University Sustainability Practices

a program of the

Global Institute of Sustainability (GIOS)

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A snapshot of ASU's status in sustainability

Energy and greenhouse gases

- $75 million in energy savings performance contracts
- 14.5 MW of solar photovoltaic panels in operation
- Since 2007, we've reduced GHG emissions 20% GSF^{-1} and 19% FTE^{-1}

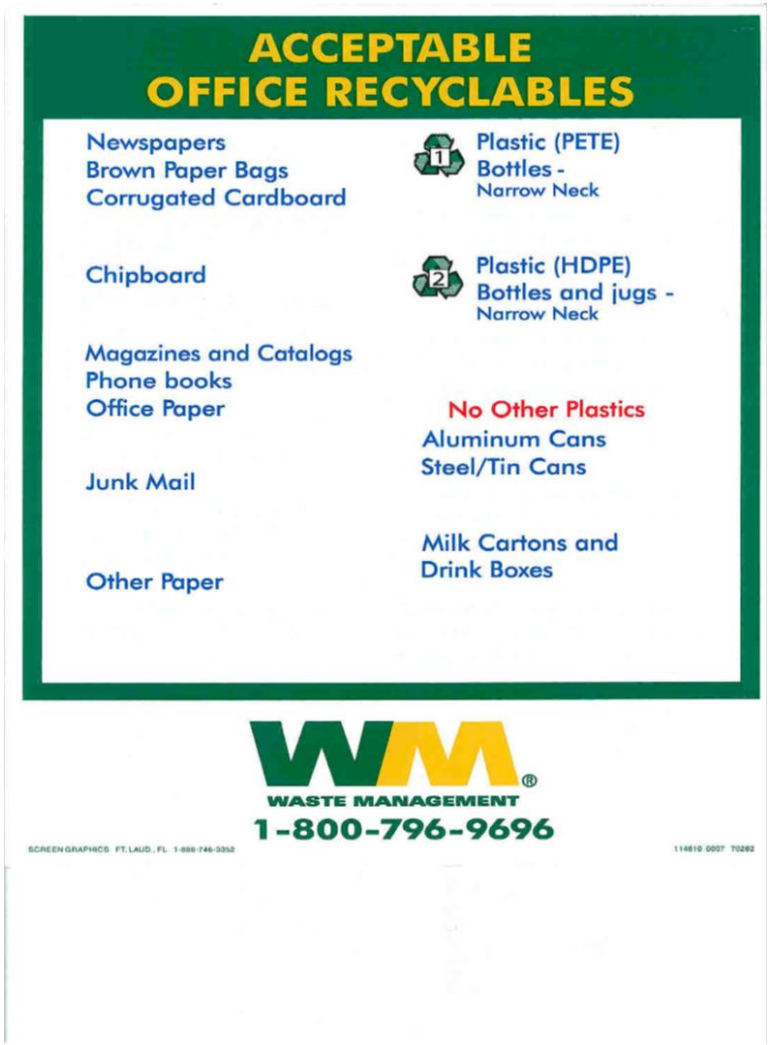
Total GHG emissions = 269,378 MT CO_2e (2010)


POWER
ASU
Sun Devil

A snapshot of ASU's status in sustainability

Waste and recycling

- 52% reduction in waste to landfills from 2007 to present, almost all of it from *aversion* projects
- Diverting thirty streams of materials from the landfill with recycling programs
- Building a Zero Waste Roadmap with Waste Management Inc.



A snapshot of ASU's status in sustainability

Campus engagement

The Sustainable Practices Network engages over 100 faculty and staff in nine work groups:

- Facilities Operations
- Water
- Energy
- Building Design and Planning
- Solid Waste
- Transportation
- Procurement
- Campus Living/Dining/Activities/Events
- Information Technology

A snapshot of ASU's status in sustainability

Principled practices at ASU

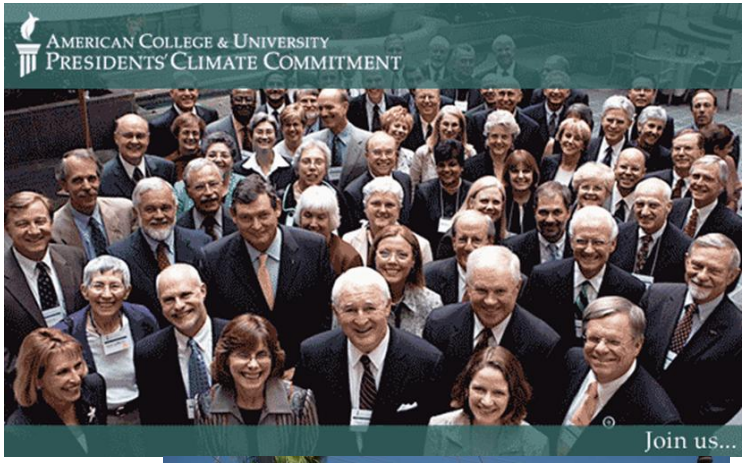
We've developed programs to improve our performance as a campus community.

- Sustainability Literacy
- Green Offices Program
- Green Labs Program
- Green Events Program
- Green Procurement Policies
- Green Design and Construction Policies

ASU's goals for sustainability

Carbon neutrality

- By 2025 all emissions from the institution's built environment will be eliminated or offset
- *By 2035 the institution will be climate neutral*, eliminating or offsetting all emissions from the built environment, transportation and all other sources



ASU's goals for sustainability

Zero waste

- By 2015 ASU will be a zero solid waste institution
- By 2020 ASU will be a zero waste water discharge institution
- By 2020, ASU will reduce landscape water consumption by 30% and building water consumption by 60% (compared to 2007)

ASU's goals for sustainability

UNIVERSITY	Core Expectations for Staff	Rating 5 (high) - 1 (low)				
	See "Evaluation Rating Chart" prior to rating	5	4	3	2	1
	Service-oriented, Positive Attitude, Helpful					
	Trustworthy, Adheres to Ethics and Compliance Standards					
	Collaborative, Team-oriented					
	Productive , Commitment to ASU					
	Flexible, Adaptable					
	Respectful Communicator					
	Resourceful, Committed to Sustainability					

Active engagement

- By 2012, 75% of staff will score average or higher sustainability rating on performance evaluations
- By 2015, 60% of faculty, staff and students will be engaged as active change agents
- By 2015, all staff will have completed the sustainability literacy program

ASU's goals for sustainability

Principled practices

- By 2013, all purchases will be in compliance with ASU's Green Purchasing Policy
- By 2014, all construction and renovation contracts will be in compliance with ASU's Green Design Policy and Green Construction Policy
- By 2018, all events will be in compliance with ASU's Green Events Policy

ASU's goals for sustainability

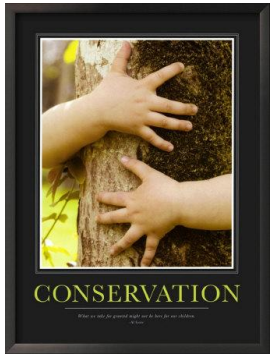
Principled practices cont'd

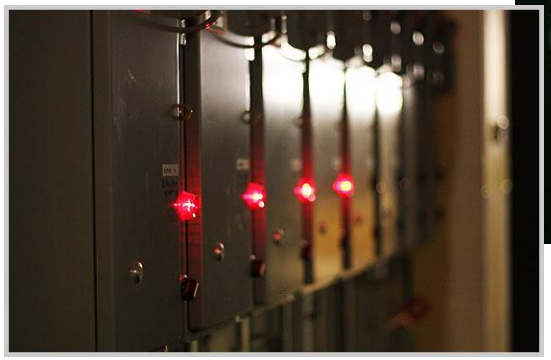
- By 2035, all offices will be in compliance with ASU's Green Offices Policy
- By 2035, all labs will be in compliance with ASU's Green Labs Policy

Energy and campus sustainability

From the demand side

- Performance contracts and other engineered conservation and efficiency measures will reduce demand by 20 -25%
- Active engagement (conservation through purposeful actions) will reduce demand by 5 – 10%





Energy and campus sustainability

From the supply side

- Photovoltaics will reduce demand by 20 - 25%
- Solar thermal energy will reduce demand by 5%
- Wind energy's impact will be negligible
- Geothermal energy's impact will be negligible

Bio Energy Systems LLC

Biomass energy systems will have to displace about 40% of current fossil fuel loads.

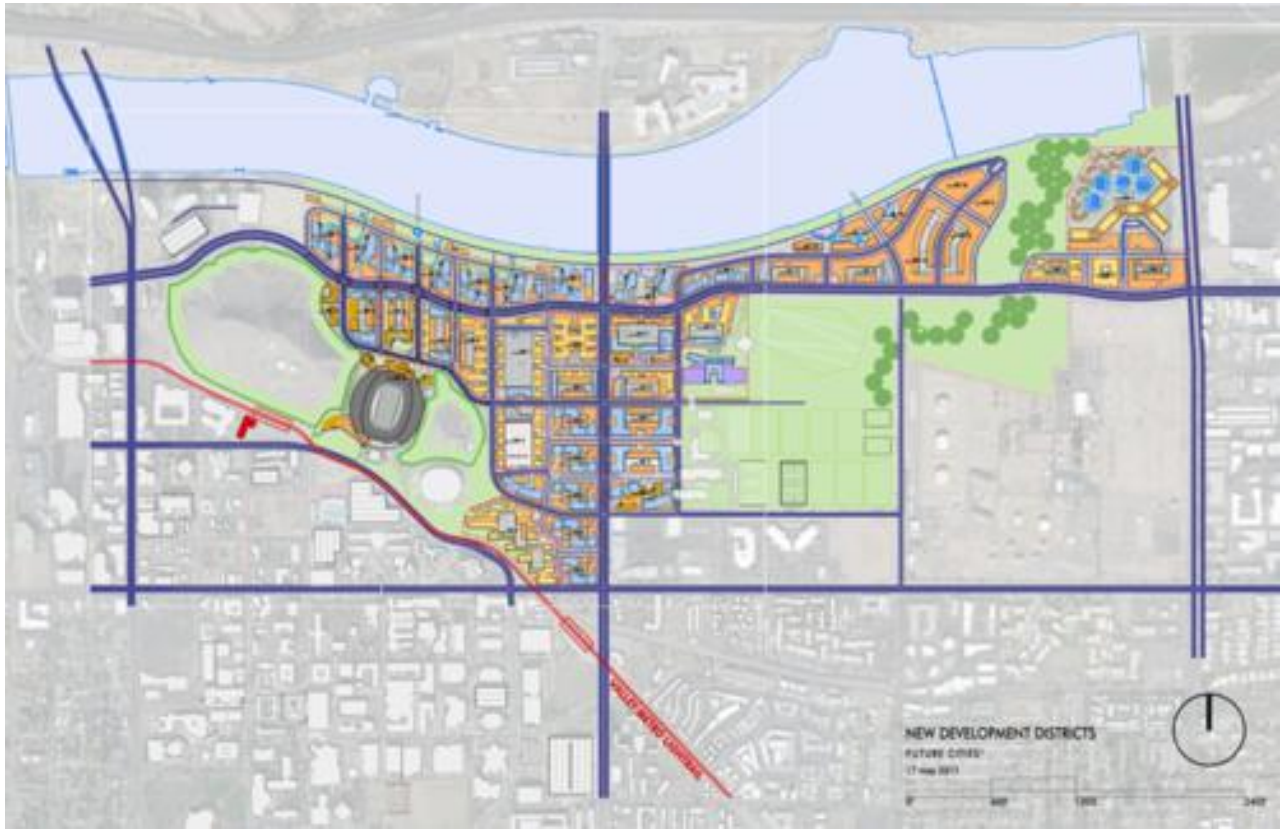
Energy and campus sustainability

What biomass resources are potentially available?

- Solid waste (trash, campus and regional)
- Food waste (from dining facilities, campus and regional)
- Green waste (yard waste, campus and regional)
- Organic industrial by-products and waste (Sun Land Beef Co, Tyson Foods, paper mills, paper products manufacturers, etc.)
- Sludge
- Algae

Energy and campus sustainability

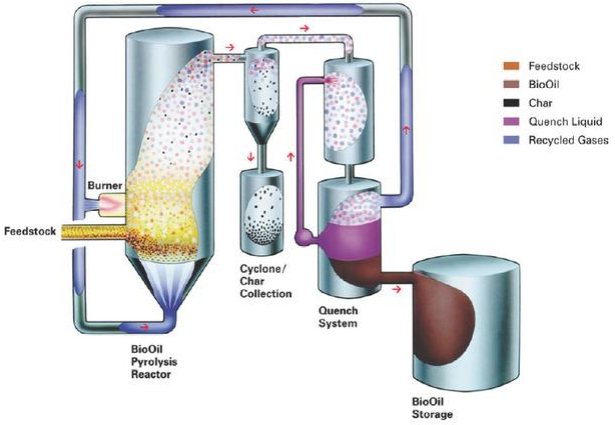
Rio Salado ecoDistrict



Zero waste

ASU and Waste Management Inc.

- Developing a Roadmap to Zero Waste
- Assessing campus solid waste and organic waste streams
  - Waste streams are a resource
    - for compost or for energy systems
  - Energetics values determine selection of technologies
  - Waste stream uses affect GHG inventory



Zero waste

The ASU/WM Roadmap to Zero Waste will include:

- A report detailing the material composition of the current waste stream, based on ASU's internal baseline study
- An inventory report that details ASU's initial disposal volumes and costs
- An assessment of current materials, methods, and management practices
- A list of tactical measures, potential cost savings and estimated expenses the campuses can employ to minimize waste, increase diversion and achieve our Zero Solid Waste goal
- A timeline of activities for short-term and long-term implementation of strategies, which will be defined partly by assessments and audits
- A description of opportunities and programmatic strategies for recycling, re-use and elimination of solid waste, hazardous materials, universal waste, and e-waste
- Additional diversion programs

Other USP programs

- Sustainability Tracking, Assessment and Rating System (STARS)
- SustainabilityConnect
- Environmental Data Indicators Management System (EDIMS)
- Campus Students Sustainability Initiative
- Campus Metabolism
- Numerous projects on *Polytechnic, West* and *Downtown* campuses

Cities and GHG emissions inventories

13 AZ cities are signatories to the
US Mayors Climate Protection Agreement

Apache Junction
Bisbee
Buckeye
Bullhead City
Flagstaff
Gilbert
Goodyear
Mesa
Oro Valley
Peoria
Phoenix
Tucson
Winslow

Cities and GHG emissions inventories

Municipal operations inventories and community inventories

GHG Summary for municipal operations

Scope 1		2005	2010
Stationary combustion	MT CO_2e	249	300
Fleet fuels	MT CO_2e	663	740
Refrigerants and chemicals	MT CO_2e	59	70
Fertilizers	MT CO_2e	1	1
Total Scope 1	MT CO_2e	**971**	**1,111**

Scope 2		2005	2010
Purchased electricity	MT CO_2e	1,487	1,828
Total Scope 2	MT CO_2e	**1,487**	**1,828**

Scope 3		2005	2010
Air Travel	MT CO_2e	1	1
Solid waste	MT CO_2e	1,251	1,209
Wastewater	MT CO_2e	0.28	0.28
Paper	MT CO_2e	18	24
Local travel	MT CO_2e	686	683
Scope 2 T&D losses	MT CO_2e	97	119
Total scope 3	MT CO_2e	**2,053**	**2,037**

Total gross GHG emissions		2005	2010
Total gross GHG emissions	MT CO_2e	**4,511**	**4,976**

Offsets		2005	2010
Total additional	MT CO_2e	-	-
Total non-additional	MT CO_2e	(1,800)	(1,800)
Total offsets	MT CO_2e	**(1,800)**	**(1,800)**

Total net GHG emissions		2005	2010
Total net GHG emissions	MT CO_2e	**4,511**	**4,976**

GHG Summary (community emissions)

Scope 1		
Stationary combustion	MT CO_2e	8,649
Local travel	MT CO_2e	13,091
Refrigerants and chemicals	MT CO_2e	2,625
Fertilizers	MT CO_2e	6
Total Scope 1	MT CO_2e	**24,370**

Scope 2		
Purchased electricity	MT CO_2e	11,406
Total Scope 2	MT CO_2e	**11,406**

Scope 3		
Air Travel	MT CO_2e	579
Train and trolley travel	MT CO_2e	204
Wastewater	MT CO_2e	243
Purchased Paper	MT CO_2e	1,822
Solid waste	MT CO_2e	1,225
Scope 2 T&D losses	MT CO_2e	741
Total scope 3	MT CO_2e	**4,815**

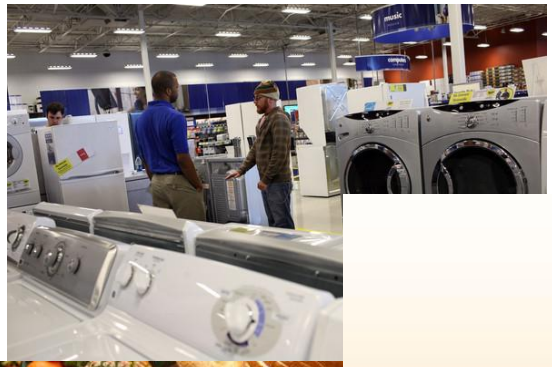
Total Gross GHG Emissions		2010
Total gross GHG emissions	MT CO_2e	**40,592**

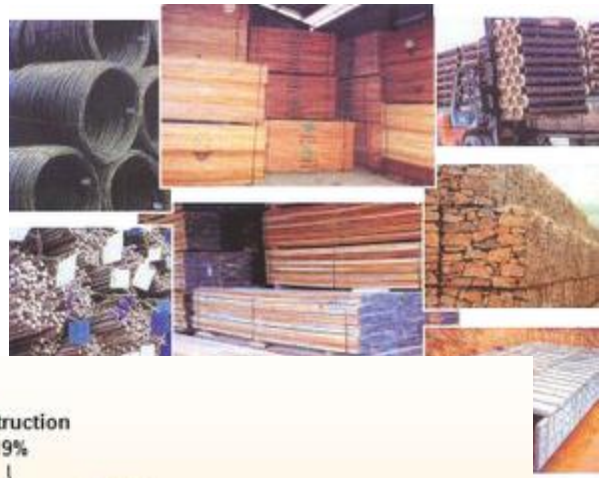
Offsets		2010
Total additional	MT CO_2e	-
Total non-additional	MT CO_2e	3,000
Total offsets	MT CO_2e	**-**

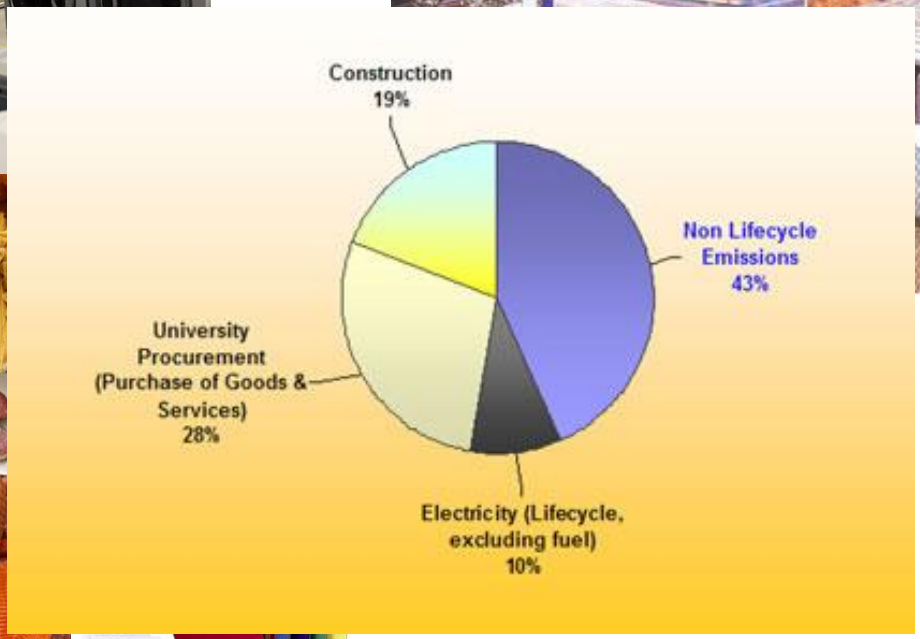
Total Net GHG Emissions		2010
Total net GHG emissions	MT CO_2e	**40,592**
GHG emissions per capita	MT CO2e	**19.6**

Cities and GHG emissions inventories

GHG inventories and full cost accounting







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Arizona State University

A New American University

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