

# Sierra Magazine's 2010 "Coolest Schools" Questionnaire

For Arizona State University

## Category 1: Energy Supply

1. Please break down the energy types that your campus uses for electricity by percentage. If the school purchases its electricity from a utility company, this information should be available from that company.

38 % Coal \_\_\_\_ % Wind \_\_\_\_ % Biomass  
34 % Natural Gas \_\_\_\_ % Solar \_\_\_\_ % Geothermal  
26 % Nuclear \_\_\_\_ % Hydro 2 % Other Renewable

FY 2009 52,800 kWh of electricity was generated on campus from Solar. 0.02%  
FY 2009 33,946,685 kWh of electricity was generated on campus from Natural Gas. 13.89%  
FY 2009 210,388,823 kWh of electricity was purchased from APS at the mixture listed above. 86.09%

2. What type(s) of energy does your campus use for heating buildings (e.g., natural gas, biomass, coal)?

\_\_\_\_ % Coal \_\_\_\_ % Biomass  
94 % Natural Gas \_\_\_\_ % Geothermal  
6 % Electricity \_\_\_\_ % Fuel Oil

If cogeneration, please explain.

Cogeneration, fueled from natural gas, supplies (based on a yearly average) slightly over 90% of the steam for the campus. The remaining steam is supplied by boilers from the campus Central Plant.

## Category 2: Efficiency

1. What percentage of campus buildings completed within the past three years have a LEED certification of at least silver?

100 %

Note whether the certification is higher than silver.

All of our new LEED buildings are Silver or higher. ASU has Silver, Gold and Platinum buildings.

2. What percentage of water used for campus landscaping is from recovered, reclaimed, or untreated sources?

0 %

ASU's Barrett Honors College Complex includes a greywater treatment and reuse system for buildings 7A and 7B. Greywater from building sinks, water fountains, and showers is treated to a reuse standard suitable as a water closet supply and/or an irrigation supply. The Greywater design flow is 10,000 gallons per day.

Also, ASU's Biodesign Building instituted a Graywater Capture Project - The Biodesign Institute has realized a 50% reduction in landscape water use from the installation of a high efficiency drip irrigation system that is supplied by greywater captured on-site. ASU does not have an exact percentage figure for the campus currently available as the university has not yet been able to install meters.

3. What percentage of campus lighting fixtures are energy-efficient (e.g., compact fluorescent, LED, or equipped with motion sensors, automatic daylight shutoff, or other energy-saving features)?

90 %

All inefficient interior lighting fixtures were replaced. Several parking garage lighting has been replaced with the most efficient lighting available. (CFL's and LED) At this time, 80% to 90% of ASU's Tempe campus lighting fixtures are energy efficient. About 10% more will be retrofit to energy efficient when we complete the exterior lighting project.

4. What percentage of campus appliances are Energy Star-rated?

57.0 %

For more than 10 years, the University has had a policy of purchasing only Energy Star electrical products when available. When products with Energy Star labels are not available, products that are in the upper 25 per cent of energy efficiency as designated by the federal Energy Management Program shall be used. If an Energy Star product is available in any category, that product will be bought before any non-Energy Star certified product.

5. Does the institution have underway a program of energy-efficiency retrofitting projects, such as improving building insulation or sealing heating and cooling ducts?

Arizona State University is currently undergoing Phase II of its \$70 million Energy Performance Contract where, through the upgrade of our utilities infrastructure, we are working to reduce the energy consumption on the four ASU campuses, in the form of electricity and natural gas, as well as reducing the use of chilled water for cooling. We anticipate that the energy improvements will occur on an ongoing basis.

These energy efficiency projects include the following: The retrofit of interior lighting systems with lower wattage fluorescent light bulbs; the installation of 78 watt LED parking structure fixtures; changing out of campus exterior lighting for lower wattage fixtures; repairing or replacing steam traps; upgrading building HVAC controls with Direct Digital Control Systems and VAV retrofit; installing occupancy sensors; Installing zone pressure sensors, Aircurity, and Phoenix Valves on laboratory fume hoods; as well as implementing an on-going continuous commissioning program.

## Category 3: Food

1. What percentage (in dollars) of food served at cafeterias is grown or raised within 100 miles of the campus?

15 %

ARAMARK, ASU's largest/primary food service provider, is continually in the process of developing more precise procedures to track local food purchasing. Based on reports from our primary food distributors, roughly 15% of total purchases are from within a 150 mile radius; unfortunately this does not differentiate residential dining vs. convenience stores, food vs. supplies, locally grown vs. locally processed/packaged. ARAMARK is also working closely with ASU to better understand the challenges regarding the sustainability of growing in the desert given the hot and arid climate.

Engrained café is our new environmentally-conscious restaurant at ASU which opened September 2008 as part of Sun Devil Dining's sustainability platform. The restaurant is an opportunity for students, faculty and staff, and the larger Tempe community to engage in sustainable dining through a learning-living restaurant committed to locally grown food and environmentally friendly practices. The mission behind Engrained is outlined in our Six Green Intentions: Radius 150, Buy Smart, Daily Commute, Wall to Wall, Waste Not Want Not, and Around the Community. Local and organic food purchases for Engrained are approximately 26%.

2. What percentage (in dollars) of food served at campus cafeterias is USDA-certified organic?

\_\_3% organic\_\_%

ARAMARK offers select organic items in retail locations, residential dining, and convenience stores. Engrained Café, the new environmentally-conscious restaurant on campus, features a variety of organic items, although most are from small-medium local farms which have organic practices but have not gone through USDA certification.

According to our Chef at the new Barrett Residential dining hall, the types of organic items that we purchase for the residential dining hall include: Lentils, cannellini, tomatoes, carrots, spring mix, apples, granola, tamari sauce, and cream. Barrett is the largest dining hall and he estimates that 3% of Barrett purchases are organic.

The percentage of USDA certified organic items is currently unavailable.

3. Do campus cafeterias source seafood that is deemed sustainable by the Marine Stewardship Council, the Monterey Bay Aquarium's Seafood Watch Program, or a similar program?

ARAMARK Higher Education has established a partnership with Monterey Bay Aquarium's Sustainable Seafood Watch in a commitment to align U.S. seafood purchases toward sustainable sources over the next ten years. Through the Seafood Watch Guidelines, ARAMARK will be better able to make responsible decisions regarding sustainable seafood purchases. More information about this partnership is available at:

<http://www.aramark.com/PressReleaseDetailTemplate.aspx?PostingID=1161&ChannelID=417>

At Sun Devil Dining, all of our Chefs have the Monterey Bay Aquarium Sustainable Seafood WATCH next to their ordering computers to help guide seafood purchasing decisions.

4. What percentage of entrées served in campus dining locations include meat? If the meat is produced sustainably (for example, free-range or grass-fed), explain.

\_\_23-28\_\_%

Meat usage on campus is approximately 23%-28%. Roughly 5% of meat is from sustainability raised, such as cage-free eggs and chickens and grass-fed beef.

5. Are nutritionally complete vegetarian and/or vegan options available at every meal?

Each of the three major residential dining halls has a designated station that offers either a vegan or vegetarian option that is a complete-protein at every meal. The vegetarian/vegan station is in addition to other vegetarian options also available in the salad, soup, pizza, and entree stations. Based upon one week's menu, there are approximately 50% vegetarian options including all food choices. Daily menus are available online for students to determine the best options to suit their preferences.

## 6. Is bottled water sold or distributed on campus?

Yes, bottled water is sold on campus. That said, our Communications Team in partnership with University Student Initiatives has developed an informational piece about the impact of bottled water called Pocket Change. We want to provide this information to people so they can make informed sustainable choices. Pocket Change: tips and information for advancing a better, more sustainable world  
<http://sustainability.asu.edu/docs/gios/ASU-pocketchange.pdf>

## 7. Does your school maintain a campus farm or garden? Does it use organic methods? Please describe the garden and methods used.

Community gardens are a place for communal learning and enjoyment of literal down-to-earth work. The Polytechnic program has started with large-sized plots for a small fee where a person or group can then lead their own food growing effort. The garden has jump started a residential composting program. The Tempe campus community garden and edible landscape programs are powered by the campus arboretum green initiatives for organic grounds keeping practices. Throughout the year the campus landscapes and gardens are fertilized with a hydrolyzed fish solution, organic tea and compost made from green waste generated from the entire 750 acre campus. No chemical pesticides are used on campus, only IPM and organic methods of pest control are used.

## Category 4: Academics

### 1. Does your school offer any environmental- and/or sustainability-related majors, such as environmental studies, ecology, or sustainable agriculture? If so, please list them all.

ASU offers the following Sustainability degrees.

#### Undergraduate

- > Bachelor of Arts (B.A.) in Sustainability
  - > Bachelor of Science (B.S.) in Sustainability
  - Bachelor of Arts (B.A.) in Business with a Concentration in Sustainability
- <http://wpcarey.asu.edu/undergraduate/current-students/academics/ba-in-business.cfm>

#### Graduate

- > Master of Arts (M.A.) in Sustainability
- > Master of Science (M.S.) in Sustainability
- > Doctor of Philosophy (Ph.D.) in Sustainability

Ecology Explorers gives Phoenix area K-12 students and teachers opportunities to do real scientific research. Your research will be part of the Central Arizona - Phoenix Long-Term Ecological Research (CAP LTER) project being carried out by CAP LTER scientists.  
<http://caplter.asu.edu/explorers/>

### 2. Does your school offer classes about clean technologies, including topics such as energy efficiency and solar-wind energy engineering? If so, please list them all.

ASU offers an Alternative Energy Systems concentration, under the B.S. in electronics engineering technology. This concentration explores the demands of energy resources in the new economy. This program strives to educate individuals in the use of energy sources such as solar, wind, ocean, geothermal and biomass.

Here is a listing of ASU Solar Courses (both existing and proposed) that will also be offered.

Table 1 Required and Approved Courses (all courses are 3 credit hours except for MAE 593)\*

Technical (9 hours)	Non-Technical (6 hours)	Required (15 hours)
EEE 591 Fundamentals of Solid State Devices	FSE 501 Technology Entrepreneurship	EEE 598 Introduction to Solar Energy*
ALT 535 Applied Photovoltaics	SOS 516 Science, Technology, & Public Affairs	MAE 598 Solar Energy Colloquium*
MAE 598 Solar Thermal Engineering	GCU 598 Solar Energy Policy*	MAE 598 Solar Energy & Public Policy*
ATE 550 Passive Heating and Cooling	GPH 598 Energy and the Environment	MAE 593 Applied Project (6 hours)
ALT 507 Evaluations of Photovoltaic and Fuel Cell Systems	GCU 598 Solar Energy and Sustainability	
ALT 598 Reliability, Standards and Codes of Alternative Energy Technologies	MAE/SOS 598 Solar Energy Project Economics*	
EEE 598 Advanced Solar Cells	MAE 598 Solar Energy Operations & Maintenance*	
EEE 537 Fundamentals of Optoelectronics	ECN 598 Renewable Energy Marketing*	
MAE 598 Solar Thermal Power Systems*	ECN 598 Solar Energy Supply Chain & Logistics*	
CHE 598 Solar Biofuels*	HSD 598 Ethical Issues in Science and Technology	
ATE 598 Building-Integrated Solar Systems*	HSD 610 Human and Social Dimensions of Science and Technology Colloquium	

\* New courses

3. Does your school provide students with a list of environmental and/or sustainability classes to make such courses easy to identify? Please provide a link, if available.

The ASU School of Sustainability provides a website that lists all of its undergraduate and graduate degree requirements and it provides a listing of sustainability classes within its “major maps” and elsewhere. <http://schoolofsustainability.asu.edu/>

List of Undergraduate Courses: <http://schoolofsustainability.asu.edu/current-students/undergraduate/courses.php>

List of Graduate Courses: <http://schoolofsustainability.asu.edu/current-students/graduate/courses.php>

4. Please provide names of standout professors who work on environmental and/or sustainability issues and list their accomplishments, including awards, honors, and publications.

ASU's School of Sustainability and its faculty members were widely recognized for achievements, educational contributions, and research advances in 2008-2009. Among the accolades:

#### FACULTY MEMBERS

**Patricia Gober**, Ph.D., was elected fellow of the American Association for the Advancement of Science, the world's largest general scientific society, in the Geology and Geography Division. In addition, Dr. Gober received the ASU Faculty Achievement Research Award sponsored by the ASU Alumni Association for her role in advancing the issues of water management and environmental change in metropolitan Phoenix. She also serves on the faculty of the School of Geographical Sciences.

**George Maracas**, Ph.D., was honored by the Phoenix Business Journal with its Green Pioneers Award, which is given to businesses, governments, and individuals that take steps to become more eco-friendly.

He also serves on the faculty of the Department of Electrical Engineering and is CEO of ASU's Solar Power Laboratory.

**Douglas Webster**, Ph.D., was awarded the 2008 Phoenix Global Power Player award by the Phoenix Business Journal. He also serves on the faculty of the School of Government, Politics & Global Studies.

**Jianguo Wu**, Ph.D., was chosen as one of 19 Leopold Leadership Program Fellows based on scientific excellence, leadership qualities, and desire to expand communication and outreach skills beyond traditional scientific circles. He also serves on the faculty of the School of Life Sciences.

#### **AFFILIATED FACULTY MEMBERS**

**Braden Allenby**, Ph.D., was named a 2008 U.S. Professor of the Year by both the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education. He is also the Director, Center for Earth Systems Engineering and Management, and serves on the faculty of the Department of Civil and Environmental Engineering. Professor Brad Allenby was tapped by the Institute of Electrical and Electronics Engineers (IEEE), the world's leading professional association for the advancement of technology, to lead an international effort to broaden public awareness and understanding of sustainability.

**Nan Ellin**, Ph.D., received Valley Forward's Environmental Excellence Award of Merit in the Environmental Education category for "Making Sustainable Communities Happen." She is also director of the Urban & Metropolitan Studies Program in the School of Public Affairs, College of Public Programs.

**Stuart Fisher**, Ph.D., won the Ecological Society of America's Eugene P. Odum Award for Excellence in Environmental Education. He also serves on the faculty of the School of Life Sciences.

**Nancy Grimm**, Ph.D., was elected fellow of the American Association for the Advancement of Science, the world's largest general scientific society, for her work in the area of urban ecology & sustainability. She also serves as co-director of the Central Arizona-Phoenix Long-Term Ecological Research Project and is a faculty member of the School of Life Sciences. Professor Nancy Grimm was among the researchers selected to author part of a key climate change report that will influence U.S. policy.

**Mark Henderson**, Ph.D., won the Creasman Award for Excellence from the ASU Alumni Association for his work as director of GlobalResolve, an interdisciplinary social-entrepreneurship initiative at Arizona State University that involves ASU students, faculty, staff, alumni, and international partners in projects that improve the lives of underprivileged people around the world. He also serves on the faculty of the ASU Polytechnic Department of Engineering.

**Margaret Nelson**, Ph.D., was named a President's Professor in 2008, an award that recognizes tenured faculty who has made outstanding contributions to undergraduate education at Arizona State University. She is also Associate Dean, Barrett, The Honors College and serves on the faculty of the School of Human Evolution and Social Change.

**David Pijawka**, Ph.D., received the 2009 Outstanding Leadership in Education award from the NAACP, Maricopa Branch. He also serves on the faculty of the School of Geographical Sciences and Urban Planning.

**Bruce E. Rittmann**, Ph.D., NAE, FAAAS, won the Simon W. Freese Environmental Engineering Award and Lecture from the American Society of Civil Engineers. He is also director of the Center for Environmental Biotechnology in the Biodesign Institute. Rittmann was just named a Regent's Professor, the highest faculty honor bestowed by the University.

**Everett Shock**, Ph.D., was named 2009 Geochemistry Fellow by the Geochemical Society and The European Association for Geochemistry, an honor that is bestowed upon outstanding scientists who have, over some years, made a major contribution to the field of geochemistry. He also serves on the faculty of the School of Earth and Space Exploration.

**B.L. Turner, Ph.D.**, won a 2009 Sustainability Science Award from the Ecological Society of America for a series on land change science in the journal, *Proceedings of the National Academy of Science (PNAS)*.

5. Do you have environment- and/or sustainability-related centers, programs, or research institutions associated with your school? If so, please provide their names and a description.

The pioneering School of Sustainability offers two undergraduate and three graduate degree programs, with continuing education programs under development. Students learn to see complex problems from many angles and develop solutions that address the world's economic, societal, and environmental challenges.

ASU's W. P. Carey School of Business offers a BA in Business with a sustainability concentration. Graduates help businesses and government understand, evaluate, and act on issues related to sustainability while making sensible business decisions for both short and long term.

The Ira A. Fulton School of Engineering has established the School of Sustainable Engineering and the Built Environment. Graduates will improve and sustain quality of life in the 21st century through advances in materials, analysis and design.

ASU's Lincoln Center for Applied Ethics launched its MA in Applied Ethics and the Professions, with a sustainability concentration. The program focuses on ethical issues arising from balancing economic, technological, environmental, social, and cultural development in a world increasingly affected by science and technology.

The Sandra Day O'Connor College of Law is developing an integrated program in law and sustainability. An alliance of scientists, designers, planners, political scientists, and legal scholars will create this new comprehensive PhD, LLM, and MLS curriculum.

6. Is an environment-themed class a core curriculum requirement? If yes, please provide the name(s) of the course(s).

#### **ASU 101 – General Studies Course**

ASU offers a freshman sustainability-themed class that is mandatory in many departments. This ASU 101 course emphasizes the unique elements, culture, challenges and opportunities of ASU. The topic of sustainability is covered since it is a core area of ASU along with the areas of student success, social embeddedness, cultural diversity, global engagement and entrepreneurship. Next month ASU will launch a university-wide sustainability literacy program that will be oriented towards staff and faculty.

**The School of Sustainability also includes a core curriculum. It is as follows:**

#### **List of Undergraduate Courses Introductory Core Courses**

ASU 101 - SOS

The ASU Experience (1) Students will learn about ASU's mission as the New American University, the importance and benefits of an entrepreneurial approach to problem solving, solutions to sustainability challenges, and the importance of social embeddedness. Additionally, through various course

discussions and assignments, students will examine the concept of academic integrity and its potential impact on their future, gain awareness of the value of engaging in research activities, and learn about taking an interdisciplinary perspective. \*For New Incoming Freshmen

#### SOS 110

Sustainable World (3) Lays the groundwork for understanding the fundamental geological, biological, and social processes that gave rise to the world we live in and continue to maintain its viability for human life.

#### SOS 111

Sustainable Cities (3) Introduces technological, social, and cultural principles and innovations for cities under the notion of sustainability and sustainable development within the global, regional, and local contexts. \*Satisfies General Studies - (HU or SB) & G

### **List of Graduate Courses** **Introductory Core Courses**

#### SOS 510

Perspectives on Sustainability (3) Uses case studies; faculty and students from engineering, architecture, social sciences, and natural sciences exchange ideas on the major challenges faced in forming a sustainable future at the local, national, and global levels. \* Enrollment restricted to sustainability graduate students

#### SOS 511

Quantitative Methods in Sustainability (3) Provides a sense of when, where, and how quantitative methods are used in studying questions related to sustainability; a roadmap for furthering quantitative skill sets; and opportunities to refresh and build some basic mathematical skills from selected topics in differential and integral calculus, linear algebra, and probability and statistics that will be required for further study. \* Enrollment restricted to sustainability graduate students

7. What percentage of academic departments offer environment- or sustainability-related classes?

\_\_\_\_\_ %

ASU offers 222 climate and sustainability courses by 46 departments from 20 colleges and schools.  
Courses

- 9 are climate courses
- 6 are climate related courses
- 97 are sustainability courses
- 110 are sustainability related courses
- 6 are capstone/experiential learning
- 122 are undergraduate courses
- 100 are graduate courses

Departments

- 5 departments offer climate courses
- 4 departments offer climate related courses
- 20 departments offer sustainability courses
- 35 departments offer sustainability related courses
- 14 departments offered 4 or more direct or related courses

These departments include:

- American English and Culture Program
- Anthropology (Science and Mathematics)
- Anthropology (Social and Behavioral)
- Applied Biological Sciences
- Architecture and Landscape Architecture

Architectural Design and Technology Studios  
Architectural Philosophy and History  
Biology  
Business  
Civil and Environmental Engineering  
Chemical Engineering  
Chemistry  
Construction  
Economics  
Environmental Design and Planning  
Environmental Life Science  
Environmental Social Science  
Environmental Technology Management  
Fulton School of Engineering  
Cultural Geography  
Geological Sciences  
Physical Geography  
History  
Honors  
Housing and Urban Development  
Integrated Studies  
Justice Studies  
Law  
Life Sciences  
Masters of Arts in Disciplinary Studies  
Mechanical and Aerospace Engineering  
Mechanical & Manufacturing Engineering Technology  
Nonprofit Leadership and Management  
Parks and Recreation Management  
Philosophy  
Plant Biology  
Public Affairs  
Urban and Environmental Planning  
Social and Behavioral Sciences  
School of Global Studies  
Sociology  
School of Sustainability  
Science, Technology, and Society  
Tourism Development and Management  
Urban and Metropolitan Studies  
Women's Studies

## Category 5: Purchasing

1. Does your school have a sustainable-purchasing policy? If yes, briefly explain.

Arizona State University has both an extensive sustainable purchasing policy and a values-based standard for suppliers. The sustainable purchasing policy is at <http://www.asu.edu/aad/manuals/pur/pur210.html> and the values-based standard for suppliers is at <http://www.asu.edu/aad/manuals/pur/pur211.html> on the web. The sustainable purchasing policy establishes requirements in the following nine areas: energy use, water use, minimization of toxins and pollutants, use of biobased products, forest conservation, recycling, minimization of packaging, green building standards, and landscaping. The values-based standard for suppliers establishes requirements for nondiscrimination and affirmative action, freedom of association and collective bargaining, compliance with immigration law, labor standards, health and safety, forced labor, harassment or abuse, use of

controlled substances, and weapons. It also gives preference to suppliers who pay higher wages, who are more environmentally responsible, who provide better employee education and training programs, who practice nondiscrimination, and who have a grievance process.

2. What percentage of paper used on campus is made from at least 30% postconsumer recycled content?

100 %

There are only two types of office paper available on campus: 30% post consumer waste content, and 100% post consumer waste content.

Does your school purchase paper that is Forest Stewardship Council-certified?

Yes. Our ASU Print and Imaging facility is FSC certified. The paper they use, among other things, is FSC certified. All ASU stationary and business cards are printed on 100% FSC certified recycled content paper. Also, many of our recent major publications are printed on FSC certified paper. For example the ASU Magazine is published this way.

3. Does your school have a policy to purchase Electronic Product Environmental Assessment Tool (EPEAT)-certified (or similar) electronics? If yes, please describe.

All desktop computers, notebooks, and monitors purchased must meet all Electronic Product Environmental Assessment Tool (EPEAT) environmental criteria designated as "gold" as contained in the IEEE 1680 Standard for the Environmental Assessment of Personal Computer Products. Per ASU PUR 210: Green Purchasing Policy <http://www.asu.edu/aad/manuals/pur/pur210.html>

4. Do you have packaging agreements with suppliers that minimize waste? If yes, please describe.

All of our solicitations contain the following language on packaging:

Proposer shall provide packaging/packing materials that meet at least one of, and preferably, all of the following criteria:

- Made from 100% post-consumer recycled materials;
- Be recyclable;
- Reusable;
- Non-toxic;
- Bio-degradable.

5. Does your school specify in its purchasing contracts that products with energy-saving features be installed or delivered with these features enabled?

Yes, solicitations require the following:

Arizona requires that we purchase ENERGY STAR® products or those certified by the Federal Energy Management Program as energy efficient in all categories available. If this solicitation is for a product in a category for which ENERGY STAR® or certified products are available, please submit evidence of the ENERGY STAR® status or certification for the products you are bidding. Please note that if you fail to submit this information but a competitor does, we will select your competitor's product as meeting specifications and deem your product as not meeting specifications. See A.R.S. §34-451.

The University requires that all desktop computers, notebooks, and monitors purchased must meet Electronic Product Environmental Assessment Tool (EPEAT) Gold status as contained in the IEEE 1680 Standard for the Environmental Assessment of Personal Computer Products. The registration criteria and a list of all registered equipment are at <http://www.epeat.net> on the Web.

## Category 6: Transportation

1. Does your school provide a free shuttle service around campus and town? If yes, briefly explain.

ASU does have a free shuttle service for students, faculty and staff around the campus and town.

### 1. Tempe Campus Shuttles

On the Tempe campus, students and employees can board one of four shuttle routes to get from one campus building or parking location to another. These shuttles include the FLASH Forward, FLASH Back, FLASH to University Drive and the McAllister shuttles. No boarding pass or ticket of any kind is required to ride these shuttles.

### 2. Intercampus Shuttles

West/Downtown Phoenix campus and Polytechnic campus shuttles arrive and depart on the Tempe Campus. No boarding pass or ticket of any kind is required for these shuttles

3. For travels between the Tempe and Downtown Phoenix campuses, ASU students and employees are encouraged to take the METRO light rail. The METRO light rail service is provided at a discounted fee to ASU students. Faculty and staff must pay 55% of the light rail/Metro bus fare. Faculty/staff if qualified have the option of purchasing via payroll deduction pretax.

2. What has your school done to promote bicycling as a transportation method?

ASU offers a free bike-sharing program that is called the Bike Co-Op. To encourage students, faculty, and staff to bike to campus instead of driving, the Bike Repair Co-op provides reduced-cost tools, parts (both new and used), and assistance needed to repair bicycles. Also, the Bike Co-op houses the USG Community Bikes program, an initiative that allows ASU students, faculty, and staff to check out one of 15 bicycles for up to 10 days for no charge.

ASU Commuter Options Program offers helmets/headlights/U-Locks at 50% off retail prices. ASU has also recently increased the number of bike racks close to the heart of campus.

3. Does your school encourage its students and employees to use public transit, carpool, or use some other form of alternative transportation? If yes, what are the incentives?

ASU encourages students, faculty and staff to use an alternate mode of transportation as often as possible. Parking and Transit Services' commuter options program provides a number of transit options for the ASU community, most of which are free.

1. Parking and Transit Services provides free on-campus shuttle service on the Tempe campus and free intercampus shuttle service between the Tempe, West, Downtown Phoenix and Polytechnic campuses.

2. The ASU U-Pass offers unlimited, annual access on Valley Metro bus route and the METRO light rail. The U-Pass is an annual transit pass, valid from July 1, 2009 - June 30, 2010. ASU students receive the

U-Pass at a steeply discounted fee of \$40 per semester with a valid Sun Card. University employees can purchase the U-Pass at a discounted rate and may opt for payroll deduction thereby taking advantage of the pretax benefit. ASU Parking and Transit subsidizes the cost of the passes for both students and employees.

3. USG Community Bikes program, an initiative that allows ASU students, faculty, and staff to check out one of 15 bicycles for up to 10 days for no charge. ASU Polytechnic campus has a similar program.

4. ShareTheRide.com is a free ride-matching service that provides faculty, staff and students with an easy way to find others in the Valley who are interested in sharing a ride to work in a carpool or vanpool. A person can even find somebody to bike with to work.

5. Carpool-reserved spaces are located on the Tempe and West Campuses

6. The City of Tempe and the City of Phoenix both offer free neighborhood circulator shuttles.

City of Tempe - Orbit

City of Phoenix - DASH

7. Valley Metro, the public bus agency that provides service to nearly every city in the greater Phoenix area, operates throughout the Valley including stops on all four ASU campuses and Sky Harbor International Airport. ASU students, faculty and staff can ride Valley Metro buses by obtaining an ASU U-Pass.

8. The METRO light rail provides ASU with yet another convenient method for travel around the greater Phoenix area and across two ASU campuses. The METRO light rail service is provided free to ASU students. The University subsidizes 45% of the cost of light rail passes for faculty and staff.

4. Approximately what percentage of students drive to school in a car?  
\_\_\_\_\_ %

The information provided is per campus. It includes data from the March 2009 surveys. The information includes carpooling:

Tempe campus: SOV (single occupant vehicle) 53.51% carpool 9.7%  
West campus: SOV 75% carpool 9.7%  
Polytechnic campus: SOV 76.32% carpool 8.0%  
Downtown Phoenix campus: SOV 44.69% carpool 10

5. Approximately what percentage of faculty and staff drive to work in a car?  
\_\_\_\_\_ %

The information provided is per campus. It includes data from the March 2009 surveys. The information includes carpooling:

Tempe campus: SOV 65.65% carpool 12.1%  
West campus: SOV 82.48% carpool 8.7%  
Polytechnic campus: SOV 86.04% carpool 5.3%  
Downtown Phoenix campus: SOV 57.93%; carpool 9.7%

## Category 7: Waste Management

1. What is your campus's current waste-diversion rate (i.e., percentage of campus waste being diverted from landfills)?

\_\_\_15% - 20%\_\_\_\_\_%

2. Does your campus provide recycling receptacles wherever there are trash cans?

ASU currently has 50% of its trash cans matched up with recycling receptacles.

3. Are recycling bins readily available at large events such as football games?

ASU Athletics offers some recycling during its football games through its food service provider. Recycling for other large campus events are managed by the Undergraduate Student Government's "Green Team" in partnership with R.A.D. Recycling and with assistance by ASU Facilities Services. The Green Team consists of student volunteers whose aim it is to educate ASU's students, faculty, staff and community visitors about what it means to go 'green', as well as the need for better recycling practices.

4. Does your school compost? If yes, are compost receptacles available at all or most on-campus dining locations?

ASU composts an average of 322,588 lbs. of green waste a year. Ninety percent plus of the green waste that was generated by the Grounds department is sent to a local compost farm to be composted. Composting organic food waste is currently not available in our area. We are actively seeking alternatives. The compost is then purchased to be used on the campus in lieu of commercial fertilizers.

We do not yet offer composting receptacles in our on-campus dining locations.

5. Is your school committed to waste-reduction goals, such as zero waste? Please explain.

ASU has a goal to be a "zero waste" school by 2030. We have already established the following programs and initiatives to reach this goal:

### Solid Waste

1. University-wide recycling program
2. Green Purchasing Guidelines which provide front end elimination
3. Purchase of solar powered trash compactors
4. Blue Mall Program
5. Divert landscaping waste to a local farm

### Water Waste

1. Low water use appliances
2. Water capture
3. Drip Irrigation vs. Flood Irrigation
4. Largely still to be defined

6. Does your campus administer a donation program for clothing and other used goods when students are moving out of student housing? If so, are bins located in every dormitory?

A Ditch the Dumpster program occurs each semester during "Move Out." Ditch the Dumpster volunteers accept clothing, furniture, household goods and many other reusable items which are donated to Swift Charities for Children for the benefit of local kids in need. ASU Recycling also participates by collecting atypical recyclables during the event, including ink and toner cartridges, cell phones and electronics, CDs, DVDs, athletic shoes over 13 locations on the Tempe campus. ASU residents donated 10,000 pounds of useable items to charity last year.

## Category 8: Administration

1. Is environmental sustainability part of your institution's mission statement, guiding principles, or similar document? If so, please provide the text or link.

The university has four goals related sustainability practices: Carbon Neutrality, Zero Solid & Water Waste, Active Engagement (engaging our over 81k potential change agents in our university) and Principled Practice (expressing the university's value system in the way we operate the campuses – cleaning practices, purchasing, food served in dining facilities, etc).

<http://sustainability.asu.edu/campus/>

We have formal policies related to recycling, purchasing practices <http://www.asu.edu/aad/manuals/pur/pur210.html>, and a LEED Silver mandate on all new buildings owned and funded by the university. New building design, construction and renovation guidelines are under final review by the University's Executive Committee. A formal sustainability statement will be published in a sustainability plan scheduled for release in January.

There is a Sustainability link within ASU's homepage to inform people about ASU's commitment to sustainability. <http://www.asu.edu/>

Another ASU Website includes an on-line tour of the ASU Sustainability Points of Pride

<http://www.asu.edu/tour/sustainability/>

2. Does your school employ at least one person dedicated to overseeing campus environmental initiatives, such as a sustainability coordinator, or have a sustainability task force or committee? Is the coordinator position a part-time or full-time position?

ASU has 22 dedicated FTE employees that are directly or indirectly involved in sustainability. This includes a full time Director of University Sustainability Practices, three full time Sustainability Program Coordinators and four student interns. The Director, Program Coordinators and Student Interns report to the full time University Sustainability Operations Officer. The total above also includes personnel in areas such as energy managers, food service, purchasing personnel, University Architect staff, university housing, facilities management staff (grounds services, paint shop, etc, transportation, and Surplus Property.

ASU also has the Sustainability Practices Network that comprises nine key Work Groups that work in tandem with four Resource Groups. All ensure the success of sustainability practices across the university.

3. Has your school made an official commitment to reducing its impact on climate change by setting goals of emission reductions by a certain date? If yes, does your school have a plan for achieving these reductions? If so, briefly explain the plan.

As a leader in sustainability and the American College & University Presidents' Climate Commitment, ASU has unveiled a plan to guide students, faculty, staff and partners in making the University carbon neutral by 2025, with our transportation goal set for 2035.

ASU Carbon Neutrality website: <http://carbonzero.asu.edu/>

**4. Has your school conducted a complete greenhouse-gas-emissions audit of its campus?**

ASU has completed its FY 2007 and FY 2008 greenhouse-gas emissions audit as part of its requirement to fulfill the American College and University Presidents Climate Commitment.

**5. Has your school achieved a reduction in total annual carbon emissions? If yes, please explain and provide the benchmark year and percentage.**

ASU achieved a combined campus (Tempe, West, Polytechnic and Downtown Phoenix Campus) reduction in total annual carbon emissions during the FY 2008 year of 4.859%, as compared to its benchmark July 1, 2006 through June 30, 2007.

FY 2007 308,123 MT eCO<sub>2</sub>

FY 2008 292,155 MT eCO<sub>2</sub>

ASU is currently completing its FY 2009 greenhouse-gas-audit. It is highly anticipated that we will see a continued reduction in total annual carbon emissions based receiving an EPA 2009 Certificate of Greenhouse Gas Reduction for our largest Combined Heat and Power Plant, as well as, the addition of 2.2 MW of Solar installations during 2009.

## Category 9: Financial Investments

**1. Is all information about your endowment fund publicly available? Briefly explain.**

ASU makes all investment holdings available on-line to the public in accordance with open records law. The ASU Foundation makes all investment holdings available to trustees, senior administration and other select members of the school community.

**2. Does your institution have an investment-responsibility committee that considers and acts on environmental issues?**

The ASU Foundation utilizes some investment managers that have an allocation to investments that take environmental factors into consideration.

**3. Does your school make environmentally responsible investments? If so, briefly explain what they are and whether they're made on an ongoing basis.**

As stated in Category 2: Efficiency Question #5, Arizona State University is currently undergoing Phase II of its \$70 million Energy Performance Contract where, through the upgrade of our utilities infrastructure, we are working to reduce the energy consumption on the four ASU campuses. We anticipate that the energy improvements will occur on an ongoing basis.

In addition, the University's solar initiative has already installed 2.04 MW of photovoltaic power on the Tempe campus, providing 7% of the Tempe campus electric demand, and has a 4.65 MW solar

installation under way on the West campus. Plans call for 10 MW of solar power capacity by the end of 2010, and 20 MW at the end of future phases, enough to provide electricity to 2,920 homes.

## Category 10: Other Initiatives

1. Have any of your school's students effected positive environmental change on a campus, state, or national level? If so, please describe. (To nominate a specific student for greater attention in our coverage, please email [cool.schools@sierraclub.org](mailto:cool.schools@sierraclub.org) with his or her name, accomplishments, and contact information.)

Please see the following listing of ways that the ASU School of Sustainability students are effecting positive environmental change.

### **City of Chandler Sustainable Development Plan**

School of Sustainability students Jin Ho Jo and Joby Carlson worked with the City of Chandler in Arizona, USA announced its sustainability goals, mainly focused on improving the city's practices to preserve resources and to prevent energy price increase and instability. As part of the City's sustainable development plan, we initiated the research project to evaluate solar energy potential in the city. The objective of this research investigation is to assess potential of the New City Hall's parking garage as a renewable energy infrastructure. We determined an appropriate PV system parking structure and proposed the Smart Garage which accommodates electric vehicles (EV) as a backup energy source to manage peak-time energy demand for the New City Hall building energy consumption. We quantified annual energy benefits from the PV system electricity generation and the operation of the Smart Garage. The project method involved manual PV system design and various computer model simulations. Contact: [jin.jo@asu.edu](mailto:jin.jo@asu.edu) and [jobias@asu.edu](mailto:jobias@asu.edu)

### **Sustainability Jedi**

SJedi is an ASU student organization "Think Tank" led by Peter Gbelia that focuses on sustainable development in third world countries. SJedi students have engaged with communities in Liberia to develop a Sustainable Village Initiative model and framework using sustainable strategies and best practices. SJedi recently won a \$32,000 grant from UNDP and the GEF-SGP to initiate a jatropha curcas based rural energy project. Contact: [pobelgia@asu.edu](mailto:pobelgia@asu.edu)

### **Caldwell Township Sustainable Development Project**

The Township of Caldwell, a suburb of Monrovia in the West African country of Liberia, and the surrounding villages encompass over 50,000 citizens without a single library. The mayor of Caldwell approached SOS student Peter Gbelia on a recent trip to assess the need for efficient cookstoves for his student organization Sustainability Jedi. SJedi is currently engaged with Caldwell to develop their sustainable strategy for future implementation along with ASU's Stardust Center for Affordable Living, and the ECOSA Institute of Sustainability in Prescott, Arizona. Together they will develop a master plan for the community and a "Green" multi-functional community center complete with a Library and other educational facilities. Contact: [pobelgia@asu.edu](mailto:pobelgia@asu.edu)

### **Envirofit Cookstoves for Africa**

ASU student organization SJedi led by Peter Gbelia has partnered with Envirofit International of Boulder Colorado to distribute highly efficient cookstoves to thousands of families in rural villages all across sub-Saharan Africa. SJedi seeks to mimic the success of Envirofit's G3300 series cookstoves in India where "over the next five years these 60K cookstoves could keep over 400,000 tons of CO<sub>2</sub> and over 85,000 kg of black carbon from entering the atmosphere, while garnering savings of over 900 million rupees (\$18M USD) for some of India's lowest-income consumers." SJedi shares Envirofit's vision to tackle the difficult challenges of "indoor air pollution, poverty, energy, health, climate change and gender issues that impact

half the world's population...Viable, sustainable, scalable solutions will have a positive impact on all of these areas. Envirofit's new stove represents a significant step forward in this endeavor."

Contact: [pgbelia@asu.edu](mailto:pgbelia@asu.edu)

### **Kiang West National Park Sustainable Development Project**

During SOS student Aurian Koster's amazing journey to explore the beautiful country of the Gambia, she was able to stay at some amazing bird watching and natural history camps like Tendaba and Baobalong Camp in the Kiang West National Park. When the park rangers learned that she was a SOS student, they asked her for help. The Kiang is in need of a sustainability solution. This amazing national park is slowly losing funding and has become inhabited by poachers. About 145km from Banjul, the 110km<sup>2</sup> park is situated on the south bank of the river and encompasses dry deciduous woodland, savannah, mangrove creeks and tidal flats. Over 300 species of birds have been sighted in the area as well as the West African Manatee, otters, sitatunga and roan antelopes. Unfortunately, due to a loss of funding, focus and the basic needs of the local people, the park is slowly being destroyed.

Contact: [Auriane.Koster@asu.edu](mailto:Auriane.Koster@asu.edu)

### **Renewable Energy**

In September 2009, Wayne Porter accepted a \$15,000 fellowship from TogetherGreen to work with researchers at the National Audubon Society's Appleton-Whittell Research Ranch in Elgin, Ariz., in 2009-10. Porter will analyze the economic, social, and cultural factors that influence the rural residents' understanding, acceptance and implementation of energy efficiency measures and their adoption of renewable energy technology, particularly photovoltaic systems.

Contact: [weporter@asu.edu](mailto:weporter@asu.edu)

### **Detergent Data**

The Sustainability Consortium has a bold plan: to develop an index rating the sustainability of consumer products worldwide. Vee Subramanian is the lead researcher on a pilot program that will form the basis of the Consortium's ongoing indexing efforts. His assignment: create a replicable methodology for assessing and comparing the sustainability of two or more liquid laundry detergents.

Contact: [Vee.Subramanian@asu.edu](mailto:Vee.Subramanian@asu.edu)

### **Desert TULIP**

Desert TULIP is a strategy developed by SOS students and Professor Nan Ellin to promote low-cost ideas, including the construction of planter boxes, to transform vacant lots in downtown Phoenix for temporary use until their development. In 2000, the Phoenix metropolitan area contained 42.6 percent vacant land, significantly higher than most American cities. To address this vexing challenge, the office of the mayor requested that ASU students develop a model for the temporary use of publicly-owned vacant lots. In response, students developed the Desert TULIP – Temporary Urban Laboratory Infill Project – a low-cost strategy to transform vacant lots until their development. In Phoenix, they spoke with citizens, community organizations, local businesses and city officials for input on the project. High-resolution 3-D models of Phoenix were employed to envision Desert TULIP projects; and a collaborative project constructing planter boxes was undertaken as a first step toward turning Phoenix's vacant lots into urban amenities.

Website: [http://asunews.asu.edu/20091124\\_tulip](http://asunews.asu.edu/20091124_tulip)

Contact: [Braden.Kay@asu.edu](mailto:Braden.Kay@asu.edu)

### **Sustainable Stagecraft**

Students from the School of Sustainability are creating a series of workshops to improve the sustainability of the theater production process for Arizona theaters. Through partnering with the largest children's theater in the state, the students are working on helping theaters adopt alternative building materials, shared resource systems and sustainability frameworks. The project is sponsored through a Theaters Communications Group/ Met Life grant and is the beginning of a statewide partnership among theaters to examine how they can become more sustainable.

Website: <http://aha.tcg.org/2010/02/childsplay-hosts-sustainable-stagecraft.html>

Contact: [Braden.Kay@asu.edu](mailto:Braden.Kay@asu.edu)

### **Litter Free Inauguration 2009**

Litter Free Inauguration was conceived by a group of ASU School of Sustainability students inspired by Barack Obama's message of change. Through a new media campaign they spread this idea to Inaugural attendees, and to keep our National Mall clean. This is a new era for civic participation and personal responsibility, and we hope this is just the beginning. The campaign was covered by the Economist, CBS, CNN, and numerous websites including being named Treehugger.com's top 5 ways to be green at the Inauguration.

Website: <http://president.asu.edu/node/599>

Contact: [Braden.kay@asu.edu](mailto:Braden.kay@asu.edu)

### **SANS – Students Act Now for Sustainability**

SANS has been a catalyst for some major events including the planning of Earth week 09" including solar bake off and having peach cake. SANS also had a large presence on Campus Sustainability Day, which included tabling of sustainability related orgs, an organic fashion show, and a 350 display. SANS also sponsored the showing of No Impact Man which was followed by a discussion and a "stuff swap" in which people traded used stuff. SANS networks between students and community members interested in Sustainability with clubs that are working on sustainability initiatives. SANS publicizes sustainability events going on campus and around Tempe. Affiliate student organizations include Emerging Green Builders (EGB); Greenpeace; Mothers Acting up (MAU); Arizona Public Interest Research Group (PIRG); Sustainability House at Barret (SHAB); Sustainable Initiatives Group (SIG); United Students for Fair Trade (USFT); Undergraduate Student Government Green Team (USG Green); Veg Aware.

[Stacia.Turner@asu.edu](mailto:Stacia.Turner@asu.edu) [www.azsans.org](http://www.azsans.org)

### **Sustainability Review – Journal**

Robert Horner, RJ Meyers, Haley Paul, Sandra Rodegher and Maren Mahoney just published the first issue of The Sustainability Review, an online, biannual, graduate-student edited publication hosting art, opinion and research contributions. TSR is associated with Arizona State University's School of Sustainability, but is open to participation and contribution from people across and outside of academia. TSR has two overarching goals: to communicate the concepts, challenges and approaches of sustainability, sustainability science and sustainable thinking, and to engage people from all fields in discussions about sustainability topics through accessible and interesting writing and other communication forms, such as photography.

Website: [www.thesustainabilityreview.org](http://www.thesustainabilityreview.org)

Contact: [Sandra.rodegher@asu.edu](mailto:Sandra.rodegher@asu.edu), [haley.paul@asu.edu](mailto:haley.paul@asu.edu), [rjmeyers@asu.edu](mailto:rjmeyers@asu.edu), [mmmahone@asu.edu](mailto:mmmahone@asu.edu)

### **Sustainable Strategies for Multinational Corporations in India**

Before the 1980s, environmental regulation in India was almost non-existent. In pursuit of economic development, the Government of India (GoI) kept environmental regulation of multinational corporations to a minimum in order to attract foreign direct investment. Multinational corporations have often been blamed for taking advantage of weak enforcements in India; however, in recent years, many of them have started to self-regulate and often set their environmental standards above the minimum compliances enforced by the GoI. My research will investigate the change in environmental management of PepsiCo, India—an American large food and beverage multinational corporation. Preliminary analysis indicates that these companies in India consider local communities, consumers, and the government as their key stakeholders. Over the years, these big firms have come to realize that environmental management is not limited to managing the "physical" environment, but requires a holistic strategy that is enmeshed with the values, culture, politics, and history of the countries in which they have subsidiaries. SOS graduate student Manjyot Bahn proposes that by exploring the drivers for environmental management, policy recommendations can be made for the environmental regulatory regime for the government of India; it can be a good awareness tool for CSR managers; and environmental NGOS can develop paths of interventions through effective corporate-NGO partnerships for business sustainability. Further, it can help MNCs back at their headquarters to get a good idea of how and what is the best way for implementing sustainability initiatives in a complex and dynamic country like India, and therefore be able to get a competitive advantage over other MNCs competing to either set up their operations in India or improve upon their existing programs.

United Students for Fair Trade advocates for fair trade food in the dining halls and in markets, in addition to promoting fair trade in the community by hosting educational events.

The Undergraduate Student Government Green Team is committed to recycling during campus events. Students of Arizona Network for Sustainability have a local garden, host educational documentary showings, volunteer off-campus for clean-ups, and more.

Greenpeace and Arizona PIRG advocate on a national level for sustainability-related legislation.

2. Have students participated in environmental challenges or events such as the Solar Decathlon, environmental design contests, or environmental debates? If so, which events and how did they do?

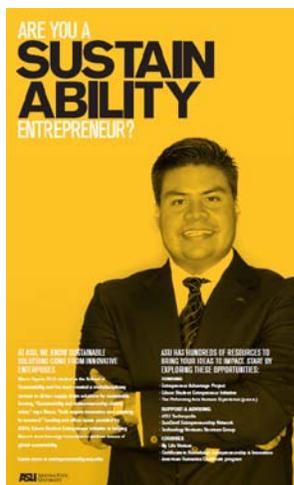
Students across ASU participated in the 2009 Focus the Nation Teach-In on Global Warming Solutions. Participants watched webcasts and documentaries, met noted environmentalists and learned more about sustainable groups and clubs on campus. With hundreds of universities participating nationally, the teach-in event connected more than a million Americans in a solutions-driven global warming dialogue.

Sustainability-minded student groups at ASU organized their biggest-yet Earth Day event in 2009. The day-long fair included dozens of informative booths and demonstrations, speeches from State Representatives Ed Ableser and David Schapira, contests, prizes, a solar-powered concert and a community 5K race with proceeds donated to the School of Sustainability Scholarship Fund. The annual event encourages participants to think and act in a sustainable way every day.

---

Marco Ugarte, a PhD student in the School of Sustainability and Research Associate for the Sustainability Consortium at ASU, has been significantly involved in sustainability-based entrepreneurship.

In 2009, partnering with doctoral students from Plant Biology, Biology, and Industrial Engineering, they reached the semifinals at the MIT Clean Energy Prize in the Renewable Category and won a grant from the Edson Entrepreneurship Initiative at ASU. This grant not only provided generous funding for the team, but office space and mentoring in several key areas such as strategic planning, finance, and intellectual property management. The venture was featured on the GetYourBizSavvy blog in November (<http://getyourbizsavvy.com/2009/11/marco-ugarte-synecheia/>).



So far in 2010, Marco continues to partner with Raul Gonzalez, PhD student in Plant Biology on their new venture, Agavenol. This project has won the Southwest Regional Competition from the Walmart Better Living Business Plan Contest. The team will be heading to the Semifinals at Walmart Global Headquarters with full travel expenses sponsored by the retail giant. Moreover, Agavenol is a **semifinalist at the MIT Clean Energy Prize in the Transportation Category. The venture has been featured on the ASU Pulse Newsletter in March**

(<http://entrepreneurship.asu.edu/newsletter/2010/03/01/our-story-fertile-soil-sustainable-entrepreneurship-asu>).

Besides his academic endeavors as full-time PhD student, Marco took the ASU Technopolis SuperCoach Entrepreneurial Training program at ASU

SkySong and achieved his designation as Associate Instructor for CPIM & CSCP Programs under the APICS Instructor Development Program. In addition, Marco was selected for second consecutive year to the APICS Scholar Education Program, and invited as guest speaker for several Professional Development Meetings. His latest speaking engagement was with the Logistics & Supply Chain Forum, and he recently co-authored an article on the Journal of Integrative Environmental Sciences.

*Short Bio:*

Marco Ugarte earned a B.S. in Industrial & Systems Engineering and a M.E. in Quality and Productivity Systems, both from Tecnológico de Monterrey (ITESM-Mexico). In addition, he is currently designated as Certified in Production and Inventory Management (CPIM), Certified Supply Chain Professional (CSCP), and Certified Quality Improvement Associate (CQIA) by APICS, The Association for Operations Management, and ASQ, The American Society for Quality.

3. Has your school set aside part of its campus as natural habitat, stipulated limited campus development, or enacted programs preserving its land? If so, please explain.

This is typical for all four campuses:

The campuses were designed to have much more than just setting aside a percentage for preservation or limited development.

The Comprehensive Development Plan imparts balanced relationships between the built and natural systems, academic and recreation spaces, learning and living environments, research and applications formal and informal, campus and town, and the old and the new. The plan is intended to be implemented in four phases, integrating instruction with defined residential neighborhoods.

Sustainable Measures

In the arid climate of the Sonoran Desert, water is precious. Design guidelines were developed to include working models for rainwater harvesting on the campus, storm water reuse, gray-water recycling and the collection of air conditioner condensate for water features. Porous paving is proposed for parking lots, recycled broken concrete paving to be used for walkways, retention as urban wildlife habitats, low water use plants, trees located to provide shading of buildings to reduce energy costs, furnishings of recycled and post-consumer recyclable materials. ASU's four campuses as a whole are an arboretum.

4. Does your school adhere to an indoor air-quality policy (e.g., the mandated use of nontoxic cleaning supplies)? If yes, describe the policy.

ASU's Environmental Health & Safety has developed a website that includes an Indoor Air Quality Guidance Document. This information is listed within the following link:

[http://uabf.asu.edu/ehs\\_indoor\\_air\\_quality](http://uabf.asu.edu/ehs_indoor_air_quality)

5. Does your school offer outdoor- or nature-based programs, classes, or extracurricular activities to students and/or faculty? If yes, please list and describe.

With a university the size of ASU, there are many opportunities for students and faculty to participate in outdoor or nature-based programs. Here is a sampling of notable programs.

- Ecology Explorers is an award-winning outreach program that includes 2,000 students in 75 schools across the Phoenix metro area. Student and Teacher Ecological Explorers collect data that is helping us to understand the workings of an urban ecosystem while learning about scientific inquiry and the

environment. Ecology Explorers creates a community of scientists among university researchers, K-12 students and their teachers.

Ecology Explorers: <http://ecologyexplorers.asu.edu/>

- Herberger Institute for Design and the Arts Community Engagement utilizes Arizona's Valley of the Sun as its laboratory for learning. In doing so it:
  - Increasing student awareness of and appreciation for how culture and creativity shape economies.
  - Inculcating a tradition of student engagement with the community so that they may contribute, at many levels, to the new vibrant economy of the 21st century.
  - Allowing students to become active ambassadors of The New American University, and further ASU's engagement with the everyday life of our city.
  - Demonstrating that ASU's education works most effectively in tandem with partners in the community.

A great advantage for the ASU Herberger Institute for Design and the Arts is its location in one of the fastest growing metropolitan areas in the country. This affords our students many exciting educational and professional opportunities. Our faculty has created innovative partnerships with the major local arts and design organizations. We collaborate in education and therapy initiatives with schools across the state and with hospitals, including the prestigious Mayo Clinic in Scottsdale.

- The Global Institute of Sustainability continually offers international study-abroad opportunities. Here is a listing of our summer 2010 offerings:

Australia: Human Dimensions of Sustainability

Thailand: Urban Sustainability and Planning

<http://schoolofsustainability.asu.edu/current-students/study-abroad.php>

- The Arizona Water Institute (AWI) is a consortium of Arizona's universities – Arizona State University, the University of Arizona, and Northern Arizona – focused on water sustainability through research, education, capacity building and technology development.

Created through a partnership between Intel, the Salt River Project, the Governor's Office and the three universities, AWI harnesses the expertise of over 400 faculty and staff within these universities to seek "real-world" solutions to water issues. Improved access to water information, technology transfer to water-related industries, and technical support for local governments, tribes and communities are a few of the ways AWI is helping create a sustainable water future for Arizona.

See link for more information: <http://schoolofsustainability.asu.edu/news/greentalk/water-consortium-promotes-innovation>

## Category 10: Other Initiatives, continued

6. What specific actions has your school taken to improve its environmental sustainability since spring 2009?

Please list all improvements.

Many of the energy efficiency projects described in Category 2: Efficiency Question #5 occurred since spring 2009, as well as, 7 different solar installations. Also, all new buildings at ASU must conform to the Leadership in Energy and Environmental Design (LEED) building concepts, with a minimum of Silver Certification as the goal. Currently, 22 buildings have achieved LEED certification with 11 additional buildings pending. Of those certified all but one has received a designation of Silver or better.

7. Please use this space to address any other unique or interesting sustainability initiatives that have not been previously mentioned:

- Professor Kevin Dooley, Dean's Council of 100 Distinguished Scholar and professor of supply chain management, is acting as director of life cycle research in the newly-formed Sustainability Consortium, co-founded by ASU and the University of Arkansas. It is working with global participants to build a scientific foundation that drives innovation to improve consumer product sustainability. The "sustainable products index" examines the energy and climate, material efficiency, natural resources, and people and community aspects of a consumer product throughout its life cycle. The consortium is supporting Wal-Mart's effort to develop a sustainability index for all consumer products. The Sustainability Consortium's first pilot is with manufacturers in the chemical intensive products sector. Specifically, Dooley and a team of faculty and students are working with Proctor & Gamble, Colgate-Palmolive, Dial Corp., Unilever, SC Johnson, Clorox and Waste Management on the development of a pilot index for washing detergent.
- Professors Qiang Hu and Milton Sommerfeld in the College of Technology and Innovation received Arizona's highest honor for technology innovation for their work with the process of converting algae into jet fuel. The two ASU scientists who started their work with algae more than 25 years ago were recognized with the Innovator of the Year-Academia award at the 2009 Governor's Celebration of Innovation. Science Foundation Arizona donated \$2 million to the sustainability project, which was matched by the private sector.
- The Arizona Indicators Project was developed through a partnership with the Arizona Community Foundation, Valley of the Sun United Way, Arizona Republic and Arizona Department of Commerce. Arizona Indicators provides information that shows Arizona's competitive position and trajectory. The Web site includes data on economics, education, innovation, sustainability, quality of life, health, human services, criminal justice and children and families.
- ASU worked with city, county and tribal leaders to establish the [Sustainable Cities Network](#) to strengthen regional sustainability efforts. Beginning in February 2009, partners work together to streamline and make green city operations, advance solar energy, mitigate the urban heat island, design sustainable neighborhoods and secure water supplies in a changing climate. The Sustainable Cities Network will also share best practices with other cities on a local, national and global basis.
- [Decision Theater](#) used visualization, simulation and collaboration tools to address the public health challenges of pandemic flu. This work helped Arizona's Department of Health Services and three counties plan a response to H1N1 flu and attracted international health leaders to a conference at ASU in June 2009 to plan methods of mitigating the pandemic.
- TUV Rheinland Group joined forces with ASU to create [TUV Rheinland PTL](#), the world's most comprehensive, state-of-the-art facility for testing and certification of solar energy equipment. The collaboration, which is a private venture based in Tempe, leverages the extensive solar testing know-how of ASU's Photovoltaic Testing Laboratory with the technological sophistication, management expertise and international reach of TUV Rheinland Group.
- The disparity in energy use at these two neighboring residence halls could stem from structural differences between the two buildings, like offices or kitchen areas, said ASU research engineer Joby

Carlson. But the difference could also mean that more lights are on or appliances like televisions and computers are plugged in when not in use at Hayden East, he said. This kind of energy-usage data is now provided for 13 buildings on the Tempe campus by the [Campus Metabolism](#) project, which aims to identify places where ASU can save energy. The data will be shown on the Campus Metabolism Web site, which tracks and displays real-time and historical data on a building's energy usage. Carlson, an ASU research engineer at the National Center of Excellence on SMART Innovations, began the project as a graduate student for the student organization Engineers Without Borders. "Basically we want to monitor and visualize resource use on campus," Carlson said.

- The Memorial Union has been awarded a LEED EB Gold certification from the U.S. Green Building Council for its post-fire renovation. This facility integrates the spirit of the campus and region, while maintaining its role as a hub of campus activity.

Sustainability features include;

- The use of regional and recycled materials which supports local industry
  - Individual lighting control systems provide energy savings of 40-70% while reducing maintenance costs
  - A comprehensive network of real-time monitoring and trending sensors that communicate the building's environmental variables (temperature, fresh air, humidity, alarm and fire).
  - The use of special recessed lighting fixtures and efficient fixture layouts reduce the light power density by 25%. The amount of construction waste that was diverted from landfills and recycled was 95% (1,128 tons).
  - Interior materials contain zero volatile organic compounds which provide improved air quality and durability.
- The Barrett Honors College is located on 9 acres and opened its doors in August 2009 to 1,700 students. The Honors Complex is seeking LEED Silver certification. Sustainability features include low flow plumbing fixtures, a green roof organic garden, a gray water reuse system, and enhanced energy monitoring.
  - SHAB (Sustainability House at Barrett) is a living-learning community that is housed within the Sage North building in the Barrett Honors College Complex. The SHAB community/club's main goals are to learn how to live sustainably in an environment such as college dorms one cannot control their environment. A supportive group, SHAB also serves as a gathering place for many lifestyles that are otherwise difficult to maintain, such as vegans and vegetarians. The eventual goal is to spread the methodology of sustainable living, especially in dorms, across the ASU campus and beyond, while educating everyone on sustainable living in general. Many of the campus student leaders live in or in some way are a part of the SHAB community, but the group typically does not itself run any projects or programs outside its walls.
  - **Monthly Farmers Market** – The first Arizona State University Tempe Campus Farmers Market corresponded with the start of ASU Wellness Week. The September 29, 2009 event featured 20 vendors with fresh produce grown by local Arizona farmers, and other local products. The Farmers Market concept started as a Service Learning course class project in the (then) University College. Since the first Farmers Market was very successful, ASU has organized monthly Farmers Market events to promote healthy eating and sustainability among students, faculty, and staff.
  - In fall 2009, selected ASU students will use the [Kindle](#) wireless reading device instead of traditional printed textbooks.

- **SunSET** - Sun (Devils) Surplus Exchange and Transfer—allows ASU departments to offer or request ASU-owned office or lab supplies, specialty furniture, and other general-use items online for interdepartmental exchange. This reduces waste-handling costs and complies with the university-wide zero waste initiative. The Web site is designed for those items that are too small to be sent to Surplus Property. After five months of planning, the site was rolled out for testing on July 1, 2009. SunSET's site is sponsored by Surplus Property and Purchasing with further support from the Global Institute of Sustainability.