



BOWIE STATE UNIVERSITY

CLIMATE ACTION PLAN

BSU ENVIRONMENTAL SUSTAINABILITY TEAM (BEST)

OCTOBER 2009

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BOWIE STATE UNIVERSITY

CLIMATE ACTION PLAN

"Sustainability implies that the critical activities of a higher education institution are (at a minimum) ecologically sound, socially just, and economically viable, and that they will continue to be so for future generations. A truly sustainable college or university would emphasize these concepts in its curriculum and research, preparing students to contribute as working citizens to an environmentally sound and socially just society. The institution would function as a sustainable community, embodying responsible consumption of food and energy, treating its diverse members with respect, and supporting these values in the surrounding community."

Association of University Leaders for a Sustainable Future (www.ulsf.org)

EXECUTIVE SUMMARY

The Climate Commitment Coordinating Committee (C4) at the behest of the Bowie State University (BSU) president, Dr. Mickey L. Burnim, has developed a Climate Control Action plan geared toward creating a roadmap for carbon neutrality by 2012. An institutional climate action plan is a requirement of the American College and University Presidents Climate Commitment (ACUPCC). Carbon neutrality occurs when energy and resources are used in a way that does not increase the net amount of carbon dioxide or other greenhouse gases (GHG) in the atmosphere over time.

The rationale for developing a campus climate control action plan includes consideration of the current state of the world, and the role that a large institution can play in shaping the future. Environmental issues and their social impacts and causes have precipitated debates about how a healthy, prosperous and just future will be produced. Universities already play unique roles in educating society and conducting research. Thus, BSU can lead and help develop sustainable practices by educating and by example. The challenges imposed by a, suburban setting, large commuting population, importing of materials and energy, and exporting nearly all wastes, are relevant to surrounding communities.

Over the last several years, the institution has updated campus master plans, conducted an environmental audit, and made material investments in infrastructure. The university's aim is to be recognized as a leader in operations, teaching, and campus events related to sustainability. In addition, BSU's institutional vision and mission supports the inclusion of sustainability as an institutional goal by reinforcing constituent needs, market demands, and the emerging challenges confronting socioeconomic cultures that serve as an important basis in the University's efforts to develop educational programs and improve student access to instruction.

Chapter 1. Introduction

Experts in various disciplines and arenas have shown that human impacts on the environment are creating situations that lower the capacity of Earth to support humanity and other life forms, and that in certain key arenas the situation is likely to deteriorate. Efforts to mitigate the problem have revolved around the concept of humanity living in a sustainable fashion. Although there are various definitions of sustainability, the basic meaning is living in a way that ensures that future generations enjoy the benefits of a healthy environment and social well-being. Sustainability is not limited to environmental concerns but rather integrates three dimensions: ecological integrity, social justice, and economic well-being. It is also not limited to merely preserving resources. It also includes positive steps toward ecological, social, and economic health.

BSU has been making significant steps towards a sustainable future. Progress towards campus sustainability can be traced back to strategic planning that occurred within the past three years. As a result of that planning, the university developed a series of statements and guiding principles that have influenced our efforts by advocating excellence, civility, integrity, diversity and accountability. The BSU Vision includes the goal of “placing emphasis on science, technology, teacher education and business disciplines” that ultimately results in engaging people and ideas for common good.

Our Core Values include “Excellence and Accountability” and as such we believe that educators and students should explore and engage the challenges that confront regional, national and global communities, using their intellectual and creative capabilities to understand, investigate and solve problems. Excellence and Accountability will enhance our social awareness allowing us to respond to domestic and international needs for equitable and sustainable societies.

By proactively endorsing sustainability throughout the BSU community, the university has committed itself to the principles of ecological integrity, social and economic justice, and democracy. In keeping with climate control and sustainability consciousness the C4 team mantra is that “we must decide to live with a sense of universal responsibility, identifying ourselves with the whole Earth community as well as our local communities.”

Over the last several years, the institution has updated campus master plans, conducted an environmental audit, and made material investments in staff and infrastructure. The university strives to be acknowledged as a regional leader in operations, teaching, and campus events related to sustainability. In higher education, the notion of sustainability has special meanings. University Leaders for a Sustainable Future (ULSF) has stated that: “Sustainability implies that the critical activities of a higher education institution are at a minimum ecologically sound, socially just, and economically viable, and those will continue to be so for future generations. A truly sustainable college or university would emphasize these concepts in its curriculum and research, preparing students to contribute as working citizens to an environmentally sound and socially just society. The institution endeavors to function as a sustainable community, embodying responsible consumption of food and energy, treating its diverse members with respect, and supporting these values in the surrounding community.”

As this definition suggests, there are various aspects to sustainability in higher education. Four dimensions are often highlighted: teaching, research, operations, and outreach, with the notion of sustainability having different nuances in each. The Presidents Council on Sustainable Development indicated that “Education for sustainability is a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and

social literacy, and commitment to engage in responsible individual and cooperative actions. These actions will help ensure an environmentally sound and economically prosperous future.”

Education for sustainability, then, seeks to empower students with a deep sense of environmental and social citizenship and with the knowledge and skills needed to work effectively for sustainability. Sustainability in research involves gaining expertise and communicating new ideas that enable society to create a sustainable future. Sustainability in operations involves minimizing our ecological footprint and ensuring an economically and socially just community on campus. Sustainability in outreach includes sharing that knowledge with the broader community, as well as obtaining financial resources necessary to accomplish all of these goals.

Chapter 2. Administrative Guidelines

Team Creation

In December 2007, President Burnim established a Campus Sustainability Team and charged the team with the responsibility of developing an integrated Campus Sustainability Plan (CSP) which would guide the University in an effort to be a leader in responsible environmental stewardship, education, outreach and research. The full text of the President's Charge memo is included in Appendix III. The specific elements of the Team and Plan Goals are listed below.

President's Charge

The Campus Sustainability Plan will:

- Indicate how the plan is an outgrowth of BSU's governing ideas, and recognition of the university's responsibility to work toward a sustainable future.
- Help ensure that our campus sustainability is comprehensive, including operations, teaching, research, and outreach.
- Make substantive recommendations for achieving sustainable operations and sustainability education based on environmental audits and needs assessments.
- Increase the sense of environmental and social citizenship of BSU as a whole and as one goal of our students' education.
- Cultivate awareness and appreciation on campus of sustainability, its relevance throughout the university, our responsibility to promote it.
- Be distributed for consideration by governance groups, vice presidents and deans.

Team Goals

In accomplishing the team charge, the Team will pursue the following goals:

- Maximize campus ownership of the planning process and the resulting plan;
- Involve internal and external University constituents in the on-going operational planning and refinement process;
- Analyze the current level and significance of sustainability in operations, teaching, research, and outreach;
- Analyze the resources being used for campus sustainability and estimate additional resources needed;
- Clarify the notion of campus sustainability, learning from how other campuses and organizations conceptualize sustainability and put sustainability into practice; and
- Establish criteria for BSU to be a model institution dedicated to sustainability.

Sustainability Plan Goals

The proposed goals should:

- be easy to measure, so as to hold BSU accountable for progress
- avoid confusion with broad strategies and action plans
- align with, or minimize conflicts with, other university strategic and operational plans
- share responsibility and benefits with the whole University
- be engaging and strategic
- demonstrate a grounding in baseline data and needs assessments
- apply both internally and externally to university-related activities.

Team Membership

Members from BSU's Shared Governance jointly participated in the plan development.

The Climate Commitment Coordinating Committee is comprised of a wide spectrum of students,

faculty and staff who were selected because of their expertise and commitment to work together toward sustainability goals.

Listed below are the members who serve on the Climate Commitment Coordinating Committee (C4):

Dr. Karl Brockenbrough, Chair, Vice President for Administration and Finance Division

Dr. Alirio Valbuena, Vice President for Division of Information Technology

Dr. Darsana Joysula, Faculty, Computer Science Department

Darryl Williford, Director, Facilities Management

Kevin Pothier, Staff, Head of Acquisitions

Dr. Regina Tawah, Faculty, Accounting, Finance and Economics Department

Patricia Hughes, Faculty, Computer Science Department

Barbara Mansfield, Staff, Division of Information Technology

Mi'Shaun Stevenson, Staff, Administration and Finance

Dr. Steve Sheffield, Faculty, Natural Science Department

Jacqueline Palmer, Staff, Facilities Management

Dr. Bill Lawrence, Faculty, Natural Science Department

Dr. Felicia Valdez, Faculty, Technology, Learning and Professional Development

Dr. Cornelia Brooks, Faculty, Psychology Department

Yolanda Dandridge, Staff, University, Relations and Marketing

Susan Damon, Staff, Student Accounts Office

SGA Representatives

GSA Representatives

Plan Development Process

The Campus Sustainability Plan (CSP) was developed as a result of a year long effort by team members. Highlights of that effort are listed below:

- January 2008 – October 2008: Team developed carbon footprint/inventory meet on a regular basis to research and develop carbon footprint/inventory, as well as analyze and develop potential recommendations for the plan
- March 2008 – C4 Chair meets with President to provide a status update on the Carbon Footprint Inventory
- June 2009: The BSU Environmental Sustainability Team (BEST) began work on the creation of a Climate Action Plan draft with a target completion date of fall 2009
- August – October 2009: Draft plan revised and reviewed by various members of BEST
- Revisions to plan will be made based upon feedback from campus community
- November 2009 – Anticipated completion of revisions and BEST submission to C4 Chair for review and presentation to University Council and President’s Cabinet.

The Campus Sustainability Plan contains an Executive Summary, an Introduction, six sections containing specific recommendations (Organization, Operations, Teaching, Outreach, Research, and Assessment), and a Conclusion. The recommendation sections are organized in a similar fashion, starting with a long term vision, an introduction, major goal, history of campus activity, and an action plan. The action plan contains recommendations for achieving the stated goals. Specific recommendations are categorized as either possible today (“initial consideration”), requiring more time (“within three years”), or long term (defined as 5 years or greater).

Organization

Introduction. To be effective in making sustainability a more significant part of the campus, we need to formalize and institutionalize the university's commitment to sustainability by creating structures and positions that assist in the development, coordination, and oversight of the sustainability initiative. The C4 considers the recommendations in this section of the plan to be crucial to launching a coordinated effort to carry out the campus sustainability plan. Success in all other areas of the plan is dependent upon sound organization and structure.

Long-term vision: To have positions, offices, and programs sufficient to support initiatives for, and enhance the importance of, sustainability in all facets of campus life.

Goal: To establish an organization capable of supporting campus sustainability initiatives as soon as is feasible, but within twelve months of the adoption of this plan.

History: In recent years, sustainability efforts at BSU have been supported by various individuals, offices, and programs, from the President to student volunteers. In 2007 the President established the Climate Commitment Coordination Committee (C4) to create a sustainability plan for the campus. However, this work has generally been done by individuals on top of a full slate of other duties and obligations, making support of sustainability conflict with regular job performance. In addition, we have proceeded without someone who coordinates and has expertise in all the aspects of sustainability. As a result, there is inadequate development and coordination of all the various aspects of sustainability on campus.

Action plan recommendations:

In order to adequately carry out the ambitious goals contained in this plan, the following organizational changes should be implemented as soon as possible:

Initial Consideration First Year

- Reaffirmation of established Climate Commitment Coordinating Committee (C4), with representation from across campus, to advise campus leaders on sustainability initiatives and to provide oversight of sustainability efforts
- Establish a Unit Level Sustainability Coordinators (ULSC) from each functional area.
 - Coordinators will be trained in sustainability initiatives and policies and act as a local resource and sounding board for sustainability related matters.
- Establish a C4 Budget Sub-Committee tasked with determining and investigating funding sources and requirements for ongoing campus-wide Green Initiatives
- Establish a C4 Outreach Sub-committee to directly interact with student centered organizations as well as internal and external campus community
- Establish a C4 Sub-committee devoted to risk management and assessment
- Designate sustainability responsibilities for Administrators to institutionalize the university's commitment to sustainability
- Award Energy Performance Contract to ensure appropriate energy conservation measures are instituted with regard to building systems
- Develop sustainability presentation to be incorporated and presented each semester at freshman seminar, and faculty orientation as well as new employee orientations as they occur throughout the year
- Develop paper community program whereby employees are issued electronic pay stubs as well as advocate campus-wide paperless work processes were practicable. This program would also offer an Opt-out for junk mail

- Develop “Green-Whistle” program which will establish a method for reporting or inquiring about campus green concerns

Within Three Years

- Establish a Campus Sustainability Endowment Fund to provide a method for donors to contribute to sustainability and to provide a reliable and continuing source of funds for the future.
- Obtain LEED Certification for Janitorial staff.

These thirteen recommendations would be combined to provide the attention, effort, and resource gathering needed to accomplish specific recommendations listed elsewhere in this plan.

Organizational Relationships

C4 generated many specific ideas about how the organizational recommendations might be implemented. Several are critical to understanding how the recommendations are linked.

Climate Commitment Coordination Committee (C4) responsibility

C4 shall report to the BSU President. C4 shall oversee, provide direction to, and evaluate the efforts of the ULSC’s across campus. C4 also may assist the ULSC’s in certain matters, take leadership in special issues (such as the curriculum), and advise campus leaders on sustainability initiatives. The leadership of the C4 could be shared (e.g. co-chaired) by staff with demonstrated commitment to sustainability representing both teaching and operational aspects of the university. The goal would be to provide a balanced, well-informed, and objective leadership for this administration-advising body. The C4 makes recommendations to the President.

- priorities for sustainability plan goals
- campus wide sustainability procedures and policies
- membership in off-campus sustainability organizations or initiatives

Unit Level Sustainability Coordinator (ULSC) duties:

The ULSC shall report to the C4 regarding progress towards the achievement of sustainability goals and objectives. The ULSC could have other stand-alone duties, such as:

- foster coordination and communication between individuals and units
- collect and manage data vital to implement and assess the Campus Sustainability Plan
- assist and support efforts of students by supervising interns and collaborating with student groups
- lead on sustainability training, outreach and publicity (e.g. website, presentations, events)
- assist faculty teaching by providing information and sharing expertise gained from C4 interaction
- facilitate collaboration with other universities and outside organizations
- assist with sustainability research and extend the C4's capacity to inform the campus community and receive feedback by:
 - Transferring information to and from major functional areas of the campus
 - Receiving more training to be able to serve as resource specialists

Administrators

Administrators could call on the ULSC and C4 to develop and implement strategies for meeting sustainability goals in the area of responsibility. The C4, ULSC and administrators could all play roles in creating and fostering alliances with surrounding communities, groups and businesses.

Organization

The goal and recommendations in this section of the plan were deemed crucial to launching a coordinated effort to carry out the campus sustainability plan. Success in all other areas of the plan is dependent upon sound organization and structure. The long-term vision is to have resources sufficient to support initiatives for, and enhance the importance of, sustainability in all facets of campus life.

Goal: Establish an organization capable of supporting campus sustainability initiatives as soon as is feasible, but within twelve months of the adoption of this plan. The main recommendations to support this vision and goal are:

- Create a Unit Level Sustainability Coordinators from each functional area
- Designate sustainability responsibilities for Administrators
- Establish a Campus Sustainability Fund

Chapter 3. Energy Conservation and Power Sources

The operations section contains eleven sub-sections covering a wide range of activities.

The long term vision is that BSU will conduct all aspects of campus operations in a fashion that is ecologically sound, socially just, and economically viable. The C4 will assume a leadership role in the effort to create a truly sustainable campus with the goal to have a net zero impact upon the climate and environment. The sub-sections and associated goals are:

Electrical Energy Management and Conservation: Become an institutional role model for electricity conservation through the rigorous implementation of emerging technology to increase efficiency, and the application of policy-based conservation practices to reduce waste. Our goal is to reduce overall electrical consumption 20% from 2006 levels by 2012.

Campus Heating: Reduce the annual consumption of fossil fuels for heating by 20% from 2006 levels by 2012.

Sustainable Energy: Become less dependent upon fossil fuel energy for electricity, heating and cooling.

Fresh Water Conservation: Reduce overall water consumption levels by 30% from 2006 levels by 2012.

Storm Water Management: Reduce the amount of total suspended solids coming off of the campus by 20% before 2010 and 40% before 2013 (from 2006 baseline).

Facilities Planning, Renovations and Construction: Utilize energy efficient and sustainable design standards on all new construction and applicable renovation projects undertaken after 2009. As of that deadline, all construction and renovations projects shall seek to meet or exceed LEED “Silver” level of sustainability pending capital funds availability.

Transportation: Reduce automobile trips to campus by 20% by 2012, through incentives and improvements in sustainable alternatives such as advocating carpooling and public transportation. Possibly institute a shuttle service to subway.

Purchasing: Develop and follow sustainability-focused purchasing policies in more than 50% of spending for campus materials and equipment by 2012 by instituting a shared supply system.

Solid Waste Management: Reduce production of municipal solid waste by 30% from 2006 levels by 2012 by working in conjunction with Facilities Management and Food Services to enhance solid waste and recycle programs. Introduce “Trayless” days in the cafeteria by limiting tray usage which may lessen discarded amounts of uneaten foods. Increase recycling efforts to include all recyclables including cardboard. Expand recycling incentives such as recycle-mania to include all buildings on campus and participate in nationwide competitions.

Greenhouse Gas Inventory and Reporting: Reduce greenhouse gas emissions campus wide. In 2007 BSU completed calculations of greenhouse gas emissions utilizing Clean Air Cool Planet’s Carbon Calculator spreadsheet. This will serve as the baseline for measuring reductions in emissions in the future. The summary is included in appendix IV.

Food Services: Minimize the environmental and social impacts of operations including indirect impacts of suppliers while continuously providing a variety of nutritious and sustainably-grown foods by possibly establishing campus community gardens.

Grounds Maintenance: Increase biodiversity and usable green space of the campus while reducing dependence on fossil fuels, other extracted minerals, chemical fertilizers and pesticides by advocating composting. As equipment is replaced investigate the availability of alternative power sources for replacements.

Chapter 4. Transportation

Transportation to and from Bowie State University (BSU) is a significant contributor to the campus' carbon footprint. As shown in the below table, BSU issued 2,668 parking permits for FY 2010. BSU also operates a fleet of vehicles for Public Safety, Maintenance, Athletics, and staff transportation.

Parking Permits issued for Bowie State University Fall 2009

Type of Permit Issued	Classification	Number Issued
I	Fall Semester, Only – students	207
C	Commuter Students (full-time)	1123
P	Part-Time Commuters	402
R	Resident Students	324
F	Faculty	247
RES	Reserve Faculty/Staff	77
S	Staff	288
TOTAL		2668

Upon signing the President's Climate Commitment, the University obliged itself to review all areas of potential reductions in carbon emissions. Campus transportation is one of those areas. BSU is uniquely situated in a location between Washington, DC and Baltimore, MD and is served by the Washington Metro Transit Authority bus systems as well as the MARC train system with connections to the Baltimore and Washington metro areas. The Marc train station (Penn Line) is directly adjacent to the campus and bus service is provided directly to the main campus area. All stations and stops are within walking distance to all campus buildings eliminating the need for a shuttle service.

The Climate Commitment Coordinating Committee is continually to review the utilization of these transportation options and will make recommendations for improvements when necessary.

I. Approach

A. Faculty, Staff and Student Commuting to Campus

Faculty, staff and students commuters utilize various methods to commute to campus. Currently approximately 96% of staff and 61% of faculty drive their personal vehicles to campus. Of the 5,600 students enrolled at BSU over 2,000 are currently authorized to drive and/or park a vehicle on campus. The committee estimated these numbers based on parking permit data from the Department of Public Safety. The University needs to promote the use of public transportation and encourage diverse options that will assist employees and students lower their carbon footprint.

Diverse Lower Carbon Strategies Needed

Lower carbon commuting strategies include a greater promotional plan to encourage faculty, staff & students to use the MARC Train and Metro Bus system. The University could derive at incentives that will increase the use of public transportation.

BSU is located in the center of the 3 major cities in the DC/MD region there is Annapolis, Baltimore and Washington, DC. The University should broker more connections with other busing companies from Annapolis, MD which is home to a large number of faculty, staff and students and yet there is no bus that can get them from that area to the University. The neighboring city of Laurel, MD also is also home to a major number of the University Community and there is very limited public transportation to and from that area.

The University is considering construction of new resident halls. BSU is also being considered for a property transfer of land near the MARC Station and is working with Prince George's County to develop strategies for this land to increase a variety of apartment complexes that will increase the number of students living on and near campus.

The University initiated out a carpooling program. The program is underutilized and needs to be redeveloped and marketed to encourage employees to carpool to work in order to reduce the number of vehicles coming to campus. There are many staff and faculty who carpool and they should be contacted by the C4 committee to assist in encouraging others to do the same.

Lastly, as BSU moves to purchase new vehicles for its fleet, hybrids and other energy efficient vehicles should be considered. Currently the University owns 38 vehicles in total. The Transportation Department currently has 3 alternative fueled vehicles; Public Safety has 1 alternative fueled vehicle. BSU purchases its vehicles from the Maryland State Contracts. Alternative fueled vehicles should be considered for all new vehicles purchases from the contract. However because some of these cutting edge technologies are still in their infancy a thorough evaluation must be completed before purchasing such vehicles. Areas to be considered include refueling infrastructure, funding, maintenance and training.

Impacts from reduced Vehicles on Campus

There will likely be a number of positive impacts from reducing the number of cars on campus. Among these impacts is a lessening of congestion on campus. There may be less demand for parking, which may allow certain lots to free up and the land used for other initiatives.

The increase of residence buildings in the next 5 years and the increase cost in fuel, car repairs and other vehicle expenses will allow the University to rethink how to offer new

incentives like a shuttle bus to local entertainment and shopping for a larger student body on campus. Better services to students will encourage the increase in future residence buildings making BSU more a resident University than a commuter university.

Measuring the Adoption of Alternative Transportation Options

Given the challenge and expense of monitoring multiple modes of transportation to determine mode switching and the resulting emission reductions, the Climate Control Coordinating Committee recommends that in the near- term, commuter parking permits be used to track progress away from single occupancy vehicle commuting to more sustainable modes of transportation. It is recognized that this metric is imperfect for a number of reasons. Specifically, the total number of issued commuter permits does not directly correlate to the amount of greenhouse gas emissions associated with commuting. The University does not have accurate survey data about campus commuter behavior, and therefore, use of the metric relies on a number of assumptions about commuter frequency and the average fuel economy of commuter vehicles.

Nonetheless, using the number of issued commuter parking permits as a method of measuring progress is the most viable near- term strategy since the data is readily available and currently used to estimate commuter related emissions. Moreover, giving up one's commuter parking permit and the associated convenience signals a willingness to change one's behavior and try lower carbon modes. Thus, the milestones established by the Climate Control Coordinating Committee will be based on reducing commuter parking permits which are converted into an emission reduction target. The University needs better commuter frequency and vehicle data to more accurately estimate the commuter footprint. This will allow for direct

computation of each individual's commuting footprint and diminish the need to use parking permits as the sole measurement tool.

Chapter 5. Education, Training and Research

The long-term vision is to link the university's formal teaching mission and informal teaching opportunities to develop understanding, attitudes and habits that promote sustainability. This section of the plan suggests a variety of ways that BSU can improve the way that it teaches sustainability, both inside the classroom and outside of it. The sub-sections and associated goals are:

Curriculum: Sustainability should be a recognized, emphasized, and common theme across colleges, departments and general education initiatives. Students should have extensive and diverse opportunities to study sustainability in their coursework. C4 can enlist help from the Provost and Student Affairs to introduce green-consciousness into the curricula.

Extra-curricular Awareness Raising across Campus: Raise awareness of students and staff through participation in campus sustainability activities that take place outside of the formal classroom. Doing so will increase our chances of generating a campus-wide commitment to sustainability by working with Student Affairs and SGA to develop Student Green-Fun awareness programs

Campus Events: Offer a large number and wide variety of well-attended events that teach and promote sustainability, and to coordinate and promote those events. Encourage active participation in annual Earth Day celebrations, Recyclemania competition and institute "Adopt-an-Area" competitions among the student groups.

Internships, Service Learning and Volunteering: Expand the opportunities for students to garner hands-on experience in a wide range of sustainability initiatives by increasing the

number of available internship, service learning, and volunteer experiences. Working with SGA to enlist green champions among student body

Research

The long term vision is that scholarly activities by faculty, staff and students generate ideas for creating a sustainable future. This section of the plan is primarily a vision of how to create future opportunities.

Goal: Develop and maintain research and scholarships that support campus sustainability efforts, contribute to the professional development of staff, and challenges students to apply their emerging skills and knowledge.

Chapter 6. Funding the Plan

The human resources described above will need financial and institutional support. The recommendation to establish a fund would provide one instrument for focusing resources, e.g. by collecting donations, revenues, or cost-savings. This would be in addition to using existing means to procure funding through the state, and grants.

Discussions could also be undertaken with the BSU Foundation and student organizations about ways they might wish to contribute to fundraising. Regardless of which funding sources are identified, the human resources are a prerequisite to being able to fully implement campus sustainability.

Budget Recommendation:

An appropriate level of funding will be required for successful implementation of Campus Sustainability Plan. Student assistants would be extremely valuable given the scope (e.g. auditing, planning, outreach, etc.) and the importance of student involvement and engagement.

Sustainability Fund: A sustainability fund or funds could be created to address:

- Donations to be collected by the BSU's Foundation
- A specific capital campaign, or strengthening the sustainability dimensions of other capital campaigns (e.g. New Academic Building)
- Targeted faculty chairs, scholarships, internships and student research funds to reward and encourage sustainability related activities on campus
- A rotating fund that can capture cost savings and revenues for later investment in new initiatives

Chapter 7. Goals and Recommendations

The Campus Sustainability Plan is comprehensive and ambitious, and includes many recommendations for initial consideration, within three years, and future consideration. While all of the recommendations would help make BSU more sustainable, some are critical, especially as we begin the process of implementation. Below is a list of those crucial tasks.

- 1) Create Organizational Infrastructure to Support Sustainability
- 2) Perform Energy Audit and Implement Recommendations
- 3) Encourage the Teaching of Sustainability
- 4) Initiate Residence Hall Programs on Sustainability
- 5) Implement recommendations from recent campus-wide environmental audit
- 6) Initiate Planning Procedures in Key Operational Areas
 - Transportation
 - Purchasing
 - Recycling
- 7) Develop Websites
- 8) Develop Community Gardens and Composting Site
- 9) Implement modifications to dining services (e.g. trayless services, composting)
- 10) Adopt LEED standards for construction and renovation projects as funds allow
- 11) Perform annual action plan progress review

Outreach

The long-term vision is that the university is well-known throughout the region and country as a source of information and inspiration about sustainability. This part of the plan focuses on ways of

sharing knowledge with the broader community and draws from the Sustainability Education, Teaching and Research dimensions.

Goal: Develop and maintain sufficient outreach efforts so that the sustainability lessons learned by BSU are known, appreciated, understood and used by the public.

A. Establish relationship with City to partner in and elevate green-awareness in the surrounding community.

- a. Host an annual Earth Day celebration/conference and advertise event via eco-networks (GenGreenLife, Earthbeat Radio, etc.)
- b. Maintain teaching food gardens (for use in campus cafeteria and/or donated to local food banks and/or sold at Bowie Farmer's Markets in summer)
 - i. On campus grounds
 - ii. With MNCPPC and other local growers on Enterprise Road
- c. Faculty, staff and student participation in congressional meetings, rallies or other green initiatives and politics to foster sustainability both locally and globally
- d. Create a prominent C4 link on the BSU website to disseminate updated green information and tips to the community; perhaps include mainstream communication methods such as Facebook, MySpace and Twitter
- e. Provide interviews/advice via local TV, radio & newspaper

B. Establish relationships with local schools for the purpose green-awareness and sustainability.

- a. Facilitate green information events for schools, students & parents
 - b. Advise and support school gardens
 - c. Host green competitions include full-family competitions for grade school
 - d. Offer credit and non-credit classes on sustainability and promote via eco-networks Note: BSU's Natural Science Department is currently listed with www.GenGreenLife.com
- C.** Faculty, staff and student participation/presentation in established local & national sustainability activities.
- a. DOE's annual Solar Decathlon held in DC on the National Mall
 - b. The annual Green Festivals in DC, Chicago, Denver, San Francisco and Seattle
- D.** Establish relationships with local green businesses for supplies and services
- E.** Create sustainability partnerships with villages and towns in US and other countries and sell their mindful wares in the bookstore and at Earth Day; may require transportation energy, but does speak to C4's commitment to social justice and global community.
- a. products e.g. Ugandan women making beaded necklaces and bracelets out of paper
 - b. Fair Trade e.g. chocolate from unified cocoa farmers of the Kuapa Kokoo Cooperative in Ghana

- F. Provide online report card of yearly sustainability events and promote to campus community. This is typically a part of the Assessment dimension of sustainability.

Assessment

The long term vision is that BSU acquires and uses sufficient information to guide and make understandable its sustainability efforts, planning, and decision-making.

Goal: Establish the means to assess campus sustainability and provide information to students, staff and community by featuring C4 projects and initiatives on the BSU website.

Appendix I. Acronym List

ACUPCC American College and University Presidents Climate Commitment

AF Administration and Finance

AFV Alternatively Fueled Vehicle

AREC Agricultural and Resource Economics

BEST BSU Environmental Sustainability Team

C4 Climate Commitment Coordinating Committee

CAFE Corporate Average Fuel Economy

CAP Climate Action Plan

CHP Combined Heat and Power

CIER Center for Integrative Environmental Research

CO2 Carbon dioxide

COMAR Code of Maryland Regulations

CPU Central Processing Unit

DIT Division of Information Technology

DOTS Department of Transportation Services

EPA Environmental Protection Agency

EPAct Energy Policy Act of 2005 / 1992

EPC Energy Performance Contract

EPP Environmentally Preferable Procurement

ESCO Energy Service Company

FMO Facilities Management Office

FTE Full Time Equivalent

GHG Greenhouse Gas

GRB General Research Board

GSA Graduate Student Association

HRO Human Resources Office

HVAC Heating, Ventilation and Air Conditioning

KWh Kilowatt-hour

LEED Leadership in Energy and Environmental Design

MD Maryland

MFRI Maryland Fire and Rescue Institute

MRA Maryland Recycling Act

MTCO₂e Metric Ton CO₂ equivalent

MW Megawatt

NPV Net Present Value

PRD Performance Review and Development Process

PV Photovoltaic

REC Renewable Energy Certificate

RPS Renewable Energy Portfolio Standard

SGA Student Government Association

TBA To Be Announced

TBD To Be Determined

UC University Council

UMR University Marketing and Relations

WG Work Group

Appendix II Glossary

Alternative Energy: Energy sources different from those in widespread use at the moments, which are referred to as conventional. Alternative energy sources include solar, wind, wave, tidal, hydroelectric, and geothermal. Although each has its drawbacks, none of these energy sources produces significant air pollution, unlike conventional sources.

Bio-Diesel: A type of biofuel that can be used in place of diesel fuel in modified engines. Biodiesel (fatty acid alkyl esters) is a cleaner burning diesel replacement fuel produced (by transesterification) from natural, renewable sources such as new and used vegetable oils and animal fats. A common form of biodiesel is rapeseed methyl ester (RME), which is derived from rapeseed oil.

Biofiltration: A pollution control technique using living material to capture and biologically degrade process pollutants. Common uses include processing waste water, capturing harmful chemicals or silt from surface runoff, and micro biotic oxidation of contaminants in air.

Biomass: Refers to living and recently dead biological material which can be used as fuel or for industrial production. Most commonly, biomass refers to plant matter grown for use as biofuel, but it also includes plant or animal matter used for production of fibers, chemicals or heat. Biomass may also include biodegradable wastes that can be burnt as fuel.

British thermal unit (BTU): Any of several units of energy (heat) in the HVAC industry, each slightly more than 1 kJ. One BTU is the energy required to raise one pound of water one degree Fahrenheit, but the many different types of BTU are based on different interpretations of this “definition”. The power of HVAC systems (the rate of cooling and dehumidifying or heating) is sometimes expressed in BTU/hour instead of simply watts.

Chiller: A device that removes heat from a liquid via a vapor-compression or absorption refrigeration cycle. This cooled liquid flows through pipes in a building and passes through coils in air handlers, fan-coil units, or other systems, cooling and usually dehumidifying the air in the building. Chillers are of two types; air-cooled or water-cooled. Air-cooled chillers are usually outside and consist of condenser coils cooled by fan-driven air. Water-cooled chillers are usually inside a building, and heat from these chillers is carried by recirculating water to outdoor cooling towers.

Composting: The controlled aerobic decomposition of biodegradable organic matter, producing compost. The decomposition is performed primarily by aerobic bacteria, helped by larger creatures such as ants, nematodes and oligochaete worms.

Connected Load: The sum of the ratings of the electricity consuming apparatus connected to a generating system.

Controller: A device that controls the operation of part or all of a system. It may simply turn a device on and off, or it may more subtly modulate burners, compressors, pumps, valves, fans, dampers, and the like. Most controllers are automatic but have user input such as temperature set points, e.g. a thermostat. Controls may be analog, or digital, or pneumatic, or a combination of these.

Ethanol: Also known as *ethyl alcohol* or *grain alcohol*, a colorless liquid that is produced by the fermentation and distillation of starch crops, such as corn, barley, that have been converted into simple sugars. Its chemical formula is C_2H_5OH . Ethanol can also be produced from cellulosic biomass such as trees and grasses and is called bioethanol. It is most commonly used to increase octane and improve the emissions quality of gasoline and is also used as an alternative fuel.

E-85: Ethanol can be blended with gasoline to create E85, a blend of 85% ethanol and 15% gasoline. E85 and blends with even higher concentrations of ethanol, E95, for example, qualify in the US as alternative fuels under the Energy Policy Act of 1992 (EPAct). Vehicles that run on E85 are called flexible fuel vehicles (FFVs) and are offered by several vehicle manufacturers.

Energy Audit: A survey that shows how much energy is used in a facility. It helps identify inefficiencies and ways to use less energy. An energy audit will pinpoint where a facility is losing energy and determine the efficiency of a facilities heating and cooling systems.

Geothermal energy: Heat from the Earth's interior that is a potential source of energy. The commonest way of capturing the energy from geothermal sources is to tap into naturally occurring hydrothermal convection systems where cooler water seeps into the Earth's crust, is heated, and then rises to the surface. When heated water is forced to the surface, it is straightforward to capture that steam and use it to drive generators.

Geothermal Heat Pump: A type of heat pump that uses the ground, ground water, or ponds as a heat source and heat sink, rather than outside air. Ground or water temperatures are more constant and are warmer in winter and cooler in summer than air temperatures. Geothermal heat pumps operate more efficiently than conventional or air-source heat pumps.

Green Power: A popular term for energy produced from clean, renewable energy resources.

Greenhouse Gases: Those gases, such as water vapor, carbon dioxide, tropospheric ozone, methane, and low level ozone that are transparent to solar radiation, but opaque to long wave radiation, and which contribute to the greenhouse effect.

Green Roofing: A **green roof** is a roof of a building that is partially or completely covered with vegetation and soil, or a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems. The term

"green roof" may also be used to indicate roofs that utilize some form of "green" technology, such as solar panels or a photovoltaic module. Green roofs are also referred to as eco-roofs, vegetated roofs, living roofs, and green roofs.

HVAC: An acronym that stands for "**heating, ventilation, and air conditioning**". HVAC is sometimes referred to as "climate control" and is particularly important in the design of medium to large industrial and office buildings such as sky scrapers and in marine environments such as aquariums, where humidity and temperature must all be closely regulated while maintaining safe and healthy conditions within.

Kilowatt (kW): A standard unit of electrical power equal to 1000 watts, or to the energy consumption at a rate of 1000 joules per second.

Kilowatt Hour (kWh): A unit or measure of electricity supply or consumption of one thousand watts acting over a period of one hour. The kWh is a unit of energy. $1 \text{ kWh} = 3600 \text{ kJ} = 3412 \text{ Btu}$.

Leadership in Energy and Environmental Design (LEED): A list of standards and certification scheme for environmentally-sustainable construction developed by the US Green Building Council (USGBC). The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is presently the most popular and respected guide for green building in the United States. It evaluates environmental performance from a whole-building perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building."

Light Emitting Diode (LED): A semiconductor light source. LEDs can produce a very bright light for a small amount of power. They are used in many applications e.g. car break lights, traffic lights, but white colored LEDs are a relatively new technology.

Low emissivity (low-E) Glass: Glass that has a low-emissivity coating applied to it in order to control heat transfer through windows. Windows manufactured with low-E coatings typically cost about 10–15% more than regular windows, but they reduce energy loss by as much as 30–50%.

Methane: A colorless, odorless, tasteless gas composed of one molecule of carbon and four of hydrogen, which is highly flammable. It is the main constituent of natural gas that is formed naturally by methanogenic, anaerobic bacteria or can be manufactured, and which is used as a fuel and for manufacturing chemicals.

Photovoltaic: Pertaining to the direct conversion of light into electricity. The word "photovoltaic," first used in about 1890, is a combination of the Greek word for light and the name of the physicist and electricity pioneer Allesandro Volta. So, "photovoltaic" can be translated literally as "light-electricity." The conversion of sunlight to electricity using photovoltaic (PV) cells, also known as solar cells, is based on the photoelectric effect discovered by Alexander Becquerel in 1839. The photoelectric effect describes the release of positive and negative charge carriers in a solid state when light strikes its surface.

Solar Hot Water Heating System: Solar water heating systems include storage tanks and solar collectors. There are two types of solar water heating systems: active, which have circulating pumps and controls, and passive, which don't. Most solar water heaters require a well-insulated storage tank. Solar storage tanks have an additional outlet and inlet connected to and from the collector. In two-tank systems, the solar water heater preheats water before it enters the conventional water heater. In one-tank systems, the back-up heater is combined with the solar storage in one tank.

Thermal Ice Storage: Refers to a number of technologies that store energy in a thermal reservoir for later reuse. They can be employed to balance energy demand between day time and night time. The thermal reservoir may be maintained at a temperature above (hotter) or below (colder) than that of the ambient environment. The principal application today is the production of ice, chilled water or eutectic solution at night, which is then used to cool environments during the day.

Wind Turbine: A wind energy conversion device that produces electricity; it typically has one, two, or three blades. Wind turbines can be classified into the vertical axis type and the horizontal axis type. Most modern wind turbines use a horizontal axis configuration with two or three blades, operating either downwind or upwind.

Appendix III BEST Directives and Resources

President's ACUPCC



American College & University Presidents Climate Commitment

We, the undersigned presidents and chancellors of colleges and universities, are deeply concerned about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects. We recognize the scientific consensus that global warming is real and is largely being caused by humans. We further recognize the need to reduce the global emission of greenhouse gases by 80% by mid-century at the latest, in order to avert the worst impacts of global warming and to reestablish the more stable climatic conditions that have made human progress over the last 10,000 years possible.

While we understand that there might be short-term challenges associated with this effort, we believe that there will be great short-, medium-, and long-term economic, health, social and environmental benefits, including achieving energy independence for the U.S. as quickly as possible.

We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality. Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society. These colleges and universities will be providing students with the knowledge and skills needed to address the critical, systemic challenges faced by the world in this new century and enable them to benefit from the economic opportunities that will arise as a result of solutions they develop.

We further believe that colleges and universities that exert leadership in addressing climate change will stabilize and reduce their long-term energy costs, attract excellent students and faculty, attract new sources of funding, and increase the support of alumni and local communities.

Accordingly, we commit our institutions to taking the following steps in pursuit of climate neutrality:

I. Initiate the development of a comprehensive plan to achieve climate neutrality as soon as possible.

- a. Within two months of signing this document, create institutional structures to guide the development and implementation of the plan.
- b. Within one year of signing this document, complete a comprehensive inventory of all greenhouse gas emissions (including emissions from electricity, heating, commuting, and air travel) and update the inventory every other year thereafter.
- c. Within two years of signing this document, develop an institutional action plan for becoming climate neutral, which will include:
 - i. A target date for achieving climate neutrality as soon as possible.
 - ii. Interim targets for goals and actions that will lead to climate neutrality.
 - iii. Actions to make climate neutrality and sustainability a part of the curriculum and other educational experience for all students.
 - iv. Actions to expand research or other efforts necessary to achieve climate neutrality.
 - v. Mechanisms for tracking progress on goals and actions.

(continued...)

2. Initiate two or more of the following tangible actions to reduce greenhouse gases while the more comprehensive plan is being developed.
- a. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.
 - b. Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.
 - c. Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.
 - d. Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.
 - e. Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.
 - f. Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.
 - g. Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.
3. Make the action plan, inventory, and periodic progress reports publicly available by providing them to the Association for the Advancement of Sustainability in Higher Education (AASHE) for posting and dissemination.

In recognition of the need to build support for this effort among college and university administrations across America, we will encourage other presidents to join this effort and become signatories to this commitment.

Signed,



President/ Chancellor Signature

Mickey L. Burnim

President/ Chancellor Name

Bowie State University

College or University

12/21/07

Date

Please send the signed commitment document to:

Mary Reilly
Second Nature
18 Tremont St., Suite 1120
Boston, MA 02108

or fax to: 320-451-1612
or scan & email to: mreilly@secondnature.org

Climate Commitment Coordinating Committee (C4) Pledge Membership



Pledge:

I support Bowie State University in their effort to create a sustainable campus that operates under sound environmental principles. It is important to monitor our use of energy and to understand how our conservative efforts will improve future generations. By supporting Bowie State University's endeavors to improve the environment I pledge to do the following:

- **I will turn off lights and monitors whenever possible**
- **I will recycle plastic bottles, cans and paper**
- **I will print documents double-sided whenever possible and send documents electronically as much as possible**
- **I will participate in recycling efforts on campus**
- **I will encourage the use of carpooling and alternate forms of transportation**
- **I will make a conscious effort to reduce my daily water usage**

Please circle your affiliation with Bowie State University:

(Community Member, Faculty, Staff, Student, Other)

Printed Name:

Signature:

Date:

Appendix IV Greenhouse Gas Inventory Summary

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Clean Air - Cool Planet Greenhouse Gas Emissions Calculator

Worksheet 8 of 8 Sumo

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