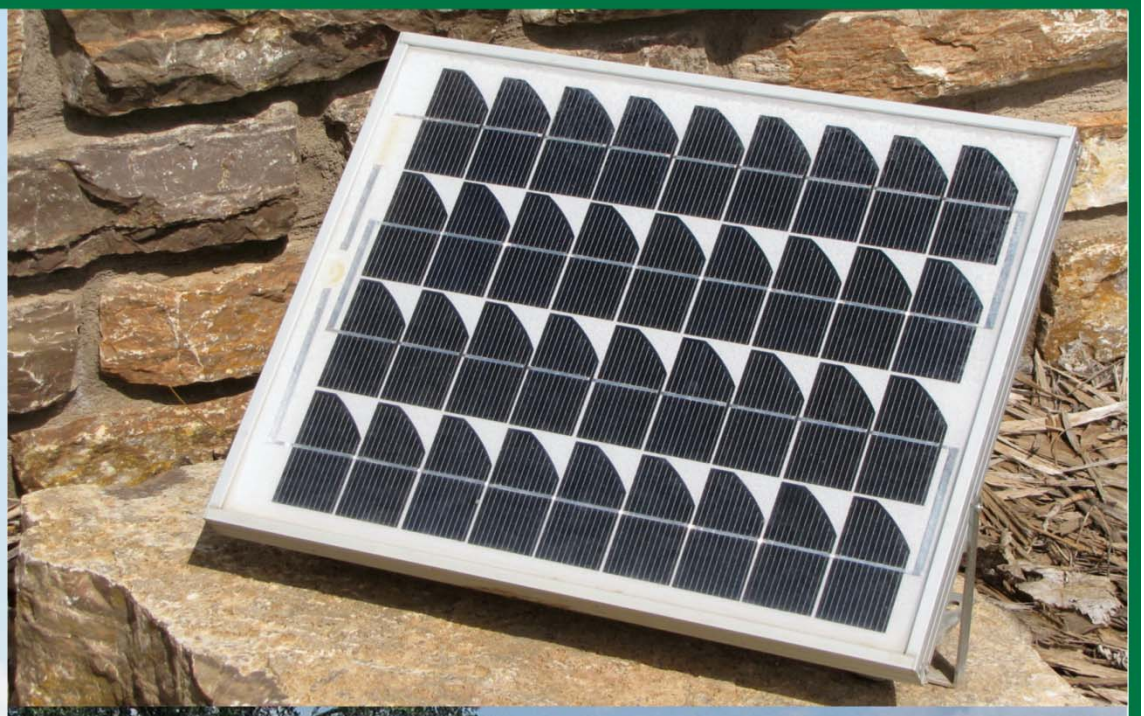
Black Hills State University
2009
Climate Action Plan



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Introduction

Black Hills State University (BHSU) is a comprehensive liberal arts university located in Spearfish, South Dakota, a community of approximately 12,000 in the heart of the scenic northern Black Hills. The university offers over 56 academic programs at the associate, bachelors, and masters degree levels. With a current enrollment exceeding 4,000 students, Black Hills State University is the third largest university in the state and the largest in the region. BHSU is one of six public universities under the control of the South Dakota Board of Regents, the state's governing board. The university's location in the beautiful Black Hills emphasizes the importance of modeling responsible environmental behavior and providing that education to our students.

On October 10, 2007, Black Hills State University President Kay Schallenkamp announced that BHSU was the first South Dakota university to join the American College and University President's Climate Commitment (ACUPCC). BHSU became a signatory of the ACUPCC on May 14, 2007 and is the 242nd signatory to join this group of colleagues. By signing the commitment, BHSU agreed to take steps in the pursuit of climate neutrality.

Last year, in accordance with the ACUPCC, BHSU completed the first of a biennial comprehensive inventory of all greenhouse gas emissions for the university and implemented two tangible actions to help reduce greenhouse gas emissions while the more comprehensive plan was being developed. This Climate Action Plan (CAP) is Black Hills State University's next step toward a sustainable future.

BHSU has been actively involved with creating a more efficient and sustainable campus in the past. While the 2009 BHSU Climate Action Plan is comprehensive in its review of last year's emissions results and looks to potential emission reduction initiatives, the CAP is intended to be an initial step towards sustainability and climate neutrality on this campus. It provides an initial guide for the university's goal of reaching climate neutrality by 2050. Additional planning and research will be necessary to account for changes in mitigation opportunities, technology, the economy, the campus community, policies, regulations, and legislation before the final goal is reached. Current mitigation efforts are not enough for BHSU to achieve climate neutrality today. As more research and planning is completed, intermediate goals will be identified as benchmarks to ensure progress is made toward the ultimate goal of climate neutrality.

This CAP will be available on BHSU's website in addition to the reporting vehicle for the ACUPCC. It will be promoted on the campus and in the community to help increase awareness

and support. The plan will be revisited every five years over its forty year life to track progress, provide accountability, and incorporate revisions as appropriate to ensure its success. BHSU is making climate neutrality a significant priority; however, due to budget constraints and the fundamental philosophy that greenhouse gas reduction is a primary concern, the purchase of carbon credits will not be considered until all other options have been exhausted.

The BHSU CAP will become an integral part of the university's planning efforts along with the following documents:

Campus Master Plan – This document was completed in 2002 and provides a guide to managed growth and renovation of the university buildings and grounds.

Utility Master Plan – This document is nearing completion and provides an overall review of the current utility infrastructure in addition to future options for heating, cooling, and electricity on campus.

University Strategic Plan – This document was completed in 2008 and provides a guide for the university to accomplish four main goals including:

> **Goal One:** Black Hills State University will provide a learning environment that inspires and facilitates personal transformation and instills life-long learning to meet the changing needs of society.
>
> **Goal Two:** Black Hills State University will engage in strategic partnerships.
>
> **Goal Three:** Black Hills State University will be an inclusive and socially responsible learning community.
>
> **Goal Four:** Black Hills State University will secure and allocate fiscal resources to be recognized as an innovative, high-quality university.

President's Climate Commitment

The impetus for preparing this climate action plan is participation in the ACUPCC. Because of its importance in guiding the present and future actions of BHSU, the text of the climate commitment is presented below for reference. Items that are in bold type have been accomplished by BHSU.

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.

1. ***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.

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,

The Signatories of the American College & University
Presidents Climate Commitment

Green House Gas (GHG) Emissions Inventory Summary

BHSU reported its 2007 GHG emissions inventory to the ACUPCC in September 2008. A greenhouse gas inventory calculator was used to calculate the main gas emissions types into metric tons equivalent of carbon dioxide ($mteCO_2$). The calculator used was designed by Clean Air-Cool Planet specifically for universities. BHSU's GHG emissions inventory analyzed both stationary (related to buildings) and mobile (related to transportation) sources of emissions.

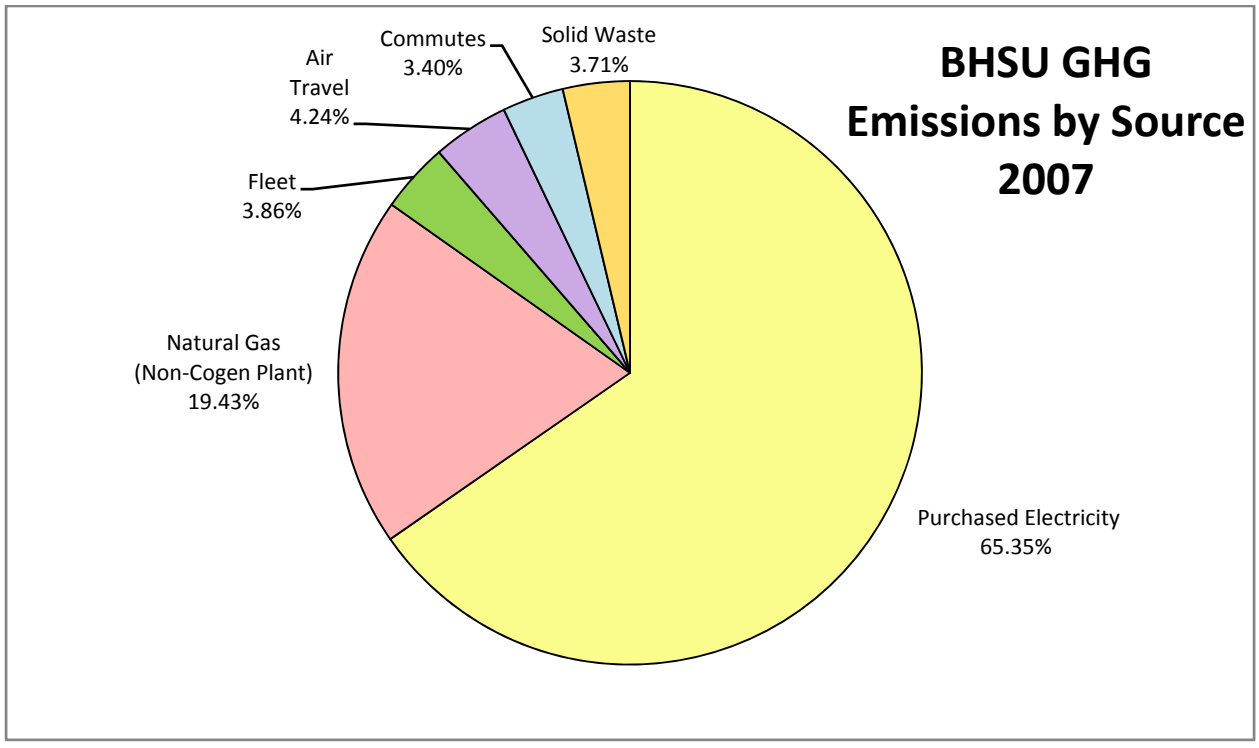
These emission sources are characterized into three scopes (summarized in Table 1 at right) by the ACUPCC. Scope I emissions are directly from sources owned or controlled by the institution, Scope II emissions are indirect emissions generated in the production of electricity consumed by the institution, and Scope III emissions are all other indirect emissions that are as a consequence of the activities of the institution, but are not directly owned or controlled by the institution.

Table 1 – Emissions scopes defined by ACUPCC

Scope	Emissions Included
I) Direct Emissions	Heating, cooling, college fleet
II) Imported Emissions	Purchased electricity
III) Other Indirect Emissions	Waste, air travel, commutes

Total emissions for Scopes I, II, and III are 2,492 $mteCO_2$, 6,991 $mteCO_2$, and 1,215 $mteCO_2$, respectively. In total this is 10,698 $mteCO_2$, which is equivalent to 3.5 $mteCO_2$ per full-time enrolled student and 14.6 $mteCO_2$ per 1,000 square feet.

Figure 1 – Overall BHSU greenhouse gas emission inventory 2007 emissions by source



Stationary Emission Sources

Stationary emission sources on the BHSU campus include natural gas for boilers for heating and purchased electricity. Stationary emission sources include the vast majority of all emission sources at BHSU (84.78%) and provide all of the power for heating, cooling, ventilation and electrical needs on campus.

Natural Gas (Non-Cogeneration Plant) - Two hot water boilers in the central boiler plant on campus serve the campus to provide heating for university buildings. The heat distribution system is steam, with a mix of steam to hot water and steam to ducted air converters in the buildings. The main fuel source for these boilers is natural gas, which produces 19.43% of the campus' GHG emissions.

Purchased Electricity - The Upper Great Plains region of the Western Area Power Administration provides power for BHSU with purchased electricity for campus use. The electricity is directly distributed to BHSU via Black Hills Power and Light. Black Hills Power is dedicated to environmental awareness and has modified old plants to be more environmentally strict. This power source includes almost two-thirds of the campus' emissions.

Mobile Emission Sources

Mobile emission sources for BHSU include the campus fleet, air travel, and faculty/staff commutes.

BHSU Fleet - The BHSU fleet contributes 3.86% of the campus' GHG emissions. The fleet uses a mix of unleaded gasoline and diesel fuel for internal combustion engine-driven vehicles. The majority of fleet transportation vehicles are midsize sedans and minivans, able to transport multiple faculty, staff or students on trips. The State of South Dakota owns the fleet and is responsible for the type of vehicles purchased. Because most fleet vehicles are used for highway driving rather than in-town driving, hybrid vehicles have not been a strategy for the State.

Other equipment accounted for includes grounds vehicles and machinery, such as Bobcats, tractors, electrical carts, and other machinery and vehicles used around campus.

Air Travel - Business air travel for faculty, staff, and graduate students totaled 584,411 miles in 2007. Air travel for this study includes trips to meetings, conferences and other business engagements. Air travel accounts for 4.24% of the emissions total for BHSU.

Faculty and Staff Commutes - Faculty and staff that commute to campus accounted for 3.40% of the GHG emissions for BHSU in 2007. This statistic was estimated as 100% of the faculty and staff commuting year round.

Solid Waste

Solid waste incorporates any garbage, food, or recyclable materials that are taken to a landfill. Emissions from this source are mainly in the form of methane over the lifetime of the breakdown of the wasted materials. Solid waste accounts for 3.71% of the GHG emissions for BHSU.

Emissions Comparison

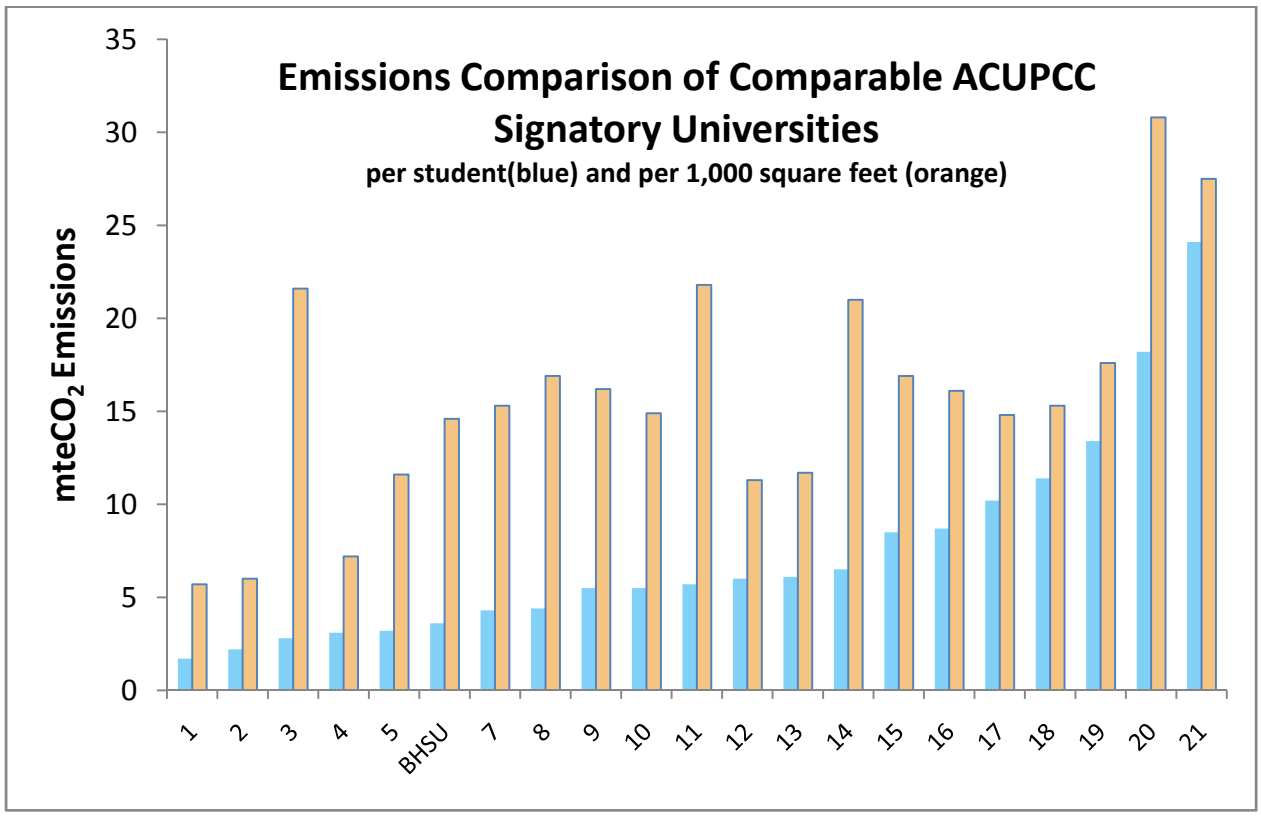
To better understand the current state of efficiency at BHSU, it was compared to similar universities around the United States. BHSU has an enrollment of approximately 4,000 students with a total campus building area of 174,836 square feet. BHSU's GHG emissions per student and per 1,000 square feet building area were compared with other universities that have 3,000 to 5,000 headcount enrollment, are signatories of the ACUPCC, and have submitted a recent GHG emissions inventory. Twenty other universities fit these requirements for comparison, and their emissions per student and per enrollment are compared to that of BHSU in Figure 2. Of the 21 universities included, BHSU currently has the 6th lowest emissions per student and 7th lowest emissions per 1,000 square feet, which reflects the historical focus that BHSU has placed on energy efficiency and sustainability.

Table 2 – Comparison of emissions for SD ACUPCC signatory colleges and universities.

	$mteCO_2$ emissions per	
	student enrolled	1,000 sq. feet building area
BHSU	3.6	14.6
USD	3.2	Not measured
SDSMT	10.9	29.5

BHSU was also compared with other South Dakota signatory universities in Table 2 including the University of South Dakota and the South Dakota School of Mines and Technology.

Figure 2 – Comparison of BHSU and 20 Comparable ACUPCC Signatory Universities



Education, Awareness and Outreach for Climate Action and Sustainability

Education and awareness about climate action and sustainability is perhaps the most important task for climate action. Saving energy and preventing excess waste can be as easy as teaching a sustainable lifestyle. Learning about sustainability and climate action can take place both in the classroom and in other areas of campus life including awareness events, student organization meetings and activities, residence life activities, communications through the school newspaper and radio station, and modeling behavior by faculty, staff, and other students. BHSU has provided many awareness activities in the recent past and will continue to promote sustainability through future activities. Some of the recent activities and organizations are identified below.

Sustainability Degree Program

Currently, BHSU has an intent to plan submitted to the Board of Regents office for an interdisciplinary program to earn a Master of Science in Sustainability Management degree. The proposal for this plan will be reviewed for approval in the near future.

Annual Sustainability Day

The annual sustainability day at BHSU was started in 2007 with the announcement of the President's Climate Commitment. This day helps promote awareness for BHSU's commitment to sustainability, green energy issues, and to demonstrate energy efficiency and sustainability ideas. Some of the activities that occurred last year include an interactive webcast sponsored by the Society for College and University Planning entitled "Campus Sustainability Day: Climate Realities, Challenges and Progress in Higher Education," a sustainability information fair, and a luncheon with administration to discuss Go Green initiatives on campus.

Madeline A. Young Distinguished Speaker Series

The Madeline A. Young Distinguished Speaker Series at BHSU was established in 1986 by an endowment from Madeline Young, a 1924 alumna. This past year, with the announcement of the commitment to the ACUPCC, the series has dedicated funds to bring speakers to BHSU to talk about sustainability issues. A notable speaker in this series was Annabelle Gurwitch, who is the host of a national reality show that encourages green living on the network Planet Green.

PETE Student Organization

People for the Ethical Treatment of the Environment (PETE) is a student organization that aims to promote and help all individuals achieve a healthier lifestyle. They hope to support the progress of the President's Climate Commitment as well as educate others on how they are affecting the climate and how they can spread the idea of sustainability. In support of this goal, they traveled to Washington D.C. in the spring of 2009 to participate in and show their support of the national climate change rally.

Green Acres – An Apartment Complex Focused on Sustainable Living

The on-campus student apartments have a sustainability theme and have implemented many sustainable programs for resident life in the apartments. The students in these apartments have contracted for year-round recycling, which is a good starting place for recycling in campus residences. The apartments have a campus garden and will be involved with composting food waste from the student union.

Bike to Work Week/Day

Along with the League of American Bicyclists, BHSU has participated in National Bike to Work Week and National Bike to Work Day. This event promotes bicycle use when feasible to replace the daily commute to work. Not only does this event decrease the number of commuters in a specified week, it also promotes awareness for bicycle use when employees live near BHSU.

Residence Hall Energy Efficiency Competitions

Last year, energy efficiency and water use reduction competitions were held throughout five residence halls and campus apartments. Over the course of the weeks of the competition,

energy use was reduced in comparison with normal levels. Not only did this competition decrease the amount of energy used over the three week time period, but it also promoted awareness of actions that everyone can take to reduce energy and water use. Signs were posted in all residence halls to inform the residents about their energy and water consumption. Examples included the amount of water used per minute in the shower and the amount of water used when it is left on while brushing teeth.

Sustainability Committee

A sustainability committee, including students, faculty, and administration at BHSU has a mission statement to recommend strategies to advance BHSU's commitment to sustainability, promote sustainability efforts on campus, and to educate the campus community on sustainability issues. This committee meets regularly throughout year to plan activities, discuss future direction, and increase awareness about sustainability on campus.

Current Emission Reduction and Sustainability Initiatives

Black Hills State University has been dedicated to energy conservation, emission reduction and sustainability for many years. More than a decade ago, electricity use reduction programs were put in place to conserve energy usage. Similarly, many products were in use at BHSU for cleaning and maintenance long before they became Green-Seal certified products. This section reviews emission reduction and sustainability initiatives that BHSU has implemented in the recent past.

Electricity

Lighting - In 1998, a comprehensive energy analysis was performed at BHSU to identify, develop and analyze available energy saving improvements. BHSU subsequently followed the plan by retrofitting campus lighting in all buildings on campus. This included replacing all incandescent lighting with new electronic ballasts, T-8 lamps, compact fluorescents, LED kits, and fluorescent fixtures, which reduced the overall electricity consumption on campus. The implementation of this plan saved approximately 1.6 million kWh of electricity each year, with a yearly savings of $112,099 in energy and maintenance costs. These savings allowed the plan to pay for itself in roughly 6.5 years. These funds are now being used to move other energy efficiency projects forward.

Consumption – President Schallenkamp has challenged all university departments to reduce their electricity consumption during FY10 and into the future. Baseline electrical consumption by university building will be posted on the BHSU website and will be tracked each month during the year to measure the electricity savings. Each individual faculty and staff member has been asked to make a difference in our daily electrical

consumption by incorporating simple practices into their daily routine including turning lights off when leaving a room, turning computers off at night, reducing air conditioning usage, and encouraging others to do the same.

Heating and Cooling

Changes in the heating and cooling systems on campus have occurred in the recent past including the installation of a semi-auto cover on the Young Center swimming pool, air conditioning improvements in the Young Center, a new boiler in Heidepriem residence hall, booster and steamer replacements in Pangburn for food service, and conversion to variable air volume in the library and Jonas Academic Hall to improve air quality. Although not all projects had a baseline to calculate the carbon savings realized, it is known that 517.6 tons of carbon dioxide emissions were saved by the improvements made in the library and Jonas Academic Hall through the retro commissioning process.

Carbon Neutral Power Sources

In the past year, BHSU has installed solar panels and a wind turbine on campus. These are the first carbon neutral power sources to be used on campus. The solar panels provide power for lighting the stone entry signs at the campus entrances. The wind turbine is located near the student union and will be used to input power back into the energy grid.

Transportation

Carpool Program - BHSU has a carpool parking program that is available to faculty, staff, and students affiliated with the university. Through the program, groups of three or more individuals sharing a ride on the majority of their trips to campus are eligible for both discounted parking fees as well as more convenient, reserved parking spaces. This program was initiated to reduce the amount of single-rider commutes, which will reduce the carbon emissions from commuting.

Campus Bike Program - Last year, BHSU implemented a program to provide bicycles for use around the campus and within Spearfish. Several bicycles are painted in green and gold school colors and allow for non-vehicular transportation around the area. Faculty, staff, and students are welcome to use the bikes to get around campus or the community. They are asked to return the bikes to any campus location so another person can use it next. This program was created for people that wish to decrease their vehicle usage when getting around campus and Spearfish for necessary errands. This program allows for reduction of emissions for trips that would have normally been made in a personal vehicle.

Spearfish Trolley - Because Spearfish is a small community, there is only one public transportation opportunity available. The Spearfish trolley runs between many

downtown areas, the BHSU campus, the city park, and Wal-Mart. The university is a sponsor of the trolley, promotes the trolley, and encourages faculty, staff, and students to take advantage of this opportunity to reduce carbon emissions from individual trips.

Architecture and Planning

In 2007, President Kay Schallenkamp committed BHSU to meet a LEED (Leadership in Energy and Environmental Design) Silver Rating on all future university building projects. LEED was developed by the U.S. Green Building Council (USGBC) and provides a framework for identifying and implementing green building design, construction, operations and maintenance solutions. Buildings designed under this plan aim to improve their performance with energy and water use, reduces carbon dioxide emissions, an improved indoor environment, and the stewardship of resources. Subsequent to President Schallenkamp's designation, the South Dakota Legislature passed a law stating that all new construction or major renovation must be LEED Silver certified.

Since the implementation of the LEED Silver Rating commitment, BHSU has begun design and/or construction on three large building projects. The new student union addition and renovation includes many components of energy efficiency and sustainability, including a green roof, a vertical wind turbine, light monitors, and the initial implementation of the campus recycling program. The new science building which is fully designed and in the bid stage and the new University Center – Black Hills in Rapid City, which is in the final design stage, will also be built to meet the LEED Silver standard.

Product Use

In 2007, along with the commitment to LEED certified buildings, BHSU committed to purchase only Energy Star rated appliances. Energy Star appliances meet strict energy efficiency guidelines that have been set by the U.S. Environmental Protection Agency and U.S. Department of Energy.

Facilities Services on campus uses many Green Seal certified cleaning products, including all purpose cleaners and towels. Green Seal certified products have undergone a thorough evaluation of the entire life-cycle of the product to assure that all significant environmental impacts are considered, from the extraction of the raw materials to the use and disposal of the product. An example is the use of twist and fill products, which are concentrated cleaning products, which lessen the transportation and packaging used in the life-cycle of the product.

Campus Grounds

Around campus, the landscape includes many trees, shrubs, and other plants. A large portion of the landscaping is zeroscaping, which focuses on using low-maintenance and native plants. This provides beautiful landscaping that needs less watering and maintenance. Flowering

plants on campus are mainly perennials, which also reduce required maintenance and the amount of yearly soil disturbance. The grasses on campus, aside from high traffic areas such as the core of the campus and the sports fields, are native grasses and survival blends or grass, which require less irrigation and maintenance than conventional grass types.

Storm Water Management

Recently, an environmentally beneficial swale was built in the new student parking lot. The bioswale captures storm water from the parking lot and uses it for irrigation rather than filling up the storm sewers. Bioswales are also beneficial for removing silt and pollution from the water that manages to run off. In addition to the swale in the student parking lot, the new student union addition includes a swale and a garden roof. These two additions to the union will help better manage the runoff from the roof, and use the water in a beneficial way for the university.

Solid Waste

Two new solid waste reduction programs have been initiated on campus with the opening of the new student union addition and renovation. This building will have a full blown recycling program including paper, aluminum, glass, cardboard, and food waste. Additionally, extractors are used in the kitchen to reduce moisture from solid waste making it available to be used in campus gardens as compost. Both of these initiatives effectively reduce the solid waste output of BHSU.

Printing

To reduce the amount of paper used for printing, faculty, staff and students have been asked to reduce their printing by eliminating it when possible or printing on both sides of the sheet when it is necessary to print. Faculty, in particular, were asked to put their syllabi on line this fall, thus saving thousands of pieces of paper. All university departments have been challenged by the President to reduce paper usage. Additionally, the print shop recycles binding materials and posters.

Potential Emission Reduction Initiatives

In order to become a climate neutral campus, significant changes need to be made in addition to the historical steps taken by BHSU. The following items would have a significant impact on BHSU's carbon footprint. Although they are not far enough along in the process to ensure they will be completed, BHSU continues to pursue them as potential emission reduction opportunities and is hopeful that they will have a significant reduction on carbon emissions for the campus in the near future.

Biomass Heating

BHSU administration has been pursuing the possibility of a wood-chip biomass boiler to produce steam to fuel the current heating infrastructure on campus in the near future. This system could use wood waste from Spearfish Forest Products, the local timber processing company, and waste biomass from forest service land to fuel the boiler. Depending on the cost of natural gas, a biomass heating system could cut the cost of energy for heating at BHSU by approximately 40% and would greatly reduce the net carbon emissions currently coming from the use of natural gas on campus.

If these systems are installed at the university, the natural gas boilers would only be used for backup heating in normal shutdown periods for the biomass boiler or in times of emergency. Natural gas accounts for approximately 19% of the total emissions for BHSU. With this system, these emissions would be greatly reduced or even eliminated. Fossil fuel combustion, in this case, natural gas, takes carbon that was locked away underground and transfers it to the atmosphere as carbon dioxide, essentially adding carbon to the natural carbon cycle. Additionally, the use of fuel oil on the campus as the current back up heating source would be entirely eliminated.

Biomass burning, in this case waste wood products, does emit CO_2 into the atmosphere; however, it is a carbon neutral process. All of the carbon in the biofuel comes from the plant's process of photosynthesis and was removed from the atmosphere during the plant's life cycle. Basically, any CO_2 put back into the atmosphere from emissions of wood burning was taken out of the atmosphere in the recent past by the plant being burned in forest land, and therefore puts no additional carbon into the atmosphere that was not already in the natural carbon cycle. If these systems are incorporated into BHSU's heating scheme, a large portion of the emissions from natural gas at BHSU would be eliminated.

Detailed engineering analyses have been completed and have determined that BHSU is a prime candidate for a biomass fuel system. Discussions have been occurring with the local timber plant, Board of Regents administrators, State of SD leaders, and SD congressional delegates to assist with potential funding opportunities.

Energy Analysis

Similar to the comprehensive energy analysis and improvements completed by BHSU in 1998, request for proposals have been issued to complete another energy analysis in the near future. Again, similar to the study in 1998, this improvement would retrofit all existing energy using products such as lights, appliances, and other equipment. With this initiative, BHSU would continue to stay on the leading edge of electrically efficient products, lessening energy usage and associated emissions while saving the university money on energy costs.

Several efficiency projects have been submitted to the State of SD administration for consideration of no interest loan funds, which must be paid back in 15 years from energy savings. These projects include retrofitting the high-bay lighting in the Donald Young Center, installation of variable frequency drives to the Donald Young Center pool's HVAC controls, and installation of residence hall wall hydrant meter.

Donald Young Center High-Bay Lighting Retrofit - This lighting project would replace 400 watt Metal Halide fixtures with high bay fluorescent fixtures in the gym, upper gym and field house. Automated lighting control is already in place and will be used with the new installed fixtures. This installation would save $14,691 in energy costs per year and would have an installation cost payback in 9.7 years.

Donald Young Center Pool HVAC Control - The heating and ventilation units on the swimming pool run 24 hours a day and seven days a week. Installation of variable frequency drives to these units will assist in comfort control as well as utility savings. This installation would save $3,400 annually in energy savings and would have a payback period of 7.5 years.

Residence Hall Wall Hydrant Meter Installation - This project would add water metering to the hose bibs that are used for lawn watering at four residence halls. Installation of these meters would reduce sewer charges and consequently provide utility savings to the Residence Life budget. This project would save $3,690 in sewer charges each year and have a payback in 10.5 years.

Goals

BHSU will continue to be committed to the environment through sustainability and energy reduction initiatives. Goal three of the BHSU strategic plan identifies the following actions to advance ecological initiatives on campus:

*Use Student Union as pilot program for recycling efforts and add one or two buildings to recycling program each year through 2013

*Reduce paper usage on campus by instituting scanning equipment and electronic workflow

*Continue discussions with Black Hills Forest Products to purchase steam at a cost lower than natural gas

*Develop partnerships with local vendors to minimize shipping costs for produce, building supplies and other items as available under current purchasing guidelines

*Improve energy efficiencies through innovative technologies and sound engineering practices including commissioning and retro-commissioning for every building or renovation project

*Assure that all future landscape work is evaluated for irrigation needs, storm water reuse, and sustainable maintenance

* Purchase alternate non-fossil fuel vehicles if available when replacing small maintenance vehicles and maintenance equipment

* Purchase only Green Star rated appliances

* Ensure all roof replacements are compliant with LEED silver or higher standards

* Transition custodial services to green cleaning supplies and institute water saving procedures

* Build all new buildings to LEED silver or higher standards

Climate Action Plan Updates

The Black Hills State University Climate Action Plan will be an evolving and comprehensive document in the future. Changes will be made when necessary and the CAP will be formally updated every five years and posted on the ACUPCC website.

Acknowledgements

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Kathy Johnson – Vice President, Finance & Administration
Art Jones – Director of Facilities Services
Joseph Manthey – Graduate Student, Primary Author of Climate Action Plan
Joshua McDonald – Undergraduate Student, member of P.E.T.E.
Kelly Smith – Undergraduate Student, President of P.E.T.E.
LeAnn Vandine – Secretary for Facilities Services

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Bibliography

Reference information for the BHSU Climate Action Plan came from the following informative websites, as well as personal contact with the helpful individuals in the acknowledgements.

American College and University Presidents Climate Commitment – www.presidentsclimatecommitment.org

Association for the Advancement of Sustainability in Higher Education – www.aashe.org

Clean Air-Cool Planet – www.cleanair-coolplanet.org

Green Seal – www.greenseal.org

Opportunity Green – www.opportunitygreen.com

Sustainable Works – www.sustainableworks.org

TerraPass – www.terrapass.com

U.S. Green Building Council – www.usgbc.org

Supplementary Table 1 – Complete list of compared schools and the mteCO2 per student and per 1000 sq. feet building area

	MTECO2 emissions	
	per student	per 1,000 sq. feet
Seattle Pacific University	1.7	5.7
Pacific Lutheran University	2.2	6.0
University of Baltimore	2.8	21.6
Western Connecticut State University	3.1	7.2
Southern Polytechnic State University	3.2	11.6
Black Hills State University	3.6	14.6
Roger Williams University	4.3	15.3
Coppin State University	4.4	16.9
California State University - Monterrey Bay	5.5	16.2
University of Portland	5.5	14.9
University of St. Thomas	5.7	21.8
Clark University	6.0	11.3
Stetson University	6.1	11.7
Frostburg State University	6.5	21.0
University of Maryland - Eastern Shore	8.5	16.9
Brandeis University	8.7	16.1
University of Richmond	10.2	14.8
Bucknell University	11.4	15.3
Furman University	13.4	17.6
Yeshiva University	18.2	30.8
University of Maryland - Baltimore	24.1	27.5