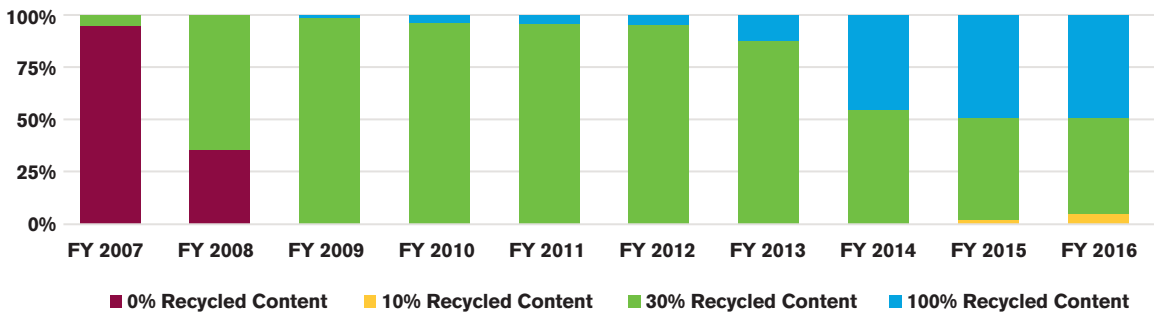
Twenty-five percent of all pages printed on **Canon** devices were printed two-sided. Through this practice and the use of Canon's Pharos print management system, in which users enter a code or swipe their university ID card at the device of their choice before documents are printed, ASU departments and students saved 12,664,928 pages of paper in FY 2016. That saved 1,434,855 gallons of water (equivalent to 239,142 dishwasher cycles) and avoided 154,739 pounds of CO2 emissions. The paper saved is equivalent to 1,688 trees or 61,159 average-length novels.

ASU has dramatically reduced its departmental paper purchases and shifted almost entirely to recycled-content paper over the years:

**Total Paper per ASU Community Member**



**Recycled Content Paper Profile**



**12,664,928 pages of paper saved in FY 2016**

## Principled Practice

**Environmental Health and Safety** implemented the **Chemical Exchange Program** to help deliver unused chemicals to other labs that will use them. EHS also uses recycled drums for handling hazardous waste, which saves \$5,000 annually.

**\$5,000**

annual savings from use of recycled drums for hazardous waste

**Environmental Health and Safety** executed the **Shut the Sash** program and affixed stickers to more than 1,000 fume hoods. The stickers note proper heights for fume hood door openings to increase lab safety and energy efficiency.

ASU **Parking and Transit Services** assisted the City of Tempe in its efforts to obtain Gold certification as a Bicycle Friendly Community by the League of American Bicyclists.

Two hundred eighty-eight ASU faculty, staff and students earned **Sustainability Literacy Education certificates** in FY 2016, which brings the cumulative total to 4,132. The interactive, online program provides examples of how everyone can support ASU's sustainability commitment.

ASU President Michael M. Crow recognized the comprehensive **No Wasted Paint** program, with the **President's Award for Sustainability**. ASU Facilities Development and Management Paint Services had diverted 1,449 gallons of leftover paint from hazardous waste disposal. Paint Services has created a tracking system and rescued leftover paint that has been re-tinted and reused.

**1,449 gallons of leftover paint diverted from hazardous waste disposal**

## Reclaimed Paint Program

[cfo.asu.edu/zerowaste-publications](http://cfo.asu.edu/zerowaste-publications)

[zerowaste.asu.edu](http://zerowaste.asu.edu)

[asusolar.asu.edu](http://asusolar.asu.edu)

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