Ball State University
Unit-level Sustainability Planning

[as mandated in Goal IV_F of the 2007-2012 Ball State University Strategic Plan]

A Sustainability Plan

for the

Department of Technology
College of Applied Sciences & Technology

Submitted to
Dr. Terry King
Provost and Vice-President for Academic Affairs

31 January, 2008

Table of Contents

Achievements to Date 1

Existing conditions as baseline 9

- **A List of Academic Offerings** 9
- **A List of Faculty, Staff and Student Activities** 12
- **A List of Operational Commitments in the Building(s) We Occupy** 15

Goals 16

Implementation 17

Achievements to Date
Department of Technology

The following are our short-form question responses within the categories of Governance and Administration, Operations, Curriculum and Research, and Community Service and Outreach. In developing these short-form responses, we are pleased to report significant achievements in these areas and have identified opportunities for further development/transformation.

[Provide brief descriptions for each affirmative or goal response]

Governance and Administration

Y N Goal
☒ ☐ ☐ **1**. The unit has standing committees to address issues of sustainability.
The Department of Technology has a standing Sustainability Committee. Membership includes: a member of the Office Staff, a member from each of the department's programs, and a student representative.

Y N Goal
☐ ☒ ☐ **2**. The unit gives assigned load and/or a staff position dedicated to sustainability initiatives.

Y N Goal
☒ ☐ ☒ **3**. The unit has established policies that encourage sustainability initiatives.
The Department of Technology and faculty have agreed to support a series of action steps/policies proposed by the Sustainability Committee.

Goal: (1) By Spring 2009, implement a green policy for purchasing. (2) By 2009, implement energy conservation and responsible material disposition policies for classrooms and labs.

Y N Goal
☐ ☒ ☐ **4**. The unit has sustainability integrated into its mission statement.

Y N Goal
☐ ☒ ☐ **5**. The unit maintains active membership in organizations engaged in promoting sustainability.

Y N Goal
☒ ☐ ☐ **6**. The unit encourages and rewards research related to sustainability.
The Department of Technology encourages faculty to conduct research in their areas of expertise or interest. The rewords system includes: progress towards promotion and tenure, salary raises, and/or travel funds to facilitate research or professional growth.

Y N Goal
☒ ☐ ☒ **7**. The unit encourages and rewards the integration of sustainability issues into course material.

GOAL: By 2011, integrate "sustainability goals, content and practices" into the curriculum. Action Items:

1. **Propose a new core curriculum course that addresses technology and sustainability.**
2. **Conduct a curriculum inventory of program mission, goals, and courses related to issues of sustainability.**
3. **With the assistance of COTE, offer a workshop which explores options for integrating sustainability into curriculum and instruction.**
4. **Contact accrediting organizations to integrate sustainability into their standards and practices.**

Operations

Y N Goal
☐ ☒ ☒ **1**. The unit purchases/uses Energy Star Office and Telecommunications Equipment.

Action Item: Establish a green policy for department purchases to maximize the purchase of energy efficient and environmentally friendly products.

Y N Goal
☐ ☒ ☒ **2**. The unit has policies to restrict paper use.

Action Items: (1) Place all department forms online, that allows them to be digitally filled out, and digitally submitted. (2) Recommend that all college and university forms be placed online, that allows them to be digitally filled-out, and digitally submitted. (3) Set the default of printers and copiers in computer labs and offices to double-sided as appropriate. (4) Post syllabi, assignments, and reading materials online.

Y N Goal
☐ ☒ ☒ **3**. The unit uses recycled paper.

Action Item: Establish a green policy for department purchases to maximize the purchase of energy efficient and environmentally friendly products.

Y N Goal
☐ ☒ ☒ **4**. The unit recycles all materials accepted by the university system.

Goal: By Fall 2008, implement a sustainability awareness program.

Y N Goal
☒ ☐ ☐ **5**. The unit has appropriate recycling bins throughout its offices.
The Department of Technology maintains several recycling containers throughout the AT Building. These include recycling containers for printer cartridges, batteries, aluminum cans, paper, cloth rags, and the university Please . . . RECYCLE containers.

Y N Goal
☐ ☒ ☐ **6**. The unit has policies that encourage the use of teleconferencing capabilities to limit travel.

Y N Goal
☐ ☒ ☐ **7**. The unit specifies hybrid electric vehicles for travel.

Y N Goal
☐ ☒ ☐ **8**. The unit shows preference for sustainable lodging for professional travel.

Y N Goal
☐ ☒ ☐ **9**. The unit uses washable dinner/service ware for its meetings/receptions.

Y N Goal
☐ ☒ ☐ **10**. The unit purchases/uses remanufactured office furniture.

Y N Goal
☐ ☒ ☒ **11**. The unit purchases/uses sustainable materials for office furnishings.

Action Item: Establish a green policy for department purchases to maximize the purchase of energy efficient and environmentally friendly products.

Y N Goal
☐ ☒ ☐ **12**. The unit discourages the use of single-occupant automobile travel.

Y N Goal
☐ ☒ ☒ **13**. Classroom, Office and/or Restroom lighting for the unit is controlled by occupancy sensors.

Action Item: With the assistance of the Physical Plant, the department Facility Committee will identify and recommend energy conserving technologies.

Y N Goal
☐ ☒ ☒ **14**. The unit's thermostats are set to minimize energy use for heating and cooling.

Action Item: With the assistance of the Physical Plant, the department Facility Committee will identify and recommend energy conserving technologies.

Curriculum

Y N Goal
☒ ☐ ☐ **1**. The unit has courses dedicated to issues related to sustainability.

ITEDU 206: Using and Assessing Technology
ITEDU 510: Technology Use and Assessment

Y N Goal
☒ ☐ ☐ **2**. The unit has courses with sustainability content.

ITEDU 101: Introduction to Technology
ITEDU 402: Designing Technological Systems

ITDPT 203: Material Processing
ITDPT 204: Energy Processing

ITMFG 225: Industrial Plastics
ITCST 250 Construction Methods and Materials
ITCST 200 Site Preparation

Y N Goal
☒ ☐ ☐ **3**. The unit has courses in which students are encouraged to address sustainability issues in their assignments.

ITDPT 160: Technical Analysis
ITDPT 299X: The Profession of Building: History & Ethics
ITEDU 694: Curriculum Development in Technology Education
ITGRA 480: Colloquium and Senior Project in Graphic Arts Management
ITCMP 466: Capstone in Computer Technology

Y N Goal
☐ ☐ ☐ **4**. The unit recognizes sustainability courses from other departments as legitimate electives for credit in its programs.

Y N Goal
☒ ☐ ☐ **5**. The unit has dedicated sustainability courses that can be taken for credit as part of a major or minor outside of the unit.

Courses within *Technology & the Environment*, Interdepartmental Minor:

ITEDU 101: Introduction to Technology
ITDPT 203: Material Processing
ITDPT 204: Energy Processing
ITEDU 206: Using and Assessing Technology
ITEDU 402: Designing Technological Systems

Research

Y N Goal
☒ ☐ ☐ **1**. Members of the unit have conducted research on issues of sustainability in their discipline.

Rose, M.A. (2007, June 12). Strategies for selecting and disposing of lamps. Human Subjects Protocol – IRB #07-302. Ball State University

Y N Goal
☒ ☐ ☐ **2**. Members of the unit have published on issues of sustainability in their discipline.

Rose, M.A. (2006). Emergency preparedness: Balancing electrical supply and demand. *The Technology Teacher, 65*(8), 6-9.

Flowers, J. (2005). Usability testing in technology education. *The Technology Teacher, 64*(8), 17-19.

Flowers, J. (1999). An outline for the study of using technology. *Journal of Industrial Technology, 15*(2). Retrieved from http://nait.org/jit/Articles/flow0299.pdf

Flowers, J. (1998). Problem solving in technology education: A Taoist perspective. Journal of Technology Education 10(1), 20-26. Retreived from http://scholar.lib.vt.edu/ejournals/JTE/v10n1/pdf/flowers.pdf

Y N Goal
☒ ☐ ☐ **3**. Members of the unit attend conferences that address issues of sustainability.

Flowers, J. Greening of the Campus Conferences at Ball State.

Hua, D. Green for Green.

Jones, J. (2007, April). Associated Schools of Construction International Conference, Flagstaff, AZ

Rose, M.A. (2007, February 1-2). Attendance at the 7th National Conference on Science, Policy, and the Environment: Integrating Environment and Human Health. Washington, D.C.

Rose, M.A. (2006, January 26-27). 6th National Conference on Science, Policy, and the Environment: Energy for a Sustainable and Secure Future. Washington, D.C.

Y N Goal
☒ ☐ ☐ **4**. Members of the unit belong to associations dedicated to sustainability issues.

Council on the Environment, Audubon, National Resource Defense Council, Sierra Club

Y N Goal
☒ ☐ ☒ **5.** The unit has hosted workshops on issues of sustainability.

National Energy Education Development (NEED) Project Workshop. (2007, June 8). Worthen Arena Lounge, Ball State University, Muncie, IN.

Y N Goal
☐ ☒ ☐ **6.** The unit has hosted conferences on issues of sustainability.

Community Service and Outreach

Y N Goal
☒ ☐ ☒ **1.** The unit engages in public and/or outreach activities that address issues of sustainability.

Rose, M.A. (2007, June 2-3). Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana. Muncie, IN.

GOAL: (1) By Spring 2009, publish sustainability content on the Department of Technology's Web site. (2) Increase communications, collaborative involvement, and leadership in community service and outreach initiatives related to sustainability.

Y N Goal

☐ ☒ ☐ **2.** The unit is in partnership with others in the community in the pursuit of sustainability.

Flowers, J. (2005-2001). Representative from the College of Applied Sciences and Technology on the BSU Council on the Environment.

Flowers, J. (2002-2001). Served as the Funding Specialist for the BSU Council on the Environment.

Rose, M.A. (Present-2006). Representative from the College of Applied Sciences and Technology on the BSU Council on the Environment .

Rose, M.A. (Present). Executive Committee Member and Grantwriter for 2008 Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana.

Rose, M.A. (2007-2006). Executive Committee Member and Member of the Children's Committee for 2007 Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana.

Y N Goal

☒ ☐ ☐ **3.** The unit participates in community events that address issues of sustainability.

Flowers, J. (2007) Assisted at the 2007 Living Lightly fair in Delaware County, Indiana.

Rose, M.A. & Brubaker, A. (2007, June 2). Vroom…Build a Solar Car. *Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana*. Delaware County Fair Grounds. Muncie, IN.

Y N Goal

☐ ☒ ☐ **4.** The unit has initiated community endeavors in pursuit of sustainability.

Existing conditions as baseline (data as available)

In preparing our short-form responses to the questions in the previous section, we accumulated the following data sets. These comprise the numerical underpinnings specific to our (pick one) Center, Institute, Department, College, Vice-Presidency.

A List of Academic Offerings

Topical Sustainability Lectures

Xu, R. (2007, Fall). ITGRA 480: Colloquium and Senior Project in Graphic Arts Management. Activity: Guest speaker from Indiana Department of Environmental Management.

Topical Sustainability Modules

Flowers, J. (2000 - 2008). ITEDU 510: Technology Use and Assessment, and ITEDU 206: Using and Assessing Technology. Module on 18 technology assessment techniques at http://jcflowers1.iweb.bsu.edu/rlo/ta.htm and student reports on technology assessment topics at http://jcflowers1.iweb.bsu.edu/rlo/taactivities.htm

Jones, J.W. (2007, Spring). ITDPT 299X: The Profession of Building: History & Ethics. Activity: Ethical dilemma paper on sustainability shortcuts.

Hua, D.A (2007, Fall). ITCMP 466: Capstone in Computer Technology. Unit on sustainability in IT

Kanu, R.C. (2006, Spring), ITMFG 225: Instruction on Plastics Waste Management

Rose, M.A. (2007, Fall). ITDPT 160: Technical Analysis. Activity: Technical writing sustainability proposal.

Rose, M.A. (2006, Fall). ITDPT 204: Energy Processing. Activity: Heat loss, harnessing alternative energy and generating useful work.

Rose, M.A. (2007, Spring). ITEDU 510: Using and Assessing Technology

Rose, M.A. (2007, Spring & Fall). ITEDU 694: Curriculum Development in Technology Education. Activity: Develop a course to address the energy crisis.

Warner, J. (2007, Fall) ITCST 200 Site Preparation: Activity 1 – Students plan to re-route storm water around the AT Building on the Ball State Campus. Students are instructed to identify water damage and inappropriate run-off. Designs for collecting and routing storm water through piping (collection or downstream piping) and pervious

concrete are some of the possible solutions. Structural sustainability is hampered by a lack of attention to best practices in site preparation. Collected water can be used for landscape watering. With pervious concrete parking lot run of is filtered and taken directly to the earth rather than to county ditches and streams.

Warner, J. (2007, Fall). ITCST 200 Site Preparation: Activity 2 – Students are given the assignment to design and excavate a construction site in the Quads lawn area. Attention is focused on soil types and conditions. Possible solutions intercept ground and surface water for collection or dispersal. Erosion on a construction site harms the natural site and any structures built on the site. Attempts are made to conserve and protect trees and other natural structures/features. Students are encouraged to identify issues that relate to sustainability in the building process.

Warner, J. (2007, Spring). ITCST 250 Construction Methods and Materials: Activity 1 – Students are challenged to build a structure that resembles a paper milk carton with hybrid low density structural trusses. The materials chosen for each truss work in a synergistic relationship. Structural truss designs are based on trusses utilized within walking distance from the AT Building, such as the Ball Gym roof trusses. Once students are familiar with how trusses perform and how loads and forces are distributed throughout a truss, they begin to design truss parts sized appropriately with less dense materials where possible. Decisions are all based on tested models of overall truss designs. Light weight structures are shown to perform well minimizing the need for oversized, dense structural components, relieving the need for dense wood, steel, and concrete utilization, thus a desirable environmental impact. Recycled composite materials are introduced and used where/when possible.

Xu, R. ITMFG-560: Occupational Health and Safety. Activity: Facility Safety Audit

Xu, R. ITEDU-550 Career and Technical Student Organizations. Activity: Planning Program of Works – Community Services

Sustainability Courses

ITEDU 510: Technology: Use and Assessment

Courses within *Technology & the Environment*, Interdepartmental Minor:

ITEDU 101: Introduction to Technology
ITDPT 203: Material Processing
ITDPT 204: Energy Processing
ITEDU 206: Using and Assessing Technology
ITEDU 402: Designing Technological Systems

Sustainability Programs

Sustainability Concentrations

Technology & the Environment, Interdepartmental Minor

Sustainability Degree Offerings

Sustainability Immersive On-and Off-Campus Experiences

Warner, J. (2008, Spring). ITCST 460 Construction Management Capstone: Comprehensive Final Project Activity – Student teams will document an existing structure within Muncie (on the White River) to be closely replicated with sustainable materials and mechanical systems. Existing structural materials and trusses will be documented for further testing and improvements, moving away from heavy dead load material configurations. A paved asphalt parking lot will be documented and possibly changed to pervious concrete with sub-draining capability. Students will work with local governmental, construction, and business professionals to select design features and solicit sponsorship of future green sites along the White River corridor

Existing conditions as baseline (data as available)

A List of Faculty, Staff and Student Activities

Research

Rose, M.A. (2007, June 12). Strategies for selecting and disposing of lamps. Human Subjects Protocol – IRB #07-302. Ball State University.

Publications

Rose, M.A. (2006). Emergency preparedness: Balancing electrical supply and demand. *The Technology Teacher, 65*(8), 6-9.

Flowers, J. (2005). Usability testing in technology education. *The Technology Teacher, 64*(8), 17-19.

Flowers, J. (1999). An outline for the study of using technology. *Journal of Industrial Technology, 15*(2). Retrieved from http://nait.org/jit/Articles/flow0299.pdf

Flowers, J. (1998). Problem solving in technology education: A Taoist perspective. Journal of Technology Education 10(1), 20-26. Retreived from http://scholar.lib.vt.edu/ejournals/JTE/v10n1/pdf/flowers.pdf

Presentations at Professional Meetings

Flowers, J. (2001). Graduate online course: Technology - Use & Assessment. International Technology Education Association Annual Conference, Atlanta, GA.

Flowers, J. (2006). Student-developed usability tests. International Technology Education Association Annual Conference, March 24, 2006, Baltimore, MD.

Flowers, J. (2005). Helping students perform formal technology assessments. International Technology Education Association Annual Conference, April 4, 2005, Kansas City, MO.

Flowers, J. (2004). An approach to usability education. Indiana Chapter, Usability Professionals Association. October 11, 2004.

Rose, M.A. (2007). Infusing sustainability principles into technology curriculum. International Technology Education Association Annual Conference, March 2007, San Antonio, TX

Rose, M.A. (2007). Professional Roundtable-Positioning Technology Education to Lead Educational Reform. Topic was "Infusing sustainability principles into technology

curriculum". International Technology Education Association Annual Conference, March 2007, San Antonio, TX.

Rose, M.A. (2004). Use and consequences: An energy decision. International Technology Education Association Annual Conference, March, 2004, Albuquerque, NM.

Rose, M.A. (2003). Photons, insolation, & sustainable solar energy technologies. International Technology Education Association Annual Conference, March, 2003, Nashville, TN

Professional Academic Organizations

Five department faculty report that they are members of committees or organizations that address issues of sustainability, including the Audubon Society, the Red-tail Conservancy, the Sierra Club, BSU's Council on the Environment, Living Lightly: A Resource Fair for Sustainability.

Conferences Attended

Flowers, J. Greening of the Campus Conferences at Ball State.

Hua, D. Green for Green.

Jones, J. (2007, April). Associated Schools of Construction International Conference, Flagstaff, AZ

Rose, M.A. (2007, February 1-2). Attendance at the 7th National Conference on Science, Policy, and the Environment: Integrating Environment and Human Health. Washington, D.C.

Rose, M.A. (2006, January 26-27). 6th National Conference on Science, Policy, and the Environment: Energy for a Sustainable and Secure Future. Washington, D.C.

Service Activities

Flowers, J. (2007) Assisted at the 2007 Living Lightly fair in Delaware County, Indiana.

Flowers, J. (2005-2001). Representative from the College of Applied Sciences and Technology on the BSU Council on the Environment.

Flowers, J. (2002-2001). Served as the Funding Specialist for the BSU Council on the Environment.

Rose, M.A. (Present-2006). Representative from the College of Applied Sciences and Technology on the BSU Council on the Environment

Rose, M.A. (Present). Executive Committee Member and Grantwriter for 2008 Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana.

Rose, M.A. (2007-2006). Executive Committee Member and Member of the Children's Committee for 2007 Living Lightly: A Resource Fair for Sustainable Lifestyles in East Central Indiana.

Professional Staff Organizations

Student Associations and Clubs

Hybrid Fleet Vehicle Use

No faculty members report driving a BSU hybrid auto.

Hybrid Electric Shuttle Bus Use

Walking

One faculty member reports that they walk to work most of the time.

Bicycling

Two faculty members report that they bicycle to work most of the time.

Carpooling

No faculty members report carpooling to work.

MITS Bio-Diesel Bus Use

One faculty member reports that they bus to work some of the time.

Conference Travel; Carbon Offset Purchases (and others…)

Existing conditions as baseline (data as available)

A List of Operational Commitments in the Building(s) We Occupy

Building Use: Lamps, Occupancy Sensors, Waterless Urinals

Material Use/Recycling: Paper, Water, Cartridges, Cans, Glass, Wet Garbage

Department facilities (offices, labs, classrooms, and labs) include BSU recycling containers, as well as battery and printer cartridge recycling.

Food Use/Recycling: Local Sourcing, Washable Dinnerware

Goals

Given our assessment of where things stand, we have identified the following goals for our unit.

Mission: Become more sustainable by infusing sustainability information, principles, and issues into the culture of the Department of Technology.

Governance and Administration

1. Maintain a working sustainability committee within the department.
2. By Fall 2008, implement a sustainability awareness program.
3. By Spring 2009, implement a recognition system within the department to reward stakeholders for promoting sustainability.
4. By Spring 2009, implement a green policy for purchasing.
5. By 2009, implement energy conservation and responsible material disposition policies for classrooms and labs.

Operations

6. Decrease paper consumption by 5% annually.
7. Reduce energy consumption by 5% annually.

Curriculum

8. By 2011, integrate "sustainability goals, content and practices" into the curriculum.

Research

9. Increase scholarly work relevant to sustainability issues.

Community Service and Outreach

10. By Spring 2009, publish sustainability content on the Department of Technology's Web site.
11. Increase communications, collaborative involvement, and leadership in community service and outreach initiatives related to sustainability.

Implementation

We have aligned specific action items with the 5-year cycling of the Strategic Plan and anticipate being able to move forward in the respective categorical areas, as described below.

2008 Action Items	Resource Needs
Governance and Administration 1. Outline the mission and responsibilities of the sustainability committee. 2. Staff a committee with representatives from all department stakeholder groups, including students, staff, and faculty. 3. Establish a program for informing students, staff and faculty about sustainability goals and practices. **Operations** 4. Place all department forms online, that allows them to be digitally filled out, and digitally submitted. 5. Set the default of printers and copiers in computer labs and offices to double-sided as appropriate. 6. Post syllabi, assignments, and reading materials online. 7. Set all computers to configure to sleep after 15 minutes. **Curriculum** 8. With the assistance of COTE, offer a workshop which explores options for integrating sustainability into curriculum and instruction. **Research** 9. With the assistance of OARSP or OTLA, offer an action research workshop targeting sustainability issues for students and faculty. **Community Service and Outreach**	**$500**

2009 Action Items	Resource Needs
Governance and Administration	
1. Staff a committee with representatives from all department stakeholder groups, including students, staff, and faculty.	
2. With the assistance of the Physical Plant, the department Facility Committee will identify and recommend energy conserving technologies.	
3. Establish a green policy for department purchases to maximize the purchase of energy efficient and environmentally friendly products.	
4. Establish a policy for each classroom and lab to reduce energy consumption and waste, as well as dispose of wastes in a responsible manner.	
5. Establish a process by which to identify and recognize students, staff, and faculty for their achievements which promote sustainability.	
Operations	
6. Recommend that all college and university forms be placed online, that allows them to be digitally filled-out, and digitally submitted.	
Curriculum	
7. Propose a new core curriculum course that addresses technology and sustainability.	
Research	
8. When available, allocate a graduate assistantship to support research, curriculum, and service activities related to sustainability. Reports to the Sustainability Committee Chair.	**$9,450**
Community Service and Outreach	
9. Create a subcategory within the department's Web site for raising awareness about sustainability and the related achievements of department stakeholders.	
10. Host a reception with representatives of community organizations for the primary intent of fostering collaborative involvement, immersive learning projects, and service initiatives related to sustainability.	
10. Recommend that COTE implement a campus-wide colloquium addressing sustainability.	**$150**

2010 Action Items	Resource Needs
Governance and Administration	
1. Staff a committee with representatives from all department stakeholder groups, including students, staff, and faculty.	
Operations	
Curriculum	
2. Conduct a curriculum inventory of program mission, goals, and courses related to issues of sustainability.	
Research	
3. When available, allocate a graduate assistantship to support research, curriculum, and service activities related to sustainability. Reports to the Sustainability Committee Chair.	**$9,500**
4. With the assistance of OARSP or OTLA, offer an action research workshop targeting sustainability issues for students and faculty.	
Community Service and Outreach	

2011 Action Items	Resource Needs
Governance and Administration	
1. Staff a committee with representatives from all department stakeholder groups, including students, staff, and faculty.	
Operations	
Curriculum	
2. With the assistance of COTE, offer a workshop which explores options for integrating sustainability into curriculum and instruction.	
3. Contact accrediting organizations to integrate sustainability into their standards and practices.	
Research	
4. When available, allocate a graduate assistantship to support research, curriculum, and service activities related to sustainability. Reports to the Sustainability Committee Chair.	**$9,600**
5. With the assistance of the OARSP and COTE, offer a workshop which helps faculty identify research topics and grant opportunities relevant to sustainability.	
Community Service and Outreach	

2012 Action Items	Resource Needs
Governance and Administration	
1. Staff a committee with representatives from all department stakeholder groups, including students, staff, and faculty.	
Operations	
Curriculum	
Research	
2. When available, allocate a graduate assistantship to support research, curriculum, and service activities related to sustainability. Reports to the Sustainability Committee Chair.	**$9,700**
Community Service and Outreach	