Salisbury University: A Maryland University of National Distinction

Climate Action Plan

2010

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Salisbury University Climate Action Plan

January 15, 2010

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INTRODUCTION

I. PREFACE

In preparing its Climate Action Plan (CAP), Salisbury University (SU) recognized the similarities between this institution and the University of Maryland College Park (UMCP). Consequently, the University carefully reviewed UMCP's Web site Climate Action Plan; whereupon, it found College Park's document to be well written and, in many instances, appropriate for Salisbury University's plan. As opposed to "reinventing the wheel," in those sections where it made sense to do so, SU chose to borrow from UMCP's document, language and/or substance, in order to create its CAP. We sincerely appreciate all of the effort UMCP put into developing its plan, thereby making this task much easier for SU.

II. BACKGROUND

By joining the Presidents' Climate Commitment, SU is setting an example of sustainability for its students, faculty, and staff.

In 2007, SU President Janet Dudley-Eshbach signed the American College and University Presidents' Climate Commitment, a pledge made by a coalition of leaders from a number of colleges and universities across the country, all concerned about the impact of global warming and dedicated to reducing greenhouse gas emissions from their institutions. As of October 2009, a total of 657 signatories had joined this consortium. In signing this pledge, President Dudley-Eshbach committed to moving Salisbury University toward "carbon neutrality."

Carbon neutrality is the act of reducing greenhouse gas emissions to the greatest extent possible and offsetting any remaining emissions such that the net emissions to the atmosphere are zero. This commitment not only signals the University's dedication to a leadership role in the fight against climate change, but it also reflects SU's central purpose: education. By joining the Presidents' Climate Commitment, SU is setting an example of sustainability for its students, faculty, and staff, and helping to educate the next generation of environmentally conscious citizens.

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Signatory schools acknowledge that climate change is a real concern, which carries the potential for widespread economic and environmental disruption. The Presidents' Climate Commitment "Call for Leadership" states that "reversing global warming is the defining challenge of the 21st century."[1] The steps toward fulfilling this campus commitment include, but are not limited to:

- Creating a campus committee or team to guide the project within two months of signing the commitment.
- Completing a greenhouse gas inventory within one year of signing the commitment.
- Creating a Climate Action Plan, including goals and implementation strategies, within two years.
- While the Climate Action Plan is being developed, initiating two of seven alternative measures to reduce greenhouse gasses in the short term, as stated in the commitment.
- Incorporating sustainability practices and theories into courses to educate the students that will become the leaders of future generations.
- Providing public access to the Climate Action Plan and the progress associated with it.

Salisbury University is located in the city of Salisbury and is the largest institution of higher education on Maryland's Eastern Shore. The campus occupies 155 acres and includes 56 buildings which total 1,641,277 gross square feet of building space. The campus is comprised of lightly wooded areas, open space, study space, and facilities for a diverse campus life.

In January 2008, President Dudley-Eshbach established the University Sustainability Committee, with faculty, staff, and students representing schools and departments from across the campus. The inaugural meeting of the University Sustainability Committee occurred in March 2008, and the group continues to meet on a regular basis. The mission of the University Sustainability Committee is to "develop and maintain a sustainability program that promotes the use of environmentally sound development and management practices campus wide and incorporates sustainability into instruction." Also the committee will "advise the President and Executive Staff in order to assure that the campus meets the objectives and commitments of the 'American College and University

The mission of the University Sustainability Committee is to "develop and maintain a sustainability program that promotes the use of environmentally sound development and management practices campus wide and incorporates sustainability into instruction.

[1] *See document at http://www2.presidentsclimatecommitment.org/pdf/climate_leadership.pdf.*

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The University's participation in the Presidents' Climate Commitment is a natural progression as SU continues and promotes efforts in environmental stewardship and sustainability.

Presidents' Climate Commitment' that was signed by President Janet Dudley-Eshbach and became effective January 2, 2008."

Salisbury University's commitment to the reduction of greenhouse gas emissions is evident from the actions already taken. A number of initiatives, strategies, plans, and programs have already begun as part of the Presidents' Climate Commitment. The University's existing programs and initiatives range from a 20-year-old recycling program, to the inclusion of sustainability in classroom curriculum, to the most recent partnership with Pepco Energy Services, Inc., for campus-wide energy conservation measures that project more than $5.3 million in savings over a 15-year period. The University's participation in the Presidents' Climate Commitment is a natural progression as SU continues and promotes efforts in environmental stewardship and sustainability.

The campus' Facilities Master Plan (FMP) identifies trends for the future and highlights opportunities to meet those future prospects. The 2009 FMP states: "It is important that Salisbury University design its new buildings to minimize negative environmental effects and costly energy usage."[2] In addition, the FMP affirms the University's desire that "the issue of sustainability has become one that is central to planning and design." To meet the needs of the future, the campus will grow in a controlled and planned way.

The 2009-2013 Strategic Plan established sustainability as a focus area and recommends that the University "implement the goals of the Facilities Master Plan and Presidents' Climate Commitment and continue to give major focus to identifying and implementing sustainability initiatives over the coming years."[3] The Strategic Plan also recommends sustainable alternatives to constructing new classrooms such as distance learning initiatives.

Greenhouse Gas Inventory: In 2008 a group of students from Salisbury University's Small Business Development Center (SBDC) and the Business, Economic, and Community Outreach Network (BEACON) conducted a comprehensive inventory of greenhouse gas emission sources in accordance with the requirements of the Presidents' Climate Commitment. The scope of the inventory included collecting data associated with electricity, fuel use, commuting, air travel, fleet vehicles, solid waste, refrigerants, and certain other chemicals associated with global warming.

[2] *See SU FMP at http://www.salisbury.edu/president/fmp/docs/Facilities_Master_Plan09.pdf.*

[3] *See document at http://www.salisbury.edu/president/strategicplanning/docs/strategicplan2009/Strategic%20Plan%202009%20Update.pdf.*

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The Clean Air-Cool Planet (CA-CP) Campus Carbon Calculator tool v6.4 converts greenhouse gas inventory data into carbon dioxide equivalent emissions or eCO2. Data from carbon dioxide equivalents may also be referred to as a "carbon inventory." The CA-CP calculator tool uses methodology consistent with standards of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to calculate eCO2 emissions. Notably, the CA-CP Campus Carbon Calculator tool is currently used by all 13 University System of Maryland Institutions for reporting greenhouse gas emissions.

Figure 1: FY08 eCO2 Emissions by Source

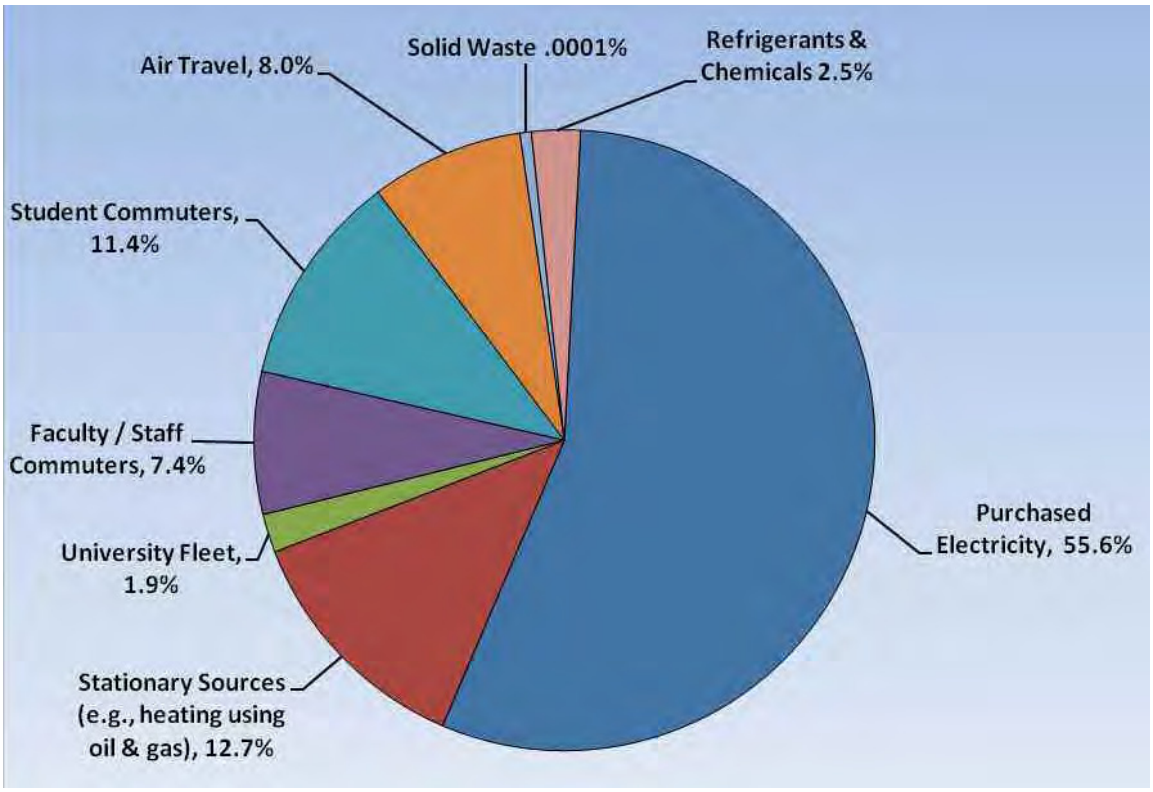


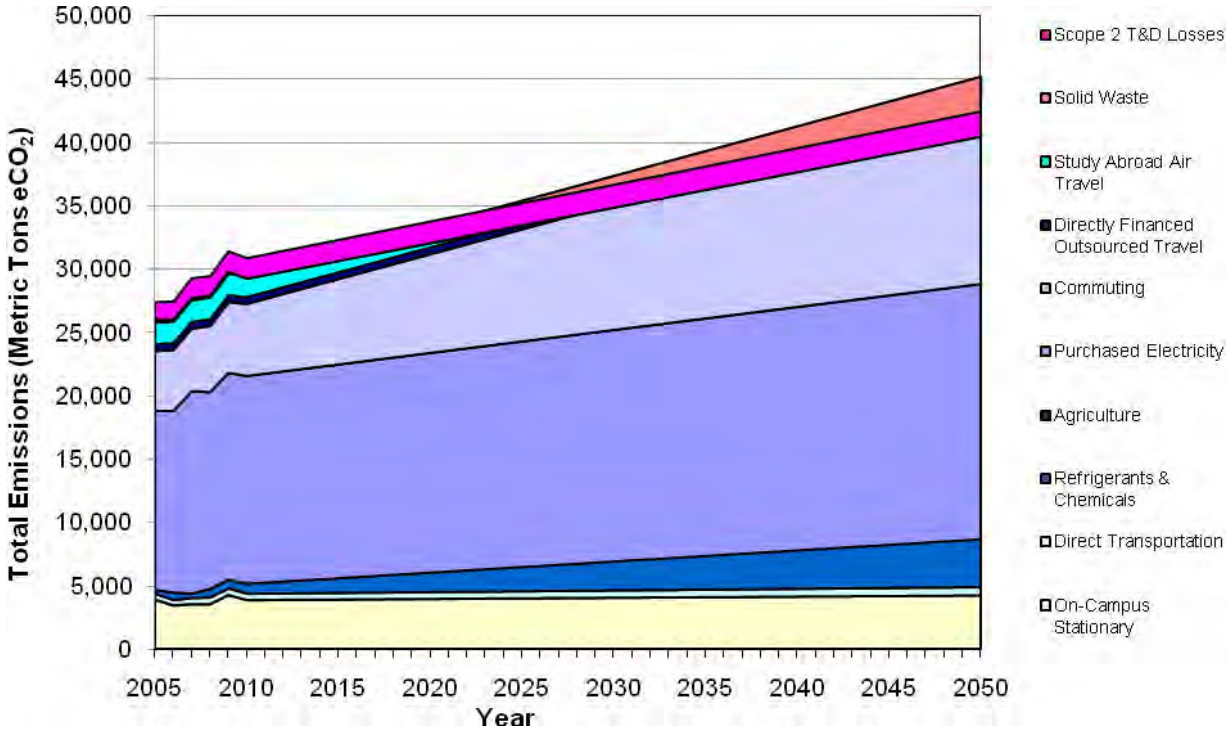
Table 1: FY08 eCO2 Emission Breakdown

Source	eCO2 Emitted (Metric Tons)
Electricity	15,525
Stationary Sources	3,551
Transportation (ground)	5,753
Transportation (air)	2,224
Refrigerants	708
Solid Waste	166
Agriculture	8
Total	27,935

In January 2009, Salisbury University published the first inventory of greenhouse gas emissions. During FY08, the University emitted approximately 27,935 metric tons of carbon dioxide equivalents. The largest contributor to this value was electricity use, followed by multiple forms of transportation, and oil and natural gas heating after that. For comparison purposes, the amount emitted is roughly equivalent to the annual emissions from 4,600 cars or sequestered by 7,600 acres of Maryland's Eastern Shore forest.

Using the FMP, consisting of campus construction and renovation plans through 2030 along with campus future population growth estimates, SU's greenhouse gas emission trajectory was developed (Figure 2). Without implementing mitigation strategies and conducting business as usual, campus emissions are projected to steadily rise to approximately 45,000 metric tons of carbon dioxide equivalent by the year 2050.

Figure 2: Emissions Trajectory



Baseline Emissions: Although greenhouse gas emission data for FY08 represent the most complete data set at present, FY05 data was chosen for the baseline year since statewide energy reduction requirements use FY05 as the baseline year. In accordance with guidance provided by the Association for the Advancement of Sustainability in Higher Education (AASHE), commuter data was collected in FY08 using a commuter survey. Since this information was not collected in prior years, it was estimated for the baseline year based on changes in population values for students, faculty, and staff. Similarly, air travel data collected in FY08 was estimated for prior years based on population changes. For future reporting, the University Sustainability Committee will work to improve both completeness and accuracy of the data.

Figure 3: FY05 eCO2 Emissions by Source

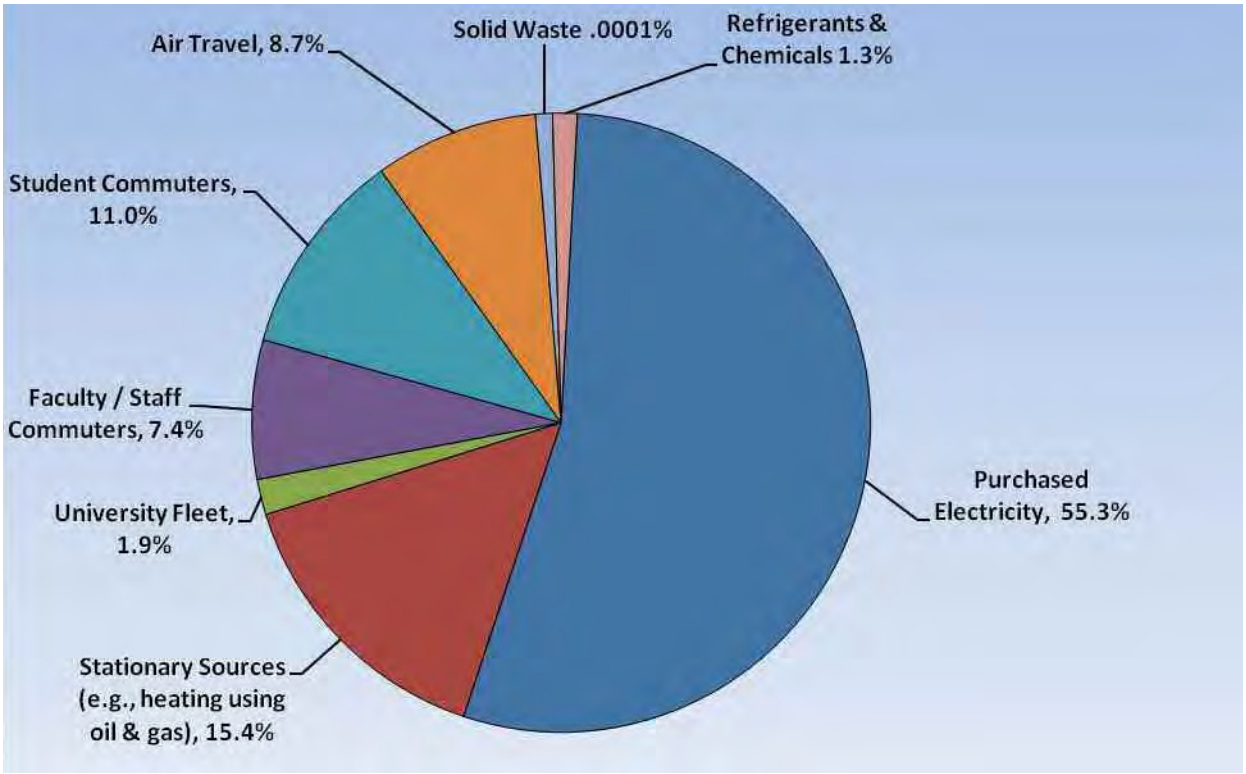


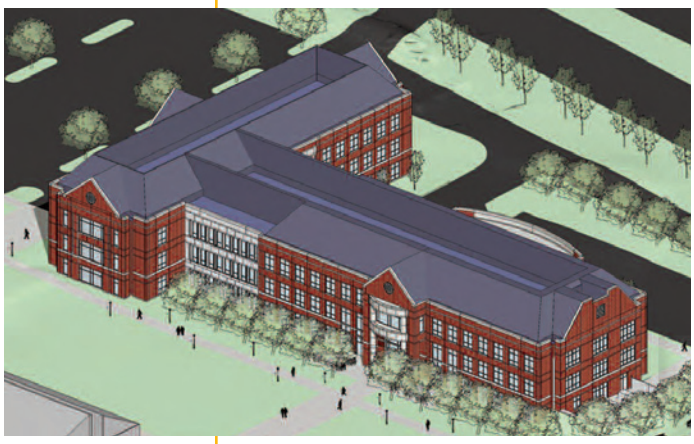
Table 2: FY05 eCO2 Emission Breakdown

Source	eCO2 Emitted (Metric Tons)
Electricity	14,122
Stationary Sources	3,927
Transportation (ground)	5,407
Transportation (air)	2,224
Refrigerants	332
Solid Waste	231
Agriculture	7
Total	26,250

Tangible Actions: The University has already taken tangible actions toward its Climate Commitment. A policy has been implemented requiring procurement of Energy Star-certified products in all areas where such products exist. A set of campus standards was created for new construction projects so that the University will strive to achieve the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification at minimum, as State funding allows. Salisbury University earned its first LEED Silver certification for the Teacher Education and Technology Center (TETC), which opened in 2008. SU's pursuit of LEED certification continues with the development of the new Perdue School of Business building (which is pursuing Gold certification), the new Sea Gull Square student housing and retail project (which is pursuing Silver certification), and all major building renovation projects.

The University will strive to achieve the U.S. Green Building Council (LEED) Silver certification at minimum.

Climate Action Plan Workgroup: Since early 2009, a group of 20 students, faculty, and staff from 16 University schools, offices, and departments have been meeting as part of the Climate Action Plan Workgroup. The project is divided into six theme areas: Administrative Policies, Power and Operations, Transportation, Solid Waste, Education and Research, and Financing the Plan. For each of the theme areas, members work to devise emission reduction strategies as well as ways to integrate sustainability, climate-change learning, and problem solving into teaching, research, and the campus community.



SU's Climate Action Plan is being crafted during a time of financial uncertainty for the campus, state, and nation. In addition, a new federal administration makes it unclear whether economic stimulus packages, new federal budget priorities, or regulatory changes will hinder or facilitate this plan. This plan was developed without specific consideration of these uncertainties, though its implementation will depend upon the financial resources and regulatory changes necessary to place these recommendations into practice.

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The strategies that are proposed here represent consideration of current and cutting-edge technologies; no single strategy will be sufficient to achieve carbon neutrality.

III. APPROACH

To develop its recommendations and goals, SU's Climate Action Plan subcommittee consulted the University of Maryland College Park's excellent Climate Action Plan and closely followed many of its recommended actions and implementation plans.[4] SU also examined climate action plans, as available, from performance peers to learn more about approaches implemented at comparable comprehensive institutions. The strategies presented in this document represent the consensus of the Climate Action Plan Workgroup at the time the document was prepared. It should be noted that the list is neither final nor comprehensive and will be subject to revisions over the years to come. Achieving carbon neutrality is not a static process; it requires changing responses to a rapidly changing world.

From the outset of this project, it was clear that the University needed to set ambitious, yet realistic, goals for emission reductions. These goals will be reached by a combination of human effort and innovative technology. Implementing this initiative will place additional demands on already limited campus resources, both human and financial. As a priority, the workgroup proposes that the University achieve carbon neutrality by investing in energy efficiency, educational programs, and conservation measures before considering carbon offset purchases for any remaining emissions.

Currently, the University predicts a campus growth rate of approximately 2 percent per year. Mitigating the emissions associated with growth requires a creative approach to development. The strategies that are proposed here represent consideration of current and cutting-edge technologies; no single strategy will be sufficient to achieve carbon neutrality. Instead, a combination of strategies is necessary which effect change in efficiency, energy source, human involvement, source choices, and educational opportunities. As changes occur in technology, supply sources, energy options, and energy cost, the priority of projects presented here may shift higher or lower due to return on investment, educational value, social value, or a combination of factors.

The Climate Action Plan includes strategies to be implemented by 2015, 2020, 2025, and 2050. Due to the difficulty in predicting technology more than 15 years out, most of the strategies are proposed within this first

[4] *See UMCP CAP, available at http://acupcc.aashe.org/cap-report.php?id=278.*

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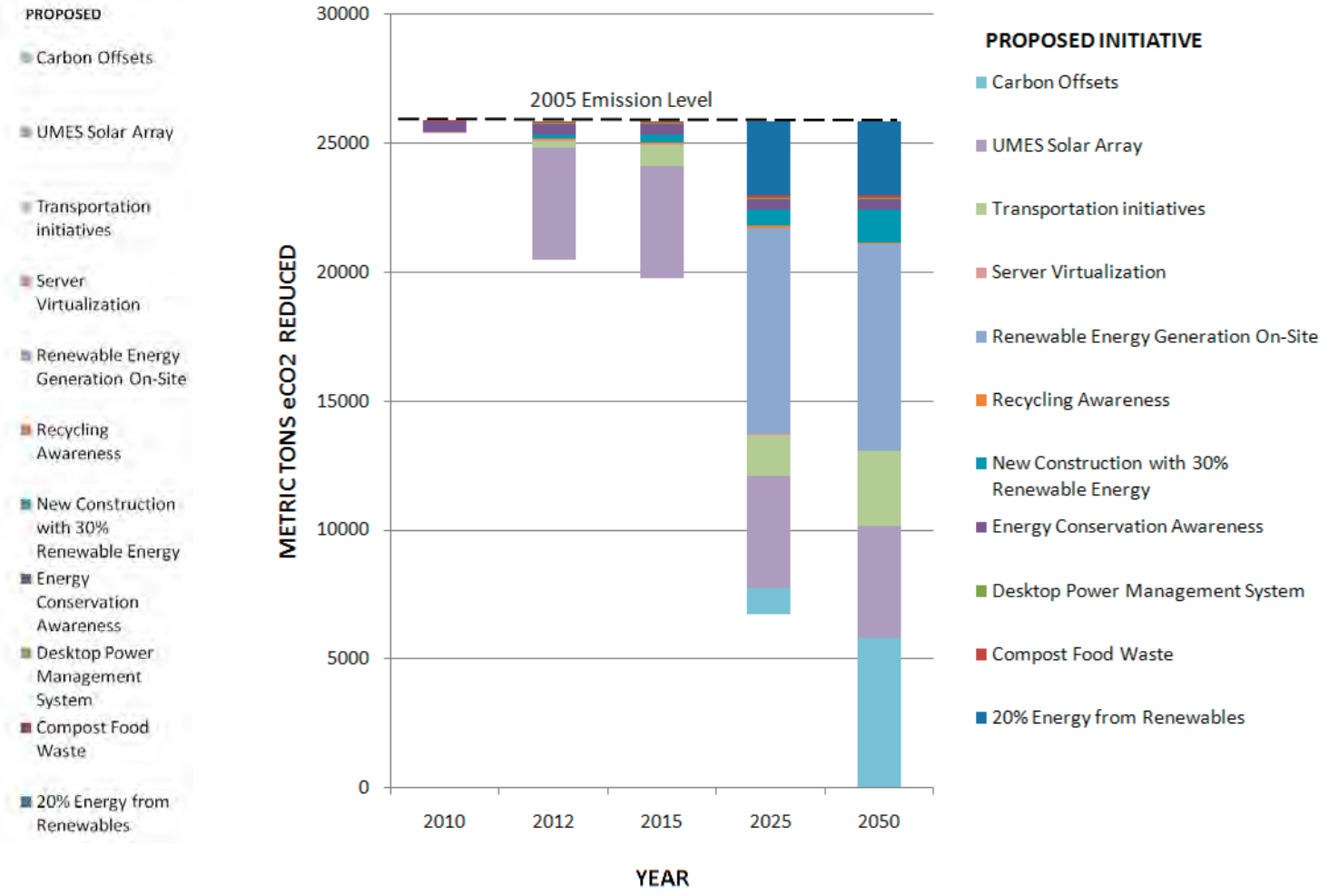
15-year period. It is anticipated that the plan will be revisited on a five-year cycle with revisions for the following 15 years based on achievements, challenges, and technological trends.

Table 3: Greenhouse Gas Reduction Goals

Fiscal Year	GHG Emissions (MTCO2e)	Salisbury University Goals	State of Maryland Goals
2005 (baseline)	26,250	N/A	N/A
2012	22,313	15% below 2005 levels	10% below 2006 levels
2015	19,688	25% below 2005 levels	15% below 2006 levels
2020	18,375	30% below 2005 levels	25%-50% below 2006 levels
2025	13,125	50% below 2005 levels	N/A
2050	0	100% below 2005 levels	90% below 2006 levels

The Draft Climate Action Plan Mitigation Strategies graph (Figure 4) illustrates the collective impact of emission-reduction strategies as outlined in subsequent sections of this report. Some projects such as an on-site renewable energy generation are conservatively estimated, though it is possible that such a system might provide more energy than the University presently consumes. Generally, where a schedule for implementation is specified the associated emission reduction has been used to illustrate progress toward the goal of neutrality. In addition, the graph includes a description for "carbon offsets" which generically represents an investment in local or regional carbon offsets for campus emissions. As stated previously, the preferred approach to carbon emission reduction is investment in technology, education, and changes in policies on the campus. At present, it is speculative whether carbon offsets will be used to achieve SU's interim goals. However, if they are used, the University will need to give priority to offsets that positively impact our city, region, state, or nation, with respect to that sequence.

Figure 4: Draft Climate Action Plan Mitigation Strategies



In accordance with the Presidents' Climate Commitment, the next greenhouse gas inventory is due in January 2011, including emissions data from FY10, and on a biannual basis from that date. Also, the Climate Action Plan must be revisited regularly, and a mechanism for tracking progress on goals and actions must be created. The next reporting period for progress on the Climate Action Plan is January 2012 and on a biannual basis from that date. Salisbury University will need to determine the appropriate body to monitor and oversee the periodic updates to the plan.

ADMINISTRATIVE POLICIES

(To develop SU's recommendations and goals, SU borrowed extensively from/duplicated the UMCP Administrative Policies section. We are truly appreciative for the effort UMCP put forth, thereby making it easier for SU to complete this task.)[5]

I. BACKGROUND

To achieve carbon neutrality the campus must undergo a paradigm shift in its operations. Looking to the short term, the Climate Action Plan Workgroup discussed several administrative policies for reducing emissions, focusing on green procurement policies for a wide range of products and services. Looking beyond these initial efforts, external policies such as State energy finance and requirements under the Energy Policy Act of 1992 and 2005 should be considered. Additional University-based policies for consideration include carbon neutrality policies for new buildings, departmental energy consumption accountability (and incentives for conservation), and petroleum-based transportation fuels reduction. As SU's pursuit of carbon neutrality develops, additional policies and procedures will evolve. These policies are inter-related, and as

[5] *See UMCP CAP, available at http://acupcc.aashe.org/cap-report.php?id=278.*

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A primary principle of the Climate Action Plan is increasing the awareness and accountability of the campus community with regard to its energy usage in all forms and the resulting greenhouse emissions from that usage.

such they relate to a number of strategies outlined in this Climate Action Plan. Implementation strategies for policies are outlined in subsequent chapters.

II. APPROACH

When considering the creation of administrative policies to support the Climate Action Plan, there are many diverse University entities and interests that must be considered. Ultimately, these policies must be in alignment with the mission, vision, and values of Salisbury University.

A primary principle of the Climate Action Plan is increasing the awareness and accountability of the campus community with regard to its energy usage in all forms—buildings, physical plant, ground transportation, air travel—and the resulting greenhouse emissions from that usage. In addition, a broader understanding of the environmental impact of procurement decisions is key. Because campus energy is centrally produced and distributed, large numbers of campus energy users have no concept of their individual usage and have little incentive to make actions toward conservation. To support campus adherence to the Climate Action Plan, University policies should have appropriate accountability measures and incentives. It may be necessary to use mandatory language when creating policies, and goal setting and progress markers are also integral components.

To minimize long-term energy, environmental, and social impacts, incorporating life-cycle thinking into University decision making is integral, particularly as it relates to building design, construction, and procurement. This helps to ensure that campus units and their operations support the University's goal of carbon neutrality.

III. ADMINISTRATIVE POLICY PROPOSALS

Salisbury University is following the University of Maryland College Park's lead and is using their developed internal and external policy strategies (Table 4) as a model for creating our own strategies.

The development of these policies will be prioritized based on their ability to create an enabling environment for carbon neutrality and sustainability on campus. This includes streamlining data sharing and reporting on projects and issues related to the plan; influencing administrative and managerial support, funding mechanisms, and campus culture; as well as emissions reduction potential and cost effectiveness.

IV. SUGGESTED COMMUNICATIONS AND OUTREACH

Marketing and outreach about new policies and procedures should include the broader context of the University's efforts to address climate change. Where possible, policies should come from the President and Vice Presidents to connote the importance of the policy as part of the Presidents' Climate Commitment and the University's Climate Action Plan.

The University needs to continue sharing with students, faculty, and staff its commitment to climate action and efforts to reduce energy consumption. The message of such communications should be that these efforts will save the University and the State money, reduce the campus' contribution to global warming, enhance its research and education missions, and establish the University as sustainability leader. All such efforts will continue to support SU's growing reputation as *A Maryland University of National Distinction.*

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Table 4: Potential Internal and External Policy Strategies for Campus Action

Action

Sustainable Procurement Policy (SPP)

Implementation Mechanism

- Draft policy developed by the Office of Procurement with input from the Climate Action Plan Work Group.
- Procurement of Energy Star product (when available) is required.
- Include designation of SPP resource person within procurement.
- Goals should be set and high priority products should be identified early in the process.

Rationale

- Saves money.
- Reduces the environmental impact on campus operations.
- Makes use of collective purchasing power of the University to support "green" products.
- Provides education on SPP.
- Encourages behavior rather than requiring something that cannot be easily enforced.

Other Benefits

- Employee environmental awareness may strengthen other campus efforts such as energy conservation.
- Reduce campus solid waste as more recyclable products are procured (including products that are "taken back" by manufacturers to be recycled).

Action

Energy Star Computer Settings

Implementation Mechanism

- Policy that implements standard energy saving settings for University-owned computers and other equipment as appropriate.

Rationale

- Saves money.
- Since equipment users do not pay for the energy associated with use, these settings have not been a priority.

Other Benefits

- Might influence employee and student home IT related energy use.

Action

Telecommuting Options for Employees

Implementation Mechanism

- Policy to support faculty/staff telecommuting as appropriate.
- Significant resources presently exist on campus that could support the program.

Rationale

- Certain campus jobs could be conducted remotely, thereby saving commuting time, emissions, etc.

Other Benefits

- Business continuity and disaster preparedness.
- Employee satisfaction and retention.

Action

Modify Campus Fleet Policies to Underscore the Importance of Fuel Efficiency and Low Emission Vehicles

Implementation Mechanism

- Add language to Motor Pool's policies: "Vehicle purchase requests must take into consideration the most economical, most fuel efficient, and lowest emissions vehicles available in a particular model year that meet the operational needs and policy requirements of the University. In addition, the University must consider safety issues, federal warnings, and commercial driver's license requirements when selecting vehicles. "

Rationale

- Include the greenhouse gas implications of purchases in Motor Pool policies.

Other Benefits

- Education of campus community.

Action

Campus Petroleum Fuel Reduction Goal

Implementation Mechanism

- Policy requiring campus to reduce petroleum usage 2% by 2012, 5% by 2015, and 15% by 2020.

Rationale

- Provide a goal to encourage campus units to reduce their petroleum-based fuel consumption.
- Oversight and accountability will be needed to measure how each Department is meeting this goal.

Other Benefits

- Begin to introduce emissions reduction goals into thinking and practice of Motor Pool and users.

Action

Carbon Neutral Grounds and Landscaping

Implementation Mechanism

- Begin to explore landscaping opportunities to reduce maintenance and other emissions, including mowers, leaf blowers, trucks, and other power equipment needed to maintain annuals and grass.

Rationale

- Groundskeeping is energy intensive.

Other Benefits

- Storm water quantity and quality.
- Aesthetics.
- Education of the campus community (visible presence on campus).

Action

Carbon Neutral New Buildings

Implementation Mechanism

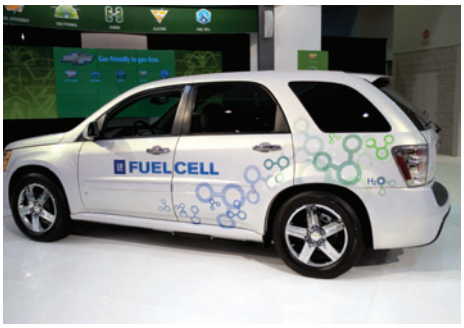
- A policy that requires all new buildings to be built carbon neutral through increased energy efficiency; renewable applications on site; and renewable energy procurement.

Rationale

- New buildings will increase the campus' carbon footprint unless designed and built carbon neutral.
- New buildings can employ the latest technologies.
- Engage new building occupants to consider energy implications of design requirements.
- Up front investment in energy efficiency will reduce GHG emissions and lower operating costs.

Other Benefits

- Policy would establish the University as a campus leader in climate action.



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Action

Behavior Modification Through Departmental Energy Reports

Implementation Mechanism

- A policy and energy reporting mechanism that encourages campus departments to reduce their energy usage.
- Departments that exceed or fall below their goals should be recognized.

Rationale

- Saves money.
- Departmental leadership across campus need to understand the energy implications of their operations and decision making.
- Departments should be incentivized to reduce their consumption.
- Measurement is needed to hold people accountable to campus goals.

Other Benefits

- Policy and practice would establish the University as a campus leader in sustainability and climate action.
- Might influence employee and student energy usage off campus, providing additional GHG reduction benefits.

Action

Cost Savings Returned to University

Implementation Mechanism

- Keep University energy budget whole while energy savings are used to pay back capital investments for energy efficiency and conservation measures.
- This could apply to savings from increased recycling on campus.
- Savings may be needed to invest is infrastructure and education outreach.

Rationale

- Long-term financial savings.

Other Benefits

- Leadership in support of USM carbon neutrality efforts.

Action

Additional Capital Investment for High Performing Energy Efficient Buildings

Implementation Mechanism

- State should provide additional capital funding to construct high performing, energy efficient buildings based on engineering estimates/guarantees of operations and maintenance savings over the life of the building.
- Currently the small premium for green building construction and design is too insignificant to make the radical leap forward that is needed.

Rationale

- Saves money over the life of the building.
- University cannot afford additional up-front capital costs.
- State will recoup investment through lower operating costs.

Other Benefits

- Opportunity to provide leadership that will support USM carbon neutrality.

Action

Evaluate Class Scheduling to Identify Potential Areas for Efficiency Improvements, in Consultation with Stakeholders

Action

Federal and Other Policy Flexibility

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POWER AND OPERATIONS

I. BACKGROUND

Emissions: In 2005, campus utilities and operations accounted for 62.4 percent of campus greenhouse gas emissions. The emissions in 2005 were as follows:

Table 5: 2005 Campus Emissions from Power and Operations

Emissions Type	$MTCO_2e$	Percentage
Purchased Electricity	14,511	49.2%
Purchased Natural Gas	2,561	8.7%
Purchased #2 Fuel Oil	1,339	4.5%
Total Power-Related Emissions	18,411	62.4%
Total Campus Emissions	29,474	100%

NOTE: FY 2005 was selected by the State of Maryland as the baseline.

Salisbury University takes great pride in its long track record of being a good energy steward. Since the late 1970s, SU has had a focus on conservation and efficiency. The position of Energy Manager was created in the mid-1970s and an energy management system was implemented in 1985. Over the years, many efficiency gains were achieved through simple and low-cost changes.

Conservation and efficiency will only take the University so far toward its goal of carbon neutrality. In the long run, the solution must be a full transition from fossil fuels to renewable energy. This transition will require new breakthroughs in technology. Planners do expect reliable commercial systems to be available in that timeframe to meet SU's carbon neutrality goal.

Electricity: The campus is currently powered by purchased electricity from Direct Energy and delivered by Delmarva Power. The Department of General Services and the University System of Maryland (USM), in the interest of efficiency, have collaborated in the procurement of electricity, factoring in a renewable requirement.

Conservation and efficiency will only take the University so far toward its goal of carbon neutrality. In the long run, the solution must be a full transition from fossil fuels to renewable energy.

The University has aggressively invested in energy savings through building upgrades and system replacements.

Energy Finance: SU currently spends approximately 3.2 percent of its total budget on energy. This includes electric consumption, natural gas, and fuel oil. Past energy savings from efficiency measures have been used to maintain and upgrade the energy management system. The University has aggressively invested in energy savings through building upgrades and system replacements.

Table 6: Salisbury University Energy Budget, 2002-2009*

	Energy Budget**	Total Campus Operating Budget	Energy % of Total Budget
2002	$ 1,995,276	$ 89,454,989	2.2%
2003	$ 2,475,139	$ 90,005,713	2.7%
2004	$ 2,571,774	$ 91,665,547	2.8%
2005	$ 2,782,551	$ 94,744,511	2.9%
2006	$ 3,183,948	$ 98,363,033	3.2%
2007	$ 3,089,285	$ 117,130,747	2.6%
2008	$ 3,922,288	$ 120,715,998	3.2%
2009	$4,295,871	$126,618,603	3.4%

*Source of data: Salisbury University Clean Air – Cool Planet Campus Carbon Calculator
**Combined budget for electric, natural gas, #2 fuel oil, and domestic water and sewer

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II. APPROACH

A. Overview

In 2007 a campus energy audit was conducted by Pepco Energy Services, Performance Contractor. The report highlighted a number of energy conservation measures (ECM). As a result of the performance contract the following ECMs were undertaken:

- High-efficiency lighting
- Domestic water conservation
- Chiller replacements/upgrade
- VAV installation
- Duct sealing
- Demand control ventilation
- Energy-efficient motor/VFD installation
- Building envelope improvements

The University will continue to address energy efficiency through facility renewal projects and will explore opportunities for energy recovery and living roof implementation across the campus. Beyond these efficiency measures, SU will pursue new technologies as they emerge to assist the University in meeting its carbon neutrality goal. However, reaching the ultimate goal of carbon neutrality is contingent on these future technologies.

Reducing Energy Demand and Planning for Growth: The following table (Table 7) illustrates how conservation and renewable energy procurement (from off campus) and on-campus production will be needed to make the campus carbon neutral by 2050. The goal is to achieve 30 percent renewable energy generated on campus (solar, wind, and bio-mass), and the balance will need to be procured from off-campus sources. The University wants to have a renewable energy generation source included in all new construction. To achieve this, high priority must be given to the funding of this renewable energy component by the USM and the State of Maryland.

SU will pursue new technologies as they emerge to assist the University in meeting its carbon neutrality goal.

Salisbury University's partnership with Mac-Gray for energy-efficient laundry machines results in an annual savings of over 100,000 gallons of water.

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Table 7: Renewable Energy Goals Based on Energy Efficiency/Conservation Measures and Campus Growth

	Energy Reduction Goals			Planned Campus Growth		Renewable Energy Goals (initial estimates)			
	% Target Reduction (From Empower Maryland)	MWhs Used	MW Used	Additional MW Needed*	Total MW Required	Off Campus (MW)	On Campus (MW)	Total (MW)	% Renewable (Given Reductions in Use + Growth)
2005	(Baseline)	26,574	5.6	0.00	5.6	0	0	0	0
2010	10%	23,917	5.0	.95	5.95	0	0	0	0
2015	15%	22,588	4.76	2.45	7.21	.72	36	1.08	15%
2020	20%	21,259	4.48	4.25	8.73	1.75	.873	2.62	30%
2025	25%	19,930	4.2	7	11.2	3.36	2.24	5.60	50%
2050	(Neutrality goal)	19,930	4.2	8.4	12.6	8.82	3.78	12.6	100%

* Above the 2005 baseline.

Projected Energy Demand Based on New Construction:

- By 2010 – an increase of 6.5 percent over 2005 baseline
  - TETC opened 2008 (.95MW)
- By 2015 – an increase of 29.0 percent over 2005 baseline
  - Perdue School of Business building 2011 (.70MW)
  - Sea Gull Square Residence Hall 2011 (.80MW)
- By 2020 – an increase of 56.0 percent over 2005 baseline
  - Recreational Center 2015 (.6 MW)
  - Library 2018 (1.2MW)
- By 2025 – an increase of 100.0 percent over 2005 baseline
  - Fine and Performing Arts center (.75 MW)
  - Physical Education Building (1.0 MW)
  - Residence Hall #1 (.5 MW)
  - Residence Hall #2 (.5 MW)
- By 2050 – an increase of 125.0 percent over 2005 baseline
  - Based on a 1 percent annual growth from 2025 to 2050 over baseline of 2005 (1.4 MW)

State Requirements: Under the EmPOWER Maryland initiative, the State is targeting a reduction in per capita electricity consumption of 15 percent by the year 2015 (below 2007 levels). For planning purposes, SU has adopted University of Maryland College Park reduction targets of 10 percent (below 2005 levels) by 2010 and proposes additional reductions of 20 percent by 2020 over 2005 levels and 25 percent below 2005 levels by 2025.

B. Emission Reduction Strategies Defined

1.0 Building Efficiency Projects

As mentioned in the overview of this chapter, SU initiated an energy performance contract with Pepco Energy Services to identify energy conservation measures (ECM). The University elected to move forward with the performance contract through self-financing, and the ECMs undertaken are highlighted previously in this plan. The University expects to recoup the investment in 16.2 years and plans to do an energy audit every five years to identify additional energy savings opportunities.

2.0 New Construction with Renewable Energy Generating Component

Another strategy for emission reduction at SU is supported by the campus' adherence to the U.S. Green Building Council's LEED Silver (or higher) rating. Separate monies in addition to construction funds need to be provided at the State level to support the higher investment required for these more stringent standards.

The University should set a goal of 30 percent of the building energy load to be provided from on-site renewable energy sources.

3.0 Behavior Modification

It has been estimated that the University could save approximately 3 percent over 2005 levels by 2015 by raising campus awareness of energy conservation. The University should aggressively promote energy conservation measures such as:

- Turning off lighting when not needed
- Shutting down computers at the end of day
- Conserving water
- Dressing appropriately for the season
- Adjusting building temperatures cooler in the winter and warmer in the summer
- Powering off equipment in classrooms, dorm rooms, and offices when not in use

The University should continue to provide incentives through competitions between various groups or departments for energy savings.

The State of Maryland has set a 2022 goal that 20 percent of electricity supplied in Maryland will be from renewable sources, including Renewable Energy Certificates (RECs).

4.0 Campus-Based Renewable Energy Generation

The University should consider hiring a consultant to evaluate the potential for a central bio-mass plant, solar arrays, central steam plant, or other renewable energy generation options. A consultant will bring industry experience and expertise and provide options previously not considered by University personnel. The University may need to partner with other local energy users in order to offset some of the costs and make the project more viable.

5.0 Maryland Renewable Portfolio Standard (RPS)

The State of Maryland has set a 2022 goal that 20 percent of electricity supplied in Maryland will be from renewable sources, including Renewable Energy Certificates (RECs). Achievement of this goal will be handled by the State of Maryland independent of the University.

6.0 Explore Locally Produced Sustainable/Renewable Electricity

SU should explore the possibility of purchasing electricity from neighboring University of Maryland Eastern Shore's solar array (UMES). UMES has an agreement with Sun Edison to build a large solar array on their campus, which has the potential to produce surplus electricity. The University should explore the possibility of expanding the planned solar array to handle SU's needs as well. In addition, SU should continue to explore any future opportunities presented by local renewable projects.

7.0 Efficiency in Computing

Information Technology (IT) is aggressively pursuing two major IT related emission reduction strategies and researching another. Presently IT is using "server virtualization" to reduce energy demand. This special software allows a single physical server to run the programs or services previously run on multiple servers. The strategy is very effective in concentrating the CPU usage of numerous underutilized boxes. This

reduction in physical servers saves both electricity and heating and cooling costs. There are additional benefits in the areas of reduced patch maintenance as well as future disaster recovery opportunities.

7.1 Power Management of University-Owned Desktop Computers

Student computer labs are configured to power up and power down on a schedule. This prevents huge numbers of computers running continuously. Additional power-saving features are being enabled on new or reconfigured computers that support these options. University employees are encouraged to power off their PCs when not in use except on "Patch Tuesday" when software updates are scheduled.

Information Technology is exploring the "thin client" for student computer labs. The technology places the CPU processing power and storage in a central server. Thin client is basically a terminal connecting through the campus network. There is an opportunity for saving electricity in the computer lab environment since the client machines draw much less power when operating. The suitability of this strategy is yet unproven and requires further study in an SU environment.

8.0 Certified Carbon Offsets

Certified Carbon Offsets can be a useful strategy in reaching carbon reduction goals. However, the focus of this Climate Action Plan is the reduction of emissions through efficiencies of operation and equipment, changes in behavior, and the increased use of renewable energy sources. As previously stated, Certified Carbon Offsets may play a role in meeting specific reduction goals but should be implemented after other available reduction strategies have been exhausted.

III. EMISSION REDUCTION STRATEGIES OVERVIEW

SU is following University of Maryland College Park's lead using their developed formula and summary table format (below). The sixth column, NPV, measured in dollars per ton of CO2e avoided, shows Net Present Value (a calculation of the present value of an investment's future net cash flows minus the initial investment) as a metric for project effectiveness. This number includes both costs and savings from the project to determine whether there are net savings or costs from a project. A discount rate of 5 percent is assumed for all calculations.

Table 8: Suggested Power and Operations Strategies for Campus Action

Action

1.0 Building Efficiency Projects

Implementation Mechanism

- Energy Services Contract (ESCO) -17 energy conservation measures identified and addressed in 2008; additional ECMs to be explored.

Estimated Annual Energy Reduction

- 11,310 MMBTU

Potential Annual Emissions Reduction (MTCO2e)

- 1,810

Potential Annual Cost to Campus

- $5.3 M initial cost
- $99,832 annually for 15 years

NPV ($/MTCO2e)

- $2,655 savings

Other Benefits

- First ESCO not financed, direct savings
- Annual cost paid from savings

Action

2.0 New Construction with Renewable Energy Generating Component

Implementation Mechanism

- Renewable energy generation through solar panels, wind turbines, and other technologies.

Estimated Annual Energy Reduction

- None

Potential Annual Emissions Reduction (MTCO2e)

- 30% of energy requirements for the building

Potential Annual Cost to Campus

- 10% increase in energy cost

NPV ($/MTCO2e)
- TBD

Other Benefits
- Educational opportunities
- University staff gain experience with renewable energy generation

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Action

3.0 Behavior Modification

Implementation Mechanism
- Promoting good energy stewardship – Goal of a 3% reduction of 2005 electricity use by 2015

Estimated Annual Energy Reduction
- 797,220 kwh

Potential Annual Emissions Reduction (MTCO2e)
- 435.33 annually

Potential Annual Cost to Campus
- $ 10,000 (minimal cost)

NPV ($/MTCO2e)
- $3,203 savings

Other Benefits
- Energy conservation awareness

Action

4.0 Campus Based Renewable Energy Generation

Implementation Mechanism
- Bring in consultant to evaluate potentials for renewable energy generation

Estimated Annual Energy Reduction
- TBD

Potential Annual Emissions Reduction (MTCO2e)
- Up to 100%

Potential Annual Cost to Campus
- $40k for feasibility study

NPV ($/MTCO2e)
- TBD

Other Benefits
- Potentially satisfy our carbon neutrality commitment

Action

5.0 Renewable Portfolio Standard (RPS)

Implementation Mechanism
- State Mandate – 2022 20% of purchased electricity will be from renewables – from 2005 baseline

Estimated Annual Energy Reduction
- None

Potential Annual Emissions Reduction (MTCO2e)
- 2,902.21

Potential Annual Cost to Campus
- $0

NPV ($/MTCO2e)
- $0 (no cost)

Other Benefits
- Further helps to achieve carbon neutrality

Action

6.0 Explore Locally Produced Sustainable/ Renewable Electricity

Implementation Mechanism
- Explore utilization of UMES solar array or other local or regional produced electricity. Possible goal of 30% from 2005 baseline

Estimated Annual Energy Reduction
- None

Potential Annual Emissions Reduction (MTCO2e)
- 4,353.31

Potential Annual Cost to Campus
- $ 239,166 (30%) premium over current electric rates

NPV ($/MTCO2e)
- $0 (no cost)

Other Benefits
- Further helps to achieve carbon neutrality
- No capital costs (long term purchasing agreement)

Action

7.0 Efficiency in Computing

Implementation Mechanism
- "Server Virtualization" – reducing the number of physical servers

Estimated Annual Energy Reduction
- 48,180 kWh by 2009

Potential Annual Emissions Reduction (MTCO2e)
- 26.31

Potential Annual Cost to Campus
- $15k annually

NPV ($/MTCO2e)
- $7,740 cost

Other Benefits
- Disaster recovery
- Less software maintenance needed

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Action

7.1 Power Management of University–Owned Desktop Computers

Implementation Mechanism

- "Server Virtualization" – reducing the number of physical servers

Estimated Annual Energy Reduction

- 86,080 kWh

Potential Annual Emissions Reduction (MTCO2e)

- 47

Potential Annual Cost to Campus

- $0

NPV ($/MTCO2e)

- $3,663 savings

Other Benefits

- easier lab operation
- allows unattended off hour power up and patching

Action

8.0 Investment in Certified Carbon Offsets

Implementation Mechanism

- Reserved for possibly closing the gap when all other strategies have been exploited

Estimated Annual Energy Reduction

- None

Potential Annual Emissions Reduction (MTCO2e)

- 725.55

Potential Annual Cost to Campus

- ~$10-$20 per ton in present dollars

NPV ($/MTCO2e)

- TBD

Other Benefits

- support cap and trade
- Motivation to reduce consumption

IV. OUTCOMES

SU has identified nine different strategies in the power and operations area. The table that follows (Table 9) illustrates how a combination of the reduction and offset strategies detailed previously will achieve the University's carbon neutrality goal. In addition, the State of Maryland's greenhouse gas reduction goals are presented for comparison.

Table 9: Salisbury University's Energy Strategies vs. State of Maryland GHG Reduction Goals

	Salisbury University's Reduction Goals		State of Maryland Reduction Goals *		Salisbury University's Climate Action Plan		
Year	Percent	MTCO2e	Percent	MTCO2e	Potential MTCO2e Reductions	% of SU Goal	% of State Goal
2012	15%	2,761	10%	1,841	1,810	66%	98%
2015	25%	4,603	15%	2,761	5,492	119%	199%
2020	50%	9,205	25%*	4,603	7,065	78%	153%
2025	60%	11,047	-	-	10,225	92.5%	-
2050	100%	18,411	90%	16,570	18,411	100%	111%

Baseline of 2005 was used to determine reduction goals
* State goal is 25 to 50% by 2020

V. SUGGESTED COMMUNICATIONS AND OUTREACH

SU has two distinct opportunities for communication. First, the University must keep the campus informed of energy saving renovations and upgrades to campus facilities. It is extremely important for the campus community to understand that these are investments in the future of our environment as well as energy saving measures.

Additionally, good energy stewardship can be promoted by reminding the campus community to do a few simple things that reduce wasted energy. The basic conservation measures suggested are outlined in section "3.0 Behavior Modification" of this chapter. If these conservation habits extend beyond the campus, there is tremendous potential for energy-waste reduction in the surrounding community. These simple steps should be promoted aggressively because they are high impact, low cost, and the right thing to do.

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TRANSPORTATION

I. BACKGROUND

Campus transportation accounts for nearly 30 percent of Salisbury University's carbon footprint. The bulk of these emissions involve student, faculty, and staff commuting by personal vehicle. Additional emissions result from University fleet vehicles, University-related transport (sports teams, student programs, internships, student teaching, etc.), and air travel. The big challenge is how to get students and employees to and from campus efficiently and inexpensively when mass transit options offer infrequent service or don't offer convenient connections. Here are some ideas and actions that could be implemented to reduce emissions.

II. APPROACH

Commuting

Near Term

- Work with local and regional authorities to enhance public transportation services and routes. SU is currently working closely with Shore Transit (www.shoretransit.org) to improve service and increase ridership.
- Create information-sharing tools to promote ride-sharing, carpooling, and bike-sharing. A possible project could be initiated through the Eastern Shore Regional GIS Cooperative (www.esrgc.org). Consider implementing a unique carpool pass with incentives to encourage carpool ridership.

Campus transportation accounts for nearly 30 percent of Salisbury University's carbon footprint.

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SU has already made significant progress by increasing the number of bike racks on campus.

- Create a bike-friendly and walkable campus and community, and introduce a bike-sharing program. SU has already made significant progress by increasing the number of bike racks on campus, but biking in Salisbury can be hazardous. The University needs to work closely with local and regional authorities to create safe and sufficient bike lanes to encourage increased usage.
- Increase distance-learning opportunities and offer block scheduling to reduce the number of days that students and faculty must travel to campus. Much has already been done to offer more online courses at SU and this should continue.

Medium Term

- Provide incentive plans for students and employees to use local transit systems, drive less, and use more fuel-efficient vehicles. For example, the University could pilot a program that would provide free bus passes to students and staff. Usage could then be monitored for a period of time, carbon emissions and reductions could be ascertained, and financial savings could be estimated.
- Consider a policy of no cars on campus for resident freshmen and sophomores. While this may be inconvenient for many students at first, it will help foster an environment that depends less on cars and travel and more on community-based, local activities.
- Create ride-share and carpool options for faculty and staff as previously discussed. Again, GIS data could be utilized to determine the demographics necessary to accomplish this goal.

Long Term

- Gradually reduce the number of parking spaces available on campus while increasing the cost of a parking permit. While this will not be popular at first, the number of cars that go to and from campus MUST diminish over time. This can only work in conjunction with improved public transportation as discussed previously.

- Increase on-campus housing to eliminate student commutes, and develop affordable housing options in surrounding neighborhoods. With the construction of the Sea Gull Square housing project and other future LEED Silver construction, SU is already working toward this goal.

University Fleet

- Vehicle purchases should take into consideration the most economical, most fuel-efficient, and lowest-emissions vehicles available in a particular model year. As part of the USM, SU is mandated to have 75 percent of new vehicle purchases as flex fueled (vehicles that use either E-85 or unleaded). To date, out of our 18 fleet cars, all but one is flex fueled, and all are mid-sized cars. When new cars are due to replace older ones, Motor Pool will look at what is offered on the State of Maryland Vehicle Contract.
- Purchase hybrid and electric vehicles as they become more available. The State contract at the time of purchase determines what types of vehicles the University has the option of purchasing. Hopefully, hybrid vehicles will become more available and offer better price options in the future.
- As the fleet of University utility vehicles (golf carts) has aged, the University has phased out the carts that are liquid propane powered and have replaced them with electric powered carts. Currently, there are seven of these electric powered utility vehicles owned by SU and 11 are fueled by unleaded gas.
- The University should set the goal of reducing petroleum-based fuel consumption by 2 percent, 5 percent, and 15 percent by 2012, 2015, and 2020, respectively. Achieving this goal can only be achieved with the cooperation of all campus departments to reduce the usage of cars for meetings, conferences, etc.
- Explore how landscaping practices could reduce mowing, leaf blowing, etc. As the look of the main campus is steadily changing (i.e., new buildings, less parking lots, etc.), the University Grounds and Horticulture Department's routine is constantly

As part of the USM, SU is mandated to have 75 percent of new vehicle purchases as flex fueled

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changing. As funds become available, newer, more energy-efficient, and "emissions-minded" equipment should be purchased to make this reduction a reality.

Institute "virtual" meetings and video conferences when possible to cut down on excessive travel.

University-Related Transport and Air Travel

- Implement accurate record keeping of students and faculty that travel for internships, student teaching, conferences, etc. A pilot project could be developed that would track students over a period of time; the data obtained from such a study could then be used to reduce wasteful habits and activities.
- Institute "virtual" meetings and video conferences when possible to cut down on excessive travel. This would be particularly valuable for meetings with other universities in the Baltimore and D.C. area.
- Encourage "telecommuting" where applicable. "Telecourses" are already being used to link SU with other regional colleges (Wor-Wic Community College, UMES, and Chesapeake College). This practice should be expanded and encouraged.
- Explore how carbon offsets might be developed to address transportation-related emissions that the University cannot otherwise reduce.

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SOLID WASTE

I. BACKGROUND

Nearly two decades ago, when Salisbury University began redefining solid waste management on campus, it quickly became apparent that opportunities for source reduction and recycling existed. Though reduction of carbon emissions was not a guiding principle, the goal was the same; reduce the environmental impact of campus operations by minimizing the volume of material that enters our waste stream.

Initially, the University targeted aluminum, white paper, glass, plastic bottles, and yard waste for recycling. As awareness and demand for recycling services increased on campus, the program grew to accommodate additional materials such as cardboard, kitchen grease, and food waste. For a 10-year period, SU composted all food waste from dining operations at a facility located a few miles south of the campus. However, the facility ceased composting operations in 2003 due to unintended waste stream contamination and changes in licensing regulations for composting. Since that time, food waste has been sent to the Wicomico County Landfill.

In baseline year 2005, solid waste accounted for less than 1 percent of total carbon dioxide equivalent emissions. Though this number seems to be an insignificant part of the overall picture, solid waste minimization and recycling are readily associated with sustainable practices. For this reason, a strong focus should remain on these programs, as they foster "greener" thinking campus-wide and demonstrate a commitment to leading by example.

Solid waste minimization and recycling are readily associated with sustainable practices.

Table 10: 2005 Campus Solid Waste-Related Emissions

Emission Type	MTCO2e	Percentage
Solid Waste	230.5	>1%
Total Campus Emissions	26,250	100%

Note: FY05 was chosen as the baseline year due to State of Maryland energy reduction requirements that use 2005 as a baseline year.

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In recent years, lead acid batteries, nickel cadmium batteries, lithium batteries, fluorescent light bulbs, electronics, and ink/toner cartridges have been added to the program with great success. As other recycling opportunities become available, SU will work to include these in our operating procedures. For example, the University has recently mandated that any carpet removed from campus buildings be recycled. Twenty years after its creation, the University boasts a recycling program that consistently achieves a recycling percent higher than the required 20 percent mandated by the Maryland Recycling Act.

One tangible action to promote recycling is residence hall participation in Recyclemania, a nation-wide campus recycling competition for colleges and universities. In 2009, students collected 5.15 tons of recyclable material during the 10-week Recyclemania event. When presented with a choice, most people choose to recycle, though convenience is an important factor. For this reason, SU's standard for campus buildings is a "decision station" where trash cans are paired with recycling cans. Large recycling decision stations are also available next to the dumpsters outside each residence hall to make recycling easy and accessible.

In addition to increasing the collection of recyclable materials, SU has worked to raise awareness about waste reduction. Further, SU is always looking for ways to decrease the number of trips the commercial waste hauler makes to the campus. For this reason, most of the dumpsters are "on-call" so that they are only emptied when they are actually full. In addition, trash compactors are placed in high-use areas. These steps have dramatically decreased the frequency for emptying and the overall number of trips to the campus.

Students initiated a pilot-scale composting program using food waste from the dining hall. "Eat what you take for the Earth's sake" has been the mantra of the students that are stationed in the Commons dining hall as they monitor what food is being collected for composting. Dining Services also implemented a program called "tray-less Tuesday" in an effort to reduce the amount of food students waste.

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II. APPROACH

In an effort to continue its tradition of environmentally conscious practices, SU proposes the following initiatives to achieve a 50 percent waste diversion goal by 2014:

- Confirm all campus printers are set to print as double-sided copies when possible.
- Investigate opportunities to use recyclable mugs and compostable take-out containers in campus eateries and Cool Beans coffee.
- Collaborate with Sports Information and Publications on a recycling campaign for all home sporting events to include digital public service announcements on the stadium scoreboard and printed recycling reminders on game-day programs.
- Continue to work with Housing and Residence Life on strategies for limiting waste during move in/out.
- Organize and coordinate a formal process for move in and move out that involves student organizations and local charities to reuse food, clothing and quality unwanted goods.
- Secure contract with new vendor for food waste composting.
- Organize an "eliminate junk mail" campaign campus-wide.
- Mandate that any bulk mattress replacement projects have a stipulation for recycling all old mattresses.
- Investigate opportunities for eliminating plastic bags usage in the University Bookstore.
- Encourage the use of online phone directories, campus publications, etc. to reduce campus printing.
- Encourage Housing and Residence Life to purchase reusable bags for residents to easily transport their recyclables from their rooms to recycling stations.
- Establish a campus-wide marketing campaign related to sustainability.

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III. EMISSION REDUCTION STRATEGIES:

Table 11: Suggested Solid Waste Strategies

Action

1.0 Reduce Solid Waste

Implementation Mechanism

- Increase food waste composting program, overall campus recycling, and "greener practices" campus-wide (i.e. dining hall, Bookstore, outdoor events)

Potential Emissions Reduction—Annual MTCO2e

- 64 (by 2011)
- 115.3 (by 2014)

Potential Annual Savings and Costs

- Annual Savings
  - 2011- $25K
  - 2014-$35K
- Annual Costs
  - $75K/yr for
  - 5 yr for labor and infrastructure

NPV ($/MTCO2)

- $781 cost up to 2014
- $348 cost after 2015

Other Benefits

- Reduces campus hauling and disposal costs
- Increases amount of waste that's diverted from landfill
- Enhances awareness of campus sustainability

Action

2.0 Investment in Other Carbon Offset Strategies

Implementation Mechanism

- Select offsets to neutralize solid waste related emissions that cannot be eliminated

Potential Emissions Reduction—Annual MTCO2e

- 115

Potential Annual Savings and Costs

- ~$10 - $20 per ton cost

NPV ($/MTCO2)

- $15 cost

Other Benefits

- Education of campus community
- Improved community relations if offsets can be procured locally

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IV. OUTCOMES

The previous table (Table 11) outlines a comprehensive solid waste reduction through the aforementioned initiatives. The table that follows (Table 12) provides a comparison of SU's goals as compared to the State of Maryland greenhouse reduction goals. Effective and aggressive source reduction, construction recycling, procurement efforts, and waste diversion will significantly reduce the amount of material reaching the landfill.

Table 12: Reduction Goals

	Salisbury University's Reduction Goals		State of Maryland Reduction Goals *		Salisbury University's Climate Action Plan		
Year	Percent	MTCO2e	Percent	MTCO2e	Potential MTCO2e Reductions	% of SU Goal	% of State Goal
2012	10%	23.1	10%	23.1	64	277%	277%
2015	20%	46.1	15%	34.6	115.3	250%	333%
2050	100%	230.5	90%	207.5	230.5	100%	111%

Baseline of 2005 was used to determine reduction goals
* State goal is 25 to 50% by 2020

V. SUGGESTED COMMUNICATIONS AND OUTREACH

The success of the waste reduction and recycling program depends on effective communication and partnering with campus stakeholders. This work group proposes expanding communication and partnering in the following areas:

- Recycling Web site
- Facilities Services staff outreach
- Office of Procurement educating about recycling, re-using, Terrapin Trader, take backs, trade-ins, etc. on their Web site
- Athletic events
- Dining Services guest education
- Conference Planning
- Residence Life resident education
- Student Affairs
- Academic departments
- Human Resources new employee orientation and Web site
- Other administrative offices

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Given the core mission of the University, it is imperative that sustainability is equally well integrated into our educational and scholarship efforts.

EDUCATION AND RESEARCH

I. BACKGROUND

Salisbury University is committed to carbon neutrality and other sustainability goals. To date, most of the University's efforts have focused on physical plant and building operations, including two LEED-certified building projects as well as campus-wide lighting replacements and other improvements. Given the core mission of the University, it is imperative that sustainability is equally well integrated into our educational and scholarship efforts.

Salisbury University has several academic and research programs that directly relate to sustainability and climate issues. These include the Eastern Shore Regional GIS Cooperative (www.esrgc.org), Shore Energy (www.salisbury.edu/shoreenergy), the Bacterial Source Tracking Lab (www.salisbury.edu/biology/bstl), and research on smart growth (Geography and Geosciences Department), biofuels (Biological Sciences Department), local sustainable agriculture (Sociology Department), and sustainable land-use in the Brazilian Amazon (Economics and Finance Department). Academic programs that currently focus on sustainability include the environmental issues major and minor, the dual-degree program in biology and environmental/marine science,[6] and the environmental/land-use planning and Earth and atmospheric science tracks in the geography major. The Green Floor is an SU Living-Learning Community within Student Housing and Residence Life that focuses on sustainability issues and actions toward achieving them. University Research Services regularly searches for grant funding opportunities pertaining to green or sustainability initiatives that could benefit SU. In addition, SU partners with the Newton Marasco Foundation to host the Green Earth Book Awards each spring. The Green Earth Book Awards honor children's and young adult books that focus on environmental sustainability. Last year, as part of the Green Earth Book Awards activities, the Newton Marasco Foundation presented SU President Janet Dudley-Eshbach with its first Leading Environmental Sustainability Award for her commitment to sustainability.

[6] *Dual-degree program between Salisbury University and the University of Maryland Eastern Shore.*

In addition to hosting academic programs that focus on sustainability and environmentalism, we need to infuse a focus on carbon neutrality throughout the curriculum and in our research and creative scholarship. Such efforts will not only allow SU to reduce its climate impacts, but also it will better prepare our students for employment in the green economy and to lead more sustainable lives.

II. APPROACH

To develop its recommendations and goals, the Climate Action Plan Education and Research sub-committee consulted the University of Maryland College Park's Climate Action Plan Workgroup and closely followed many of its recommended actions and implementation plans.[7] SU also examined Climate Action Plans, as available, from performance peers to learn more about approaches implemented at comparable comprehensive institutions.

Achieving carbon neutrality will depend on the concerted and coordinated efforts of students, faculty, and staff, and thus will require effective communication so that members of the SU community can better understand the climate implications of campus activities. Further, it is essential that campus community members are aware of and committed to SU's Climate Action Plan and support its seamless integration into all University activities.

Information Sharing: To maximize information sharing, the Climate Action Plan Workgroup will develop and post inventories of existing courses, research projects, library resources, and research centers that substantially focus on carbon neutrality, sustainability, or climate issues. Further, the group will develop a resource for interested students and faculty which lists potential projects and research questions relevant to SU's carbon footprint and other sustainability impacts. Finally, to allow members of the SU community to monitor their collective progress on achieving carbon-neutrality goals, the group will develop a Sustainability Dashboard with direct and indirect indicators of carbon/climate impacts.

Education: The strategies that follow focus on integrating carbon neutrality and sustainability in the curriculum so that all students have a basic understanding of sustainability issues and how to function as an environmentally responsible citizen. Further, a diverse array of

Achieving carbon neutrality will depend on the concerted and coordinated efforts of students, faculty, and staff, and thus will require effective communication.

[7] *See UMCP CAP, available at http://acupcc.aashe.org/cap-report.php?id=278.*

opportunities will be provided to students interested in gaining deep knowledge of and taking action toward these issues. Specifically, this plan recommends creation/expansion of activities targeted at first-year students, engaging students in academic work and research projects related to sustainability topics, emphasizing the strong connections between the proposed Climate Action Plan and SU's existing General Education principles and goals; expanding academic programming related to sustainability, including strengthening resources for SU's environmental issues program; and providing regular training and other programming about carbon/climate and sustainability issues to the SU and greater Salisbury communities.

Research: This plan recommends two primary strategies to enhance the sustainability in the University's research and creative scholarship activities. First, SU will support and encourage research and creative scholarship related to carbon neutrality and sustainability. This might include research on campus needs (e.g. cost/benefits of "alternative" energy, solar heating) and on-going efforts (e.g. reductions achieved through the Henson Challenge), or sustainability more generally (e.g. local food movement). Second, SU, through the efforts of University Research Services, Blackwell Library, and the Office of Sustainability and Environmental Safety, will support the incorporation of sustainability in the responsible conduct of research (RCR).

Benefits of Implementing Actions Recommended for Education and Research: These strategies have several benefits, many of which may be difficult to measure directly. However, baseline data on appropriate indicators would prove useful in assessing reductions achieved through these collective efforts, which then can be displayed in the dashboard as described in the following chart (Table 13).

III. EDUCATION AND RESEARCH STRATEGIES

Table 13: Education Strategies

Action

1.0 Information Sharing

1.1 Make education- and research-related resources related to climate change, energy efficiency, and sustainability accessible to all members of the SU community.

Implementation Mechanism

- To ensure access to educational and research programs, create and maintain a campus-wide course and program inventory available through SU's Sustainability Web site. (Appendix IV – To be posted online January 15, 2010)
- To ensure access to educational and research materials available through Blackwell Library, create and maintain a resource inventory available through SU's Sustainability Web site. (To be posted online January 15, 2010)

Timing

- FY 2010

Cost

- Done

Action

1.2 Direct student and faculty projects to address campus-relevant research questions and service projects.

Implementation Mechanism

- Develop a wiki of potential term paper topics, class projects, and research topics to help advance campus carbon neutrality.

Timing

- FY2011

Cost

- Time: 40 hrs/yr

Action

1.3 Make information about campus carbon and other impacts available on a real-time basis to SU community.

Implementation Mechanism

- Develop and routinely update a Sustainability Dashboard with indicators for utilities use, solid waste production, use of green fuels, etc. The Sustainability Dashboard will allow for intra- and inter-annual comparisons and may drill down to school or other unit level.

Timing

- FY2011

Cost

- Time: 80 hours set-up, 50 hours per year thereafter.

Action

2.0 Education

2.1 Educate first-year students about sustainability so that they have a foundational understanding of the issues and SU's carbon neutrality efforts.

Implementation Mechanism

- Expand First-Year Seminar courses, Living-Learning Communities (LLCs), or Freshman Interest Groups (FIGs) that focus on sustainability or carbon neutrality.
- Support campus speakers on sustainability issues, particularly for campus-wide, first-year student events like convocation and the New Student Reader program.

Timing

- Fall 2010

Cost

- $80,000 annually

Action

2.2 Encourage service learning, thematic learning clusters, and beyond classroom learning (e.g. Fulton School course enhancements, laboratories) toward carbon neutrality and sustainability topics.

Implementation Mechanism

- As described in 1.2, develop a wiki of potential term paper topics, class projects, and research topics to help advance campus carbon neutrality. Provide advice to students and faculty as needed (e.g., sources of campus data, key contacts, etc).

Timing

- FY2011

Cost

- Time: 40 hrs/yr

Action

2.3 Emphasize connections between carbon neutrality/sustainable habits and SU's Learning Principles and Student Learning Goals by integrating themes of sustainability throughout various disciplines and courses.

Implementation Mechanism

- SU Climate Action Plan shared with campus community through faculty development day or other appropriate venue. Emphasize connection between carbon neutrality and SU's Learning Principle of "demonstrates global awareness in order to function responsibly in an interdependent world" and Student Learning Goal "Social Responsibility - … disposition toward responsible citizenship and a connection to the community."
- Provide support for inclusion of carbon neutrality/sustainability themes in existing and new courses.
- Emphasize the utility of liberal arts education and multidisciplinary approaches to study of the environment and sustainability.
- Investigate opportunities for sustainability-themed international exchange programs.
- When not obvious, work with academic department to determine how sustainability could be incorporated into their curriculum.

Timing
- Within two years

Cost
- TBD

Action

2.4 Strengthen resources for SU's burgeoning environmental issues program.

Implementation Mechanism
- One of the fastest growing majors on campus is environmental issues, yet this program does not have formal shared appointments of faculty or operating or library budgets (space was recently assigned to the program). To allow this program to meet current and future student demand, allocate resources to formally establish shared appointments (covering half-time release from home departments), provide for an operating budget comparable to other departments; and plan of continuity of leadership and adequate administrative support to move program to department status.

Timing
- Within three years

Cost
- TBD

Action

2.5 Provide training for SU and greater Salisbury communities on a variety of carbon neutrality and sustainability topics

Implementation Mechanism
- Implementation to be led by SU Office of Sustainability and Environmental Safety with input from VPs of Academic Affairs, Student Affairs, and Finance and Administration.

Timing
- Within three years

Cost
- TBD

Action

2.6 Reduce use of paper and other resources used in teaching and learning, without negatively impacting quality of either.

Implementation Mechanism
- Increase faculty facility with and use of electronic tools for teaching, learning and committee work (e.g. MyClasses, podcasts, streamed video).

Timing
- Within three years

Cost
- TBD

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Providing avenues to recognize, celebrate, and promote campus education and research projects focused on sustainability issues is an important part of the Climate Action Plan.

Action

3.0 Research

3.1 Foster research and creative scholarship on sustainability.

Implementation Mechanism

- The University will maintain and publish a list of potential climate action items (e.g. use of geothermal, green roof, or biofuels technologies on campus) that may help reduce campus emissions and for which insufficient data or research are available to guide decisions (see 1.2 above).

Timing

- FY10

Cost

- Time: 40 hrs

IV. SUGGESTED COMMUNICATIONS AND OUTREACH

Providing avenues to recognize, celebrate, and promote campus education and research projects focused on sustainability issues is an important part of the Climate Action Plan. The SU Climate Action Plan will include the promotion of such projects, to the campus and broader communities, through articles in University publications, through special campus recognitions and awards, and through news releases to local news sources. The Office of Sustainability and Environmental Safety will serve as a conduit and as a resource for students, faculty and staff interested in sustainability issues on the SU campus.

FINANCING THE PLAN

The cost for some of the projects proposed in this plan cannot be determined until an evaluation is performed by engineers and specialists. For each, a cost/benefit analysis should be performed before any decision to move forward might be made. As previously stated, purchasing certified carbon offsets will only be considered when all other emission-reduction strategies have been evaluated and administrative policy supports such a purchase.

The University, of course, will need to determine the importance of these projects as compared with other strategic initiatives of the campus. SU should consider the development of a Campus Sustainability Fund, which might include revenue generated form donations by corporations, benefactors, alumni, faculty, and staff in order to provide support for some of the proposed strategies.

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TRACKING PROGRESS AND NEXT STEPS

The University Sustainability Committee will oversee periodic revisions to the Climate Action Plan and evaluate the progress of strategy implementation.

I. BACKGROUND

Tracking the Greenhouse Gas Inventory is critical to evaluating progress toward achieving the reductions identified in the Climate Action Plan. In accordance with the Presidents' Climate Commitment, a Greenhouse Gas Inventory must be completed and made publicly available every two years. The first inventory was made publicly available in January 2009 and included data for FY08; therefore, the inventory for FY10 will be due in January 2011. In addition, the Presidents' Climate Commitment requires a public report of progress toward initiatives from the Climate Action Plan on a biennial basis from the date the Climate Action Plan is submitted. The progress report occurs on alternating years from the Greenhouse Gas Inventory schedule.

II. APPROACH

The Climate Action Plan will always be a work in progress. Change will be requisite due to new ideas, new technology, and successes or failures along the way. In addition, data collection methods and data management will continue to be refined to provide the most consistent and accurate information possible.

Moving forward, responsibility for each category of strategies will be assigned to a champion who will track the implementation of each strategy that is reviewed and approved. In addition, the champion will assign priority to each strategy, create a mechanism for reporting progress, and provide that information to the campus on a regular basis. The responsible party also will provide the requisite publicly reviewed reporting on a biennial basis. The University Sustainability Committee will oversee periodic revisions to the Climate Action Plan and evaluate the progress of strategy implementation.

III. NEXT STEPS

The success of this plan will be determined by the extent to which the suggestions presented here are implemented and the degree to which new projects are added in the years to come.

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APPENDIX I. ACRONYMS

CA-CP	Clean Air Cool Planet
CO2	Carbon dioxide
CO2e	Carbon Dioxide Equivalent
COMAR	Code of Maryland Regulations
CPU	Central Processing Unit
ECM	Energy Conservation Measures
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005 / 1992
EPP	Environmentally Preferable Procurement
ESCO	Energy Service Company
FIG	Freshman Interest Group
FMP	Facilities Master Plan
FTE	Full Time Equivalent
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographical Information Systems
HR	Human Resources
HVAC	Heating, Ventilation and Air Conditioning
IT	Information Technology
KWh	Kilowatt hour
LEED	Leadership in Energy and Environmental Design
LLC	Living Learning Community
MD	Maryland
MRA	Maryland Recycling Act
MTCO2e	Metric Ton CO2 equivalent
MW	Megawatt
NPV	Net Present Value
PV	Photovoltaic
RCR	Responsible Conduct of Research
REC	Renewable Energy Credit
RPS	Renewable Energy Portfolio Standard
SBDC	Small Business Development Center
SGA	Student Government Association
SPP	Sustainable Procurement Policy
SU	Salisbury University
TBD	To Be Determined
TETC	Teacher Education and Technology Center
USGBC	United States Green Building Council
UMCP	University of Maryland College Park
UMES	University of Maryland Eastern Shore
USM	University System of Maryland
VP	Vice President
WG	Work Group
WRI	World Resources Institute

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APPENDIX II. CLIMATE ACTION PLAN SUBCOMMITTEE

Lora Bottinelli
Executive Director, Ward Museum

Jeff Canada
Buyer, Auxiliary Services

Betty Crockett
Vice President, Administration & Finance

Jackie Eberts
Director, Fiscal Grants Management/ University Research Services; Staff Senate

Richard England
Director, Honors Program

Danny Ervin
Associate Professor, Economics & Finance; Director, Shore Energy

Stephen Ford
Information Literacy Librarian

Tim Jones
Energy Manager

Colleen Kirby
Fleet Coordinator

Ken Kundell
Director, Information Technology

Kevin Mann
Director, Physical Plant

Karen Olmstead
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Andy Pica
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Rebecca Rosing-Johnson
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Wayne Shelton
Director, Campus Sustainability & Environmental Safety

Michael Vienna
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Elizabeth Wright
Student, Environmental Issues Major

Elizabeth Young
Student, Environmental Issues Major

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APPENDIX III. UNIVERSITY SUSTAINABILITY COMMITTEE

Arvi Arunchalam
Assistant Professor, Business Administration

Jeff Canada
Buyer, Auxiliary Services

Sandra Cohea-Weible
Assistant Vice President of Academic Affairs

Betty Crockett
Vice President, Administration & Finance

Jeffrey Downes
Director, Facilities Planning & Capital Projects

Susan Eagle
Director, Marketing & Public Relations

Danny Ervin
Associate Professor, Economics & Finance; Director, Shore Energy

Joyce Falkinburg
Director, Purchasing/Materials Management

Lisa Gray
Director, University Bookstore; Staff Senate

Dave Gutoskey
Director, Housing & Residence Life

Amy Hasson
Chief of Staff, President's Office

Shawn McEntee
Associate Professor, Sociology

Joan Maloof
Associate Professor, Biology

Kevin Mann
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Michelle Oleson
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Karen Olmstead
Dean, Henson School of Science & Technology

Gwen Owen
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Shane Sarver
Student, Student Government Representative

Wayne Shelton
Director, Campus Sustainability & Environmental Safety

Ross Tatka
Student, Student Government Representative

APPENDIX IV. SU COURSES, PROGRAMS, AND CENTERS RELATED TO SUSTAINABILITY ISSUES

Courses

Course Prefix	Course No.	Course Title
BIOL	105	Biology and Society
BIOL	220	Humans and the Environment/Honors
BIOL	401	Wetland Ecology
BIOL	410	Estuarine Biology
BIOL	433	Environmental Microbiology
BIOL	381	Environmental Chemistry
CADR	403	Resolving Environmental Conflict
CHEM	221	Humans and the Environment/Honors
CHEM	109	Energy and the Environment
CMAT	444	Environmental Communications
ECED	325	Primary Curriculum II
ECON	411	Economic Development
ECON	415	Environmental and Natural Resource Economics
ECON	338	Special Topics in Economics
EHVH	110	Introduction to Environmental Science
EHVH	210	Introduction to Environmental Health Science
EHVH	301	Principles of Epidemiology
EHVH	302	Food Aspect of Environmental Health Science
EHVH	310	Shelter and Institutional Environments
EHVH	320	Safety and Occupational Health
EHVH	330	Solid and Hazardous Waste Management
EHVH	415	Research in Environmental Health Science
EHVH	420	Readings in Environmental Health Science
EHVH	425	Toxicology
EHVH	430	Ground and Surface Water Quality
EHVH	440	Air Quality
EHVH	450	Public Health Administration
EHVH	475	Environmental Administration and Internship
EHVH	490	Special Topics in Environmental Health Science
EHVH	495	Environmental Health Field Experience Option
ELED	312	Science Instruction
ELED	313	Social Studies Instruction
ELED	408	Children's Literature
ENGL	347	Wilderness in Literature
ENGL	348	Nature in Literature
ENGL	364	Native American Literature

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ENVR	102	Earth Literacy
ENVR	150	Environmental Perspectives
ENVR	200	Environmental Studies in the Amazon
ENVR	460	Topics in Chesapeake Bay Studies
ENVR	480	Internship in Environmental Studies
ENVR	495	Environmental Field Studies
ENVR	499	Environmental Senior Seminar
GEOG	100	Introduction To Human Geography
GEOG	104	Earth and Space Science
GEOG	107	Weather and Human Affairs
GEOG	141	Current Issues In Earth Science
GEOG	200	Applications In Geographic Information Systems
GEOG	203	Economic Geography
GEOG	220	Humans and The Environment/Honors
GEOG	308	Principles Of Planning
GEOG	316	Biogeography
GEOG	318	Local Field Course
GEOG	319	Geographic Information Science
GEOG	321	Remote Sensing Of The Environment
GEOG	325	Conservation and Resource Management
GEOG	328	Applied Planning
GEOG	389	Regional Field Study Of The United States
GEOG	401/501	Soil, Water and Environment
GEOG	402	Environmental Planning
GEOG	403/503	Environmental Hazards
GEOG	404/505	Rural Geography and Land-Use Planning
GEOG	406/506	Regional Economic Development
GEOG	416	Smart Growth
GEOG	417	Water Resources
GEOG	419	Advanced Geographic Information Science
GEOL	405	Environmental Geology
HIST	386	Wilderness and US Culture, 1492-present
HIST	389	US Environmental History
HIST	392	Global Environmental History
HIST	483	Environmental History of Delmarva
INFO	326	Operations Management
MATH	144	Environmental Mathematics
MGMT	420	Business & Society
MGMT	635	External Environment of the Organization
PHIL	306	Animals and Ethics
PHIL	318	Environmental Responsibility
POSC	360	Environmental Policy
POSC	460	Environmental Law
PSYC	409	Environmental Psychology
SOCI	319	Globalization and Social Change
SOCI	322	Population Studies
SOCI	390	Sociology of the Environment

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Research and Outreach Centers

Henson School	Eastern Shore Regional GIS Cooperative (ESRGC) Bacterial Source Tracking Lab (BSTL)
Perdue School	Shore Energy Small Business Development Center (SBDC) Business, Economic, and Community Outreach Network (BEACON)

Academic Programs

Fulton and Henson Schools	Environmental Issues Major and Minor
Henson School	Biology/Environmental Marine Science Dual Degree Program Environmental/Land-Use Planning and Earth and Atmospheric Science tracks in Geography major

Other Campus Programs

Seidel School	Green Book Award Celebration (Newton Marasco Foundation)

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