Sustainability Points

(Examples discussed from the June 2007 CFFO)
MnSCU was "green before it was cool to be green"

Today, the terms "green" and "sustainable" turn up in the common vocabulary used to describe everything from consumer products to neighborhood design–largely the result of the general public's heightened environmental awareness. **But green and sustainable also describe longstanding best practices in facilities planning and design within the Minnesota State Colleges and Universities system.**

Renovate, reuse, recycle–these are the first choices for facilities planners when a campus needs updated or additional space to meet educational needs or faces serious building deterioration. Renovation extends the lifespan of existing buildings by another 50 years or so, conserves natural resources, reduces landfill and increases the quality of students' educational experiences.

Presidents that have joined (or are in process) of the Presidents Climate Commitment
http://www.presidentsclimatecommitment.org/
Review this strong commitment that will impact all facilities and academics!

Augsburg College Paul C. Pribbenow,President
Carleton College Robert A. Oden Jr., President*
Century College Lawrence P. Litecky, President
College of Saint Benedict MaryAnn Baenninger, President*
Dakota County Technical College Ronald E. Thomas, President
Gustavus Adophus College James L. Peterson, President
Macalester College Brian C. Rosenberg, President*
Minneapolis Community & Tech College Phillip Davis, President
Rochester Community and Technical College Donald D. Supalla, President
Saint John's University Dietrich Reinhart, President
University of Minnesota Robert H. Bruininks, President
University of Minnesota Morris Jacqueline Johnson, Chancellor
Winona State University Judith A. Ramaley, President
….coming in April **Inver Hills Community College**

Examples of sustainability in the 2008 capital budget are numerous. Over 26 projects are renovation of the system. Since 1998; the system has only increased its square footage by 10% but the actual student count has increased 25%. Over 69% of the square footage in the proposed 2008-10 budget is for renovation and repurposing of academic space.

All priorities are rooted in planning sustainability. 14 projects that are 100% renovations to extend the useful life and repurpose these valued classrooms and lab

- Energy Management Systems (EMS) on 32 campuses that controls temperatures using different zones and times of day for more efficient control; thereby reducing energy use and providing increased comfort
- Advanced air quality and energy efficiency thru construction and operating procedures. Turning heat down during hours when the building is closed–set back thermostat & energy management systems

The system has continuously improved its spaces with training, seeking energy efficient funding sources and development of:

- Energy efficient boilers and chillers
- Zoned systems
- Valve Controlled Heads
- Heat Exchangers
- Set Back Thermostats
- Air quality–system air intake design–Co2 sensors
- Steam purchased from a waste to energy plant
- Converting steam to hot water with new HVAC units for energy efficiency
- Transitioned to electric hot water heaters for summer domestic hot water. This enabled to turn off fuel-oil fired boiler and circulating pumps during summer months
- Water closet, lavatory, shower sensors
- Natural gas hedging
- Commissioning required on all new buildings

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- Re-commissioning on existing buildings to improve the mechanical systems and to recalibrate to run efficiently to the intended design

Electrical Standards

- Light and motion detection sensors
- Photo-voltaic sensors
- Lighting retrofits- changing HDI lamps to T35 have cut energy use by half
- Co-generation of electrical at two major universities; reduces cost of electrical.
- Wind energy turbine at MnWest Canby campus and one in process at Ridgewater College at Willmar
- Purchase of alternative energy: Bemidji State University and MSU Moorhead
- Corn burner at Central Lakes Staples campus agriculture center

Operational issues improve sustainability at campuses:

- Development of on-line academic programs to limit requirement to be physically at the campus
- Programs that emphasize sustainability– facilities working with academics
- Energy Star buying program
- Academics scheduling for maximum efficiency; classes in certain wings of the bldgs so that the air/heat can be adjusted to save energy costs during low occupant times
- Transportation: subsidizing Bus–Ride Share parking lot locations
- Recycle programs at campuses
- Wrote recycle clause into food service contract
- Vending machines on timers
- Retained safety & chemical specialist who manages regulation for storm water, chemical handling & disposal, OSHA compliance, employee training
- Landscaping: raingardens for improved water quality storm water run off, planting for wind and sun shade with natural prairie grass: no chemicals applied - mow less growing prairie grass
- Use of non-toxic snow and ice removal chemicals
- One campus re-asphalt large parking lot using reclaiming process (equip brought in from another state)

1. General Concepts

- Green Sustainable Mn State Colleges & Universities Design Guidelines plus B-3 Adherence
- Recycle programs at campuses
- Advanced air quality thru construction and operating procedures
- Energy Management Systems: training staff to incrementally improve operations
- Life cycle costing (envelope, materials & equipment)
- Wind energy – MnWest Canby campus
- Purchase of alternative energy: Bemidji State University and MSU Moorhead
- Corn burner at Central Lakes Staples Campus Agriculture center
- Research & Analysis: development of optimum building sites and locations in master plan and predesign options
- Composting – worm example at Lake Superior College and organic refuse picked up at cafeteria at St Cloud State University for pig farming
- Energy Star buying program
- Earth friendly custodial products
- Vehicles purchased are E85 vehicles or Hybrids
- Environmental design
- Commissioning + Re-commissioning
- Water conservation
- Mold resistant building structure
- Low VOC – formaldehyde free products
- Air quality – system air intake design – Co2 sensors
- Energy Management Systems & Training
- Water sensitive sprinkler system
- Natural gas hedging
- Transportation: Bus encouragement – Ride Share parking lot locations – charge the 'real' fee for creating and maintaining parking lots

2. Site Concepts

- Co-generation of electrical at Winona State University and MSU Mankato.
- Rain gardens–storm water management
- Natural prairie grass: no chemicals applied
- Lead Cleaning

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- Green house–Winona State University growing flowers from seeds with manpower from community group raising vegetables seeds for low income group

3. Building Specifics

- Renovation – program of renovation vs. new construction
- Recycle demolition
- B3 Guidelines
- Energy Efficient HVAC
    - Valve Controlled Heads
    - Heat Exchangers
    - Set Back Thermostats
    - Hot Water (not steam)
    - Boiler Certification
    - Energy Management Systems
- Energy Efficient Roofing
- Water Proofing vs. Damp Proofing
- Bearing walls limited to encourage flexibility
- Durable material selection (life cycle)
- Energy efficient electrical power
    - Photo-voltaic sensors
    - Motion sensors – lighting
    - Lighting Retrofits

Note: specific issues campuses reported in June 2007 – network with Office of the Chancellor Facilities or directly with these folks to IMPROVE !

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1. Recycling glass, plastic, cans, paper & cardboard.
2. 2. Turning heat down during hours when the building is closed–set back thermostat & energy management systems.

Ed Wines, VP Normandale
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1. New HVAC systems in the Fine Arts Renovation & Expansion will assist in reducing energy costs

Dan Kirk Metro State
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1. Re-commissioning
2. Removed acreage from maintenance–replaced with rain-garden
3. Use "green" cleaning chemicals
4. Energy Management System upgrades–Programmed for efficiency
5. Develop and study cost estimates for alternative energy options
6. Recycling program
7. "green" aesthetics proponent

➔ Saves $
➔ Recycles/ minimizes waste

Judy Enright
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1. Looking into making our own bio diesel for our grounds dept by using the grease/oil from the kitchen
2. Working with academics to schedule classes in certain wings of the bldgs so that the air/heat can be adjusted to save energy costs during low occupant times

➔ This will save on diesel fuel costs for the grounds equipment
➔ Save on utility bills

Marilyn Hansmann
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1. Installing new energy management systems and controls
2. Integrating all bldgs into energy management systems

Bob Gooden
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1. Installing more energy efficient boilers + chillers.
2. Working toward eliminating our demand change
3. Expanding the use of our EMS
4. We also set a goal to reduce our energy use by 10% during this next year.

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1. Establishing a heightened awareness for recycling program

Beth Fondell
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1. Removing skylights in the Albert Lea campuses lobby

➔ Reduces energy (electricity) costs

Rick Otteson
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1. Changing out all lighting in Both Staples + Brainerd campus then energy savings contracts
2. Replacing window with better value windows
3. Using water conservation measure thru out both campuses such as automatic flush valves
4. Replacing energy management system at Brainerd campus

➔ These projects will impact the electrical usage–natural gas & water usage.

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1. Creating nutrients by composting
2. Worm bin
5. Green office furniture
6. Creation & implementation of the Lean Program modeled w/St Mary's
7. Recycle steel from used vehicles
8. The tech program recycles other items such as trailers for teaching

➔ Selling the compost to farmers gives us revenue stream

➔ Green office furniture saves material resources

➔ Lean Program will allows us to operate more efficiently

➔ Recycled steel gives revenue stream and saves us resources

Dave Marshall
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1. Transitioned to electric hot water heaters for summer domestic hot water. This enabled us to turn off fuel-oil fired boiler and circulating pumps during summer months
2. Occupancy sensors being phased into all classrooms
3. **Exploring geothermal warming/cooling option – actively involved in lobbying federal government for projects**

➔ Saved $20,000 in fuel oil costs

Gary Myhre
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1. Proposing a new central efficient central heating system
2. Have peak shaving agreement with local utilities
3. Entering land lease agreement to allow local utilities to erect wind turbines
4. Applied and received grants to re-commission
5. Entire fleet of pool vehicles are E-85
6. Expanded and update EMS

➔ Installed low VOC carpet

➔ Proposing demolition of energy inefficient buildings

➔ Purchase low cost electricity from West Coast supplier

➔ Using green solvents & degreasing in shops

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1. Change AHU Pneumatic to a DOC multi zone unit with space sensors (from study by Ed Cook) Saved energy!
2. change HDI lamps in Guy to T35 -> Cut energy by over one half!

Paul Demuth–DCTL
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1. Joint green campus association
2. New chiller plant
3. Mow less growing prairie grass
4. plant for trees
5. re-use heat energy from low compressors
6. Light sensors
7. water closet sensors

➔ Energy projected savings of 60,000 per year

➔ Lower emissions

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1. Participants on MTC Bus Rapid Transit (BRT) thru Henn Cty Council (Mike Opat)

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which helped move Bus Route next to campus
2. New AHUs (2 bldgs) with HEAPR
3. EMS system now controls 100% of campus–offsite home locations
4. Re-asphalt large parking lot using reclaiming process (equip brought in from TN)
5. Recycle paper and cans and bottles, florescent bulbs, chemicals, paints, inks, computers, other IT, etc
6. Environmentally friendly cleaning supplies
7. Use of light sensors in all rooms
8. Adjust temperatures to Gov. Exec. Orders
9. Wrote recycle clause into food service contract w/ Taherie, no Styrofoam.
10. Change run-off ponds into arboretum (dredge ponds–plant native plants–Biology projects)
11. Put water softener system in science bldg to help avoid equip breakdown and supply turnover
12. **Consult Xcel Energy for "ENERGY MODELING" on all renovations & new construction for electrical subsystems** (AHU, lighting) for energy efficiency products (substantial rebates & cost savings)
13. Hired safety & chemical specialist who manages regulation for storm water, chemical handling & disposal, OSHA compliance, employee training
14. Sustainability guidelines being used in new CBT addition & renovation and all future construction
15. Policy governing air quality. We test air quality upon any employee request/concern
16. Use of plant friendly outdoor chemicals.

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1. Energy management system
2. motion sensors–lighting
3. replaced original windows (phasing)
4. UED–chiller project
5. Recycling cardboard, paper, batteries
6. Natural gas hedging
7. custodial products
8. replacement of skylights
9. replacement of lighting in high bay labs

➔ amount of energy used
➔ amount of trash

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1. All current and future electrical equipment is energy star rated
2. Finished energy management program and continuing education for maintenance employees.
3. Maintain recycling shed with county
4. Utilizing green products
5. Switch to 4-10 hour days this summer
6. Replacing window wall with energy efficient windows

➔ **Switch to 4-10 hour days will result in a minimum of 20% energy savings during June, July & August**.

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Campus is looking into using ground source heating & cooling for a new residence hall facility. Potential savings on energy reducing our need/ use of electrical allocation providing us with greater flexibility in other facilities

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1. Increased recycling in residence halls 300%
2. Green sheet cleaners in res halls
3. High performance cleaners

Jim Nieswaag
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1. Using a co-mingled recycling system–paper, cardboard, magazines and phone books along with cans, plastic and glass all go into one container

➔ **Has increased the percentage of materials collected** !

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1. Steam purchased from a waste to energy plant
2. signed campus climate commitment
3. Eco-lot- new parking lot is being designed with bioswales to handle water run-off
4. All cleaning products are going "green"
5. Lighting retro-fit all bldgs

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1. Converting steam to hot water with new HVAC units

➔ better control ability

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1. Purchasing hybrid cars
2. Replace incandescent lamps with energy fluorescent ones
3. use or specify energy efficient building materials for projects that are Capital or HEAPR.

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1. Combining cooling systems and grouping buildings for efficiency and to take old systems offline

➔ Systems have lower maintenance costs, lower operating costs per BTU of cooling

Kip Oveson
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1. We are now installing a new carpet which is close to mold proof. We also use a low VOC adhesive–very little "gas of"
2. Just completed a recommission project which we hope will save 5% energy savings across campus

➔ The better carpet will help us to space out our replacement times & provides for better Indoor Air Quality (IAQ)

➔ Recommission could save a minimum of $15–$20 thousand

Steve Lange
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1. HEAPR project request submitted for converting steam to hot water boiler system
2. Co-mingled recycling program started year ago.

Let us know other energy efficiencies!

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- **Review your energy bills monthly – examine and verify demand**
- **Benchmark: we can't improve what we have not measured**
- **Work with energy provider: model proposed changes and monitor and recommissioin existing spaces**
- **Energy Audits**
- **Work with other partners to evaluate sustainability issues**
- **Evaluate options to improve environmental footprint**