Colorado State University

Facilities Management
Environmental Report FY07
Mission Statement

The Facilities Management Department is committed to quality competitive service. Our mission is to anticipate and provide the physical environment, which enables Colorado State University to achieve its objectives in instruction, research, and public service.

Acknowledgments

Many thanks to the staff within Facilities Management that helped to create this report. Thanks to Carol Dollard, Heidi Mechtenberg, Marlene Lopez, Jeff Stoddart, Sheela Backen, Mike Rush, Derek Keen, Caitlin Weller and Fred Haberecht for providing data and answering questions. Additional thanks go to the numerous individuals that provided editorial commentary and content.
What is sustainability?

“Sustainability is meeting the needs of today without compromising the ability of future generations to meet their own needs.” (U.N. Brundtland Commission 1987)

As part of a larger system, Colorado State University is working to become a sustainable institution by reaching its economic and social goals, while seeking to maintain and enhance the environment, rather than degrade or destroy it.

What does Facilities do?

Since its founding in 1870, Colorado State University has grown to include over 9,000 acres of land. With plans of further expansion, it is important for the University to remain focused upon its overarching mission: to set the standard for public research universities in teaching, research, service and extension for the benefit of the citizens of Colorado, the United States, and the world.

Facilities Management is a key aspect to achieving that mission with responsibility for all physical aspects of the campus, including long-range planning, design, remodeling, construction, roads, grounds, buildings, and all associated mechanical systems, including heating, cooling, etc.

Areas not under the department are University parking lots and telecommunications lines (e.g. telephones, computers, and network connections).

Facilities Management is committed to projects that conserve water and energy in order to create a healthier and more sustainable campus and community. The following environmental report offers a glimpse of the features and initiatives accomplished by Facilities Management with regard to sustainable practices.
Milestones

1999-2000 – Integrated Solid Waste introduced recycling bins into the residence halls and piloted a vermin-composting project for food waste.

2001, Spring – The Talloires Declaration was signed by then President Albert C. Yates.


2003 – The Main Campus Greenhouse wetlands was completed to help filter sediments and pollutants from storm and waste water.

2004 – The University began a voluntary green power program for on-campus residents.

2005 – Colorado State received the Fort Collins Chamber of Commerce Environmental Leader award, recognizing environmental leadership in the areas of energy, water, transportation, recycling and materials.

2006 – The University ranked 4th in the second year of participation in RecycleMania.

2006 – Colorado State became the first University to be awarded LEED CI (commercial interior) Silver certification for the renovation of three classrooms in Guggenheim Hall.

2006 – The University published their first GHG inventory, using a tool provided by the Fort Collins ClimateWise program, in order to quantify the footprint of all campuses.

2007 – The University placed 3rd in waste minimization for RecycleMania and 9th overall.

2007 – The Transit Center received LEED Gold certification.

2007 – Colorado State Housing & Dining Services was recognized as an EPA Wind Power Partner.

2007 – The University reached an agreement with Wind Holding, LLC. to develop wind turbines on Maxwell Ranch. When completed it is expected to be the largest US wind farm on university owned land.
Microbiology Study Lounge

By summer 2007, students were already enjoying the new Microbiology Study Lounge, which was near completion. It features a balcony and natural light is incorporated as the primary means of light for the interior.

LEED Gold Transit Center

The Transit Center was designed and constructed to meet the Green Building Council’s LEED (Leadership in Energy and Environmental Design) standards, which emphasize state-of-the-art strategies for sustainable site development, energy efficiency, indoor environment quality, water savings, and material selection.

The University, in conjunction with the City of Fort Collins, had previously sought LEED Silver Certification. At completion, the Lory Transit Center featured low-flow water fixtures, indoor air quality management and over 85% construction waste management. The Green Building Council awarded LEED Gold certification, indicating a higher sustainable rating had been achieved.

Did You Know?

Buildings have a huge impact. In the U.S., buildings account for 36% of total energy use, 65% of electricity consumption, 30% of greenhouse gas emissions, 30% of raw materials use, 30% of waste output (136 million tons annually), and 12% of potable water consumption.
Coming together is a beginning; keeping together is progress; working together is success.

**Academic Village**

To replace Ellis Hall, the University decided to build the Academic Village as an “environmentally responsible building.” The facility features ultra low-flow water fixtures to conserve water use. Additionally, there will be displays with information on energy consumption as an educational tool. The two-story Dining Commons will feature a "pulper" that takes food waste and, using water, compacts the waste and then re-circulates the water for conservation.

**Future Academic Instruction Building**

This new building will be located south of the Clark C-Wing and offer high quality learning spaces for students and room to hold faculty as the University continues to grow. The building will be designed and constructed to meet LEED certification standards. Features being considered in the early design phase include a garden atrium, water efficient landscape, use of renewable energy systems, and local materials.

**Academic Village sketch**

**Initial design of the Academic Instruction Building**

**HENRY FORD**

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Efficient energy use reduces Colorado State’s total energy demand, decreases harmful emissions, and minimizes the cost of providing energy to the campus.

As a result of energy conservation initiatives that have been implemented over the past twenty years, the average demand per square foot on campus has actually flattened out and is currently showing little growth.

**Maxwell Ranch Wind Farm**

The Colorado State University Research Foundation signed an agreement with Wind Holdings, LLC to develop a minimum of 25 wind turbines with the potential of 200 megawatts on the University’s 11,000-acre Maxwell Ranch near the Wyoming border.

Currently, at peak demand, Colorado State uses about 16 megawatts of power. The excess power generated could produce an additional $30 million in revenue for the University over the twenty-five year life of the project.
Biomass Boiler at Animal Reproduction and Biotechnology Laboratory

The future groundbreaking of the Foothills Campus biomass boiler is another step towards energy efficiency. The fuel cost will be approximately one-half the cost of natural gas. The project also means a partnership with Colorado State Forest Service, as part of the Healthy Forest Initiative. Woodchips will come from fire mitigation projects and benefit the forest all along the Front Range, especially at a time of pine beetle infestation.

Yates Hall Energy Reduction

Staff from Facilities Management worked together with the occupants of Yates Hall to optimize ventilation for safety and energy efficiency. The result was a 26% decrease in the electric use of the building.

Did You Know?

If every household in the U.S. replaced one light bulb with one compact fluorescent bulb, we would save enough energy to light more than 2.5 million homes for a year and prevent greenhouse gases equivalent to the emissions of nearly 800,000 cars.

Lighting Retrofits

There were several lighting retrofits throughout campus. The incandescent canopy lights in Moby gym were replaced with compact fluorescent lights. The South College Gym and field house lights, along with 555 Howes Street, were given a lighting upgrade.

Green Power

In 2004, Colorado State became one of the first Universities in the nation to offer on-campus residents the option to purchase green power. Over 700 students have signed up for this option in the past three years.

Based on national average emissions rates, the U.S. Environmental Protection Agency estimates that Colorado State's purchase of 547,000 kWh is equivalent to keeping more than 760,000 pounds of CO₂ from entering the Earth's atmosphere over the next year. That amount is equivalent to eliminating CO₂ emissions associated with the use of nearly 40,000 gallons of gasoline annually.
Waste management is one of the oldest initiatives at Colorado State University. In the 1970s, a group of student volunteers formed Campus Recycle. Given the high amount of waste generated per person in America, they knew it was important to reduce the load on the landfills. The best practice became to reduce, reuse and recycle all applicable items in order to send less to a landfill.

In FY07, Colorado State landfilled 44.9% of all waste, meaning over 55% was recycled. One notable impact on the recycling rate was the placement of recycling bins in Summit Hall that promoted an 8% increase in recycling for that residence hall.

**Great Sofa Round-Up 2006**

Approximately 600 sofas were offered for trade during the two day event. About half of those couches were saved from the landfill.

**RecycleMania 2007**

Colorado State competed for the third time in this friendly national recycling competition between over 200 other colleges and universities. In the competition for Grand Champion, the University finished ninth, but placed third for Waste Minimization with just 38.14 lbs. of waste per person.

**Residence Hall Move-In 2006**

Each year that new residents move into the halls means a lot of empty cardboard boxes. Due to the set-up of “cardboard corrals” throughout campus, 17.2 tons of cardboard were recycled in just a five day period.

**Recycle to Reuse**

- 14 plastic bottles = 1 T-shirt
- 63 plastic bottles = 1 fleece sweater
- 83 plastic bottles = 1 sleeping bag fiberfill
Waste at Colorado State University

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Landfilled</th>
<th>Recycled</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY98</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>FY99</td>
<td>15,000</td>
<td>15,000</td>
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<td>FY00</td>
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<td>FY02</td>
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<td>FY06</td>
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<tr>
<td>FY07</td>
<td>55,000</td>
<td>55,000</td>
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</tbody>
</table>

What to Look for in FY08

One new initiative already seen on campus is a three stream recycle collection process for cardboard, commingled containers and mixed paper.

A new paper shredding program is available through the Facilities Management website for $2 per box, with a maximum of five boxes per office per week. An alkaline battery recycling program is also available.

Facilities Management will get a new recycling truck that will minimize collection time and hold more material, meaning fewer trips to the recycling center. Like the rest of Facilities’ vehicles, it will run on biodiesel.

Did You Know?

In 2003, U.S. residents, businesses and institutions produced more than 236 million tons of municipal solid waste, approximately 4.5 pounds of waste per person every day. The Environmental Protection Agency estimates that Coloradans dispose of 6.1 pounds of waste per person per day: 26% more than the average American.
Water is a valuable resource, especially in the semi-arid west. As a result, the University is committed to conserving water and has been actively researching state of the art ways to accomplish this goal.

Since 1990, potable water use has decreased over 22% (108 millions gallons), despite a student population increase of 25% and building square footage increase of 19%.

**Bioremediation Wetlands**

A one-quarter acre wetlands located at the Equine Center of Foothills Campus is near completion. Due to lack of storm water runoff, it is expected to be functional early next year. This wetlands is the second of three wetlands that function as filters for pollutants and sediments from storm and waste water.
Irrigation Water

Approximately 95% of the University’s irrigation water is raw water. The annual cost avoidance by not using treated tap water is about $250,000.

A computerized irrigation control system allows sprinkler schedules to be set from a centralized location – this helps prevent over-watering and thus, conserves water.

Recycled Mulch

Tree pruning products are chipped and then recycled into mulch. In an average year, this produces approximately 2,000 cubic yards of mulch.

Outdoor Pest Control

Wherever possible, the preferred method is to use biological controls or natural substances for controlling pests, plant diseases, and weeds on campus.

Top Ten Water Users on Campus
(based on GAL/gsf):
1. Biohazard Research Lab (BHRB)
2. Livestock Area (Foothills campus)
3. Center for Disease Control (CDC)
4. Portner Farm
5. Chemistry Building
6. Lake Street Greenhouses
7. Painter Building
8. Hughes Stadium
9. CSFS State Office
10. CSFS Nursery

Colorado Canyon

The Colorado Canyon, located in between the Engineering Building and north end of the Lory Student Center, is an example of landscaping with water conservation in mind. Plants whose natural requirements are appropriate to the local climate are emphasized.

When we see land as a community to which we belong, we may begin to use it with love and respect.

ALDO LEOPOLD
The University Master Plan calls for a continuing move towards a more pedestrian friendly campus. By moving parking closer to the edges of campus, Colorado State aims to encourage alternative modes of transportation on campus, such as walking and bicycling.

**Main Campus Land Use: What share is transportation?**

- Roads, sidewalks & parking lots: 37%
- Greenspace: 48%
- Buildings: 15%

**Biodiesel**

In October 2006, the University switched all diesel powered vehicles, including snowplows, to biodiesel. They use B20 (20% biodiesel and 80% petroleum diesel), which is expected to reduce emissions by 15-75%.

**Electric Vehicles**

Colorado State utilizes electric vehicles, where possible. Currently, Facilities Management, as well as Central Receiving, Athletics Department, and Parking Services use these vehicles.
Hybrid Electric Vehicles

The University has two hybrid electric vehicles from Toyota and Honda. One of the vehicles is used as the departmental vehicle for Facilities and the other will be offered for campus use through motor pool.

Did You Know?

The average driver in Colorado uses the equivalent of 16 barrels of oil a year.

Best Practices

Carpooling – In an effort to encourage students to carpool, Colorado State has established a ride board in the basement of the Lory Student Center.

Bike to Work Day – The University is a breakfast station sponsor, offering food and bike support, in this city-wide event in June.

Transfort – Colorado State partnered with the City of Fort Collins to provide bus service to the campus community. Students receive a free pass to ride the Transfort bus system, and faculty and staff are offered a reduced rate to purchase the PassFort pass.

Charter buses – Transportation services offers charter bus service to the campus community in order to move large numbers of people in one vehicle. This helps reduce the number of vehicles on the road for field trips or long-distance travel.
Colorado State University is currently working on several initiatives, such as reducing the amount of greenhouse gases emitted by the University.

Greenhouse gases (GHGs) are a variety of gases that trap heat from the sun before it escapes back into space, thereby creating what has been referred to as the ‘greenhouse effect’ because they act as a shield to keep the earth warm. While these gases are necessary, there is a concern that they have globally increased to dangerous levels.

Many of the daily activities on campus, such driving and generating waste, contribute to our GHG emissions.

**Green Cleaning**

Environmentally friendly cleaning products are used in the routine cleaning of building interiors, which includes paper with a minimum 30% post-consumer recycled content, rags made from ruined linen, and low voc (volatile organic compound) H2 Orange is used for cleaning common areas and offices.

**Hazardous Waste**

The Environmental Health Services group operates a hazardous waste tracking system. This system assures wastes are properly handled and disposed of. They also educate graduate lab instructors to help achieve their goal of designing learning experiences that emphasize a minimum of hazardous waste.

**Greening State Government**

On April 16, 2007, Colorado Governor Bill Ritter Jr. signed several energy-related bills into law and issued two “Greening of State Government” executive orders (one order sets goals and objectives, and the other serves as the implementing document). The orders establish goals for reducing energy consumption in state facilities and vehicles, and for using efficient materials and resources, by 2012.

Some of the specific goals include:
- a 20% reduction in energy consumption
- a 20% reduction of paper usage
- a 10% reduction of water consumption
- a 25% reduction in petroleum fuel use

Colorado State has a variety of projects planned to meet these and other goals.

**Association for the Advancement of Sustainability in Higher Education Member**

This membership connects the University with a growing network of colleges, universities, businesses and nonprofits that are working to achieve a sustainable future.
The Green is Gold program, which has been running for five years, is a campus-wide energy awareness campaign designed to increase participation by students and staff in energy conservation efforts. Efforts include placing posters in each building on campus depicting utility usage and cost, as well as numerous press releases encouraging the campus community to think green.

**U.S. Green Building Council Member** – In FY02, Facilities Management joined the U.S. Green Building Council. Council members work together to develop LEED products and resources, the Greenbuild Annual International Conference and Expo, policy guidance, and educational and marketing tools that support the adoption of sustainable building.

**City of Fort Collins ClimateWise Partner** – Colorado State joined other local businesses in 2003 in an effort to reduce greenhouse gas emissions and improve the quality of life in Fort Collins.

**EPA Energy Star Program Partner & Green Power Partner** – Housing & Dining Services is a member of the EPA’s Energy Star Program, which provides a powerful platform for utilities, state agencies, and other organizations implementing energy efficiency programs to make a bigger difference in their communities. As a Green Power Partner, Housing & Dining Services has agreed to procure an amount of green power proportional to their annual electricity use.

**Talloires Declaration Signatory** – In 2001, then University President Albert Yates joined hundreds of other Universities in signing the Talloires Declaration. By signing this declaration, President Yates committed the University to comply with a ten-point action plan for incorporating sustainability and environmental literacy into its teaching, research, operations and outreach efforts. To learn more, visit the University Leaders for a Sustainable Future website, www.ulsf.org.
How does Facilities Management rate?

While this report has highlighted a number of areas in which the department has lowered the environmental impact of Colorado State University, there are a number of areas in need of improvement. Ratings have been designated based on whether or not Colorado State’s Main Campus had a smaller or larger ecological footprint in FY07, than it had in FY06. The report card illustrates areas in which the department exceeds, as well as areas of focus for the future.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Energy and Water</th>
<th>Waste and Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>Energy Sources</td>
<td>Waste Generation</td>
</tr>
<tr>
<td>Green space has remained stable; future buildings designed on already developed land</td>
<td>Maxwell Ranch Wind Farm contract expands University’s commitment green power</td>
<td>Amount of waste landfilled increased slightly; construction waste needs improvement</td>
</tr>
<tr>
<td>Transportation</td>
<td>Energy Use</td>
<td>Recycling</td>
</tr>
<tr>
<td>Motor Pool switched all diesel vehicles to biodiesel</td>
<td>Electricity and natural gas usage increased, however FY07 was 13% colder than FY06</td>
<td>Still recycled more than landfilled, but numbers remain consistent</td>
</tr>
<tr>
<td>Building Design &amp; Construction</td>
<td>Water Use</td>
<td>Greenhouse Gas Emissions</td>
</tr>
<tr>
<td>Academic Village will not be LEED certified, but still built with environmentally responsible features</td>
<td>Main campus water usage continued to decrease, despite gsf increase</td>
<td>Greenhouse gas emissions have increased significantly compared with FY06</td>
</tr>
</tbody>
</table>
Great things are not done by impulse, but by a series of small things brought together.

VINCENT VAN GOGH

It makes far better sense to reshape ourselves to fit a finite planet than to attempt to reshape the planet to fit our infinite wants.

DAVID ORR

To obtain a copy of this report visit Facilities Management’s Sustainability Website at www.fm.colostate.edu/sustain/