

Environmental Report

protecting +
preserving
our resources

The Regents of the University of Michigan

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With these words, President Mary Sue Coleman launched a multi-faceted initiative at the start of the school year to build on U-M's longstanding leadership with a new, elevated commitment to sustainability.

A new leadership framework for sustainability includes a Sustainability Executive Council, chaired by the president and comprising university leadership, to ensure sustainability is a priority at the highest level.

A new Office of Campus Sustainability will serve as the focal point for sustainable campus operations. The OCS will promote and coordinate sustainability activities throughout campus, and will make recommendations on sustainability standards and goals.

A new special counsel to the president for sustainability will serve as campus point person, to set direction, advise the administration, serve as liaison to students and guide sustainability activities.

"The pressing challenge of environmental sustainability is a huge global concern. From teaching and research, to hands-on engagement, we are going to leverage our many strengths to make significant contributions to an urgent and extraordinarily complex problem."

—President Mary Sue Coleman

The annual Environmental Report for the University of Michigan tracks institutional performance and documents our progress toward achieving a greener campus.

The Ann Arbor campus is a \$4 billion operation comprising more than 3,000 acres, 300 buildings and 78,000 faculty, students and staff. With a growing physical plant to support research, teaching and student life the university faces a challenge to achieve more sustainable practices—and the opportunity to make a difference on a significant scale.

U-M's first annual Environmental Report was issued in 2007, following a prototype developed by graduate students from the School of Natural Resources and Environment. This year we will issue the 2009 report in a variety of formats to increase its reach and usability. This highlights brochure offers a brief presentation of facts, while a larger print report to be issued later in the year will provide the traditional presentation of environmental metrics. Information also will be made available on an Environmental Report Web site.

Data collection is provided for the July 1 through June 30 fiscal calendar years, 2004–2009, for the University of Michigan Ann Arbor campus.

For more information about sustainability at U-M, go to: www.sustainable.umich.edu

Did you know?

A solar collector array located atop the central power plant saves approximately 250 million BTUs of energy annually.

Climate Savers collected about 281 tons of electronic waste at nine public events last year.

The Graham Environmental Sustainability Institute maintains comprehensive searchable databases of sustainability-related courses and faculty members.

A centralized chiller plant on Hatcher Library saves more than 50 billion BTUs and 2.5 million gallons of water a year.

The U-M natural gas fueled power plant is more than twice as efficient and produces only 1/6th of the Green House Gases of a conventional utility coal fired plant.

Planet Blue

Planet Blue achieved a **six percent average reduction in energy consumption** in the first full year for its initial group of five pilot buildings. But that result belies much more dramatic results in individual buildings.

- Rackham Graduate School, **32 percent reduction**
- Institute for Social Research, **26 percent reduction**
- Space Research, **17 percent reduction**

In two other pilot buildings, Planet Blue's intensive systems assessment pointed the way to achieving the desired results in the future.

- Chemistry Building. Projects underway to reduce steam usage. New electrical meters will provide accurate benchmark.
- Fleming Building. Relocation of servers expected to send energy use down next year.

Planet Blue ramps up to create greater impact

- 30 buildings in 2009
- 30 building goal for 2010

Planet Blue's approach

- Actively engage the university community to conserve utilities
- Intensive building systems and HVAC assessment
- Remote monitoring of building energy use
- Outreach and education for building occupants



planet blue
UofM environmental & energy initiative

“Go Blue. Think Green.”

The Transportation Services campaign encourages faculty, students and staff to adopt more sustainable transportation. In 2009

- MRide ridership in conjunction with the city bus system reached 2.4 million, **up 10 percent over last year and up 56 percent since 2005.**
- **6 million riders** used the free on-campus bus service.
- With **596 U-M vehicles running on alternative fuel**, U-M was the only university included in *Automotive Fleet* magazine’s list of the top 100 Alternate Fuel Fleets.
- U-M celebrated the **30th anniversary of university-sponsored car pools**; 527 employees commuted in one of 86 sponsored vans.
- GreenRide has signed more than **3,000 employees** to this Internet-based ride-matching system.
- **ZimRide**, the social media program, gives U-M students and employees more ride sharing opportunities.

Building Standards

Energy reduction is a key component of U-M’s sustainability plan. With campus buildings responsible for over 90 percent of the university’s energy use, incorporating energy reduction in building design has a large impact. New building design guidelines require major projects to implement energy and water conservation measures that are 30 percent more restrictive than those in ASHRAE 90.1-2007, a widely recognized national building code which is 10 percent more efficient than current State of Michigan code.

Conservation Measures Include:

- Compliance with a new U-M Laboratory Design Guideline that follows the U.S. EPA Labs for the 21st Century Initiative strategies
- Thermal scanning to identify energy loss
- Energy impact statements
- Highly efficient insulation, windows, and ventilation
- Lighting controls and day lighting strategies
- Waterless or 1/8 gallon per flush urinals
- Dual flush water closets

North Quad

The North Quad Complex, the first new residence hall in 40 years, will be a **showcase for energy efficiency**. It will feature increased levels of insulation, high performance windows, occupancy sensors to reduce lighting, variable flow kitchen hoods, dorm room thermostat setback, and exhaust heat recovery.



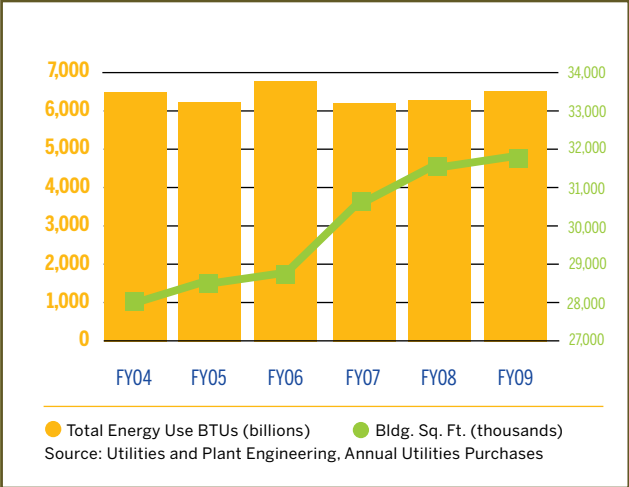
Environmental Metrics: Energy Use

Over the last six years the university has succeeded in keeping total energy use stable despite a 9 percent increase in population and an 11 percent increase in building area.

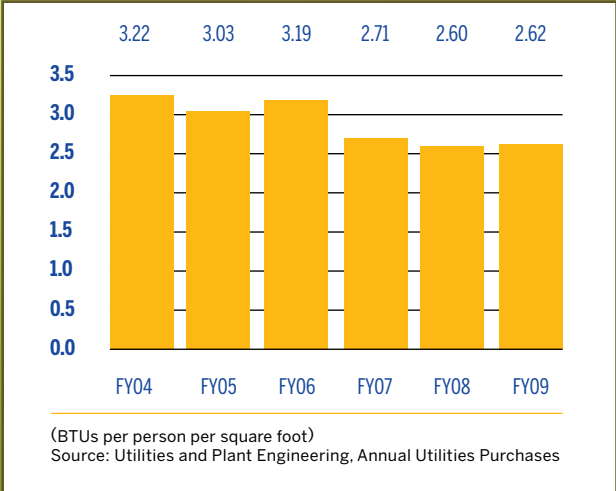
Campus consumption	6.5 trillion BTUs
Physical plant	31 million square feet
Building energy use	6.4 trillion BTUs
Fleet	1,119 vehicles
Fleet energy use	109 billion BTUs
Energy consumption-buses	41 billion BTUs
Transportation energy from renewable sources	20 billion BTUs
Students	40,000
Faculty and staff	38,000

U-M strives for increased energy efficiency as the most effective way to reduce its carbon footprint.

ENERGY USE IS STABLE AS THE UNIVERSITY HAS GROWN



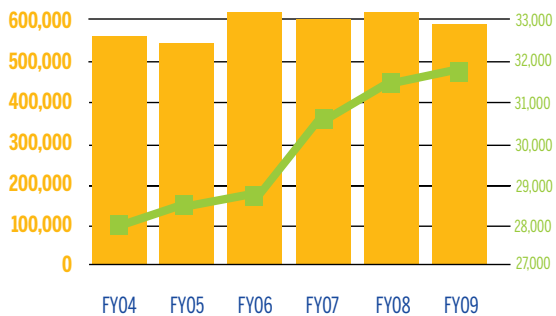
ENERGY USE PER PERSON PER SQ. FT. IS STABLE



Greater utilization of electricity generated at U-M's gas-fueled co-generation central power plant brought **Green House Gas emissions down 3.8 percent** overall, from 615,000 to 592,000 metric tons.

- Green House Gas emissions generated by U-M buildings and vehicles have decreased 8.5 percent since FY04.
- Green House Gas emissions generated offsite through purchased electricity have increased 21 percent since FY04.
- Green House Gas emissions from all sources have increased 5.2 percent since FY04.
- Per capita emissions decreased 5.2 percent from FY08 to FY09 and are down 3.3 percent since FY04.

EMISSIONS ARE STABLE AS BUILDING SPACE HAS GROWN



● Green House Gases CO₂E (metric tons) ● Bldg. Sq. Ft. (thousands)
Source: Office of Campus Sustainability

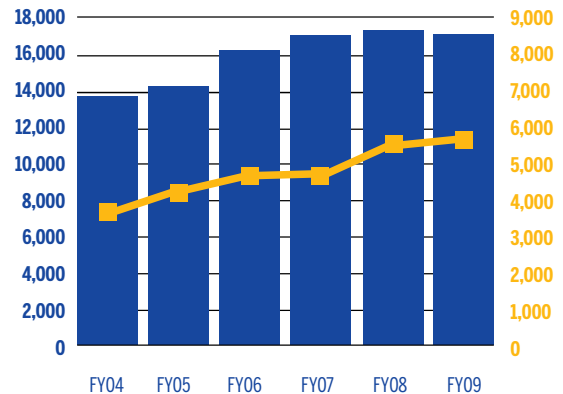
Environmental Metrics: Solid Waste

Amount collected	17,400 tons
Amount per person	438 pounds
Amount recycled	33 percent

Recycling initiatives

- Move Out diverted more than 138 tons from the waste stream with its program to encourage students to donate rather than discard.
- The Stadium Recycling Program recycled 29.5 tons of waste during the 2008 football season.
- The winner of Recycling Champions, a building competition, recycled 66 percent of its solid waste.
- Green Purchasing reduces packaging waste by encouraging minimum office supply orders of \$50.

RECYCLING IS GROWING FASTER THAN WASTE GENERATION



● Total Solid Waste (tons) ● Total Recycled (tons)
Source: Waste Management Services

Land + Water

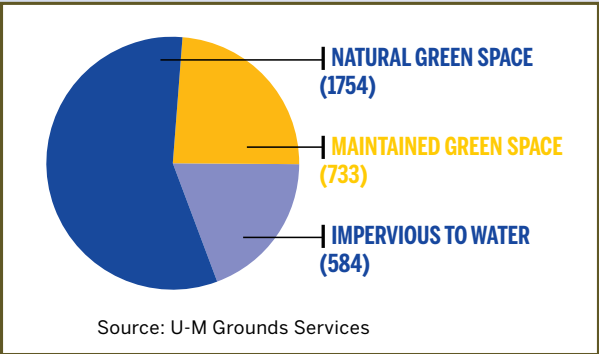
Land Use

Total land area	3070 acres
Pervious to water	2486 acres
Tree population	14,006
Building area	31 million square feet
Building efficiency	397 ft ² /person

North Campus Research Complex

The university purchased a 174-acre former pharmaceutical research facility with 30 buildings comprising nearly 2 million square feet, with plans to renovate it for university research space. The North Campus Research Complex will minimize the environmental impact associated with new construction and tap into existing bus and parking options. The purchase occurred at the close of the year and the stats are not included in this year's metrics.

U-M LAND USE (Acres)

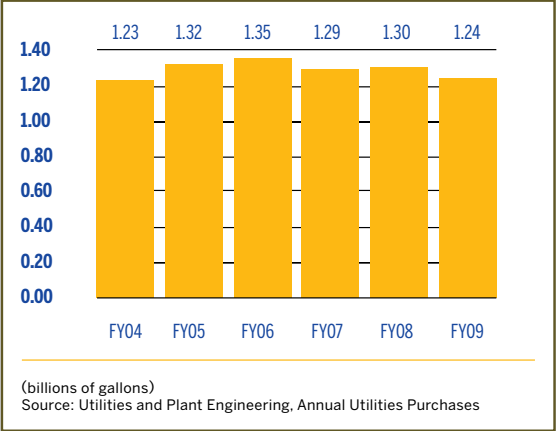


Water Use

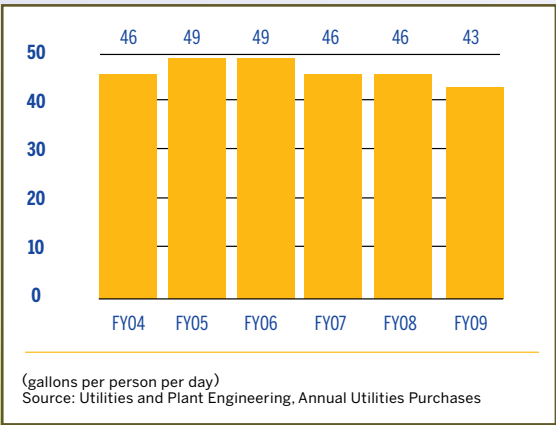
Per capita water use is down 7.1 percent since FY 04.

Water use	1.24 billion gallons
Use per person	15,700 gallons/person
Daily use	43 gallons/person/day
By building area	39.6 gallons/ft ²

WATER USE IS STABLE AS THE UNIVERSITY HAS GROWN



PER CAPITA WATER USE IS DECLINING



Campus Life

Education

The University of Michigan offers more than 10 undergraduate degrees, 11 master's degrees and 15 doctoral level courses of study on some aspect of environmental sustainability.

The **Engineering Sustainable Systems** master's degree, launched in fall 2007, is the first in the world to offer a dual degree in engineering and environmental science. It creates uniquely qualified students who graduate with an MS in engineering and an MS from the School of Natural Resources and Environment.

The undergraduate course **"Sustainability and the Campus"** gives students a hands-on opportunity to participate in identifying potential environmental initiatives for campus. The 24 students in last year's course looked at such items as a solar power array for an athletic facility, removing trays from a dining hall, and a LEED assessment for a campus building.

Student Initiatives

The Michigan campus is home to close to 50 student-run organizations that pursue activities in the area of environmental sustainability.

The **Student Sustainability Initiative**, organized last year, brings together leaders from major campus groups to create stronger advocacy with a broad student constituency. Its work helped bring about the creation of the Office of Campus Sustainability.

Cultivating Community gives students a hands-on way to experience the connection between healthy food choices and earth-friendly cultivating techniques. The group gardens at U-M's Matthaei Botanical Garden using no-spray techniques that avoid chemical fertilizer and pesticides. They grow many traditional Michigan crops, like tomatoes, pumpkin and sweet corn.

