

# Climate Action Plan



Update

# 2015



## Table of Contents

---

Introduction	2
President’s Climate Commitment	4
Greenhouse Gas Emission Inventory	6
Natural Gas	7
Purchased Electricity	7
BHSU Fleet	7
Air Travel	7
Faculty, Staff, and Student Commutes	7
Solid Waste	8
Paper Purchasing	8
Waste Water	8
2007 and 2012 Greenhouse Gas Inventory	9
Education, Awareness and Outreach for Climate Action and Sustainability	10
Current Emission Reduction and Sustainability Initiatives	12
Progress on Goals from 2009 Climate Action Plan	14
New Goals	16
Climate Action Plan Updates	24
Acknowledgements	24
References	26

## Introduction

---

Black Hills State University (BHSU) is a comprehensive liberal arts university located in Spearfish, South Dakota, a community of approximately 11,000 in the heart of the scenic northern Black Hills. The university offers over 70 academic programs at the associate, bachelor's, and master's degree levels. With 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 university's location in the beautiful Black Hills emphasizes the importance of modeling responsible environmental behavior and providing that education to our students.

BHSU became a signatory of the American College and University President's Climate Commitment (ACUPCC) on May 14, 2007 becoming the first university to do so in South Dakota and the 242<sup>nd</sup> signatory to join this group of colleagues. By signing the commitment, BHSU agreed to take steps in the pursuit of climate neutrality by 2050.

In continuation of this commitment, BHSU published an original Climate Action Plan (CAP) in 2009. The 2009 BHSU CAP was a comprehensive review of the previous year's emissions inventory results that aimed to identify and implement potential emission reduction initiatives. As stated in the original document, "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."

Black Hills State University further solidified their climate commitment by becoming a member of the Association for the Advancement of Sustainability in Higher Education (AASHE). The University participates in AASHE's Sustainability, Tracking, Assessment, and Rating (STARS) program. Based on our sustainability efforts, Black Hills State University received a STARS Silver rating in 2014.



In accordance with the ACUPCC, BHSU regularly completes a comprehensive inventory of all greenhouse gas emissions for the university. This inventory is and will be used in conjunction with the STARS assessment to identify campus sustainability initiatives and set emission reduction goals. Identified goals and initiatives will be written into the Climate Action Plan. This document will in turn act as Black Hills State University's guide toward a sustainable future.

BHSU is actively working to create a more efficient and sustainable campus. 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 Climate Action Plan 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. This plan will be revised 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, the purchase of carbon credits will not be considered until all reduction options have been exhausted.

The BHSU Climate Action Plan is 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 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*

**Greenhouse Gas Emission Inventory**

In order to achieve carbon neutrality, we must first know how much carbon dioxide we emit as a result of university business. ACUPCC requires institutions to submit a greenhouse gas inventory every two years.

BHSU uses a greenhouse gas inventory calculator to calculate the main gas emissions types (carbon dioxide, methane, nitrous oxide, etc.) into metric tons equivalent of carbon dioxide (MTCO<sub>2</sub>e). MTCO<sub>2</sub>e is a standard metric used to compare emissions from different greenhouse gases based on the ability of the gas to trap heat in the atmosphere. Our total greenhouse gas emission in carbon dioxide equivalent is also referred to as a carbon footprint. The calculator used is called the Campus Carbon Calculator, specifically designed for universities.

BHSU's greenhouse gas emissions inventory analyzes 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. Scope III emissions are all other

<p>Scope Emissions Include</p> <ul style="list-style-type: none"> <li>I) Direct Emissions: Heating, cooling, college fleet</li> <li>II) Imported Emissions: Purchased electricity</li> <li>III) Other Indirect Emissions Waste: University - funded travel (air, car, and public transportation); faculty, staff, and student commute from home to campus; waste water; solid waste; and paper purchasing</li> </ul>
--

**Table 1. Emission Sources as defined by ACUPCC**

indirect emissions due to the activities of the institution, but are not directly owned or controlled by the institution.

Total emissions for Scopes I, II, and III are 2,352 MTCO<sub>2</sub>e , 7018 MTCO<sub>2</sub>e , and 3,909 MTCO<sub>2</sub>e , respectively. In total this is 13,279 MTCO<sub>2</sub>e , which is equivalent to 4.0 MTCO<sub>2</sub>e per full-time enrolled student and 16.7 MTCO<sub>2</sub>e per 1,000 square feet.

Year-to-year data will fluctuate due to variations in weather. For example, a warmer summer will result in more electricity used for air conditioning and a colder winter will require more natural gas for heating. Over time, compiled yearly data will enable us to establish trends and better analyze what emission reduction measures are successful.

### **Stationary Emission Sources**

Stationary emission sources on the BHSU campus include natural gas boilers for heating and purchased electricity. Stationary emission sources include the vast majority of all emission sources at BHSU 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 majority of campus heating. The heat distribution system is steam, with a mix of steam to hot water and steam to ducted air converters in the buildings. Some buildings on campus are heated by additional smaller boilers. The main fuel source for these boilers is natural gas, which produces 16% 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. A significant portion of this power is hydroelectric (about 70%) and the rest from coal power generation.

### **Mobile Emission Sources**

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

**BHSU Fleet** - The BHSU fleet contributes 2% of the campus' GHG emissions, using both unleaded gasoline and diesel fuel. 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. 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 to travel to meetings, conferences and other business engagements totaled 374,979 miles in 2012. Air travel accounts for 2% of the emissions total for BHSU.

**Faculty, Staff, and Student Commutes** - Students, faculty, and staff who commute to campus accounted for 17% of the GHG emissions for BHSU in 2012. This statistic was estimated. An effort to distribute a survey to make a more accurate measurement of commute miles started in 2015.



### Solid Waste

Solid waste includes any garbage, food, or recyclable materials taken to a landfill. Emissions from this source are mainly in the form of methane from the breakdown of the wasted materials. Solid waste accounts for 10% of BHSU's carbon footprint. This number is estimated based on the volume and number of dumpsters on campus. It will be difficult to get a more accurate emissions number because weighing garbage daily is not currently practical.

### Paper Purchasing

Paper is counted by reams of recycled paper and virgin paper. This does not measure whether or not we recycle the paper after our use, but if the paper was made from recycled material. The majority of paper purchased by BHSU is made from 30% recycled paper. In 2012, BHSU purchased 5,955 reams of 30% recycled paper and 60 reams on non-recycled paper. One ream is 500 sheets of paper. This accounted for 41 MTCO<sub>2</sub>e and less than 1% of our total carbon footprint.

### Waste Water

Waste water is measured in gallons of water consumed by the university campus. In 2012, 38,365,690 gallons of water from the university was processed aerobically through an activated sludge method at Spearfish's Waste Water Treatment Plant. This accounts for 19 MTCO<sub>2</sub>e, or less than 1% of our carbon footprint.

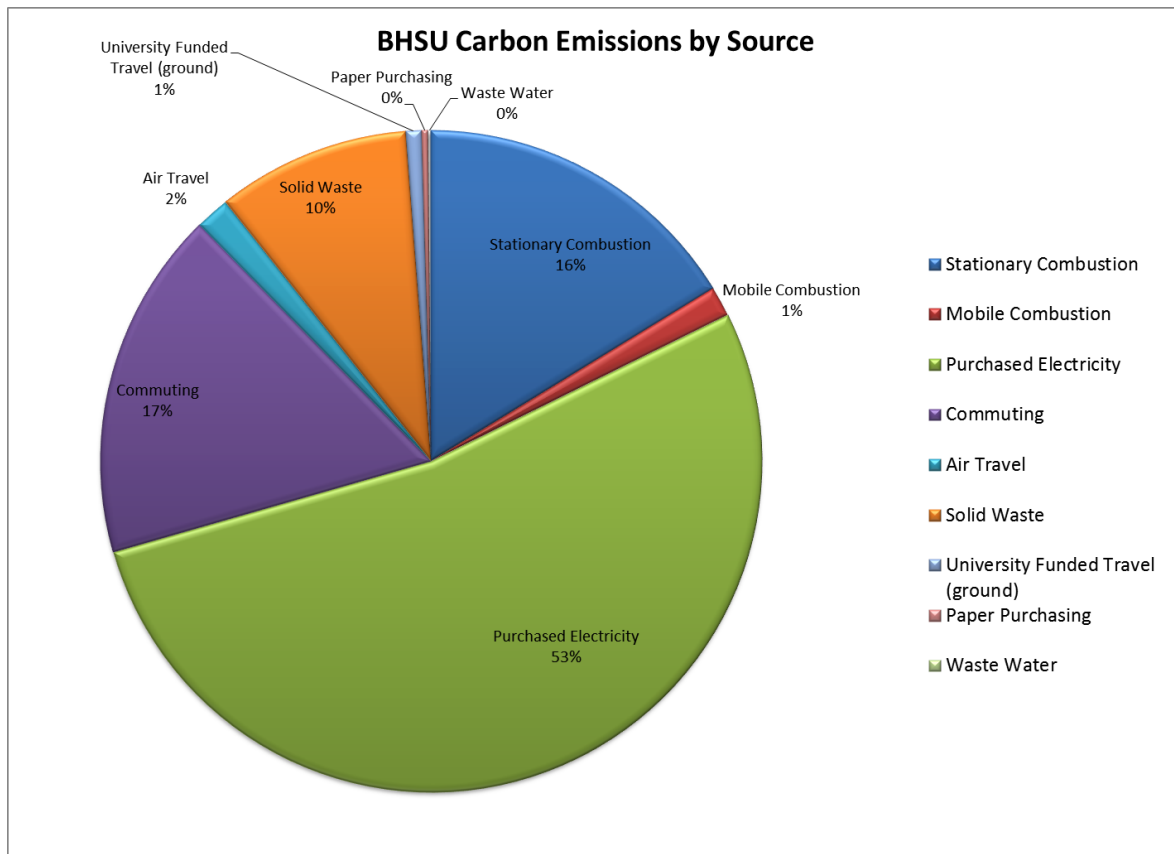


Figure 1. BHSU Fiscal Year 2012 Carbon Emissions by Source

	Fiscal Year 2007	Fiscal Year 2012
Stationary Combustion	2079	2159
Mobile Combustion	413	193
Process Emissions	0	0
Fugitive Emissions	0	0
<b>Total Scope 1</b>	<b>2492</b>	<b>2352</b>
Purchased Electricity	6991	7018
Purchased Heating	0	0
Purchased Cooling	0	0
Purchased Steam	0	0
<b>Total Scope 2</b>	<b>6991</b>	<b>7018</b>
Commuting	2365	2269
Air Travel	454	221
Solid Waste	1243	1256
University Funded Travel (ground)	-	103
Paper Purchasing	-	41
Waste Water	-	19
<b>Total Scope 3</b>	<b>4062</b>	<b>3909</b>
Gross square feet of building space	731695	754430
Total student enrollment (Full-time equivalent)	2950	3291
Residential Students	736	788
Full-time Faculty	121	144
Part-time Faculty	11	68
Full-time Staff	206	224
Part-time Staff	21	41
Heating Degree Days*	-	5917
Cooling Degree Days*	-	1078

Table 2. BHSU Greenhouse Gas Emission Inventory, FY 2007 and 2012 in MTCO<sub>2</sub>e

\*Heating and cooling degree days are a measurement to gauge the energy demand required to heat or cool a building based on outside air temperature.

## Education, Awareness and Outreach for Climate Action and Sustainability

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 in Academics** – A survey in spring 2014 showed that over 10% of undergraduate courses offered at BHSU included sustainability as a learning outcome. A Masters of Science in Sustainability was offered beginning in 2013, but was placed on hold in 2015 due to budget cuts and low enrollment.

**Annual Sustainability Day and Earth Day** - BHSU celebrates the environment and sustainable practices twice a year, Sustainability Day in October and Earth Day in April. The days are devoted to promoting awareness for BHSU's commitment to sustainability, green energy issues, and to demonstrate energy efficiency and sustainability ideas. Student organizations often participate with a service project.



Figure 2. Jared Capp, of Pangea Designs, demonstrates the benefits of natural building to students on Earth Day, 2014.

**Sustainability Committee** - The Sustainability Committee, includes students, faculty, and administration at BHSU and 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 every semester to plan activities, discuss future direction, and increase awareness about sustainability on campus.

**Spearfish Local** - Spearfish Local is a new initiative that brings together local producers, distributors, purchasers, and consumers of local food and other locally-sourced products. The goal of Spearfish Local is to grow support of the local economy and to work together to achieve greater things than we could as separate organizations. In supporting the local economy and the growing demand for healthy food sources, BHSU has launched an independent certification system to provide an unambiguous definition and identification to local products.



Figure 3. Spearfish Local logo, designed by business administration major, Danielle Doney

**RecycleMania** – BHSU began participation in the national RecycleMania competition in 2014. Our first event was a Feb. 22, 2014 basketball game, where students and sustainability staff strived to reduce landfill waste. Trash cans were all moved away except for one and replaced with recycling and compost collections. The Athletics Department changed to compostable plates to reduce waste from concessions. After sifting through and weighing all trash generated from the event, (totaling 325 lbs.) over 75% of the materials by weight were recycled or composted. Nationally, BHSU came in 3<sup>rd</sup> place in

recycling per capita for the game day basketball event! In 2015, we beat our previous year's score by diverting 87% of Feb. 13's basketball game trash from the landfill.

**BHSU Garden** – The BHSU campus garden, located south of the Yellow Jacket Apartments, was established in 2008 by students living in the residence halls. Since then, the garden has grown through the volunteer efforts of faculty and staff, student organizations, and community groups. We've estimated that the garden requires 550+



**Figure 4. International student, Minji Jung, groundskeeper, April Yenglin, and Sustainability Coordinator, Katie Greer, picking pattypan squash from the garden, summer 2014**

hours of planting, watering, weeding, harvesting, and ground preparation each year. All of the produce harvested from the garden is prepared into meals at our campus dining hall, The Hive. A container garden (made from recycled pallet wood) was built in 2014 and placed on the South side of the Student Union to bring a part of the garden closer to the heart of campus. In 2015, BHSU rented space in a local strawbale greenhouse to provide season extension into the school year, providing volunteer opportunities to BH students and educational programming for youth.

**Sting's Eco-Explorers Summer Camp** – In 2014, BHSU held its first sustainability summer camp for kids 4-12. The camp focused on teaching children the importance of sustainability while creating an environment that was fun and friendly.



**Figure 7. Chemistry professor, Dan Asunskis, teaching renewable energy to summer camp attendees**

The camp offered tours and activities at the Student Union, dining services in the Hive, the campus garden, the chemistry lab, and the underground tunnels. Professors and students were involved with lessons for the children and the University provided healthy snacks. The camp was held again in July 2015 and organizers plan to host the program again each summer.



**Figure 5. Katie Greer, Sustainability Coordinator and students Samantha Starkey and Brady Licht with the collection from the 2014 RecycleMania basketball game. All but the two bags in front were recycled or composted.**



**Figure 6. Student Thomas Trimble showing a pumpkin plant to summer camp kids, summer 2014**

**Environmental Sustainability Student Organization** – Formed in fall 2014, ESSO is a student group with a mission to protect and conserve the environment while creating awareness to generate involvement surrounding environmental issues on campus and within the community. Students involved are looking for opportunities to gain experience in leadership and volunteering through community engagement, education, outreach, and expansion of their social networks.

**Social media** – Facebook (BHSU Sustainability), Twitter (@BHSUSustainable), and Instagram (@BHSUSustainability) accounts were opened in summer 2014 and updated several times per week to reach a larger audience on day-to-day information.

### **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.

**Renewable Energy Power Sources** - In 2009, BHSU installed solar panels and a wind turbine on campus. The solar panels provide power for lighting the stone entry signs at the campus entrances and enable us to light the signs without extending an electric line to the edges of campus. The wind turbine, a 1.8kW Skystream, is located near the student union and is used to input power back into the energy grid. The wind turbine functions appropriately for its size, generating about 2,200 kilowatt-hours of power each year.

**Heating** – The Central Plant natural gas boilers were replaced with higher efficiency boilers in 2012.

**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 discounted parking fees. This program was initiated to reduce the amount of single-rider commutes, which will reduce the carbon emissions from commuting. Faculty traveling to the Black Hills State University - Rapid City campus at similar times are asked to carpool when utilizing a state vehicle.

**Lisa Bike** – Led by Enactus, a BHSU business student organization, this program lets students lease out bikes for an assigned amount of time. The group recently installed a “fix-it” station thanks to some additional funding. The Lisa Bike Program, named from a play on words “Lease-a-bike,” started fall 2013 by getting the fix-it station and six bikes, three men’s and three women’s, for students to rent for a semester.



Figure 8. ESSO's first officers, John Morgan (Secretary), Katerina Griffin (Vice President), Chance Simonton (President), and Megan Brink (Public Relations)

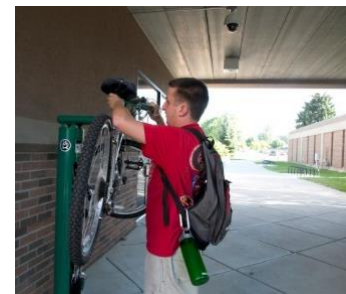


Figure 7. The "fix-it" station is located in the breezeway between the Student Union and Jonas. It is free to use for anyone in the community.



**Architecture and Planning** - In 2007, former 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 state-owned new construction or major renovation must be LEED Silver certified.

**Product Use** - In 2007, along with the commitment to LEED certified buildings, BHSU committed to purchase Energy Star rated appliances. Energy Star appliances have been independently certified to meet strict energy efficiency guidelines.

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 portion of the landscaping is xeriscaping, 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 of grass, which require less irrigation and maintenance than conventional grass types.

**Storm Water Management** - Black Hills State University is located on a northern facing, sloped aspect, that at times is required to drain large amounts of storm water. A major goal of all new construction, including the new Crow Peak residence hall, is the ability to slow and divert this storm water. Much of this runoff is in turn captured and diverted to large bioswales, removing silt and pollution from the water. This prevents both erosion and sedimentary pollution of Spearfish Creek, located downhill from campus. Bioswales are located in the Jonas parking lot, the Student Union, and Crow Peak landscaping. The Student Union also features a green roof with low maintenance plants, helping to better manage the runoff from the roof as well as improving the heating and cooling efficiency of the building.

**Green Restaurant Association certification** – The Hive and The Buzz Shack were certified as 2-Star Green Restaurants in 2014. The certification requires recycling and zero Styrofoam use as well as a host of energy efficiency and waste reduction measures.

**Solid Waste** – Recycling collection is now available in every building on campus. To keep track of our progress, all recycling is weighed and recorded by type (plastic, metal, motor oil, cardboard, paper, phone books, and batteries) throughout the year.

Post-consumer food waste was reduced when Dining Services began its policy of trayless dining in The Hive, reducing the amount of food that patrons take back to their tables at one time. Food and napkin waste left on plates are processed by a Somat extractor in The Hive's dish room. It is then sent to a composting facility instead of going to a landfill. During the school year, about a ton of dehydrated food waste is composted per month.

At least once a year, Facilities Services holds a sale of surplus equipment. Departments have first choice and then the sale opens to the community. What is not sold is recycled, if possible. The BHSU bookstore's used book/book rental program keeps textbooks in circulation longer, reducing the amount of paper waste.

**Lighting upgrades** – When feasible, LED lighting will be used in all new construction and lighting updates. In 2014, BHSU began replacing the outdoor lighting fixtures and upgrading bulbs from halogen to LED. This project will be completed in three phases. Lighting in E. Y. Library Learning Center was recently replaced with 18-Watt LED bulbs.

**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. A fee is instituted for printing on campus. Students are given a small stipend each year for printing and are required to pay for anything over that amount. Faculty are asked to put their syllabi online instead of in print.

### **Progress on Goals from 2009 Climate Action Plan**

---

BHSU's first Climate Action Plan listed the following emission reduction strategies. Goals successfully implemented are listed in bold. Notes and updates are in italics.

1. Biomass Heating - BHSU administration pursued the possibility of a wood-chip biomass boiler to produce steam to fuel the current heating infrastructure on campus in the near future. *This project was deemed cost prohibitive at the time. Instead, we purchased more efficient natural gas boilers.*
2. **Energy Analysis**
  - **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.**
  - Donald Young Center Pool HVAC Control - *this project hasn't been completed yet, but is still in the Young Center upgrade plans.*
  - 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. *This has not been implemented yet.*

3. **Use Student Union as pilot program for recycling efforts and add one or two buildings to recycling program each year through 2013.** – *Recycling bins are now located in every campus building.*
4. Reduce paper usage on campus by instituting scanning equipment and electronic workflow – *Scanning equipment and some paper reduction policies are in place, but there is no campus-wide electronic workflow policy.*
5. Continue discussions with Black Hills Forest Products to purchase steam at a cost lower than natural gas - *Higher efficiency natural gas boilers were installed in 2012 instead.*
6. Develop partnerships with local vendors to minimize shipping costs for produce, building supplies and other items as available under current purchasing guidelines. – *There have been purchases where this is implemented, but there is no policy to require this. Purchases for the campus are made through state contract purchasing policies.*
7. **Improve energy efficiencies through innovative technologies and sound engineering practices including commissioning and retro-commissioning for every building or renovation project.** - *All new buildings and major renovations are built to LEED Silver or higher standards. LED bulbs are utilized whenever lighting replacements are made.*
8. **Assure that all future landscape work is evaluated for irrigation needs, storm water reuse, and sustainable maintenance.** – *BHSU is currently in the process of completing an irrigation plan for the campus and several bioswales have been constructed to redirect storm water.*
9. **Purchase alternate non-fossil fuel vehicles if available when replacing small maintenance vehicles and maintenance equipment** – *Electric carts are used for intercampus transportation instead of gasoline or diesel vehicles. An all-electric waste collection vehicle has replaced dump trucks for trash collection on campus. Electric cars are plugged into our campus grid. The majority of the power on campus comes from a hydropower dam through a contract with the Western Area Power Administration.*
10. **Purchase only Green Star rated appliances** – *This is campus policy.*
11. Ensure all roof replacements are compliant with LEED silver or higher standards – *New construction and major renovations are required to meet LEED Silver certification, but roof projects have not been required.*
12. **Transition custodial services to green cleaning supplies and institute water saving procedures** – *Custodians use microfiber towels first and, when necessary, supplement with 100% recycled Green Seal certified paper towels. The primary cleaning product is 3M® Neutral Cleaner which is also Green Seal certified. Hard surface floors (with the exception of athletic surfaces) are cleaned by TENNANT T3, T5, and T7® cleaning scrubbers. These products utilize ec-H2O® technology using no chemicals, just water. 80% of all campus cleaning products are Green Seal certified.*
13. **Build all new buildings to LEED silver or higher standards** –*Since 2009, we've achieve LEED Gold certification on the Student Union renovation and LEED Silver certification on the Life Science Building. Crow Peak Residence Hall is expected to receive LEED Silver certification after completion. BHSU- Rapid City, a satellite campus shared with other South Dakota universities, is also a LEED Silver certified building. BHSU holds the contract to maintain BHSU-RC.*



## New Goals

---

A committee of students, faculty, and staff meet several times in 2014 to discuss new goals for this Climate Action Plan. In addition to feasibility and affordability, there were a few factors we considered with each idea: will this effort decrease our carbon footprint, make the University more sustainable, and follow the BHSU Strategic Plan?

Decreasing our carbon footprint is the purpose of this plan in order to achieve carbon neutrality by 2050. However, there are goals that do not directly reduce our carbon footprint that are still important to achieve our sustainability mission. AASHE's STARS rating covers sustainability issues that are not directly reflected in our carbon footprint report such as academics and community engagement. The purpose of measuring the impact of a goal by STARS points is not solely for the allure of a higher STARS rating; it is a measurement we can use to evaluate progress on a goal. STARS is a guidepost for us to use to ensure thoroughness of new sustainability projects, evaluate our results, and create accountability. STARS points listed in this document are from the STARS 2.0 Technical Manual and are subject to change. It is important to note that the number of points STARS has assigned to a goal does not reflect the level of difficulty of implementation.

Information sourced in this section:

[BHSU Carbon Footprint, FY 2012](#)

[Black Hills State University STARS Report, April 22, 2014](#)

[STARS Technical Manual, Version 2.0](#)

[Black Hills State University Strategic Plan, 2008](#)

Responsibility of monitoring progress on these goals lies on the Sustainability Office, housed in the Facilities Services department, and with members of the Sustainability Committee, comprised of students, faculty, and staff. Implementation of these goals will require the support and effort of the entire campus community.

1. Continue to increase campus energy efficiency by following through with previous and future energy audit recommendations, especially areas where electricity or heating demands can be significantly reduced. Ensure that efficiency measures are well maintained and continue to work properly to save fiscal resources. Complete an upgrade of the building automation system by 2018.

### Impact

Carbon Footprint: Scope 2 (purchased electricity), currently 7,018.0 MTCO<sub>2</sub>e / year

STARS: Improvements in energy efficiency are measured in STARS 2.0 Section Operations and Planning 8: Building Energy Consumption, worth 6 points total. Institutions earn the maximum of 3 points available for Part 1 of this credit by reducing building energy consumption per gross square foot of floor area by 50 percent compared to a baseline. An institution earns the

maximum of 3 points available for Part 2 when its annual building energy consumption is 90 percent or more below the minimum performance threshold of 28 Btu per gross square foot per degree day. Our score for this section is currently 2.57/6 using a performance year of 2012 and a baseline year of 2007.

Strategic Plan: Goal Three, Step 2a. Reduce dependence on non-renewable resources and consumables.

2. Expand the use of renewable energy by installing a solar array on campus of at least 20-50 kW capacity by 2020. In addition to providing green power the campus, the solar array will be visible, accessible, and provide educational opportunities to students and the greater community on renewable energy technology.

Impact

Carbon Footprint: Scope 2 (purchased electricity), currently 7,018.0 MTCO<sub>2</sub>e / year

STARS: Measurement of this goal is in Operations and Planning 9: Clean and Renewable Energy, worth 4 points. The points are scored based on renewable energy as a percentage of total energy consumption for the campus, therefore a solar array of this size will not likely result in points for STARS; however it is an important step toward investing in clean power. Our current score is 0/4.

Strategic Plan: Goal Three, Step 2a. Reduce dependence on non-renewable resources and consumables.

3. Develop a coalition of faculty by 2017 to work to incorporate sustainability across disciplines throughout campus with the intent to increase sustainability as a learning objective in more undergraduate classes.

Impact

Carbon Footprint: No direct effect.

STARS: Academics: AC-1 Academic Courses (current score 10.31 / 14.00) and AC-2 Learning Outcomes (current score: 4.96 / 8.00)

Strategic Plan: Goal One: Black Hills State University will provide a learning environment characterized by innovative, high-quality academic experiences.

4. Reduce the use of plastic one-use water bottles on campus by increasing the number of filtered water bottle filling stations across campus and providing high quality, affordable water bottles to students starting 2016. As of 2014, we have nine refillable water stations in various buildings across campus. Facilities Services plans to install six more by 2016 and continue to replace traditional water fountains with water bottle refillable stations as replacements are needed.

Impact

Carbon Footprint: Scope 3 (solid waste), currently 1,256.0 MTCO<sub>2</sub>e / year

Note: We could also increase our Scope 3 (waste water) emissions count, currently 19 metric tons of CO<sub>2</sub>e / year, since waste water is measured based on water consumption. However, this program is intended to create good habits in our campus community that they will take into their lives after graduation and therefore we believe this is an important sustainability step.

STARS: OP 22: Waste Minimization, worth a total of 5 points. Institutions earn maximum points of 2.5 points available for Part 1 by reducing their total waste generation by 50 percent or more compared to a baseline. An institution earns the maximum of 2.5 points available for Part 2 of this credit when its total annual waste generation per weighted campus user is 90 percent less than the minimum performance threshold of 0.45 short tons. Our current score is 1.71 / 5.00 with a performance year of 2012 and a baseline year of 2007.

Strategic Plan: Goal Three, Step 2a. Reduce dependence on non-renewable resources and consumables and Goal Three, Step 2b. Increase use of recycling and use of sustainable products when economically feasible.

5. Develop a comprehensive campus wide landscape management plan by 2018 with a goal to create an Integrated Pest Management plan, reduce diesel and gasoline by 10% or more, and identify a conservative watering and mowing schedule.

#### Impact

Carbon footprint: Scope 1 (mobile emissions), currently 193.0 MTCO<sub>2</sub>e / year

STARS: Operations and Planning 10: Landscape Management. Part 1: An Integrated Pest Management plan calls for using least-toxic chemical pesticides, minimum use of chemicals, and use of chemicals only in targeted locations and only for targeted species (1 point).

Part 2: Sustainable Landscape Management Program: The program includes formally adopted guidelines, policies and/or practices that cover all of the following: Integrated Pest Management (see above), plant stewardship, soil stewardship, use of environmentally preferable materials, hydrology and water use, materials management and waste minimization, and snow and ice management (1.5 points). Our score is currently 0.00 / 2.00.

Strategic Plan: Goal Three, Step 2a. Reduce dependence on non-renewable resources and consumables.

6. Reduce emissions from transportation between the Spearfish campus and the BHSU-Rapid City campus by implementing a pilot transportation program. Feasibility of an electric or hybrid vehicle or regular bus route will be analyzed in 2015 with a goal for implementation by 2017.

#### Impact

Carbon footprint: Scope 3 (University funded travel), currently 103.0 MTCO<sub>2</sub>e /year

STARS: OP 21: Support for Sustainable Transportation Part 2: Offers free or reduced price transit passes and/or operates a free campus shuttle for commuters (0.25 points). Participates in a car sharing program, such as a commercial car-sharing program, one administered by the institution, or one administered by a regional organization (0.25 points). Has one or more Level 2 or Level 3 electric vehicle recharging stations that are accessible to student and employee

commuters (0.25 points). Our current score for this section (including part 1 not mentioned above) is 0.88 / 2.00.

Strategic Plan: Goal Three, Step 2a. Reduce dependence on non-renewable resources and consumables.

7. Grow recycling program by continuing to increase the amount of recycling bins across campus and find outlets to recycle new materials such as magazines, newspapers, cell phones, and plastic bags with the goal to increase recycling from 40 tons in 2014 to 50 tons per year by 2018.

Impact

Carbon footprint: Scope 3 (solid waste), currently 1,256.0 MTCO<sub>2</sub>e/ year

STARS: Operations and Planning 23: Waste Diversion. Institutions earn the maximum 3 points for this credit by diverting all waste from the landfill or incinerator. Our score is currently 0.24 / 3.00.

Strategic Plan: Goal Three, Step 2b. Increase use of recycling and use of sustainable products when economically feasible.

8. Approve a tree care plan and commit to a \$3 per full time enrolled student annual investment for tree planting and care by applying to the Arbor Day Foundation to become a Tree Campus USA by 2016.

Impact

Carbon footprint: Carbon absorbed by trees on campus is not currently a measured in our greenhouse gas report. According to the American College and President's Climate Commitment, "Institutions are generally discouraged from counting sequestration by institution-owned land as an emissions reduction unless they clearly meet 'additionality' requirements – i.e. that the offset would not have occurred in the absence of the institution's action." The carbon absorption from campus trees is very small compared to our current emission output.

STARS: Operations and Planning 10: Landscape Management. The campus tree care plan is a component of a sustainable landscape management program. Our score is currently 0.00 / 2.00.

Strategic Plan: Goal Three. Step 2. Advance ecological and energy saving initiatives

9. Continue to increase community involvement by working with local partners such as the City of Spearfish, Spearfish Chamber of Commerce, Hills Horizon, Spearfish Bicycle Cooperative, Northern Hills Master Gardeners, Dakota Rural Action, Project Learning Tree, Leave No Trace South Dakota, the Scouting programs, area schools and daycares, local businesses, and other interested organizations, to provide events, workshops, educational opportunities, and debates to develop awareness of sustainability issues on campus and in our greater community and to encourage BHSU students to become involved citizens of their communities after graduation.

Impact

Carbon Footprint: No direct effect.

STARS: There are several sections covering campus and public engagement. Our current scores are 8.49/20.00 in campus engagement and 12.18/21.00 in public engagement.

Strategic Plan: Goal Two: Black Hills State University will engage in Strategic Partnerships to increase BHSU's presence in the state, the Black Hills region, the nation and the world, that will lead to greater appreciation and support of the University.

Action Steps:

1. Maximize awareness of faculty, staff, and student expertise and service
  - a. Increase faculty, staff, and student involvement with the community.
2. Enhance community/regional relations
  - a. Increase attendance by community members as well as faculty and staff at BHSU lectures, athletic, and cultural events.
  - c. Increase attendance at city council meetings, chamber functions, economic development meetings, cracker barrels and other community events.
3. Increase partnerships with local, state, and federal agencies
  - a. Develop experiential learning opportunities for students with local, state and federal agencies.
  - c. Create experiential opportunities with state and federal agencies for faculty/staff.
4. Increase partnerships with businesses and industries
  - a. Create experiential learning opportunities in business and industry for students, faculty, and staff through research and collaborations.

Goal Three: Step 1. d. Support policies, dialogues and accountability activities that address civility and justice. Step 3 b. Develop and support internships, service learning and community service opportunities.

10. Continue to increase awareness of the sustainability program on campus through events, social media, Sustainability Day, Earth Day, summer camps, outreach material and publications, and other programming. Establish a place on campus for a permanent sustainability display and utilize BHSU Marketing's video production abilities to reach more people.

#### Impact

Carbon footprint: This will not have a direct impact on greenhouse gas emissions, however may affect individual behaviors which could decrease our scope 3 emissions.

STARS: EN 4: Outreach Materials and Publications. Our current score is 1.5/2.00. There are several sections covering campus and public engagement. Our current scores are 8.49/20 in campus engagement and 12.18/21 in public engagement.

11. Continue to look for locations in Spearfish to compost post-consumer food waste from the campus dining hall to reduce the gas used to transport the material. These trips are combined with other weekly errands in Rapid City (delivering mail to BHSU-RC and dropping off glass and plastic recycling) however, a smaller vehicle could be used for Rapid City trips if the food waste

was not included. This may involve finding an entity willing to take the dehydrated food waste processed by the Somat machine or purchasing equipment and forming a staff and student campus team to compost the material ourselves.

#### Impact

Carbon Footprint: Scope 1 (mobile emissions), currently 193.0 MTCO<sub>2</sub>e / year. Composting food waste already has made a significant impact on Scope 3 (solid waste) emissions by reducing landfill waste by over 11 tons per year.

STARS: AC-8: Campus as a Living Laboratory: Waste. This credit recognizes institutions that utilize their infrastructure and operations as living environments for multidisciplinary learning, applied research and practical work that advances sustainability on campus. Current score 2.40 / 4.00.

Strategic Plan: Goal One. Step 2. a. Expand the number and quality of experiential learning opportunities for students including practica, internships, study abroad, Problem-Based Learning, community-based research, academic service learning, student employment as undergraduate research assistantship, tutors, undergraduate learning assistantships, etc. Goal Two. Step 4 a. Create experiential learning opportunities in business and industry for students, faculty, and staff through research and collaborations. Goal Three: Step 2 a. Reduce dependence on non-renewable resources and consumables. Goal Three Step 3 b. Develop and support internships, service learning and community service opportunities.

12. Increase the accuracy of our greenhouse gas report by surveying mileage and frequency of commutes by students, faculty, and staff for the 2015 carbon footprint report. This is an opportunity for a yearly student initiative through the Sustainability Office.

#### Impact

Carbon Footprint: increase accuracy for Scope 3 (Commutes).

STARS: AC 8: Campus as a Living Laboratory: Transportation. This credit recognizes institutions that utilize their infrastructure and operations as living environments for multidisciplinary learning, applied research and practical work that advances sustainability on campus. Current score 2.40 / 4.00.

This information will allow us to submit data for OP 19: Student Commute Modal Split and OP 20: Employee Commute Modal Split. Our current score for each is 0.00 / 2.00 because we don't currently have the data this section requires. Having the survey completed in 2015 will give us a baseline to measure progress in any sustainable transportation efforts.

Strategic Plan: Strategic Plan: Goal One. Step 2. a. Expand the number and quality of experiential learning opportunities for students including practica, internships, study abroad, Problem-Based Learning, community-based research, academic service learning, student employment as undergraduate research assistantship, tutors, undergraduate learning assistantships, etc.

13. Include sustainability prominently in new student orientation by summer 2016.

### Impact

Carbon Footprint: No direct impact, but programming may have an effect on student behavior which could reduce Scopes 2 (purchased electricity) and Scope 3 (solid waste, paper purchasing, waste water, and commuting) emissions.

STARS: EN 2: Student Orientation. This credit recognizes institutions that include sustainability in orientation activities and programming. Including sustainability in student orientation demonstrates that sustainability is an institutional goal and encourages students to adopt sustainable habits in their new school environments. Orientation sets the tone for the campus experience. Current score is 0.00 / 2.00.

Strategic Plan: Goal Three: BHSU will be an inclusive and socially responsible learning community.

14. Start an Eco-Rep program with a student representative from each residence hall by 2016. Eco-Rep (short for Ecological Representative) is a peer-to-peer sustainability educator program. Eco-Rep programs focus on teaching sustainable living practices using peer education techniques. Student Eco-Reps help to raise awareness about ecological issues, encourage environmentally responsible behavior in their hall mates and peers, and plan related events and activities.

### Impact

Carbon footprint: No direct impact, but programming may have an effect on student behavior which could reduce Scopes 2 (purchased electricity) and Scope 3 (solid waste, paper purchasing, waste water, and commuting) emissions.

STARS: EN 1: Student Educators Program. This credit recognizes institutions with programs that engage students to serve as educators in peer-to-peer sustainability outreach. Our current score is 0.99 / 4.

Strategic Plan: Goal One. Step 2 a. Expand the number and quality of experiential learning opportunities for students including practica, internships, study abroad, Problem-Based Learning, community-based research, academic service learning, student employment as undergraduate research assistantship, tutors, undergraduate learning assistantships, etc. Goal Three. Step 2 b. Increase use of recycling and use of sustainable products when economically feasible.

15. By 2017, offer training and/or other professional development opportunities in sustainability for all staff at least once per year.

### Impact

Carbon Footprint: No direct impact, but programming may have an effect on staff behavior which could reduce Scopes 2 (purchased electricity) and Scope 3 (solid waste, paper purchasing, waste water, and commuting) emissions.

STARS: EN 8: Staff Professional Development. Our current score 0.00 / 2.00.

Strategic Plan: Goal One. Step 2 a. Provide opportunities for faculty/staff to engage in professional development appropriate to the discipline and consistent with high impact practices.

16. Continue to grow the campus vegetable garden by working to increase the produce amount, number of containers in the container garden, and/or volunteers each year. BHSU will continue to search for funds for a strawbale greenhouse to extend the growing season.

Impact

Carbon Footprint: No direct impact since emissions from transportation of food purchased for campus are not currently measured on our greenhouse gas report.

STARS: AC-8: Campus as a Living Laboratory (Dining). Current score is 2.40 / 4.00.

Strategic Plan: Goal Three. Step 2 c. Expand campus garden and use of local products. Goal 4. Step 1 d. Increase federal and other grants and contracts.

17. Continue Spearfish Local, a BHSU initiative that brings together local producers, distributors, purchasers, and consumers of local food and other locally-sourced products to grow support of the local economy and to work together to achieve greater things than we could as separate organizations. Apply to at least one grant per year to pay for student internships or other opportunities for this program.

Impact

Carbon Footprint: No direct impact since emissions from transportation of food purchased for campus are not currently measured on our greenhouse gas report.

STARS: would likely qualify for an Innovation Credit. These credits recognize institutions that are seeking innovative solutions to sustainability challenges and demonstrating sustainability leadership in ways that are not otherwise captured by STARS. Current score is 1.00 / 4.00.

Strategic Plan: Goal One. Step 2. a. Expand the number and quality of experiential learning opportunities for students including practica, internships, study abroad, Problem-Based Learning, community-based research, academic service learning, student employment as undergraduate research assistantship, tutors, undergraduate learning assistantships, etc. Goal Two: Black Hills State University will engage in Strategic Partnerships to increase BHSU's presence in the state, the Black Hills region, the nation and the world, that will lead to greater appreciation and support of the University. Goal Two. Step 4 a. Create experiential learning opportunities in business and industry for students, faculty, and staff through research and collaborations. Goal Three. Step 2 c. Expand campus garden and use of local products. Goal 4. Step 1 d. Increase federal and other grants and contracts.

We acknowledge that our goals are only a pathway to move us closer to sustainability by 2020 and not a full plan to achieve carbon neutrality. There are several items the Sustainability Committee has and will continue to discuss but they are not perceived to be feasible at this time. The following items should be in continued discussions and reevaluated by the 2020 Climate Action Plan Update.



- A campus green fee for sustainability initiatives - Other colleges have tied a student green fee to a revolving loan fund where energy savings are reinvested to further efficiency projects. Current Board of Regents policy and SD State Law does not allow us to reinvest energy savings in this way. Changing this would require legislative action. In addition, the ask to start the fee would have to come from the students themselves.
- Sustainable Investment – Although BHSU does not have investments itself, BHSU Foundation has an endowment and the state of South Dakota has state employee retirement investments. Other campuses are working to divest from companies who fund coal and other non-sustainable practices. We do not have any divestment goals at this time.

### **Climate Action Plan Updates**

---

The Black Hills State University Climate Action Plan is an evolving and comprehensive document. Changes will be made when necessary and the CAP will be formally updated every five years and posted on the ACUPCC website. Each update will include a progress report on the goals from the previous Climate Action Plan.

### **Acknowledgements**

---

The following people are thanked for their involvement and help in the 2015 update of the BHSU Climate Action Plan

Randy Culver –Director of Facilities Services

Kathy Johnson – Vice President, Finance & Administration

Jeanne Hanson – Assistant Director of Facilities Services

Art Jones – previous Director of Facilities Services

Katie Greer – Sustainability Coordinator, 2015 Climate Action Plan co-author

John Hinrichs – graduate student, 2015 Climate Action Plan co-author

Joseph Manthey – Author of the 2009 Climate Action Plan

**BHSU Climate Action Plan 2015 Ad Hoc Committee**

Abigail Domagall – Associate Professor, Geology

Nicole Dragone – Assistant Professor, English

Lucas Fralick - student

Katerina Griffin - student

Katie Greer – Sustainability Coordinator

Jeanne Hanson – Assistant Director, Facilities

John Hinrichs - graduate student

Andy Johnson – Associate Director of the CAMSE, Assistant Professor, Physics

David Scarborough – Professor, Human Resources Management

Brian Smith – Professor, Biology

Rosie Sprague – Assistant Director, Center for American Indian Studies

**BHSU Sustainability Committee Members**

Katie Greer, Chair

Andy Johnson

Dan Asunskis

Kathy Johnson

Robb Campbell

Forrest King

Randy Culver

Sandy Klarenbeek

Jace DeCory

Sandra Marker

Abigail Domagall

Christine McCart

Nicholle Dragone

Adam Roosa

Robert Dooley

David Scarborough

Rachel Headley

Brian Smith

John Hinrichs

Donna VandenHoek

The following people are thanked for their involvement and help in the creation of the 2009 BHSU Climate Action Plan: William Bland, Randy Culver, Andy Johnson, Kathy Johnson, Art Jones, Joseph Manthey, Joshua McDonald, Kelly Smith, and LeAnn Vandine.

## **References**

---

[AASHE](#)

[ACUPCC](#)

[BHSU Carbon Footprint, FY 2012](#)

[Black Hills State University STARS Report, April 22, 2014](#)

[Black Hills State University Strategic Plan, 2008](#)

[STARS](#)

[STARS Technical Manual, Version 2.0](#)