The Minnesota State Mankato Climate Action Plan

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SE CERT Public Building Energy Efficiency Workshop
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Carbon Footprint

- An accounting of all greenhouse gases emitted by the campus in a year, primarily from:
  - Electricity
  - Natural gas for heat and hot water
  - Commuting

- Done by Sebesta

- Presented to the Environmental Committee on June 13, 2013
MSU, M’s Carbon Footprint, baseline year FY2012

Greenhouse gas emissions by activity

- Electricity including T & D, 54%
- Natural gas and fuel oil, 23%
- Commuting, 22%
- Fleet, 1%

Total greenhouse gas emissions = 48,630 metric tons of CO2e
Calculated with the U of New Hampshire Campus Carbon Calculator v8
The Minnesota State University, Mankato Climate Action Plan (MSU-CAP)

A Climate Action Plan:
A set of strategies, action steps and goals to reduce the University’s greenhouse gas emissions and make the University more sustainable

The MSU-CAP:
• An Environmental Committee initiative
• Funded with a Strategic Priority Initiative grant
• Consultant: Sebesta
• Partner: Urban and Regional Studies Institute
• Developed over the 2014-2015 academic year
• Approved by the Administration in 2016
Acknowledgments

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The MSU-CAP

• 25 strategies and 75 action steps arranged by category, with a general goal for each of the categories.

The categories:
  - Buildings and energy
  - Transportation
  - Water
  - Waste
  - Purchasing
  - Education and communication

• The MSU-CAP is more a sustainability plan than a climate action plan

www.mnsu.edu/greencampus
The MSU-CAP

**Category:** Buildings & Energy

**Goal:** Reduce greenhouse gas emissions from electricity, natural gas, and fuel oil use by employing both energy efficiency and renewable energy

**Strategies:**
1. Reduce energy use in buildings by implementing GESP measures ✓
2. Set high energy standards for new buildings (B3 guidelines) ✓
3. Consolidate class/event schedules at off hours to allow for building shutdown
4. Produce renewable energy on campus
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Category: Transportation

Goal: Reduce greenhouse gas emissions from commuting and from fleet vehicles

Strategies:
5. Improve alternative transportation infrastructure
   • Car share program ✓
   • Electric vehicle charging stations ✓
6. Provide incentives for alternative transportation
   • Green transportation fee ✓
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*Category:* Waste

*Goal:* Reduce waste and encourage recycling

*Strategies:*

12. Encourage recycling
13. Develop a comprehensive composting program ✓
14. Recycle electronic waste ✓
The Carbon Footprint, Updated through FY2018

MSU,M carbon footprint, weather-normalized

15.6% reduction in 6 years
How MSU,M reduced its carbon footprint by 15.6% in six years

- PBEEEP: 2.9% (1,393 metric tons of CO$_2$e)
- GESP: 9.1% (4,434 metric tons of CO$_2$e)
- Changes in commuting patterns: 2.8% (1,372 metric tons of CO$_2$e)

PBEEEP = Public Building Enhanced Energy Efficiency Program
GESP = Guaranteed Energy Savings Program
Providing a quality education for 150 years

Reduced carbon footprint by 6.8% since 2012
Reduced waste in the new dining center by 92%
15,000+ Students representing 48 states, 97 countries
4,657 Dental procedures performed by students for community members

Top 8% in the country for undergraduate research
1 National championship
6 Conference championships
7 Coaches of the year
23:1 Student to faculty ratio
150 years old on October 8, 2018

$8,164 3rd lowest tuition & fees for any Minnesota public 4-year university
Only aviation bachelor’s degree in Minnesota

University Advancement mailing Fall 2017
The Public Building Energy Efficiency Enhancement Program (PBEEEP)

• Administered by the State of Minnesota
• Brought to campus by Facilities Management (Ron Fields, Asst Vice Pres and Paul Corcoran, Planning & Construction Dir)
• PBEEEP projects were implemented at the end of Fall Semester 2012
• Cost to the University = $13,000 after federal stimulus funds and utility rebates
• Savings to the University = $119,000 a year in reduced costs for heating and electricity
The Guaranteed Energy Savings Program (GESP)

- Administered by the State of Minnesota
- Brought to campus by Facilities Management (Ron Fields and Paul Corcoran)
- Implementation essentially complete by August 2017
The takeaway

• MSU,M reduced its carbon footprint by 15.6% in six years, primarily because of PBEEEP, GESP, and changes in commuting patterns.

• The MSU-CAP provides a framework for thinking about sustainability at MSU,M.
University Dining Center

- Serves more than 3,000 students
- 49,075 sq. ft.
- Opened to students on January 9, 2017

Energy Efficiency Measures

- Heat recovery from equipment to heat water
- Light sensors to adjust inside light to ambient conditions
- Triple glazed windows
- Fins on the outside to cool in the summer, heat in the winter
University Dining Center Composting Program

• An initiative of Residence Life (Cindy Janney, Director and Rich Wheeler, Asst Director for Environment)
• 80,000 pounds of food waste was collected for composting in 2017
• Dining hall waste was reduced by 92% in 2017
Electric Vehicle Charging Stations

An initiative of Facilities Services (David Cowan, Director)

- Installed Fall 2017
- In Lot 11a west of the Student Union and across the street from Julia Sears
- Contact David Cowan, Director of Facilities Services, 389-6931, for more information

MSU Reporter, November 14, 2017
Weather-normalization of carbon footprints

Weather dependence of MSU,M fuel consumption for heat

Annual natural gas and fuel oil consumption (kBtu) vs. Annual heating degree days

- $y = 14,386x + 116,985,670$
- $y = 14,455x + 105,650,759$

Graph showing the relationship between the annual natural gas and fuel oil consumption (kBtu) and the annual heating degree days.