

Turning Green - from Policy to Planning to Practice

THE UNIVERSITY OF TEXAS AT AUSTIN

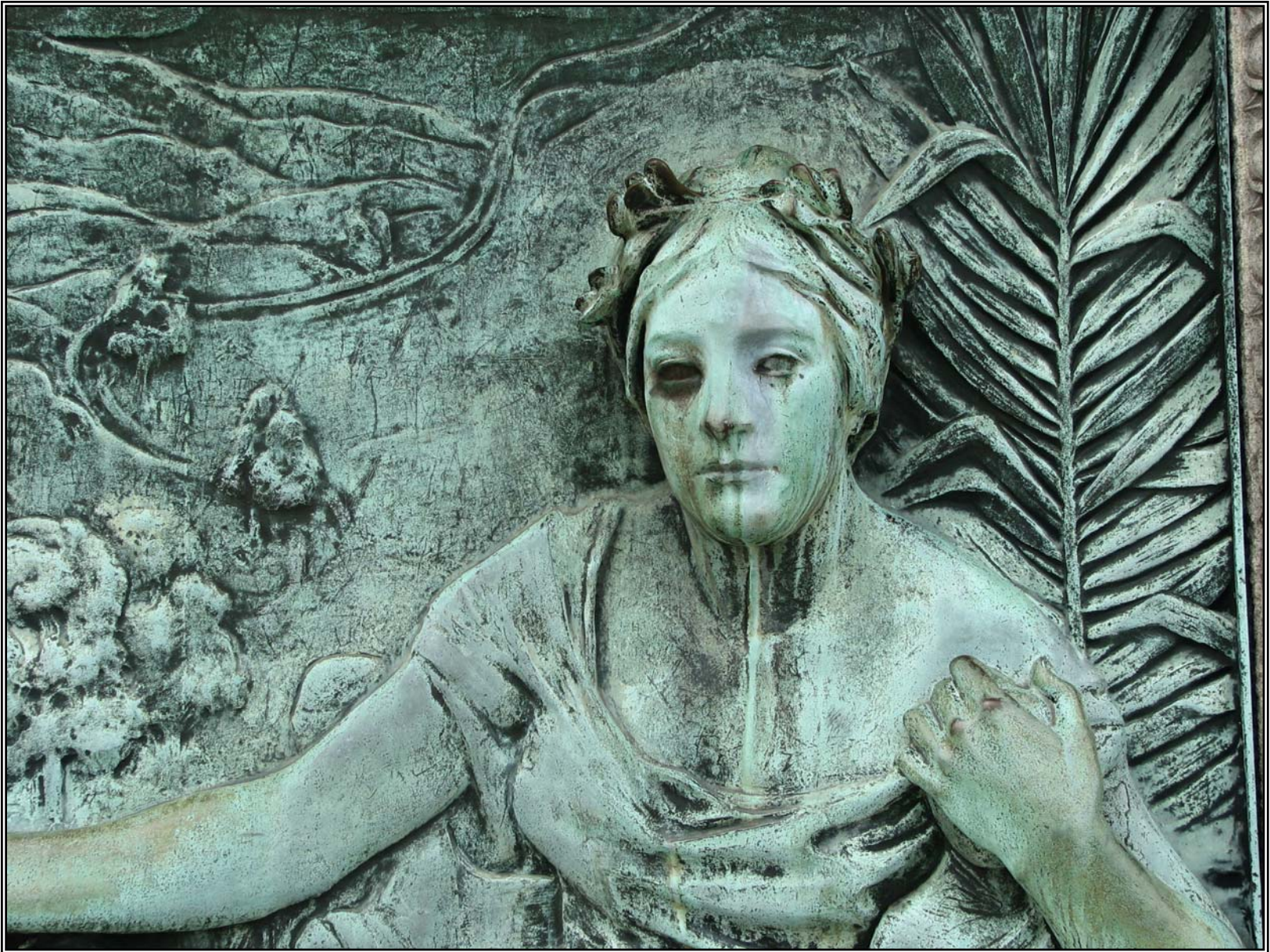


Weathering the Storms
STEWARDSHIP

THE ASSOCIATION OF
UNIVERSITY
ARCHITECTS

Hosted by The University of Texas at Austin







Recycling

"Wouldn't it be better to simply turn off the taps ?"

High Moon



To promote a strong environmental ethic and to cultivate sustainable policies, practices, and curriculum throughout the University

<http://sustainability.unc.edu>

Timeline

- 1991 Chancellor Paul Hardin signs Talloires Declaration
- 1998 University creates Carolina Environmental Program developing BA and BS in Environmental Sciences.
- 1999 Governor Jim Hunt issues Executive Order 156 encouraged all state agencies to adopt more environmentally sustainable practices.
Carolina creates grassroots Sustainability Committee.
- 2000 First Sustainability Course offered, ENST 100: A Sustainable University.
- 2001 Carolina hires first Sustainability Coordinator in UNC System.
Kenan Flagler Business School creates Sustainable Enterprise Institute (SEI) and Sustainable Enterprise Concentration for MBA degree.
Carolina hires first Transportation Demand Manager.
- 2002 Carolina partners with Chapel Hill Transit to establish fare free system.

Timeline

- 2002 Employee Forum passes Sustainability Resolution urging the University to commit itself to Sustainability Measures in its Institutional Policies and Practices. Resolution endorsed by Faculty Council and Student Government.
- 2004 Carolina establishes Sustainability Advisory Committee reporting to Vice Chancellor for Finance and Administration. Committee chaired by Director of Carolina Environmental Program and Director of Facilities Services.
- 2005 Carolina receives State Government Sustainability Award recognizing the University's 'Green' building strategies, storm water management strategies and interdisciplinary Carolina Environmental Program. Carolina commits to participate in Carbon Reduction Program.
- 2006 Chancellor adopts Sustainability Policy developed by Sustainability Advisory Committee.

Sustainability Advisory Committee

Task Groups

- Academics
- Energy
- Grounds
- High Performance Buildings
- Materials and Recycling
- Measuring Impact
- Mobility
- Purchasing
- Water

Campus Sustainability Reports published annually since 1999

Sustainability Policy

- The University of North Carolina at Chapel Hill recognizes that one of the great challenges of our time is to make decisions and investments that simultaneously advance economic vitality, ecological integrity, and social welfare.
- In order to support the University community in addressing this challenge, the University is committed to fostering and demonstrating approaches to sustainability. University policies, practices, and curricula, should, when possible, embody approaches that reduce life cycle costs, restore or maintain the functioning of natural systems, and enhance human well being.
- Carolina seeks continuous improvement in the planning, construction, and operation of capital facilities; providing transportation systems that support multiple modes of transportation, procuring and managing energy, water, and materials; stewarding natural resources; and researching and teaching sustainability principles and approaches. Budget planning, staffing, metrics of success, and performance reviews reflect these University priorities.

Strategies for Achieving Sustainability

- Developing and implement policies and practices that preserve natural resources; conserve energy water, and materials; reduce waste and emissions; and lessen overall environmental impact;
- Promoting human health and well being;
- Developing an understanding of the local, regional, and global impacts of the University's activities on the health of the planet and well being of its current and future inhabitants;
- Fostering linkages among and within campus departments, both operational and academic;
- Developing and monitoring indicators of progress toward sustainability;
- Promoting awareness of sustainability goals and fostering sustainability literacy among the entire campus community;
- Collaborating with off campus organizations in cooperative efforts to provide a healthy regional environment;
- Advocating for policy change that will allow support of environmentally and socially responsible companies;
- Promoting and celebrating accomplishments.

Jen Fabrick Emory University

THE UNIVERSITY OF TEXAS AT AUSTIN



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Emory University

Atlanta, Georgia



Emory University's March to Environmental Stewardship

7 years of effort

A Timeline:

1998 – Campus Master Plan **NO ENVIRONMENTAL TALK**

1999 – Second Nature Conference 10 Emory staff attend **LOTS OF TALK**

2000 – Ad Hoc Committee on Environmental Stewardship

Emory joins the US Green Building Council and registers a building (Whitehead) in the LEED program

2001 - University Senate passes Environmental Mission Statement & Implementation Motion

2002 - Lullwater Comprehensive Management Plan

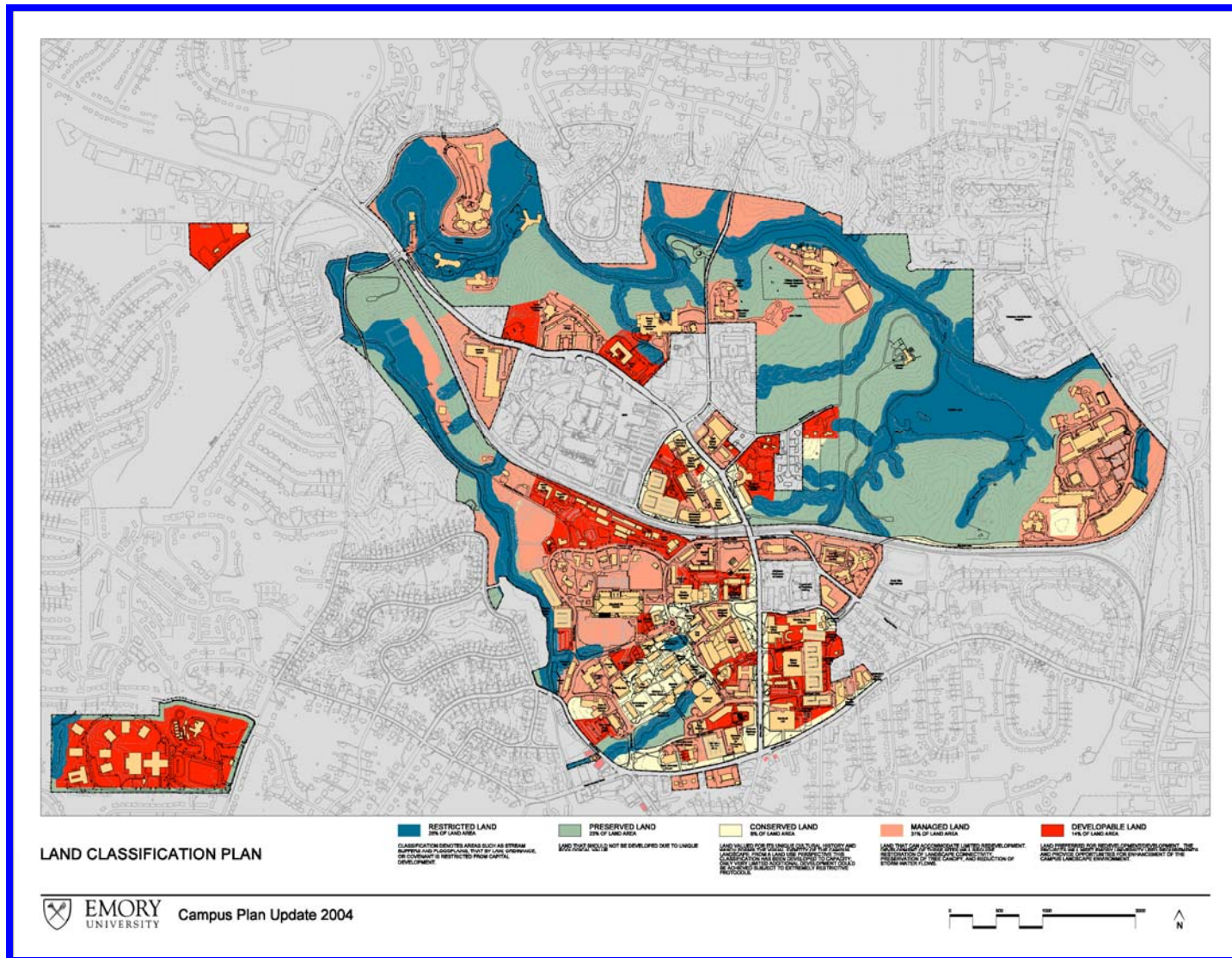
Whitehead Project receives silver LEED NC certification

2005 – LEED standards incorporated into Emory Design Standards

Winship Cancer Institute receives silver LEED NC certification

Goizueta Business School receives gold LEED EB certification

2006 - Sustainability Vision for Emory adopted - a report of the Sustainability Committee



Emory Land Use Policy - Five Classifications:

Restricted (blue) 26%, Preserved (green) 22%, Conserved (beige) 7%, Managed (buff) 31%, Developable (red) 14%. 14



GENERAL MOTORS UNVEILS ITS ANSWER
TO LOW-EMISSIONS STANDARDS.

Anna Wu

UNC Chapel Hill

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Paul Tankel University of Rochester

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CHOOSING A PATH TO IMPROVED ENVIRONMENTAL PERFORMANCE

YOUR CAMPUS CAN LEAD THE WAY TO A SUSTAINABLE FUTURE.



Renewable
Energy Park

Green Buildings
on New Campus

CO₂ Reduction Way

Recycling Center

This Way to Compliance

A COLLEGE OR UNIVERSITY can set a course in any number of environmental or sustainable directions, such as those on the signpost. There are many paths to reach these destinations, with no single "correct" route. Each campus must decide ① "Where Do We Want to Go?" and ② "How Do We Want to Get There?" Consider campus culture, core values, resources, community issues, supporting organizations and driving personalities in your plan.

IT'S HARD TO KNOW WHERE TO GO. IF YOU DON'T KNOW **WHERE YOU ARE!**

Survey your campus. Collect data to develop a campus environmental and sustainability baseline. How much waste do you generate? What is your recycling rate? How much energy do you use? Who is responsible for environmental performance? An informed understanding of where you are now — and where you have been — will assist professional staff, campus activists and decision-makers prioritize projects and design the road map to a sustainable future.



The mission of the Campus Consortium for Environmental Excellence (C2E2) is to support the continued improvement of environmental performance in higher education through environmental professional networking, information exchange, the development of professional resources and tools, and the advancement of innovative regulatory models. Environmental performance includes campus regulatory compliance, environmental management and sustainability initiatives. This poster is the 2nd in a series of posters designed to engage campus administrators, faculty, staff and students in a discussion about environmental and sustainable practices on campus.

LOOKING FOR DIRECTIONS?

GO TO WWW.C2E2.ORG for helpful links and further guidance on the topic of improving environmental performance and sustainability. Work with campus administrators, faculty, staff and students to find out about programs, activities, plans and performance on your campus.



Your Toolbox

Assessment Tools
Air Emissions Data
Benchmark Info
Faculty Research
Financial Resources
Master Plan

Mission Statement
Performance Reports
Purchasing Policies
Resources Used
Student Projects
Waste Data

WWW.C2E2.ORG

Greening Campus Operations

- Solid waste management
- Energy use and sources
- Land use
- Transportation
- Landscaping
- Water use
- Purchasing
- Hazardous waste management

Sample Environmental Reports

- Bowdoin College
 - Environmental Impact Audit, December 2000
- Middlebury College
 - Climate Neutral Working Group report
- Tufts University
 - Tufts Climate Initiative website, activities
- University of Vermont
 - Tracking UVM: Environmental Report Card 1990-2000
- Yale University
 - Yale University Environment Report: 1997-1998 through 2003-2004

Example: Tracking UVM: Environmental Report Card 1990-2000

- Land, water, energy, air, waste indicators 1990-2000
- Best management practices, community comments, next steps
- Audience: students, staff, faculty, trustees, legislature, community
- Excerpted, adapted for educational projects
- Key findings: energy use, solid waste up despite best practices



University of Vermont
Environmental Council
December 2002

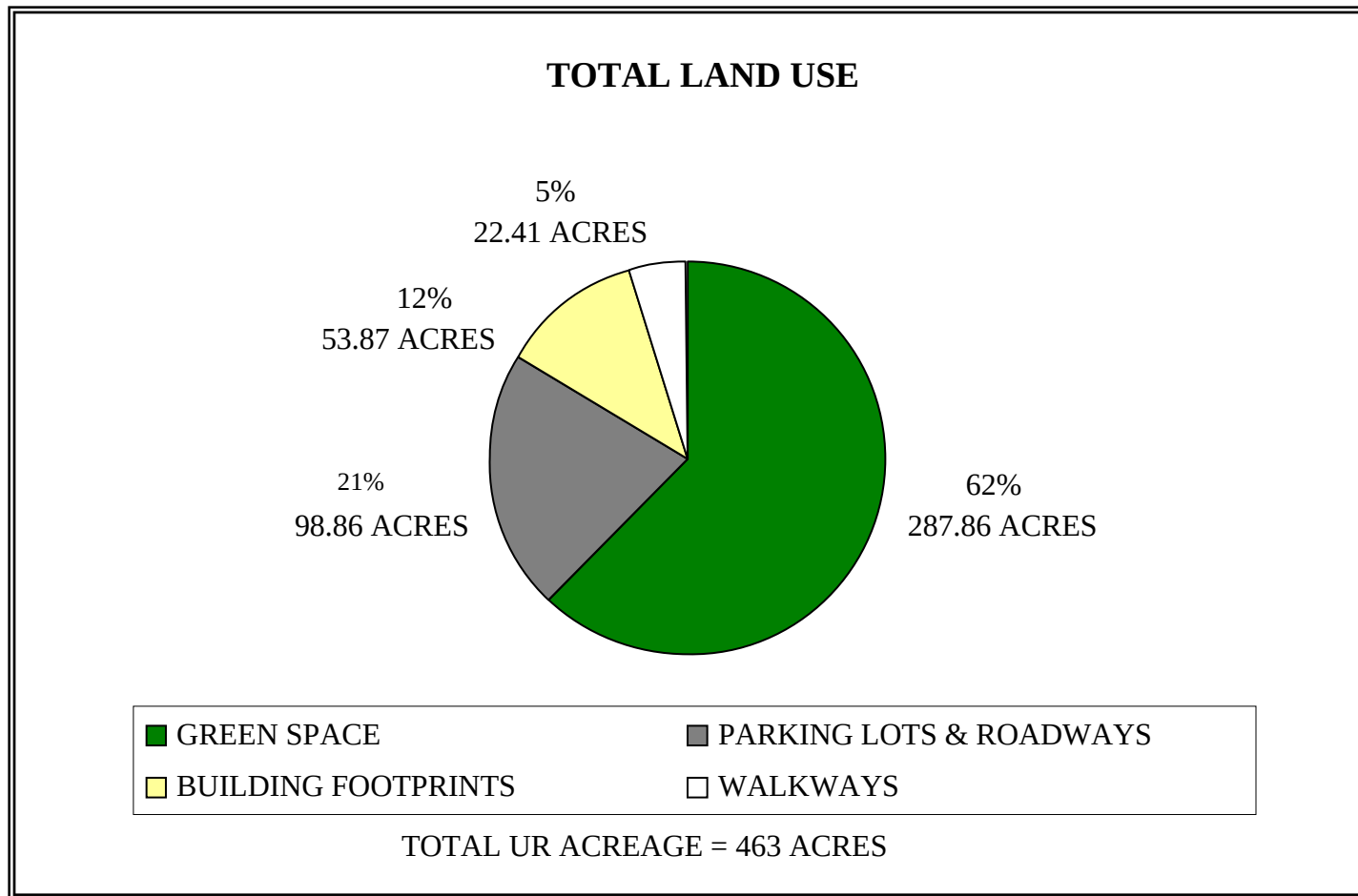
Using Indicators

- Track management practices in operations
- Strategic planning
- Master planning
- Compliance assessment
- Comparison with other institutions
- Campus community stakeholders
- Education and engagement

Integrating Indicators into Planning

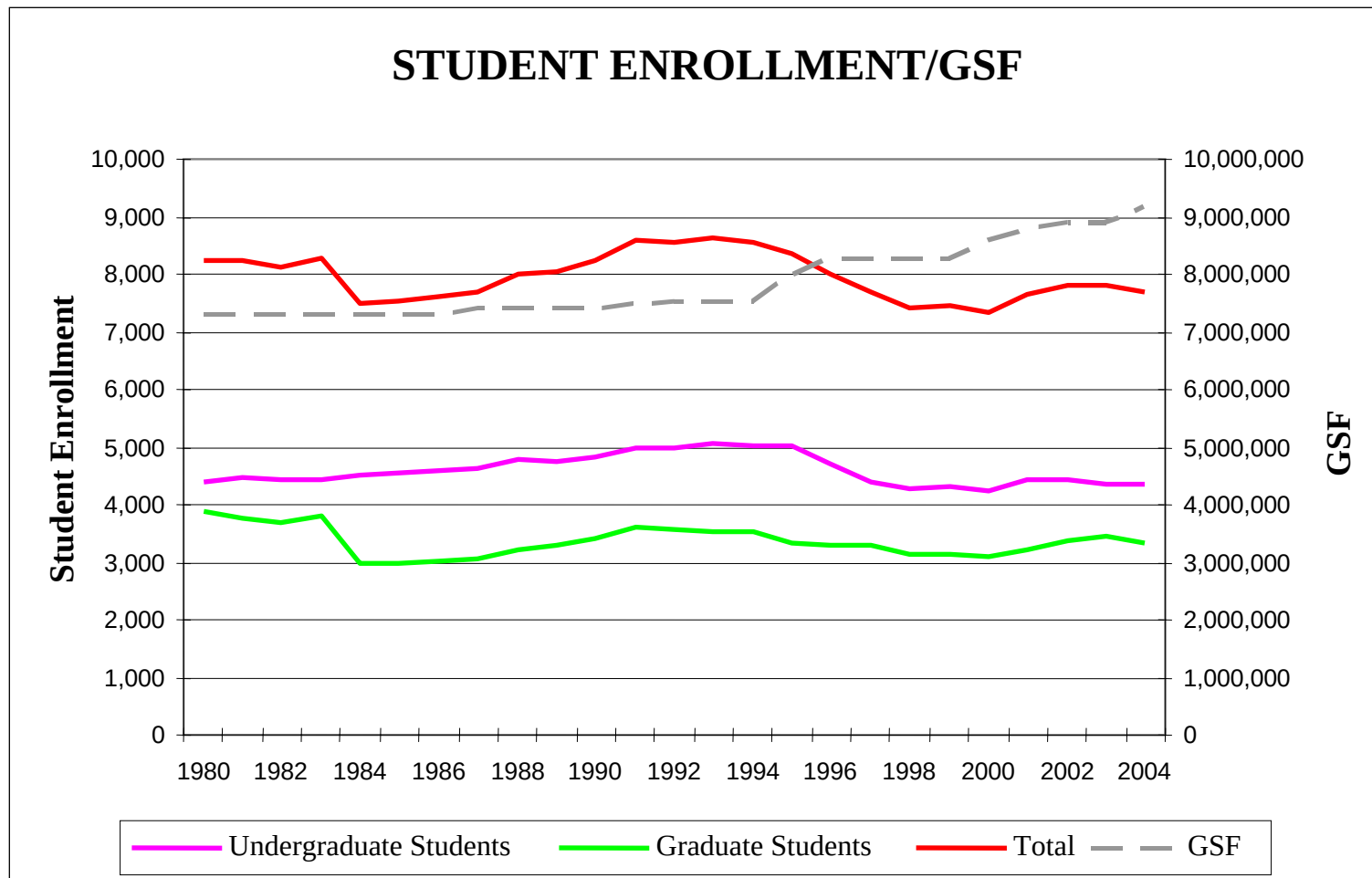
Examples:

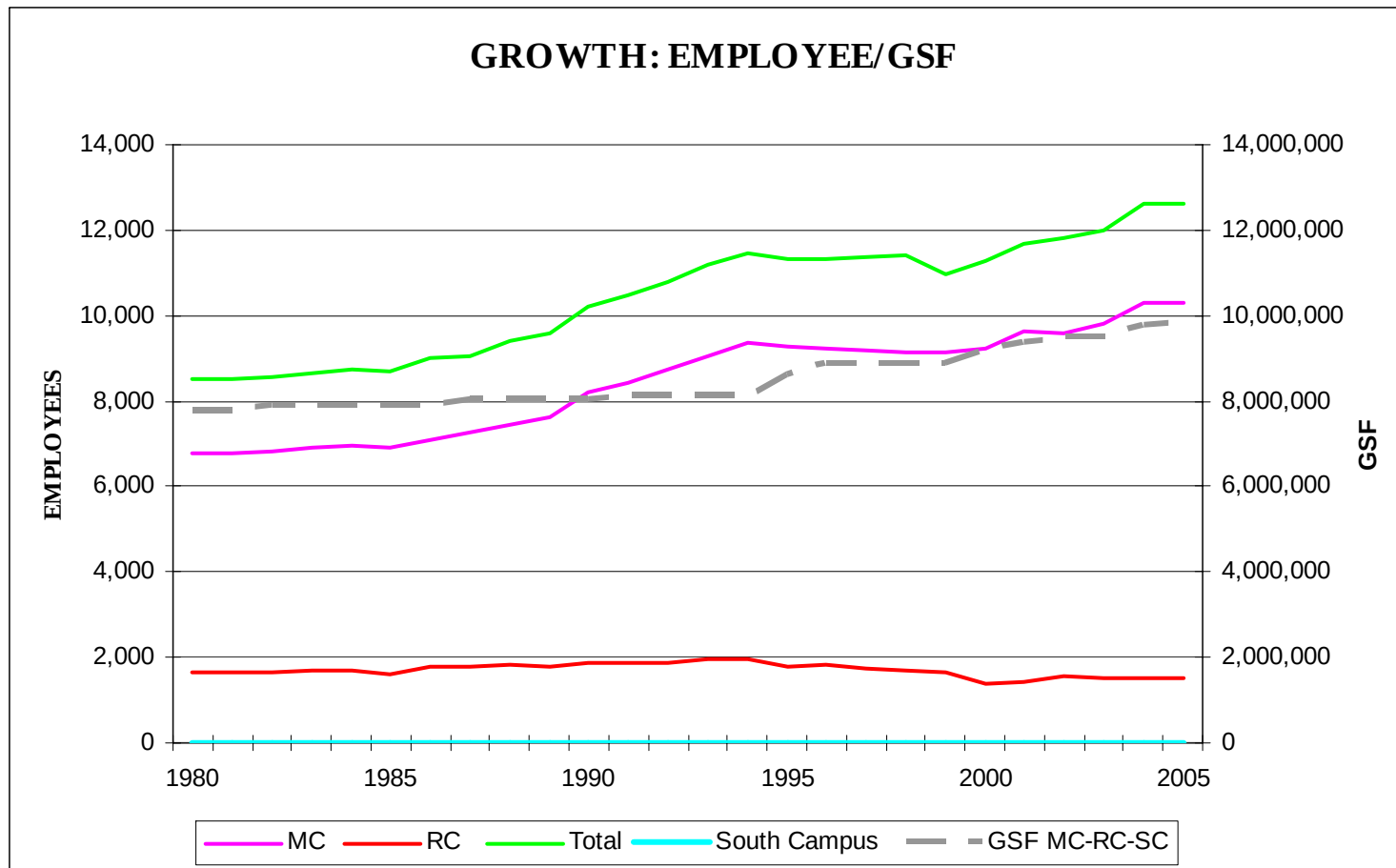
- Campus Master Plan: impervious surfaces
- Tracking Building Growth: to students, employees, research, energy use
- Transportation Plan: single occupancy vehicle rate, commuter choice options
- Utilities Plan: emissions, greenhouse gases
- Reports: air quality

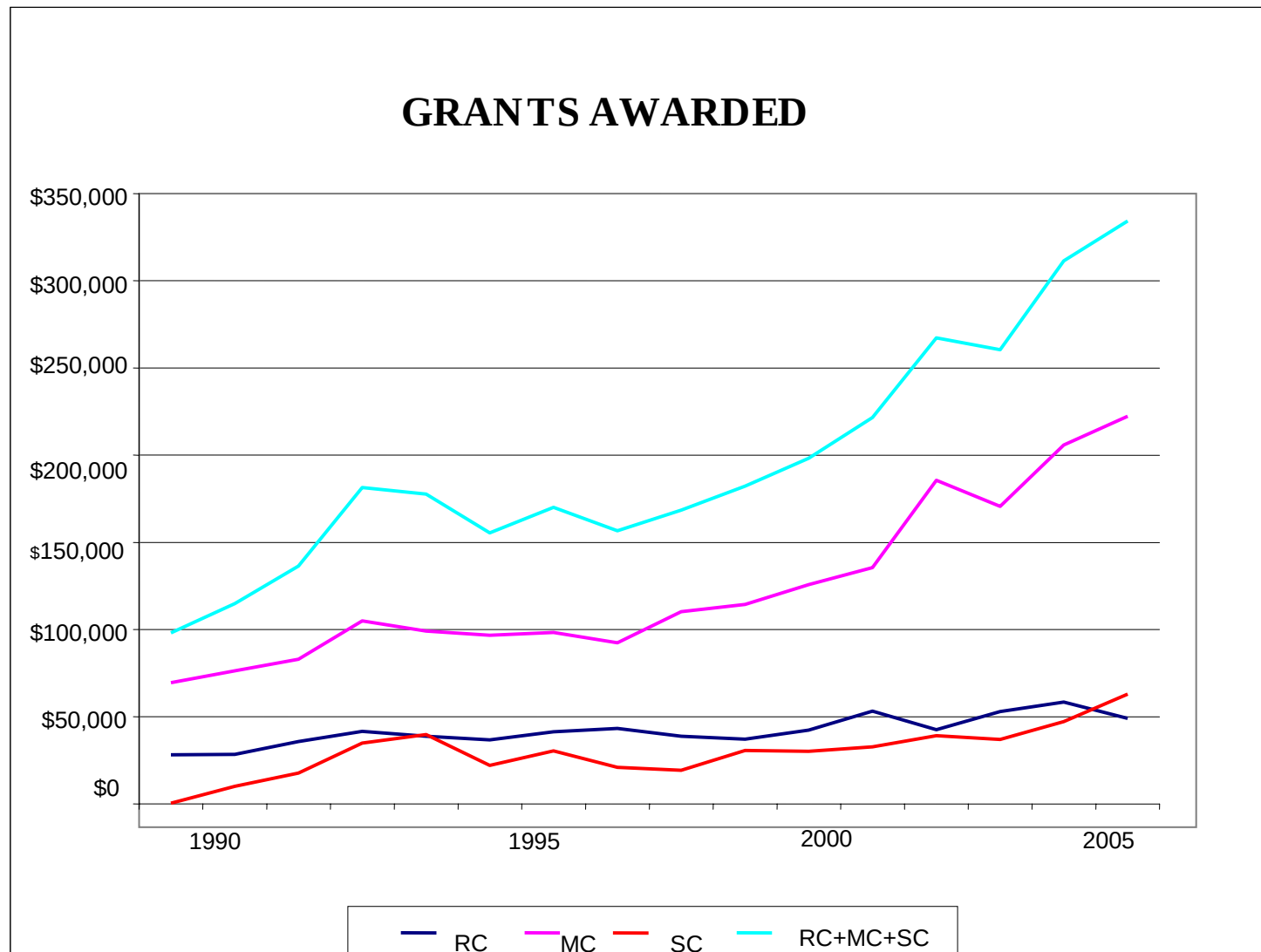


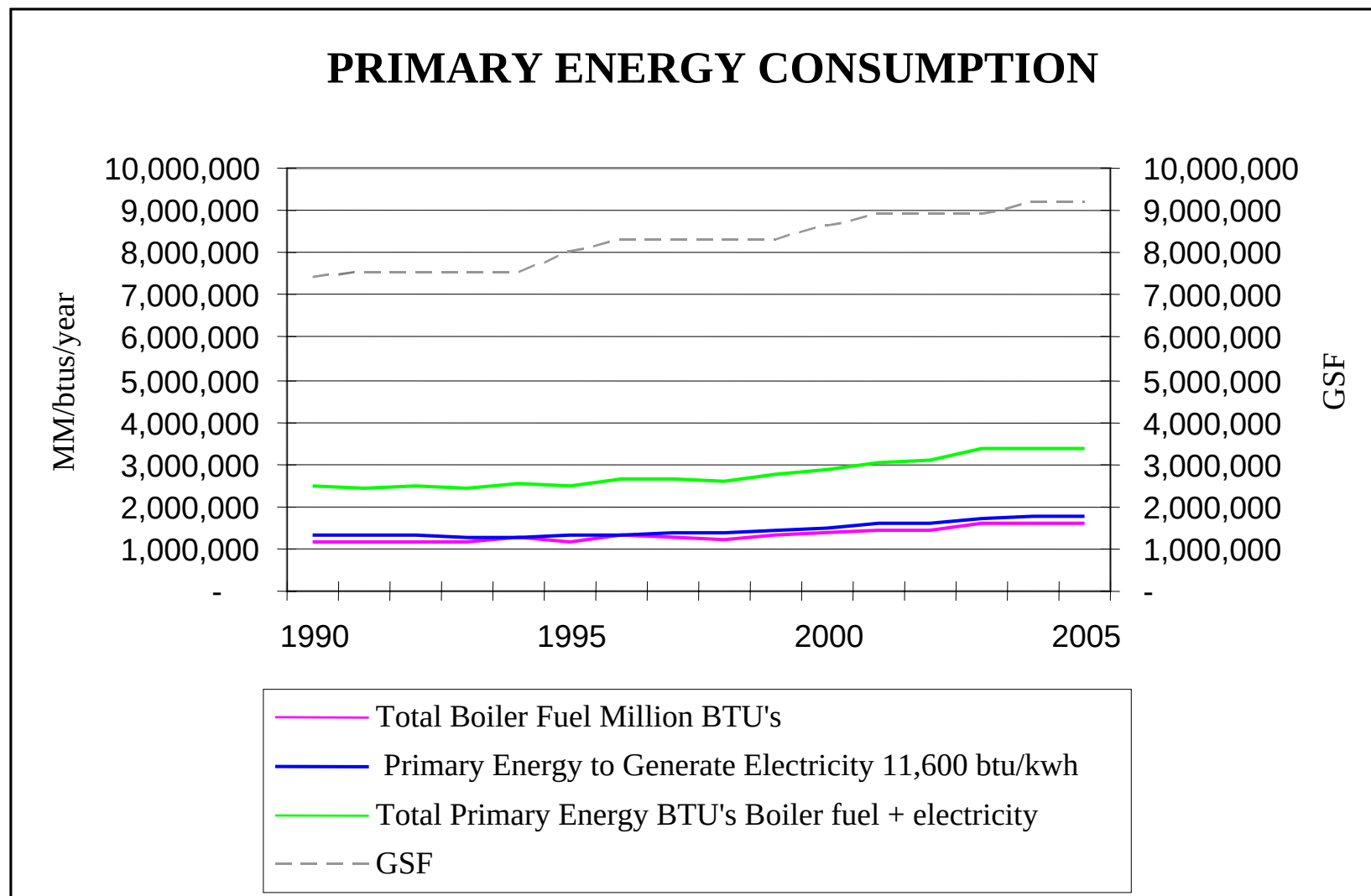
UNIVERSITY OF ROCHESTER

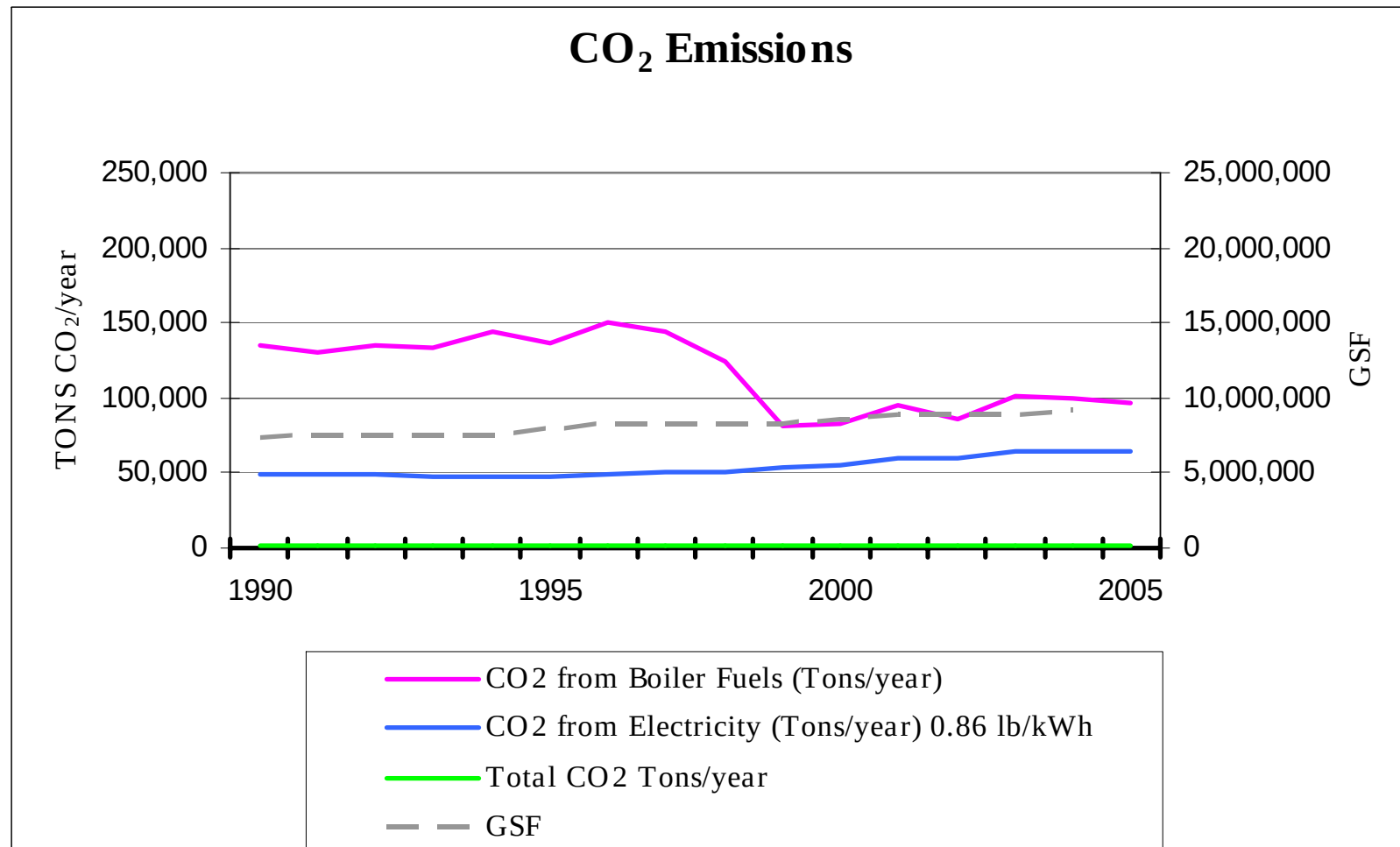


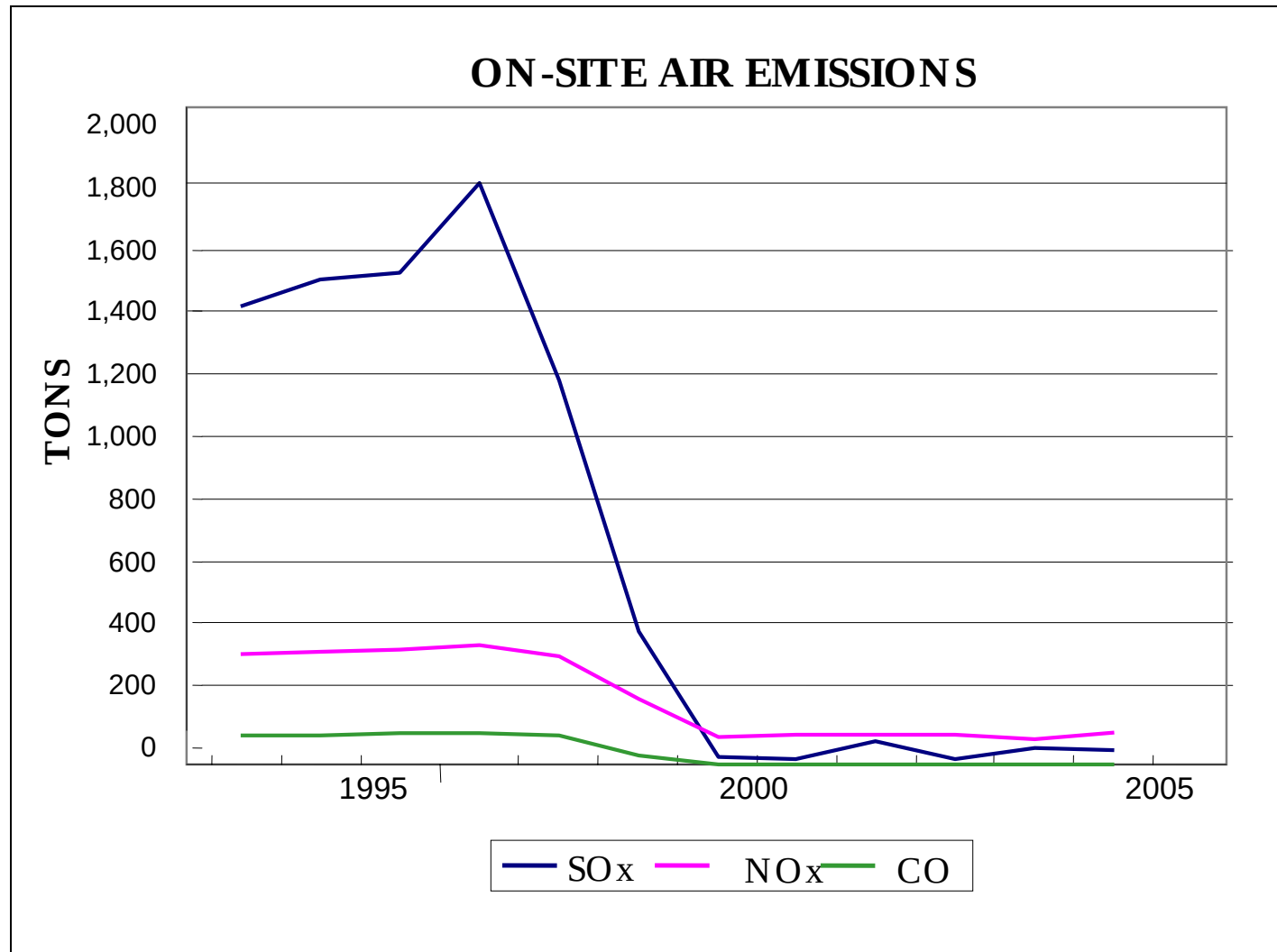


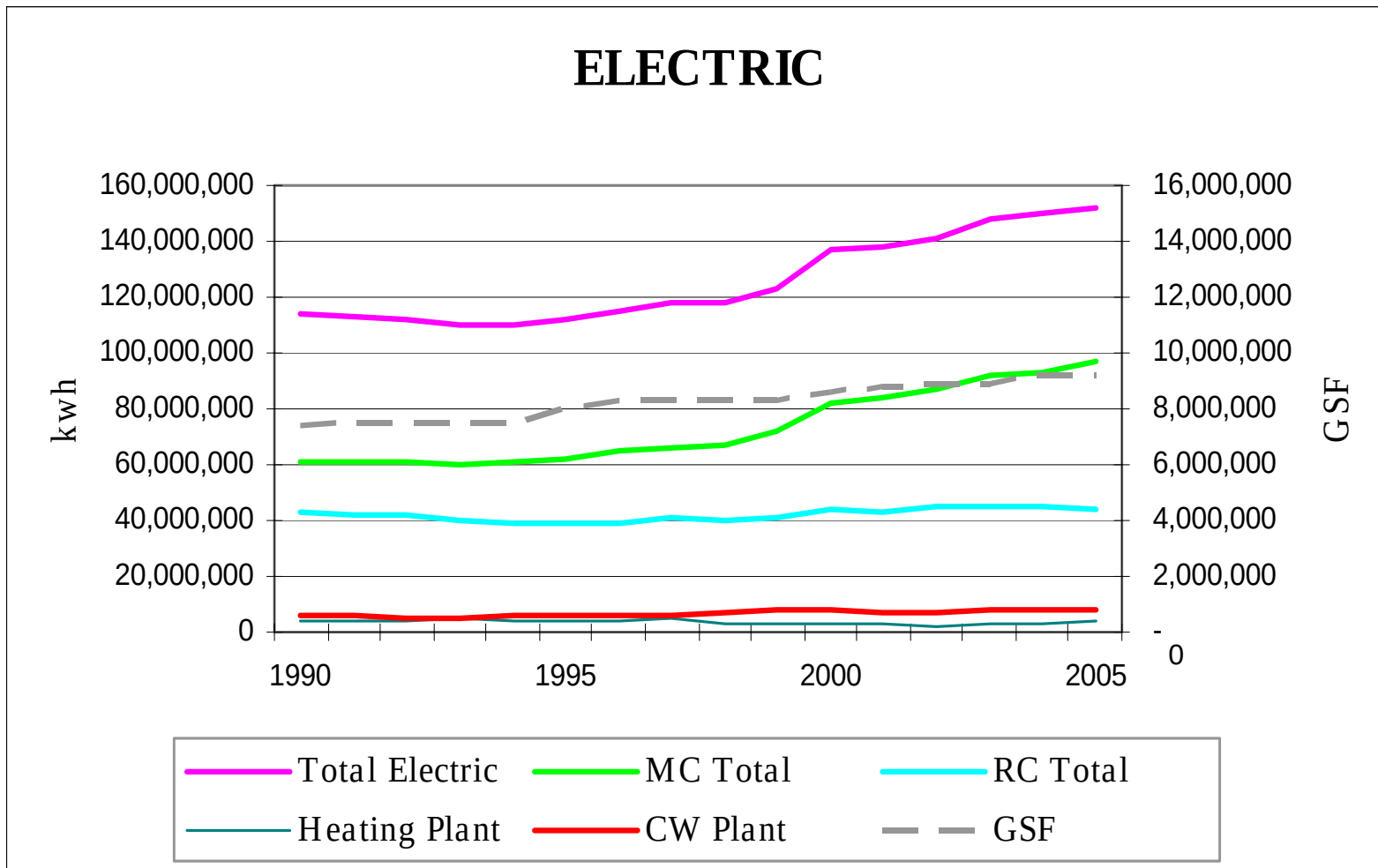


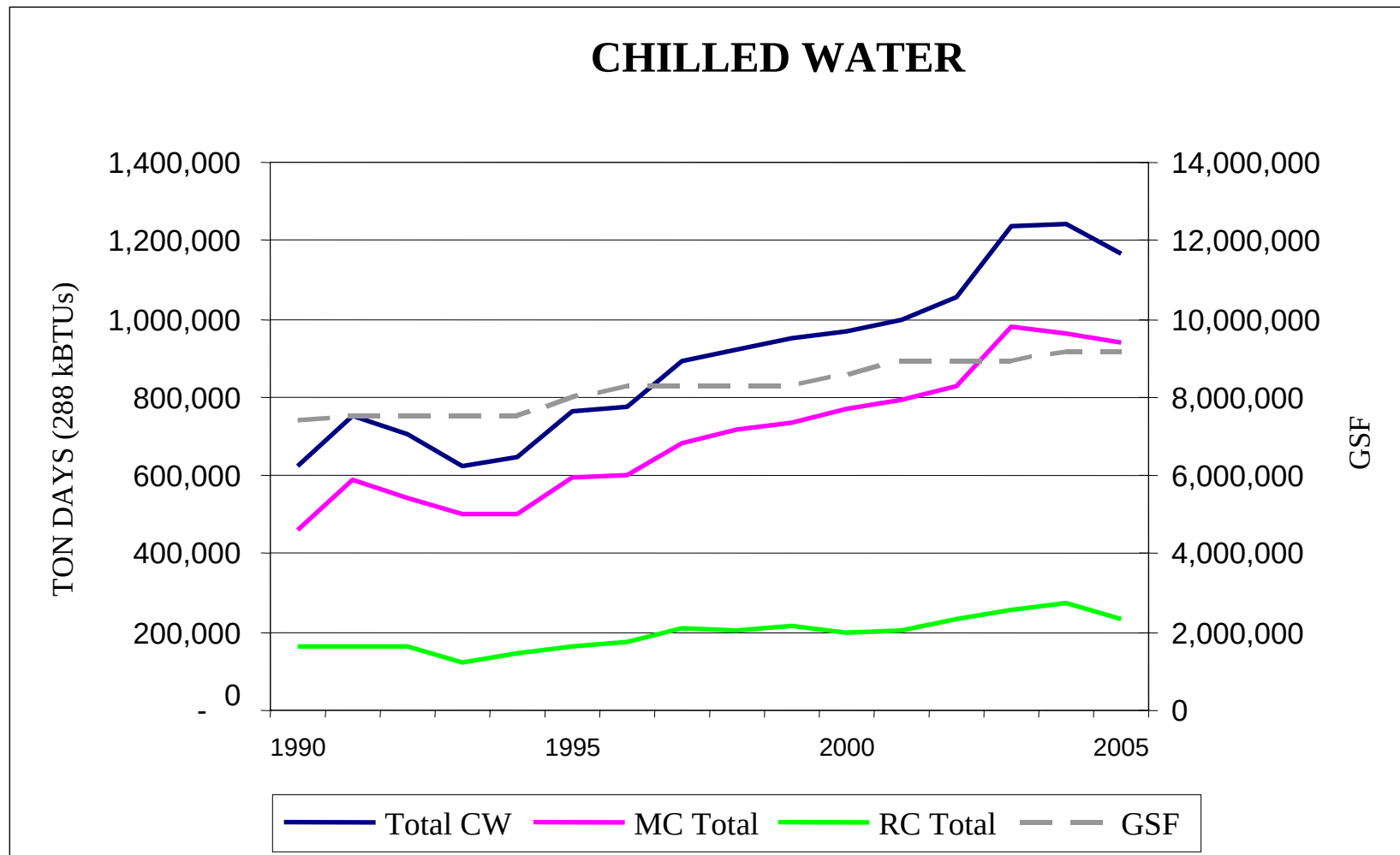


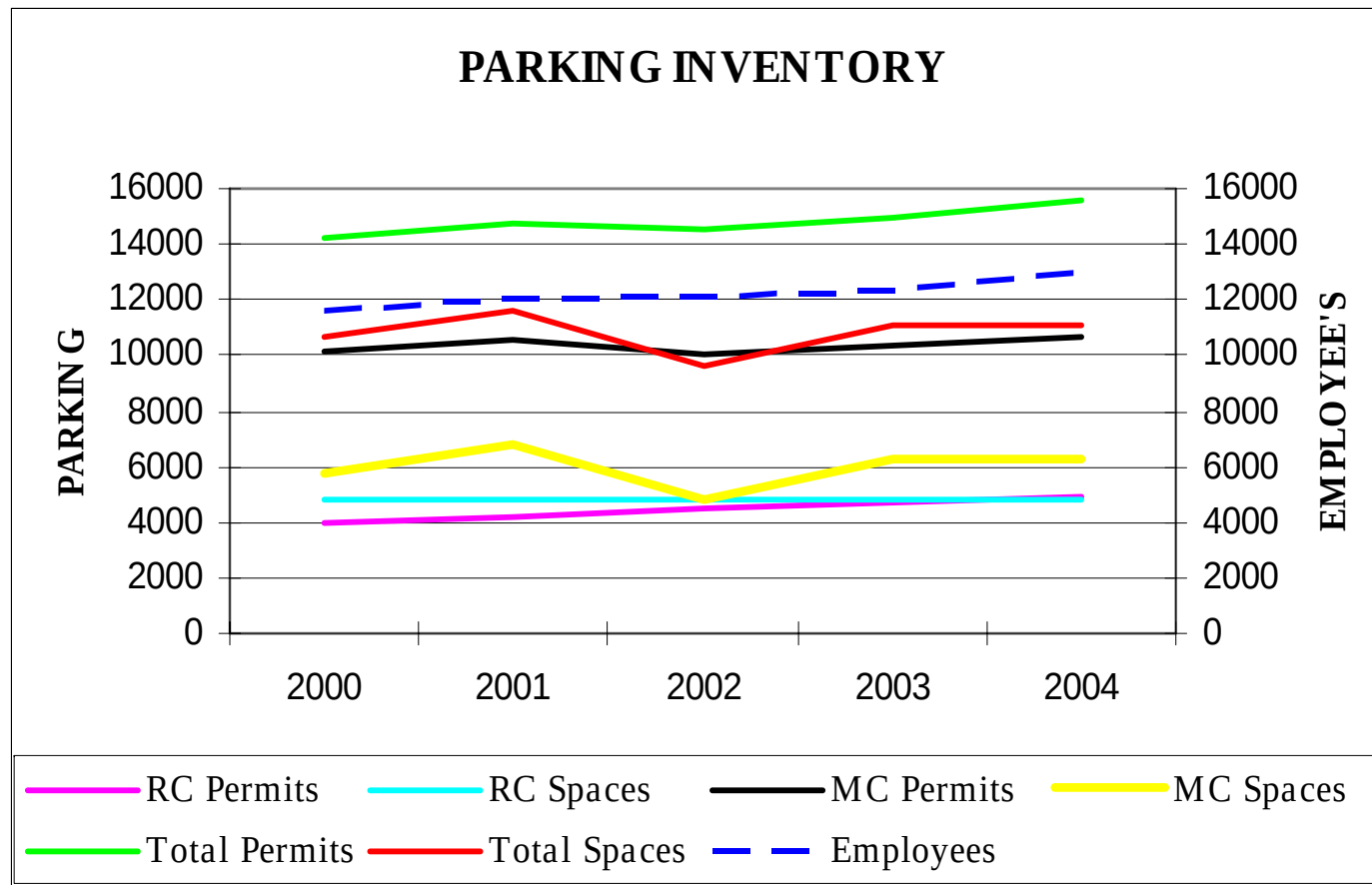








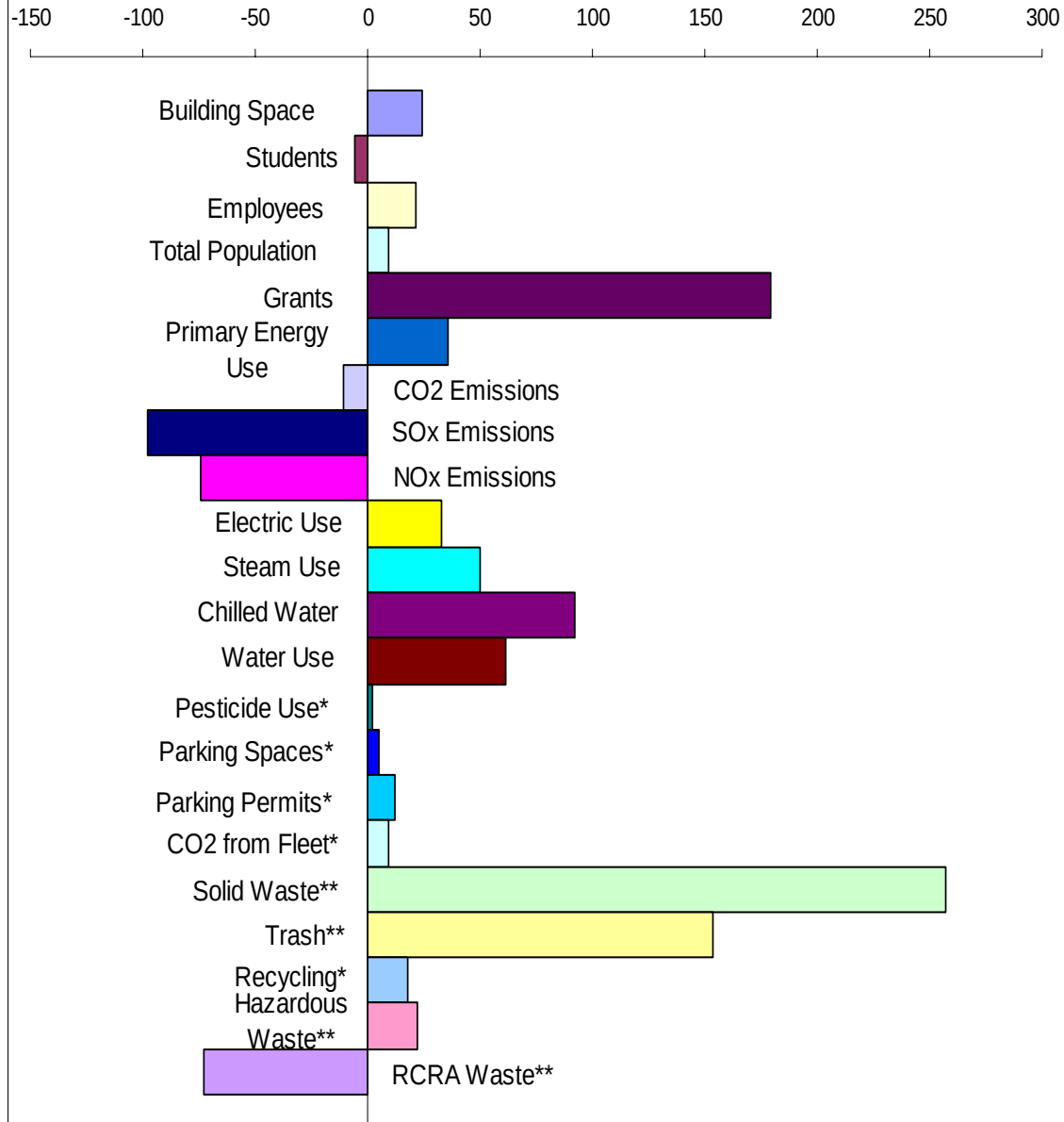




PERCENT CHANGE FROM 1990 TO 2004

* 2000-2004, ** 1994-2004

UNIVERSITY OF
ROCHESTER





Planning Tools for a Sustainable Campus

- **LEED – NC for Multiple Buildings in a Campus Setting**
 - Reduces environmental impact of building by approaching green building in a broader context
 - Certifies several buildings at once or in phases
 - Allows for opportunities for new interpretations of “NC” credits in the campus context

Planning Tools for a Sustainable Campus

- LEED – ND for Neighborhood Developments
 - A National standard for neighborhood design that integrates principles of green building and smart growth
 - Emphasizes smart growth aspects of development – and incorporates important green building practices
 - Establishes guidelines for decision making:
 - Density, mixed use, proximity to transit, variety of housing types, pedestrian and bicycle friendly design

Planning Tools for a Sustainable Campus

- EPA's Primer for Smart Growth
 - Specific to College & University Campuses
 - Tool For Decision Makers – Presidents, VP's and UA's
 - Explain Smart Growth in the context of campuses and college town districts
 - Show decision makers why they should adopt policies to:
 - ♦ Create vibrant, enduring places
 - ♦ Realize fiscal benefits by maximizing use of resources
 - ♦ Work collaboratively as a good neighbor
 - ♦ Contribute to a healthy, sustainable campus and surrounding community

Dave Zehngut Penn State University

THE UNIVERSITY OF TEXAS AT AUSTIN



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Greening the Penn State Campus



Goals

- Conserving natural resources
- Minimizing our impact on the environment
- Enhancing the health, well-being, and productivity of all
- Reducing operating costs

PENNSTATE



Re-Commissioning Existing Buildings

- Overall expenditures: \$2.2M since 1999
- Averaging a 10 year payback
- Savings to date:
 - 4,700,000 kwh of electricity
 - 57,000 klb of steam
 - 39,500 mcf of natural gas



Re-Commissioning Existing Buildings

- Bryce Jordan Center Re-Commissioning
- Project cost: \$116,000
- Substantially complete 10/2001
- Annual savings to date: averaging \$21,000



Guaranteed Energy Savings Program

- Phase I (15 Buildings)
 - Lighting upgrades
 - Water retrofits
 - Steam trap replacements



Guaranteed Energy Savings Program

Initial Investment \$2,200,000

Commodity	Savings	Avoided Cost
Electric	2.89M kWh	\$127,403
Water	5.36M gallons	31,933
<u>Steam</u>	<u>5.88M pounds</u>	<u>71,079</u>

First Year Savings \$230,415

Renewable Energy – Wind Power

- Initial 5-year commitment (2001-2006)
- 5% of campus demand
- 13,300,000 kWh
- Next contract: 10%
- Long-term goal: 20%



Recycling

- Newspaper: 190 tons/year
- Computers: 310 tons/year
- Toner Cartridges: 5 tons/year



Trash to Treasure

- 5-years: 290 tons diverted from landfills
- \$200,000 to United Way



Alternative Fuels

- 20% of Service Vehicle Fleet runs on CNG



Transportation Initiatives

- No fare on campus
- Ride for \$5



LEED Certified Buildings

- School of Architecture and Landscape Architecture Building
- School of Forest Resources Building



Scott Hurst Virginia Polytechnic & State University

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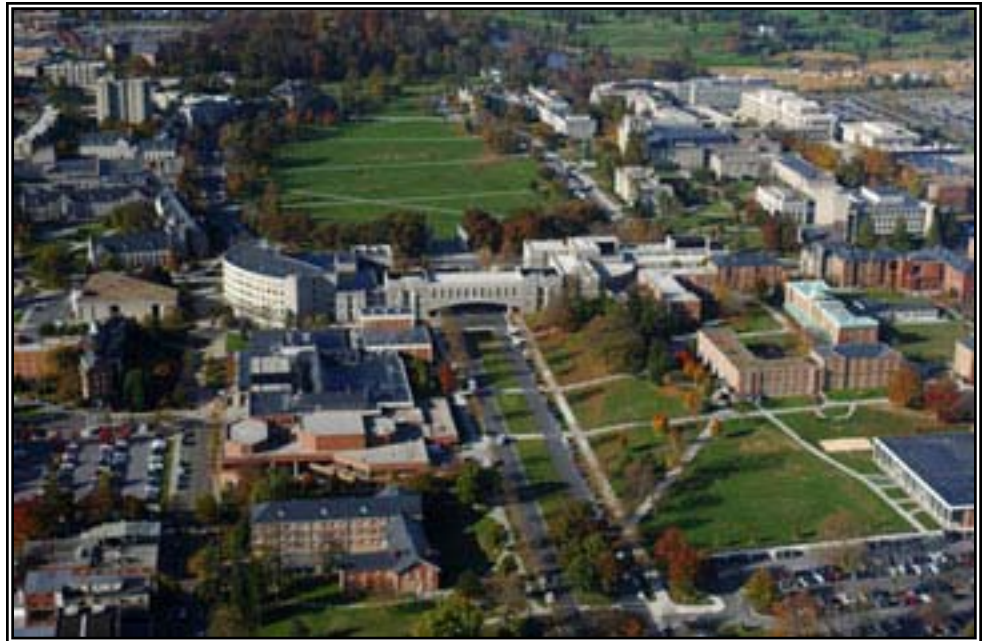


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Greening of Design Standards

The Virginia Tech experience...so far



Campus Context

- Large state-supported university
- Rural setting away from major metropolitan markets
- Research-intensive



Sustainable Design Context

Challenges

- Decision makers have not articulated a strong position on sustainability
- Project Management concerns that projects will cost more and take more time to design/review
- The potential benefits and life cycle savings may not override first cost
- In Virginia, lack of government mandates for sustainability

Sustainable Design Context

Opportunities

- Ad-hoc environmental concerns group (ACES)
- Energy Committee
- Key staff are inspired to be green champions
- Collective knowledge and experience of facilities staff
- Grassroots effort can create new paradigm

Design Guidelines Context

Challenges

- No formal update process established
- Multiple authors
- No mandated sustainability policy
- Individual ownership can impede change

Design Guidelines Context

Opportunities

- VPBA interested in LEED
- New energy policy pending 2006
- Renewed interest due to energy cost increases
- Small student activist contingent
- Strong programs in building construction, architecture and engineering and relevant research

Process for Greening Standards

- Capital Design and Construction Dept. (CDCD) managed updating of standards
- Office of University Architect (OUA) recommended updates along with several other stake-holders
- OUA elected to review entire standards for sustainability
- Worked one-on-one with several stake-holders to gain support for revisions

Outcomes

Steps toward LEED Certification

- Standards support the principles of LEED
- Set a goal to meet design and construction requirements equivalent to “LEED certified” status
- Pursue certification on a case-by-case basis

Sustainability Statement in revised standards:

“In order to incorporate sustainable design solutions in new construction and renovation projects, Virginia Tech has joined the US Green Building Council (USGBC) and fully supports the principles of the LEED (Leadership in Energy and Environmental Design) Building Rating System...All projects shall address sustainability as it relates to site issues, water, energy efficiency, materials and resources and indoor air quality...”

Outcomes

Updated standards require :

- Conformance with university energy policy
 - HVAC systems design
 - Lighting systems
 - Building envelope design
- Third party commissioning
- Space provisions for recycling
- Locally quarried stone as dominant exterior material



Outcomes

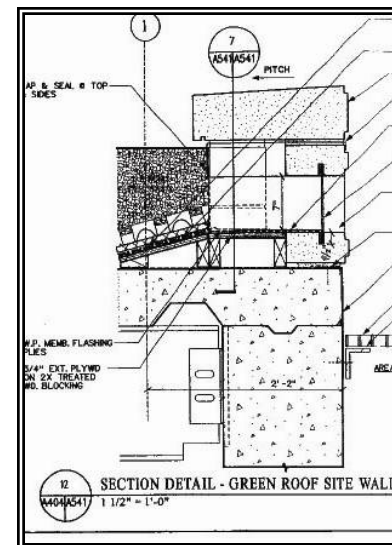
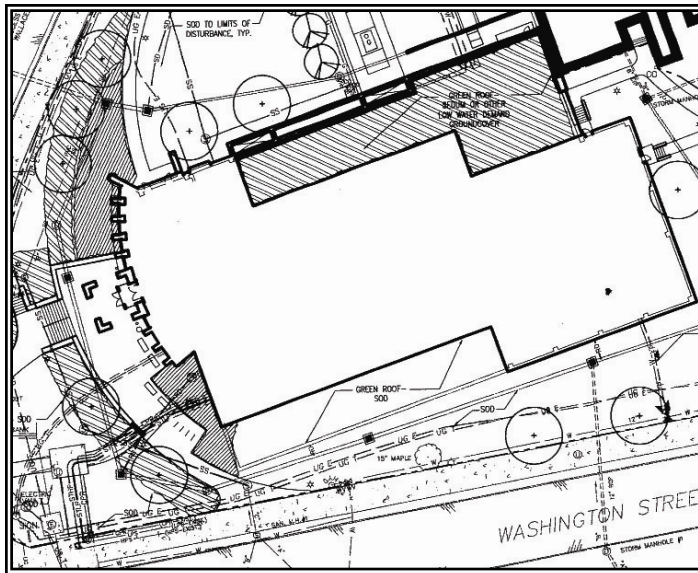
Updated standards state preferences for :

- Biobased materials
- Roofs with 65% + solar reflectivity
- Sustainably harvested wood
- Regionally quarried stone
- Recycled content finishes, fabrics
- Rapidly renewable materials
- Low VOC paints, adhesives, finishes
- Products/materials free environmental toxins
- Products/materials that are safely disposable, recyclable, or biodegradable

Outcomes

Initial implementation

- Vegetated roof as a case-study (used as research opportunity)

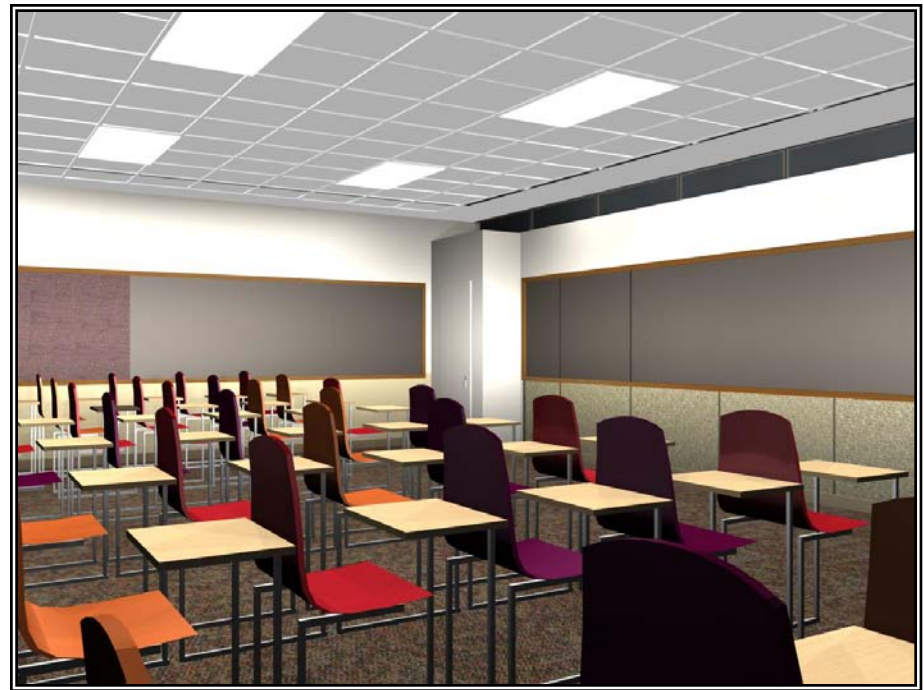


Outcomes

2006-2007 Classroom Renovations

Sustainable Features as New Standards

- Energy efficient, controllable lighting
- Carpet tiles- recycled content backing
- Recycled content upholstery fabrics
- Rapidly renewable teaching wall panels
- PVC free solar shades
- Low VOC paints



Lessons Learned

- Gatekeeper can be facilitator or roadblock
- Build consensus by reaching out to stakeholders (work one-on-one)
- Accept success measured by incremental improvements
- Remain patient, tireless in pursuing change
- Raise expectations of consultants by greening the selection process, seeking integrated sustainable design expertise

Think **YOU'RE** Tired of Pulling
All-Nighters?



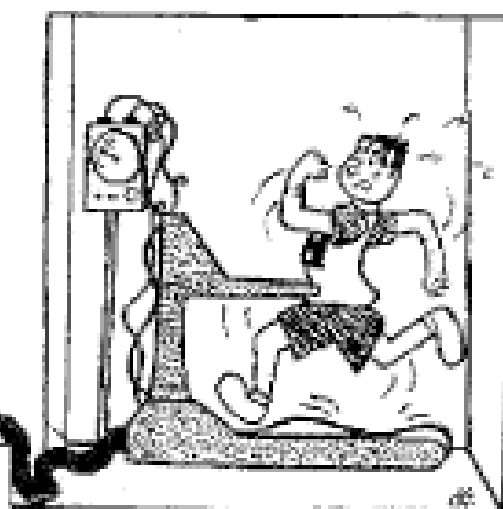
Enabling your computer's sleep function saves
energy AND money - about \$75 a year!

Go on, give your computer the night
OFF.



RENEWABLE
ENERGY.

DON'T SWEAT IT.



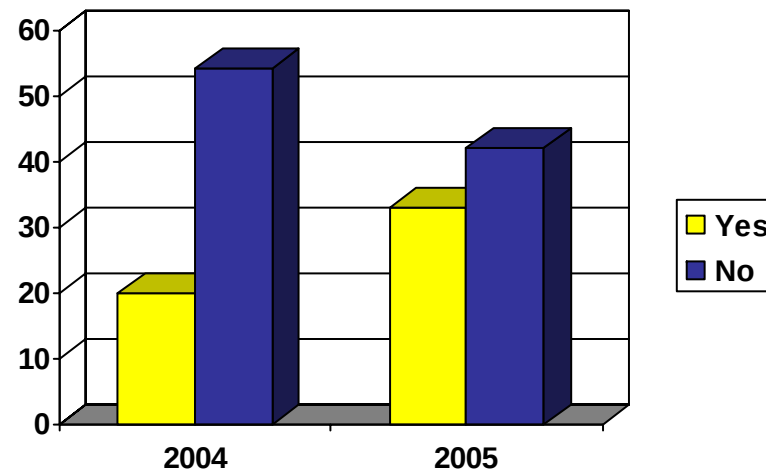


AUA Sustainability Committee Survey

1. My campus has a written policy/statement/mission that has been reviewed and adopted as part of our campus guidelines, thus requiring adherence to the concepts of environmental sustainability.

In 2004 20 campuses reported “yes” and 54 reported “no”.

33 Yes 42 No



AUA Sustainability Committee Survey

2. Disciplines and areas in which my campus has a “sustainability mentality”. (Check all appropriate)

2004 survey results in italics - # of institutions out of 74 reporting

- 67 New facility planning/design/construction (40)
- 52 Renovations of capital building projects over \$1million in cost (30)
- 42 Transportation issues, including traffic management and parking (24)
- 27 University procurement of goods and services (11)
- 51 Landscaping and Grounds (26)
- 64 Recycling (48)
- 15 Food Services, catering, meal plans (8)
- 28 Residence Halls and Campus Life (11)
- 19 Administration (10)

AUA Sustainability Committee Survey

**3. My campus is using the LEED Green Building Rating System or comparable rating system for the design of its buildings.
(2004 results in italics)**

43 Yes 32 No *(33 using Leed or comparable)*

My campus is a member of the US Green Building Council:

34 Yes 35 No *(21 were members in 2004)*

My campus has certified UGBC green buildings.

16 Yes 55 No *(3 campuses had LEED Bldgs. in 2004)*

We are currently designing/building 94 green buildings for Certification. *(24 campuses in 2004 had buildings in design/construction for Certification totaling 67 buildings in design/construction*

AUA Sustainability Committee Survey

4. My campus has staff personnel with LEED certification that are now LEED 2.2 Accredited Professionals.

30 Yes **43** No (in 2004, 20 were “yes”, 54 were “no”)

5. My campus has an administrative position for the purpose of job focus on environmental, green and sustainable campus issues.

21 Yes **53** No (in 2004, 12 were “yes”, 62 were “no”)

AUA Sustainability Committee Survey

6. My campus has made a commitment to environmental sustainability is its current Master Plan or will have it in the next Master Plan.

47 Yes 24 No Web site address of Master Plan:
(in 2004, 37 were “yes”, 37 were “no”)

7. Do you hire only architects, engineers and contractors with certified “green” building knowledge?

21 Yes 53 No *(in 2004, 11 were “yes”, 63 were “no”)*

AUA Sustainability Committee Survey

8. Do you believe in global warming?

64 Yes 8 No

*In 2004, 59 (80%) agree with the concept of global warming,
11 (15%) do not agree with the concept of global
warming 4 (5%) are undecided*

9. How much are you currently paying for a gallon of regular gasoline?

Average \$2.94 *(in 2004 the average was \$2.01)*
(\$205.84 / 70 = \$2.94) (1990 Gasoline reached the \$1 mark)

AUA Sustainability Committee Survey

10. Would you like to learn more about the following environmental issues?
Rank from your highest desire to lowest, high being 1 (numbers in italics are the results of the 2004 survey).

<u>286</u>	LEED ratings and certification system (17.6%)
<u>166</u>	New energy technologies: (55.4%) PV ____, wind ____, fuel cell ____, geothermal ____
<u>184</u>	Day lighting and artificial lighting systems and controls (55.4%)
<u>280</u>	Alternative transportation and parking systems on campuses (39%)
<u>217</u>	Sustainable renovation projects (51.4%)
<u>266</u>	“Green Housing”
<u>180</u>	Life Cycle Costing and such evaluation techniques (52.7%)
<u>224</u>	Benchmarking other institutions so you can “sell” to yours (44.5%)
<u>362</u>	Composting & Living Systems (8%)
<u>226</u>	Commissioning (40.5%)
<u>282</u>	Storm water management (23%)
<u>332</u>	Interior Finishes and Furniture (17.6%)

AUA Sustainability Committee Survey

11. What have been the difficulties your campus has to overcome to become more “green”? Check all that apply

30 top leadership/executive administration

55 funding/budgeting

50 higher first costs without life cycle analysis

18 education and resource experts

15 general lack of interest: Faculty Student Staff
(7) (1) (4)