

July 31, 2013

Senator Stuart C. Reid
2155 Grant Ave #125
Ogden, Utah 84401

Representative Brad Wilson
1423 Whispering Meadows Lane
Kaysville, Utah 84037

Senator Reid, Representative Wilson:

Attached are reports from the 8 institutions that comprise the Utah System of Higher Education on the current mitigation efforts as well as plans for mitigation to reduce emission of air pollutants within one year. This is in response to the information sent by legislative staff in keeping with the statutory requirements of H.B 168, "Air Quality Mitigation by Government Entities," which passed during the 2013 legislative session.

As you'll note, our institutions have made notable commitments to sustainability – including air quality – in their academic offerings, campus infrastructure, and academic and career preparation. We are committed to improving the learning environment in every way, including careful investment in long term sustainability programs that represent sound business practices as well support an improved natural environment.

Thank you for your work on the Economic Development Taskforce as well as your continuing service in the Legislature.

Sincerely,



Dave L. Buhler
Utah Commissioner of Higher Education



Office of the Vice President
for Administrative Services

To: ECONOMIC DEVELOPMENT TASK FORCE C/O THE COMMISSIONER'S OFFICE
Re: AIR QUALITY MITIGATION BY GOVERNMENT ENTITIES - HB168

I- INTRODUCTION

During the 2013 session the Utah State Legislature passed and the Governor signed HB168 to respond to the problem of Utah's episodically poor ambient air quality. HB168 challenges all state agencies to assess their operations to determine how they can reduce their emissions of pollutants that contribute to our episodically poor air quality. The law requires a report on current year mitigation strategies and a forward-looking plan to describe emission reduction activities that the agencies will engage in within the next year. This mitigation plan describes the University of Utah's various ongoing programs and actions to reduce air emissions of harmful pollutants.

This report and plan focus specifically on the activities and strategies the University of Utah employs to reduce the emissions of: small particulate matter (PM₁₀ and PM_{2.5}); nitrogen oxides (NO_x); sulfur dioxide (SO₂); carbon monoxide (CO); volatile organic compounds (VOCs); and hazardous air pollutants (HAPs). These are the compounds that pollute the air we breathe and lead to unhealthy ozone conditions in the summer and the small particulate matter-laden inversions in the winter.

The University of Utah is a significant leader in efforts to improve air quality through emission reductions for several years. Initiatives in transportation, energy, building and energy efficiency, transition to renewable energy, waste reduction and education have been responsible for major reductions in both regulated and non-regulated emission categories. Large reductions in the emissions of criteria pollutants, or the air pollutants that contribute to locally unhealthy conditions, have been achieved through capital-intensive projects that will be described in more detail in this report.

Since the 1990s the University, spearheaded by the Environmental Health and Safety Department and Facilities Management, has worked to reduce its permitted air emissions. A few of the major initiatives are listed here:

- In 1997, the University switched from coal to natural gas in its lower campus high temperature water plant, reducing particulate matter emissions by 63.3 tons annually and sulfur dioxide emissions by 202.90 tons per year.
- In 2007, the University replaced 1960s-era hot water generators with the lowest emitting combined heat and power (cogeneration) unit of its size constructed in Utah.
- In 2011, the replacement of a major portion of the high-temperature water infrastructure resulted in a nearly 20-percent reduction in waste and accompanying emissions for that section of campus.

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In addition to facility equipment projects, an on-going effort by Commuter Services to transition all campus shuttles from diesel fuel to natural gas by 2018 will result in major emission reductions.

II- UNIVERSITY OF UTAT AIR-QUALITY MITIGATION OVERVIEW

In 2007, the U increased its efforts to improve environmental quality and reduce air emissions quality by creating an Office of Sustainability with the mission of helping the institution as a whole to reduce the impacts of operations while maintaining a high-level of excellence in education and research. This effort culminated in 2010 with the introduction of a campus-wide plan called the “**Energy and Environmental Stewardship Initiative: 2010 Climate Action Plan**” (EESI-CAP) http://sustainability.utah.edu/static-content/pdf/EESI_2010_web2.pdf.

The EESI-CAP lays out a framework to improve environmental leadership across many areas, including:

- Education and Research
- Energy and Building Efficiency
- Renewable Energy
- Transportation
- Water, Waste, Grounds and Food
- “Guiding Principles” to provide a general framework for university efforts

The University of Utah continues progress toward fulfilling the goals set forth in the EESI-CAP. This includes explicitly integrating sustainability in campus governance; increasing efficiency and reducing energy use in campus buildings and operations; continuing research into global change and sustainability; and creating educational opportunities for students and the broader community.

Administrative Support

University of Utah administration and leadership take environmental stewardship responsibilities very seriously. Several on campus offices and boards have been created to manage or promote programs to support campus and institutional goals, to enhance the campus environment, to ensure compliance with environmental laws and regulations, and to assess and mitigate the impacts associated with university operations:

- **Environmental Health and Safety (EH&S)** <http://ehs.utah.edu/>: An office to promote, create, and maintain a safe and healthful campus environment. Responsibilities include interpreting Federal, State and local regulations related to occupational and environmental health and safety. They also provide guidance and support to University of Utah operations and advise Senior Administration on business aspects of environmental health and safety. The Environmental Health and Safety department manages the University’s permitted air quality and storm water pollution prevention programs in order to ensure compliance with Federal, State and local environmental protection laws and regulations.
- **Commuter Services** <http://www.parking.utah.edu>: This department coordinates and oversees transit and parking for the University’s main campus and Health Sciences Center. As the state’s second largest transit

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system, it coordinates efforts to encourage the use of mass transit and reduce the presence of single occupant vehicles, and the use of diesel and gasoline engines used for transit and commuting. Through education and fees, the department provides employees and students with free transit passes, access to car sharing, free intra campus shuttle service, emergency rides home, and encourages bicycling, walking and other sustainable forms of transportation. It also has committed to purchase only compressed natural gas (CNG) or electric powered vehicles in the future.

- **Energy Management Office** <http://facilities.utah.edu/facilities-services/energy-management/index.php>: Energy Management was created in 2003 with the purpose of monitoring energy usage and identifying programs and projects that will enable Facility Operations to reduce energy consumption and utility cost. Functions of Energy Management include collecting data, analyzing energy usage, reporting on consumption and cost to Facility Operations and University management, developing energy saving projects and promoting conservation. Major initiatives include a behavioral program and a revolving project fund that captures cost savings from past projects and reinvests in additional energy saving measures.
- **Recycling Coordinator** <http://facilities.utah.edu/facilities-services/u-recycling/index.php>: This role was created in 2007 to help students, faculty and staff with on campus recycling needs. This includes project planning for special activities and athletic events, implementation, training, monitoring and program modification. The office also works within Facility Operations to reduce construction waste and to establish recycling design standards for all new buildings campus wide. Additional programs include presentations to further educate our campus community on recycling policy, procedures and the overall importance of recycling and its positive impact on the environment.
- **Office of Sustainability** <http://sustainability.utah.edu/>: Created in 2007, it is the clearinghouse for sustainability planning efforts at the University. Along with the Office's professional staff, numerous paid and volunteer student interns act to implement sustainability programs throughout campus. In addition, the Office of Sustainability is responsible for the development and coordination of the Climate Action Plan, campus greenhouse gas inventories, and sustainability metrics and general accountability. In brief, the Office communicates, connects and catalyzes sustainability efforts across the campus and community.
- **The University President's Sustainability Advisory Board**: Provides guidance for the University as a whole and to Office of Sustainability staff. The Board helps assure that the President's sustainability initiatives are being met, makes various policy recommendations, and ensures that university actions are effectively moving the campus toward a more sustainable future. The Board is comprised of University of Utah students, staff, faculty, administrators and community members.

Efficiency, Renewable Energy and Emission Reduction

As part of the University of Utah's goal to increase efficiency and reduce emissions, the University recently accepted an invitation to join the U.S. Department of Energy's Better Buildings Challenge (<http://www4.eere.energy.gov/challenge/>), committing to an energy use reduction goal of 20 percent by 2020. This efficiency goal correlates directly with the greenhouse gas (GHG) reduction goals stated in the Climate Action Plan. At the same time, the emissions of pollutants that lead to locally unhealthy air will also be reduced.

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The University of Utah embraces these reduction goals with strategies that produce replicable results for our facilities. The strategies will align departments of all agendas and visions: energy and engineering, operations and maintenance, financial and business, and educational and research. These groups will provide a means to reduce, avoid, and improve energy consumption, maintain and operate new and old systems, plan and manage financial vehicles and aspects for continuous evaluation of assets, and study, promote, and publish findings and technologies. Future equipment replacement projects will also be described below in the University's air quality mitigation plan.

The 2008 Campus Master Plan includes millions of square feet of new building space to meet mission-based University needs and the growth in the student population. The University's recent adoption of LEED+ high performance building standards, ongoing investments in efficiency, and a new co-generation unit for the high-temperature plant have already resulted in significantly lower GHG emissions than projected under the business-as-usual scenario in the 2010 Climate Action Plan.

Emission inventories from 2008 and 2011 show concurrent reductions in the criteria pollutants defined in the Introduction. Future equipment replacement projects and their emissions reduction potential will be described later in this document.

Sustainability Research

In order to identify and coordinate sustainability-related research on campus, the Global Change and Sustainability Center was created in 2009. The Global Change and Sustainability Center's mission is to encourage broad interdisciplinary research, education, and outreach on natural and human-built systems, the dynamic interactions and interconnections that exist in those systems, and the role of humans in the environment. Additional research-related initiatives in air quality will be described in section "I- Additional measures".

Sustainability Education

Students at the University of Utah have the opportunity to complete an interdisciplinary degree in Environmental and Sustainability Studies, which is able to be tailored to each student's interests and goals. Starting in 2012, the University also offers an Integrated Certificate in Sustainability, which is available to undergraduate students in all majors. The identification of sustainability related and focused courses, new graduate programs, sustainability learning outcomes, and the integration of sustainability into curriculum are ongoing efforts led by Sustainability Curriculum Directors, who report to the Senior VP for Academic Affairs.

Transportation

For more than ten years, the University of Utah has increased its efforts to reduce the impacts associated with travel by providing opportunities to reduce single-occupant vehicles (SOV) use through:

- Mass transit (3,000 fewer daily trips by SOV this year alone)
- Free and functional shuttle system to minimize on-campus vehicular trips
- Bicycle and Pedestrian Master Plan to encourage human-powered transit to, and around, campus
- Fleet conversion strategies to natural gas and EV shuttles.

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These efforts will continue to be enhanced and additional efforts added to meet and exceed University commitments.

While many of these efforts are difficult to quantify (e.g. the number of trips reduced due to electronic communication), much progress has been made on almost every front. In a period of tremendous growth and new buildings, overall energy use is down, commuting by public transportation is up, and many other successes have been achieved.

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The following sections describe the University of Utah's efforts toward mitigating impacts of operations on air quality (*organized according to the structure found in HB 168*):

HB 168 includes a list of possible mitigation strategies, but all may not be applicable to every state entity. While the University of Utah has developed and implemented strategies that have paid off in measurable emission reductions, other strategies not easily quantified can reasonably be assumed to have reduced air emissions as well. The University's specific efforts are described in the following paragraphs.

a) Flexible Work Schedules to Reduce Driving During Peak Times

Current Programs: Given the scale and complexity of the University of Utah and its organizational structure, the determination of work week schedule options is largely delegated to unit level directors or the equivalent. The University of Utah Health Care system has numerous standard condensed work week schedules for medical staff, depending on the unit and position, especially in nursing and direct patient care services. On main campus, options for condensed work weeks are dependent on mission-based and work needs as well as supervisor support. See <http://www.employment.utah.edu/students/schedule.html> for further clarification.

Plan:

- Evaluate opportunities to provide flexibility for staff, faculty and students while maintaining excellence in educational and research programs throughout campus.
- Evaluate opportunity to survey and document current flex programs to establish a baseline for future efforts.

b) Telecommuting

Current Programs: The University has guidelines that clarify the terms by which an employee may telecommute. However, a telecommuting option is "*neither a universal employee right nor a universal employee benefit*" and "*telecommuting is not appropriate for all employees and jobs.*" As such, the guidelines do not suggest that telecommuting is encouraged or that it could be regarded as an existing "program." However, individual supervisors or department heads may establish their own policies, and the University encourages this option where appropriate. See <http://www.hr.utah.edu/er/> for further clarification.

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Plan:

- Promote and expand support for flextime and telecommuting for staff and faculty as appropriate to job duties and work environment.
- Evaluate opportunities to provide technology and administrative support for telecommuting for staff, faculty and students while maintaining excellence in educational and research programs throughout campus.
- Evaluate opportunity to survey and document existing telecommuting programs to establish a baseline for future progress.

c) Electronic Communication, including Teleconferencing

Current Programs: Efforts are being made across campus to reduce trips to off-campus destinations (including local, regional, national, and international destinations). Travel has been reduced significantly for initial interviews (using Skype or similar tool), research coordination (using “Go To Meetings”, “Conceptual Mapping” programs or similar), and educational opportunities (using webinars). As technology continues to develop, these methods will allow us to reduce traditional travel even further. Unfortunately, efforts to measure the number of trips avoided due to electronic communication would be extremely difficult to initiate and track.

Plan:

- Evaluate opportunities to provide technology and administrative support for electronic communication for staff, faculty and students while maintaining excellence in educational and research programs throughout campus.

d) Encouraging Ride Sharing

Current Programs: Commuter Services, in partnership with UTA, promotes and encourages ride sharing (carpooling/vanpooling) to reduce the impact of single-occupant vehicles on air quality as well as reduce parking demand. Participants are given incentives, including priority parking and financial assistance (varying by location and number of riders). Programs are on-going and an increased effort is currently underway to improve participation. See <http://www.parking.utah.edu/transportation/URideshare.html> for more information.

Plan:

- Continue to promote ride-share opportunities to students, faculty and staff.
- Evaluate and introduce additional incentives (such as priority parking) to encourage higher levels of participation.
- With each new building project, evaluate opportunities to incorporate priority parking for ridesharing, and for vehicles with low emissions (PZEV & ZEV).
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e) **Encouraging Use of Public or Alternative Forms of Transportation**

Current programs: The University of Utah is one of the leading institutions in this area (locally, regionally and nationally). Programs include:

- UTA unlimited pass for all full-time faculty, staff and students (<http://www.parking.utah.edu/transportation/index.html>),
- Bicycle Master Plan to create safe paths and routes and development of on-campus bicycle parking and maintenance facilities (see <http://facilities.utah.edu/campus-planning/master-plan/bicycle.php>)
- Bicycle Coordinator (see <http://www.parking.utah.edu/bike/index.html>)
- Marketing and promotional campaigns to encourage students to find housing near public transportation to reduce SOV travel to campus (see http://www.parking.utah.edu/transportation/housing_video.html)
- A significant free shuttle system for campus (see <http://www.parking.utah.edu/transportation/shuttles/index.html>) to help minimize vehicle trips around campus. These vehicles carry more than 14,000 passengers per week, who would otherwise drive to destinations around campus. In addition, the fleet is being converted from diesel fuel to cleaner-burning natural gas, and the savings in fuel costs is helping to make the transition in a shorter time frame.
- Electric Shuttle: In cooperation with UTA and USU's WAVE Inc., an electric inductive-power transfer shuttle is in design and should be operational by early 2014. This new shuttle will serve passengers in the north section of campus (around engineering) by creating a link between the South Campus Trax station through campus to north campus drive. This vehicle will directly reduce emissions in the air shed and provide a convenient link to Trax for many on campus who do not currently have access.

Plan:

- Continue existing successful programs and look for ways to decrease SOV trips to campus.
- Work with regional partners at Salt Lake City Transportation, UTA, UDOT, WFRC, and neighborhood councils to look for opportunities to reduce traditional SOV commuting.
- Increase bicycle facilities such as short and long-term parking, maintenance facilities, and better bicycle path network to and around campus.
- Expand education for housing selection (near transit routes) by including information in new faculty and staff orientation and continued marketing to students.
- Expand annual commuter survey to gather better data regarding commuting patterns, needs, methods, successes and barriers associated with transit and bicycle use.
- Evaluate on-campus shuttle routes to increase convenience of on-campus mobility.
- Complete shuttle fleet conversion to CNG as soon as financially feasible.
- Improve walkability and universal access on campus to minimize need for automobile travel.

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- Introduce Electric Vehicle (EV) charging stations with new major parking lot/structure construction to keep up with campus demand. Prioritize charging station locations to ensure a variety of locations and to make sure on-campus residents have access to EV charging.
- Promote U Car Share program to help individuals minimize the need for having a car on campus.
- Promote “Clear the Air Challenge” and other campaigns to reduce Single Occupant Vehicle (SOV) commuting.

f) Energy Conservation

Current programs: The University of Utah is a leader in the effort to reduce energy waste on all fronts and has created an Energy Office and Manager specifically dedicated to reducing the use of all forms of energy on campus (<http://facilities.utah.edu/facilities-services/energy-management/index.php>). The U is part of the Better Buildings Challenge (BBC), a national program sponsored by the Department of Energy to reduce energy use on campus by 20 percent by 2020 (on a per square foot basis) (see <http://sustainability.utah.edu/news/commitments.php>). Specific strategies within the BBC program will include:

- Energy tune-ups (Building Commissioning) every three years
- Behavioral programs for building occupants to reduce waste and to report problems quickly to operating staff
- Mechanical system efficiency upgrades which will be paid for by energy savings

In addition to the BBC, standards have been implemented to require new buildings to exceed energy code requirements by 20-40 percent (and which have life-cycle cost paybacks of seven years or less).

The University of Utah is also replacing its aging utility infrastructure (including electricity distribution, chilled water for cooling, and hot water for building heat) in order to reduce waste associated with outdated production and distribution. These new efforts will not only increase reliability on campus, but will cut waste associated with inefficient grids and leaky piping up to 10 percent.

Plan:

- The University is currently evaluating several alternative projects to include in the above programs and does not yet have definitive information to share at this time. However, the overall goal of 20 percent energy reductions by 2020 is a central goal of the initiative and will be met as financially feasible.

g) Using Alternative Energy Sources

Current programs: While many renewable energy sources are not yet financially feasible, the U continues to look for donor and corporate sponsorship for photovoltaic (PV), solar thermal, and wind where feasible within a seven-year payback period.

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In the last two years, the U has installed more than 600 kW of solar PV through Power Purchase Agreements, which shift the burden of ownership to third-party financiers who can take advantage of generous federal tax credits and other benefits normally intended for the private market. In addition, another 300 kW of solar PV are either under construction or being designed. These projects have received generous funding from Rocky Mountain Power, ASUU (the U's student government association), and SCIF (a sustainable grant program for students supported by a student fee <http://sustainability.utah.edu/get-involved/students/sustainable-campus-fund.php>).

Plan:

- Continue to look for funding opportunities to expand renewable and alternative energy sources as technology develops and prices continue to drop. Typical criteria for adoption of alternative/renewable energy sources are that projects have a lifecycle payback period of approximately seven years compared with current baseline technology and systems.
- Explore building-mounted PV and solar thermal applications for all new major building projects.
- Research opportunities for diurnal, seasonal, and intermittent energy storage (e.g., interior building mass, fuel cells, compressed air, flywheels, and seasonal energy) and initiate as feasible. Continue to work with College of Law to install cooling systems powered by irrigation water (with heat exchange). Monitor success and applicability for other projects on campus. Monitor success of Sill Center Seasonal Ice Storage research project by Dr. Kent Udell and evaluate for potential use at other locations on campus.

h) Recycling and Using Recycled Products;

Current programs: The University of Utah has been involved in significant efforts to reduce waste and increase recycling for more than seven years. Initiatives include:

- Recycling Program and Recycling Coordinator for main campus (see <http://facilities.utah.edu/facilities-services/u-recycling/index.php>.)
- Recycling contracts with several vendors around campus to recycle waste in nearly every corner and aspect of campus (hospitals and clinics, student housing, married student housing, and many areas of research park).
- Recycle Rice-Eccles: A student-led initiative to recycle waste at football games and other Rice-Eccles stadium events. These efforts will be expanded this year to include major sporting events at the Huntsman arena.
- Environmentally Preferred Purchasing Guidelines:
<http://fbs.admin.utah.edu/purchasing/green/environmentally-preferable-purchasing-guidelines/> .
Consistent with the University of Utah's sustainability goals; the purpose of these guidelines is to support and facilitate the purchase of products and materials that minimize harmful effects to the environment from their production, transportation, use and disposition. It is the University of Utah's preference to purchase and use environmentally preferable products whenever they perform satisfactorily and can be acquired at similar total value (cost/quality). A related purpose is to develop and implement common

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purchasing programs to be used by all University of Utah personnel that support suppliers of environmentally preferable products, services and practices.

The use of recycled products includes efforts to increase paper purchases with recycled content, as well as encouraging design teams and clients to include building products with recycled content for new construction and remodeling projects.

Plan:

- Evaluate opportunities to reduce waste production and increase recycling rates on campus.
- Work with various recycling contracts to evaluate best value for campus.
- Provide increased marketing and information to campus community regarding opportunities to recycle (based on location on campus).
- Educate campus community about Environmentally-Preferred Guidelines to increase participation in the program.
- Evaluate opportunity to do large-scale composting of garden and food waste on campus.
- Connect interested students with on-going recycling programs to increase participation levels at athletic and other cultural events.

i) Using Non-Aerosol Products

Current programs: University Facilities Management shops use a very small amount of aerosol products, with small touch up painting jobs and outdoor marking being the most common uses. The shops use approximately a dozen cans of spray paint per month. When empty, the cans are punctured in a device that captures all remaining propellant, VOCs and residual liquid. The metal cans are placed in a metal recycling collection container.

Plans:

- No additional programs are anticipated at this time – maintain existing program listed above.

j) Reducing Idling

Current programs: The University of Utah formally adopted a no-idling policy in 2011 (<http://regulations.utah.edu/administration/3-215.php> Policy 3-215: University Motor Vehicles, III-D.).

Plan:

- No additional programs are anticipated at this time – maintain existing program listed above.

k) Low-Maintenance Landscaping

Current Programs: The Grounds Department has organized daily work schedules to minimize motorized travel between different jobsites on campus, thus reducing small engine emissions. The equipment is serviced on a regular maintenance schedule so as to operate as efficiently as possible, thus reducing air emissions.

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As buildings are renovated and new buildings are constructed, the associated landscaped areas are being designed with many native and drought tolerant plant varieties to reduce the need to use gas-powered equipment.

Plan:

- Continue to service equipment on a regular basis to minimize emissions resulting from poor maintenance.
- Continue to evaluate opportunities to replace polluting maintenance equipment with alternatives as they become available and affordable.

Evaluate opportunities to reduce total landscaping area that requires high to small engine maintenance by replacing some turf areas as well as landscaping associated with new construction projects.

1) Other technology that may be used, or measures that may be taken to reduce the emission of air pollutants;

Building Heating and Emergency Power Equipment Replacement

Current Programs: In 2007, the University replaced two dual-fuel boilers at Building 303 with one natural gas-fired turbine and waste heat recovery unit duct burner (cogeneration system). Best Available Control Technology (BACT) for this unit was the 9ppm NO_x Solar SoLoNO_x™ turbine with a 15ppm low NO_x duct burner for additional heating. Recent (1/25/2013) stack testing demonstrates that at full load, the turbine (alone) is emitting 3.95 ppm NO_x and combined the turbine and duct burner are emitting 12.2 ppm NO_x, better than the guarantee provided by the equipment manufacturer. At the time that these units were permitted, they were the lowest emitting units of their type in Utah, and served to lower the bar for emissions control (BACT) in this state.

In 2011, the University replaced a very old 22 hp gasoline-fired emergency electricity generator with a 106 hp diesel generator, greatly reducing VOC emissions related to providing emergency power to a portion of campus.

In 2013, the University removed one emergency generator, replaced seven older, higher emitting emergency generators; and added three new EPA-compliant emergency generators. We replaced two 8.4MMBtu natural gas boilers with two 2.0 MMBtu natural gas boilers, providing heating and hot water much more efficiently. And finally, we combined all of our formerly discrete natural gas consumption limits to one source-wide consumption limit that is lower than the sum of the previous discrete limits, thus reducing allowable emissions by more than 10 percent.

Plan:

- In 2014 and 2015, a 1960s-era hot water generator #5 at the Lower Campus High Temperature Water Plant, Building 303, will be replaced. Generator #5 has a heat input capacity of 105 MMBtu/hr and will be replaced with a total of 100 MMBtu. The new hot water generators will be the lowest emitting units available, using Ultra-Low NO_x burner technology. They will be the

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first hot water generators of this size (50MMBtu/hr each) in this state to use Ultra-Low NOx burners. Our allowable NOx (a significant PM2.5 precursor) emissions reduction from this project is calculated to be more than 44 tons per year.

Off Highway Mobile Sources - Heavy Equipment Removal from Service

Current Programs: In the University of Utah's 2008 emissions inventory, we reported one miscellaneous diesel offroad vehicle, three diesel loaders and 10 diesel tractors with the following emissions: 0.25 tons per year of PM10; 25 tons per year of PM2.5; 0.20 tons per year of SOx; 2.55 tons per year of NOx; 0.35 tons per year of VOCs; and 4.82 tons per year of CO.

In 2011, there were major reductions across the spectrum – we reported one miscellaneous diesel offroad vehicle; one diesel loader; and two diesel tractors with the following emissions: 0.07 tons per year of PM10; 0.07 tons per year of PM2.5; 0.07 tons per year of SOx; 0.86 tons per year of NOx; 0.11 tons per year of VOCs; and 1.1 tons per year of CO.

Plan:

- Continue successful programs noted above.

Low- and No-VOC Materials Use

Current Programs: For at least 10 years a number of campus units have been aggressively seeking out low- or no-VOC products for their operations. Some examples:

- All solvent sinks in use within Facilities Management use either a citrus-based solvent or the lowest VOC petroleum-based solvent available.
- Printing Services uses a very limited amount of VOC-containing materials, and for many applications has switched to inks and cleaners that contain no VOCs. They have reduced their VOC emissions from 1,617 pounds in 2008 to 1,282 pounds in 2011.
- All new major construction projects minimize the use of paints and adhesives containing VOCs. These projects typically meet LEED standards for indoor air quality.

Plan:

- Continue successful programs noted above.

Additional Research Efforts and Initiatives Throughout Campus

Two major University of Utah initiatives are currently involved in important research regarding local and regional air-quality. The Program for Air Quality, Health and Society and the Global Change & Sustainability Center (GCSC) have fundamental research projects underway or planned that relate to atmospheric composition and air quality that may help policymakers, planners and regulators come up with workable solutions to Utah's air quality issues.

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Below is a summary of some of these projects:

- Trace gas measurements will help track future emission sources and potential solutions.
- Measurement by mobile vehicle of the high resolution spatial gradients of carbon dioxide, carbon monoxide, methane, ozone, nitrous oxide, and particulate matter to understand the spatial patterns of air quality.
- Studies on the basis for formation and persistence of meteorological events that lead to unhealthy air quality in the Salt Lake Valley during the winter inversions.
- A three-year project just funded by the NSF, will give us the tools to determine how much particulate matter (PM) comes from transportation, home heating, factories, and wood smoke, which will help to quantify and partition particulate matter by its source.
- In a three-year project just funded by the DOE, faculty will begin measuring and modeling emissions and air quality across the Salt Lake Valley and its implications for air quality outside the urban areas.
- In a five-year NSF project under review, GCSC faculty will set up an IGERT training program on Ecological Planning in Cities (EPIC) on new coursework, research, and outreach in air quality and sustainable development.
- Faculty will also be working on a basic research project to improve assessments of near-road exposures to traffic related pollution, which will enable pollutant variations to be attributed to specific emission sources and meteorological factors and help to determine the most important variables at the personal, residential and/or community levels.

Opportunities to Reduce Emissions on DAQ Air Quality Action-Alert Days:

- The University has fuel-burning restrictions in our air permit that apply during the winter inversion period (November through March). This permit condition will remain as long as the permit exists.
- The University will evaluate the opportunity/possibility to send email and/or text alerts to faculty, students and staff regarding specific conditions and information provided by DAQ. These alerts could educate our campus community and request participation in voluntary restrictions or reductions of driving and other activities harmful to air quality.

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CONCLUSION

In the last several years the University of Utah is proud to report that it has reduced its facility-based air emissions by more than 69 tons/year as shown in emission inventories submitted to the Utah Department of Environmental Quality (see table below).

Emissions in tons per year

Year	PM ₁₀	PM _{2.5}	SO _x	NO _x	VOC	CO	Lead	NH ₃
2008	5.48	5.48	.73	74.56	5.06	65.05	1.08	2.10
2011	3.81	3.64	.45	40.05	3.68	37.23	0	1.29
Reduction	1.67	1.84	0.28	34.51	1.38	27.82	1.08	0.81

These reductions were achieved despite the addition of several hundreds of thousands of square feet of classroom, research and clinical space. In this period of tremendous growth and new buildings, overall energy use is down, commuting by public transportation is up, and many other successes have been achieved.

Our future facility-based efforts include upgrades to our Upper Campus Plant that are likely to lead to measurable reductions in our NO_x emissions, and replacement of aging equipment in our Lower Campus Plant that may lead to reductions of more than 40 tons per year of NO_x. Other future efforts include substantial emissions reductions as a result of our participation in the Better Buildings Challenge, increased advocacy of and support for alternative commuting options and work schedules, and other sustainability programs on campus.

Respectfully submitted: Arnold B. Combe
Arnold B. Combe
Vice President

**A Report on Current Efforts to Mitigate Emissions of Air Pollutants
Utah State University**

**Submitted July 2013
State of Utah Economic Development Task Force**

Utah State University conducts continuous and comprehensive evaluations and activities intended to reduce harmful emissions of air pollutants. These activities are resourced through three primary university venues, 1) the Central Energy Plant Energy Management Initiative, 2) the Utah Conservation Corp, and 3) the USU Sustainability Council.

Please review the following ongoing USU initiatives, including website links to obtain more information regarding institutional pollution mitigation efforts:

Transportation

1. [Vehicle Use Policy 514.7 ENERGY EFFICIENCY](#)
 - Decrease fuel consumption
 - Mandatory emissions testing program for all USU vehicles
 - Right-sized vehicles
2. Compliance with HB 110 for 20% more fuel efficient vehicles by 2015:
 - USU's fleet of 727 vehicles includes
 - 2 electric vehicles
 - 10 CNG vehicles
 - 38 hybrids vehicles
3. A free [Aggie Shuttle](#) system on campus, with plans to implement an "inversion shuttle" during winter months to serve commuters within the valley.
4. [525: Energy Conservation and Efficiency](#)
 - Idle-free Campus
5. [Voluntary Carbon Offset Fund](#) (within travel reimbursement form), committed to projects implemented locally to improve air quality in Cache Valley
 - Council is beginning an application and evaluation process for these funds.
6. The [Presidents Climate Commitment](#), signed by President Albrecht, and the [Climate Action Plan](#), committing to carbon neutrality by 2050.
7. The Clear the Air Campaign, to increase awareness and engagement in creative solutions and research.

8. [Aggie Blue Bikes](#), a free bike share program, with 300 bike capacity. ABB is beginning an \$89,660 expansion project funded through federal Congestion Mitigation & Air Quality (CMAQ), pending final approval on July 17.
9. Implementation of a car share program in FY14.
10. [Rideshare board](#) available to employees and students.
11. Events such as Alternative Transportation Week and Earth Week, to generate engagement and awareness on campus.
12. Support and participation in Bike to Work Week and the National Bike Challenge to encourage bicycling as a form of transportation.
13. Student commute modal split:
 - 29% Single Occupancy Vehicle
 - 71% Sustainable transportation
 - 41% walk/bike/non-motorized
 - 16% vanpool or carpool
 - 14% campus shuttle or public transportation

Energy and Built Environment

1. [LEED Silver rating for new buildings mandated by DFCM](#)
 - Additionally to comply with ACUPCC agreement
2. [525: Energy Conservation and Efficiency](#)
 - Behavior change
 - Energy Star requirement
3. Retro-commissioning plan for all buildings on campus, on a rotating schedule.
4. Implementation of energy auditing including education programs for each building on campus in 2014.
5. Innovative central plant design, with co-generation, and centralized chilled water and steam production / distribution systems:
 - Decommissioned Coal fired Boilers in 2002
6. Evaluating LEED EB (LEED for Existing Buildings) pilot in FY14.

7. Conducting engineering analysis to centralize campus emergency power to the Central Energy Plant:
 - Reduce emergency power capacity requirements and emissions
 - Reduce number of emergency generators and O&M requirements
8. Energy Wars revival for FY14 in housing for students to compete to reduce energy and natural gas consumption over a two-month period.
9. New EcoReps program in Fall FY14 to emphasize energy conservation and alternative transportation choices for students living on campus.
10. Other activities that indirectly reduce harmful pollution emissions:
 - USU recycled 25% of its waste stream, equaling 625 tons in 2012. USU recycles paper, cardboard, aluminum cans, steel cans, plastics 1-7, glass bottles, rigid Styrofoam, wooden pallets, and batteries

USU goal of 35% diversion by FY2016

- Used vehicles, electronics, miscellaneous equipment, appliances, and furniture are sold through Surplus
- Water wise plants are encouraged on new constructions. Small turf areas are discouraged
- Several data centers have been consolidated to a central location to save energy

Respectfully submitted:



Charles G. Darnell, Jr.
Associate VP for Facilities
Utah State University

July 9, 2013
Date

cc: VP Dave Cowley
Alexi Lamm

**A Plan for Mitigation of Air Pollutant Emissions
Utah State University**

**Submitted July 2013
State of Utah Economic Development Task Force**

The mission of the USU air pollutant mitigation plan is to conduct a continuous effort to improve air quality in the region and to educate within both the university and local communities through leadership and engagement.

The elements of the Utah State University mitigation plan consist of:

1. Continue ongoing pollutant mitigation initiatives as reported in July 2013 to the State of Utah Economic Development Task Force.
2. Continue to evaluate and implement effective means by which harmful air emissions may be reduced, to include but not be limited to the following initiatives; a) campus and community transportation b) alternative energy sources c) energy production, distribution and end-use efficiency improvements d) reduction in waste and water usage f) increases in recycling, reuse and repurposing of material.
3. Monitor developing technologies and participate in educational conferences, webinars, and events.
4. Take advantage of available low interest loan or eco grant programs.
5. Conduct education and awareness campaigns through the campus Sustainability Program.
6. Monitor results of sustainability and pollutant mitigation efforts.

Respectfully submitted:



Charles G. Darnell, Jr.
Associate VP for Facilities
Utah State University

July 9, 2013

Date

cc: VP Dave Cowley
Alexi Lamm



July 27, 2013

Spencer Jenkins, Assistant Commissioner for Public Affairs
Office of the Commissioner of Higher Education
Board of Regents Building, Two Gateway
60 South 400 West
Salt Lake City, UT 84101-1284

RE: H.B. 168 "Air Quality Mitigation by Government Entities"

Dear Mr. Jenkins:

As required by H.B. 168, the following attached reports contain information regarding Weber State University's air quality mitigation efforts to date and future plans. Two documents address the requirement to report on mitigation efforts currently being used by WSU. The first document attached is the University Climate Action Plan which was adopted in 2009. This document provides a detailed accounting of WSU's fossil fuel consumption in the baseline year of 2007. The Climate Action Plan also provides set goals for reducing fossil fuel consumption over time with the ultimate goal of being carbon neutral by the year 2050.

The second document addressing WSU's air quality mitigation efforts to date is the University's most recent Annual Sustainability Report. This report, drafted in April 2013, reports on WSU's progress through the end of fiscal year 2012 towards meeting the goals outlined in the Climate Action Plan. I am proud to report that WSU has already made a substantial positive contribution to better air quality along the Wasatch Front by significantly reducing its natural gas and electricity consumption from the baseline year of 2007.

The final document attached is Weber State University's Air Quality Mitigation Plan. As required, this plan includes a discussion of mitigation efforts that WSU will implement within one year to reduce the emission of air pollutants on a regular basis and to reduce the emission of air pollutants on a day for which the Division of Air Quality issues an air quality action alert. The final section of this plan contains suggestions for additional funds needed to effectively implement the University's plans.

Upon reviewing these documents you will find that WSU has already demonstrated serious commitment to improving air quality along the Wasatch Front. We look forward to making further improvements through the implementation of our submitted plan. Please do not hesitate to contact me if you require any additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin Hansen".

Kevin Hansen
Associate Vice-President over Facilities Management
Weber State University

WEBER STATE UNIVERSITY CLIMATE ACTION PLAN

PROGRESS REPORT FOR FY 2012

The intent of this report is to clarify and communicate the successes and failures of Weber State University's efforts to become carbon neutral and more sustainable. Though some organizations might utilize a sustainability report to emphasize success and gloss over failures, we believe a frank assessment provides vital insight for moving toward our goals. We will use both absolute and relative metrics to best communicate our current status and progress.

As a signatory to the American College and University President's Climate Commitment, Weber State has committed to achieve carbon neutrality by the year 2050. This is an ambitious goal, but given adequate resources for investment in sustainability and energy reduction, coupled with behavioral and attitudinal changes among students, staff and faculty, it is achievable. This report details progress towards that ultimate strategic goal of carbon neutrality by 2050.

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LEADERSHIP STATEMENT

Leadership Statement

Weber State is committed to improving the learning environment in every way. One of those ways is by careful investment in long term sustainability programs that represent both sound business practices and decisions, but also sensitivity to and actions to support an improved natural environment. We feel that long term sustainability, improving our natural environment, and sound business decisions are not mutually exclusive, but are instead synergistic in making our university more attractive to students, more cost effective overall, and provide the greatest value overall for our financial and human resource investments. We are in this for the long term.

Kevin P. Hansen

Associate Vice President for Facilities & Campus Planning

Notable Energy & Sustainability News

AWARDS AND RECOGNITION

- For the second year, Princeton Review selected WSU as one of 320 schools in the U.S. and two in Canada “that demonstrate notable commitments to sustainability in their academic offerings, campus infrastructure, activities and career preparation.” To view WSU’s profile in “The Princeton Review’s Guide to 322 Green Colleges: 2013 Edition” please visit princetonreview.com/green-guide.aspx
- Weber State University was officially listed as one of the 2013 96 “cool schools” in the USA, according to Sierra Club Magazine. Hundreds of institutions of higher education were surveyed and ranked according to their measurable sustainability goals and accomplishments. All aspects of the campus dynamic, from academic programs to food services, from landscaping to energy-reduction devices, from administrative commitments to collaborations with public agencies and non-profit organizations, were taken into account. WSU’s final ranking was 74th in the Nation. Sierra Club’s final rankings can be viewed at: <http://www.sierraclub.org/sierra/201209/cool-schools/complete-rankings-cool-schools.aspx>
- The Dee Events Center won the 2012 EPA National Building Competition for the entertainment and culture category. To earn the EPA commendation, the Dee Events Center reduced its energy use by 22.1 percent and prevented 337 metric tons of greenhouse gas emissions over the course of the year. This is equivalent to the energy use from 17.3 homes. Additionally, the Dee Events Center was formally recognized for “achieving an energy use reduction of 20 percent or greater.” WSU reduced its energy use at the Dee Events Center through a variety of strategies, including:
 - Converting the lighting system for the arena from metal halide to LED. To our knowledge, WSU is the first NCAA arena in the nation to have 100 percent LED lighting.
 - Installing new high-efficiency chillers
 - Updating building controls from an inefficient pneumatic system to modern Direct Digital Control (DDC)
 - Meeting with building occupants and implementing best practices for reducing energy consumption
 - Offering incentives to building occupants for future building upgrades based on building performance

NOTABLE ENERGY & SUSTAINABILITY NEWS

STUDENT SUSTAINABILITY FUND ESTABLISHED

In the spring of 2012 the Student Sustainability Fund was created through a one-time allocation of \$9,000 from the Student Fee Recommendation Committee (SFRC). In the summer of 2012 the Energy & Sustainability Office hired a Student Sustainability Coordinator to implement sustainability projects on campus using the newly established sustainability fund.

The hired Student Sustainability Coordinator, Hannah Rice, realized that there was a great need for bike infrastructure on campus and therefore proposed a plan to install 24 bike racks and 3 bike fix-it stations on the Ogden campus. To increase awareness around the need for waste reduction, Ms. Rice also proposed that the University install 8 water bottle refill stations in various campus buildings. Ms. Rice took the proposal to the WSU Administration and was able to receive the additional funding needed to implement all of these projects. As of this writing, all of the bike racks and fix-it stations have been installed. Installation of the water bottle refill stations will be complete by the end of May 2013.

In January, 2013, Ms. Rice again went before the SFRC to present on the progress made with the one-time \$9,000 allocation and to request base funding for the Student Sustainability Fund. The SFRC agreed to provide the Student Sustainability Fund with \$16,000 in base funding. This money will be used to partially fund the Student Sustainability Coordinator position, training for that position, and additional sustainability projects.

WSU LAUNCHES ENVIRONMENTAL AMBASSADORS PROGRAM

In the fall of 2012, WSU's Student Sustainability Coordinator, Hannah Rice, launched the Environmental Ambassadors program. Environmental Ambassadors is a peer-to-peer educational outreach program that promotes environmental stewardship and awareness. The ambassadors this year consisted of approximately ten committed students who worked to spread their knowledge of environmental topics, issues, and resources to other groups and students at WSU.

The "Green Move-In" was the first of many successful events the program hosted this year. Held at University and Wildcat Villages, the Environmental Ambassadors helped set up a new recycling program in housing. They provided temporary recycling bins for movers and collected a large number of cardboard boxes to be recycled. They also went door-to-door passing out information magnets and handouts that identify all of the materials recyclable on campus.

The Environmental Ambassadors also celebrated America Recycles Day in the Shepherd Union with a waste audit and recycling education program. In the spring of 2013 they hosted two competitions: Recyclemania and Campus Conservation Nationals. Recyclemania was a campus-wide competition to increase recycling rates over an eight week period and Campus Conservation Nationals was an energy consumption reduction competition held in Wildcat Village Residence

NOTABLE ENERGY & SUSTAINABILITY NEWS

Hall 1 over a three week period. Results from both competitions were positive but left much room for improvement. It is expected that results next year will be more significant now that the Environmental Ambassadors have gained experience running the competitions for the first time.

WSU HOSTS 4TH ANNUAL SUSTAINABILITY SUMMIT

This year's Sustainability Summit proved to be an exciting and successful event with over 360 attendees. Hosted in the Shepherd Union on February 28 and March 1, the conference provided exceptional educational programs, networking, and trade show opportunities for educators; government representatives; sustainability, energy, and solid waste professionals; students; politicians; and interested public.

L. Hunter Lovins kicked off this year's Summit with her keynote address, "The Business Case for Sustainability." Lovins is president and founder of Natural Capitalism Solutions (NCS) (www.natcapsolutions.org). NCS educates senior decision-makers in business, government, and civil society to restore and enhance natural and human capital while increasing prosperity and quality of life.

On February 28th, several sessions were offered on the following topics:

- Energy Efficiency, Renewable Energy, and Achieving Carbon Neutrality
- Water Conservation, Quality, and Management
- Recycling and Waste Reduction/Elimination
- Student-gearred sessions focusing on green jobs, green building, and more

On March 1, the following professional workshops were offered:

- Leadership in Energy & Environmental Design (LEED) Green Associate Course: This course provided a detailed overview of sustainable planning, design and construction techniques based on the LEED Green Building Rating System.
- Energy & Water Management: An Introduction to Sustainable Business Development: This workshop provided an overview of energy and water waste streams in the workplace as well as the tools to help identify and measure waste and to develop a sustainable business approach.

GREENHOUSE GAS (GHG) EMISSIONS

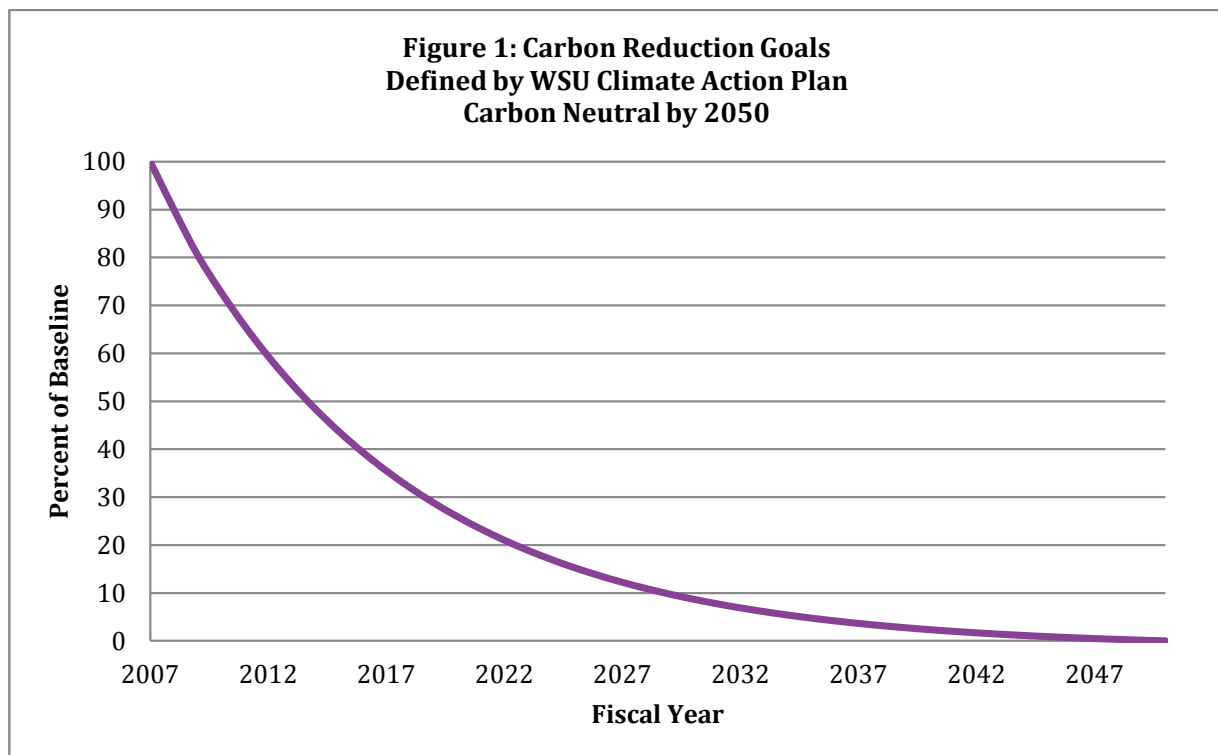
Greenhouse Gas (GHG) Emissions

NOTE REGARDING CARBON EMISSIONS CALCULATIONS

WSU has conducted its past carbon emissions inventories using Clean Air Cool Planet's Campus Excel spreadsheet Carbon Calculator v5.0. In the spring of 2013, Clean Air Cool Planet released a web-based version of the calculator (CarbonMAP). All of WSU's data was transferred over to CarbonMAP this year. Along with converting the calculator from a spreadsheet to a web-based system, Clean Air Cool Planet updated emissions factors used to calculate carbon emissions. Therefore, when comparing historical data in this report to past year's reports there will be some discrepancies. The trends (increases or decreases in emissions) remain the same. For a complete listing of changes to emissions factors please visit: <http://campuscarbonblog.org/>.

CARBON REDUCTION GOALS

The carbon reduction goals currently outlined in Weber State University's Climate Action Plan are ambitious. The long term goal is to achieve carbon neutrality by 2050 with several intermediate goals in years 2012, 2022, and 2035. WSU's first intermediate carbon reduction goal is to achieve a 40% reduction in emissions (from the baseline year of 2007) by this fiscal year.



GREENHOUSE GAS (GHG) EMISSIONS

SCOPE 1 EMISSIONS

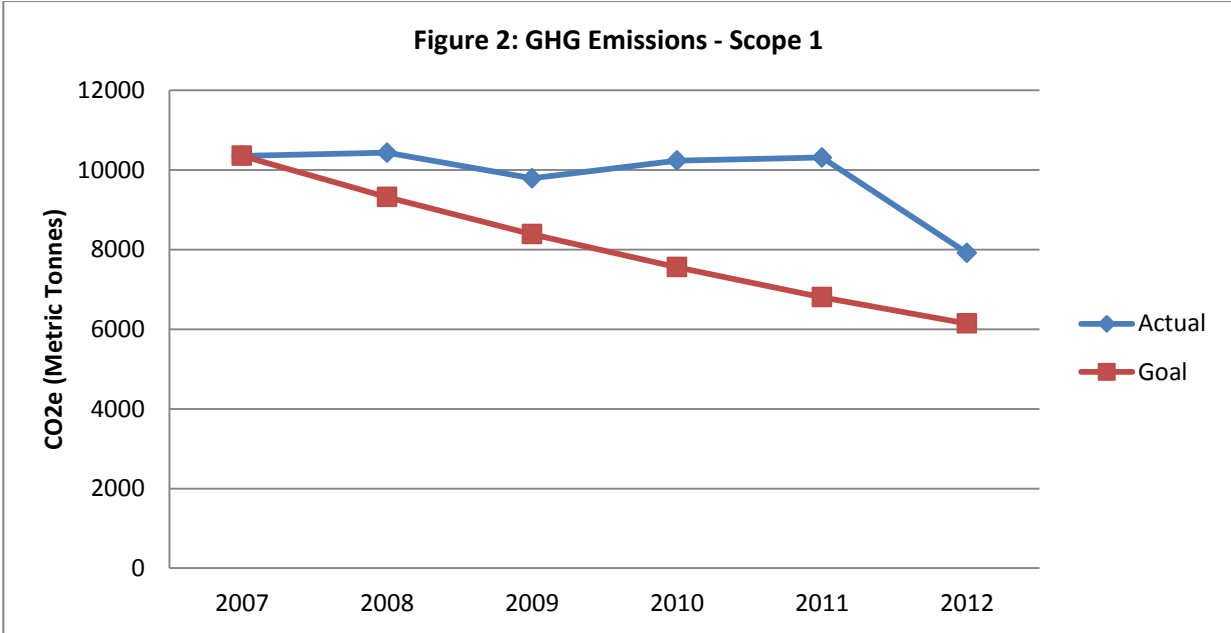
Carbon emissions are typically reported in three categories: Scope 1, Scope 2 and Scope 3 emissions. Scope 1 emissions are defined as those emissions occurring from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles, and “fugitive” emissions. For Weber State University, Scope 1 emissions are derived from the central heat plant which runs on natural gas (diesel during emergencies) and the University fleet which runs on traditional gasoline, diesel and compressed natural gas (CNG).

Emissions associated with fertilizer application have also been added to WSU’s Scope 1 footprint this fiscal year. Fertilizer application contributed approximately 15.19 metric tonnes of CO₂e to WSU’s footprint. While fertilizer has been applied to WSU’s landscape in years past, the historical data is not available. Emissions data for future applications will be collected now that this data is available.

As can be seen from the figure below, WSU’s Scope 1 emissions were reduced significantly this fiscal year. During the summer of 2011, the boilers at the University heat plant were shut off so that repairs to the steam distribution system could be made and so that new insulation could be added. Significant natural gas savings were thus realized not only from the energy efficiency upgrades and repairs made, but from shutting off the boilers for several weeks.

While WSU did not achieve the interim target goal of 40% reduction, significant progress has been made. Scope 1 emissions have been reduced by 23.6% from the baseline year of 2007; the equivalent of taking 509 cars off of the road each year.

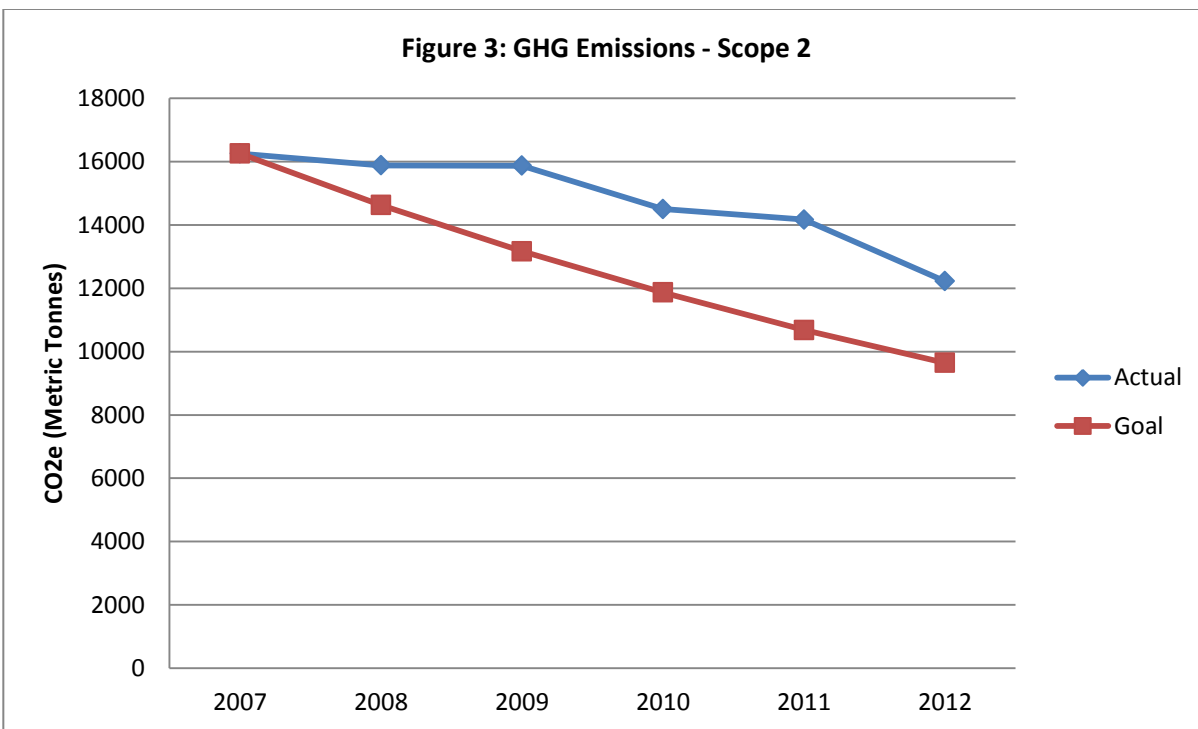
GREENHOUSE GAS (GHG) EMISSIONS



SCOPE 2 EMISSIONS

Scope 2 emissions are defined as indirect emissions generated in the production of electricity consumed by the institution. Figure 3 below shows that while WSU did not achieve its 40% emissions reduction goal, Scope 2 emissions have been reduced by 24.8% from the 2007 baseline year. This is equivalent to taking 840 cars off of the road each year. These savings can largely be attributed to campus-wide interior and exterior lighting upgrades. Additional completed energy efficiency projects are noted under the Energy Consumption and Conservation Section of this report.

GREENHOUSE GAS (GHG) EMISSIONS



SCOPE 3 EMISSIONS

Scope 3 emissions are defined as other indirect emissions that are a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution. Scope 3 emissions include University-related air travel, student, faculty, and staff commuters, and solid waste generation.

For previous years' reports, air travel data was collected by multiplying total WSU flights (obtained from WSU's Purchasing Department) by national average flight miles (see http://www.bts.gov/press_releases/). This fiscal year, WSU's Purchasing Department used WSU purchasing reports to collect destination and mileage data for each flight. Therefore this year's data is more accurate because it is not based upon an estimate of national average flight miles but actual WSU trips.

WSU's solid waste generation was obtained from the University's contractor, Waste Management. Emissions associated with solid waste production are significantly higher (for all fiscal years) in this report than previous reports for two reasons. First, in previous years Waste Management had not added in the solid waste produced by the Shepherd Union. This has been corrected not only for this year but all previous years in this report. Second, the emissions factor associated with solid waste has increased drastically based upon new science which indicates that solid waste contributes more to GHG emissions than previously thought.

GREENHOUSE GAS (GHG) EMISSIONS

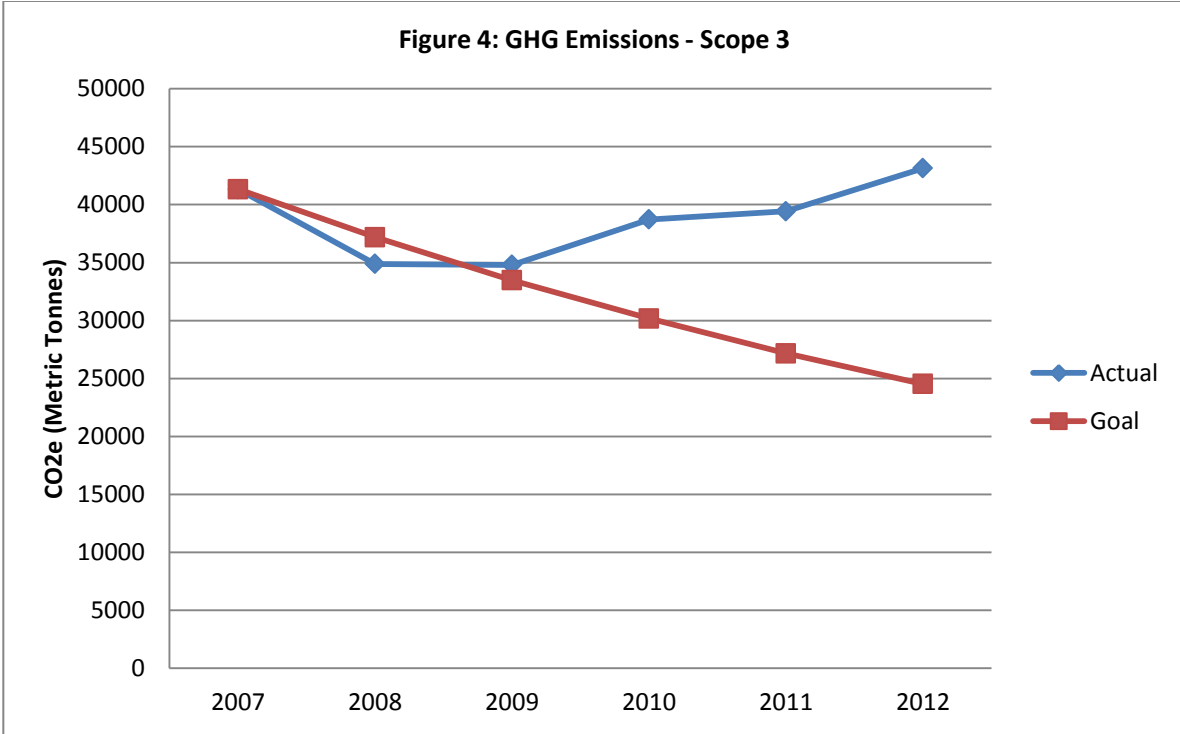
Commuting emissions data were derived from a survey conducted in the spring of 2011 by the Energy & Sustainability Office (housed in the Facilities Management Department). This survey was sent to a random sample of students, faculty and staff through WSU's Student Voice. Survey participants were asked to report on the mode(s) of transportation used to travel to campus, the distance from their home to campus, and the average number of days per week traveled to campus. If respondents indicated that they traveled to both the Ogden and Davis Campuses, then data for travel to both campuses was collected. Using the survey data, the commuting emissions for students, staff and faculty were calculated. See Table 1 below.

Table 1: Commuting Emissions

Year	Students	Faculty/Staff
2007	26,903 CO ₂ e metric tonnes	7,522 CO ₂ e metric tonnes
2008	25,733 CO ₂ e metric tonnes	7,242 CO ₂ e metric tonnes
2009	26,019 CO ₂ e metric tonnes	6,879 CO ₂ e metric tonnes
2010	27,867 CO ₂ e metric tonnes	6,978 CO ₂ e metric tonnes
2011	28,257 CO ₂ e metric tonnes	6,760 CO ₂ e metric tonnes
2012	29,945 CO ₂ e metric tonnes	7,370 CO ₂ e metric tonnes

Scope 3 emissions are depicted in Figure 4. As can be seen from the graph below, Scope 3 emissions have been increasing over the past few years. This can partially be credited to WSU's increasing student, faculty and staff population. However in FY 2012, the increase in emissions is also attributable an increase in University-related airline travel.

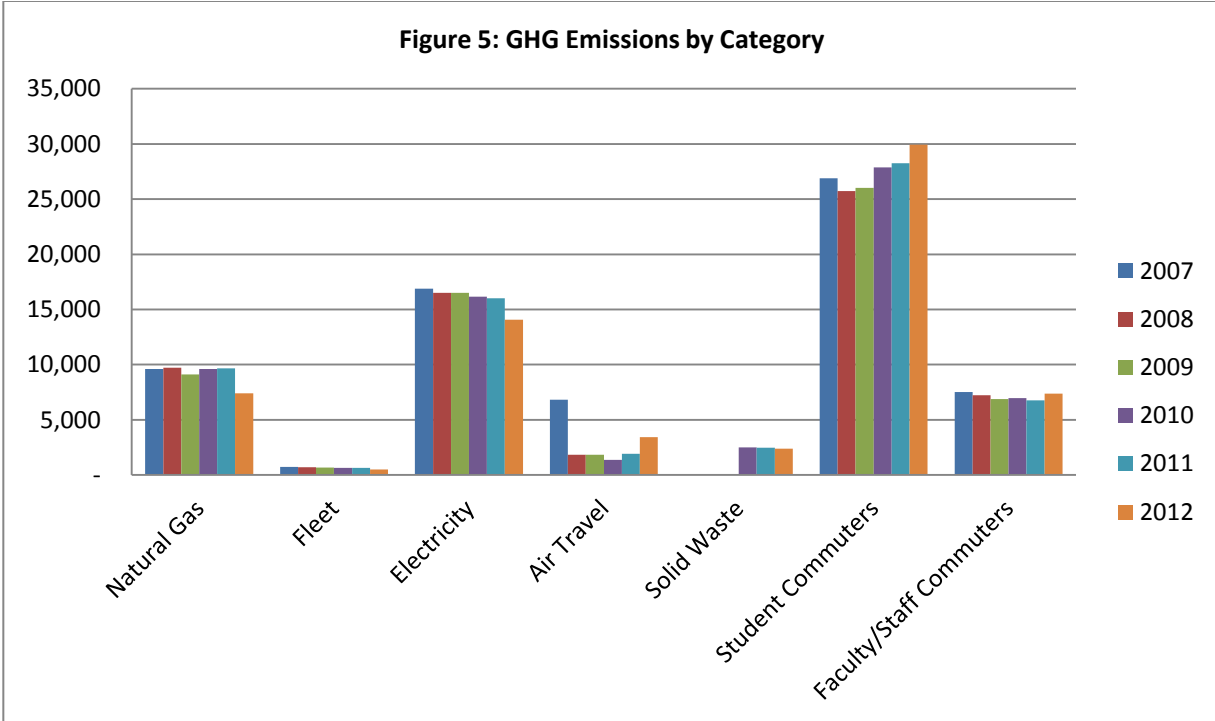
GREENHOUSE GAS (GHG) EMISSIONS



TOTAL GHG EMISSIONS

Figure 5 compares the primary sources of Scope 1, Scope 2, and Scope 3 emissions sources side by side. As can be seen from the chart, student commuting represents the largest source of emissions followed by electricity and natural gas consumption. Emissions associated with faculty and staff commuting (as of this year) is not far below natural gas emissions.

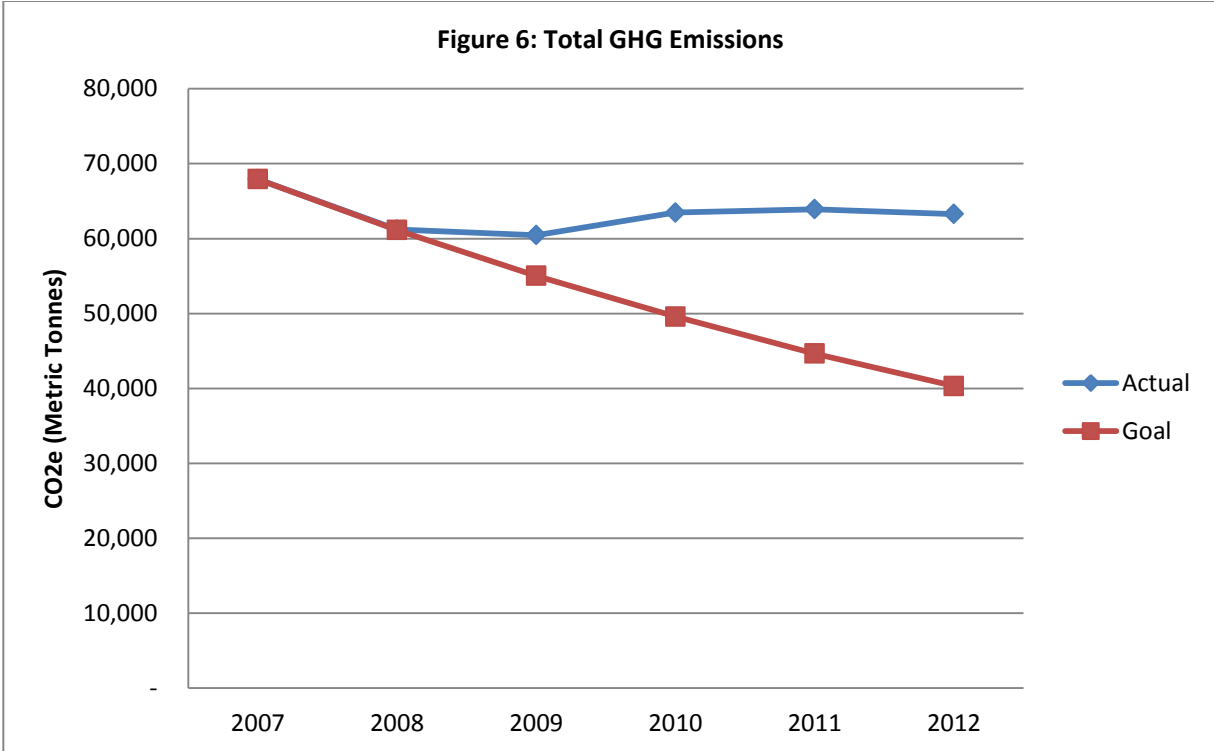
GREENHOUSE GAS (GHG) EMISSIONS



- The change in air travel from 2007 to 2008 is due to decreased air travel and due to a change in how the data is collected
- Solid waste emissions increased in Fiscal Year 2010 not because overall waste generation increased, but because the University decided to send the waste to a new landfill that does not have methane recovery capabilities.

While Scope 1 and Scope 2 emissions have decreased significantly it is evident from Figure 6 below that increases in Scope 3 emissions are impeding WSU's overall progress. As long as the vast majority of the WSU community chooses to travel to campus in a single-occupancy vehicle, it is given that emissions from University commuters will only increase as the population rises.

GREENHOUSE GAS (GHG) EMISSIONS



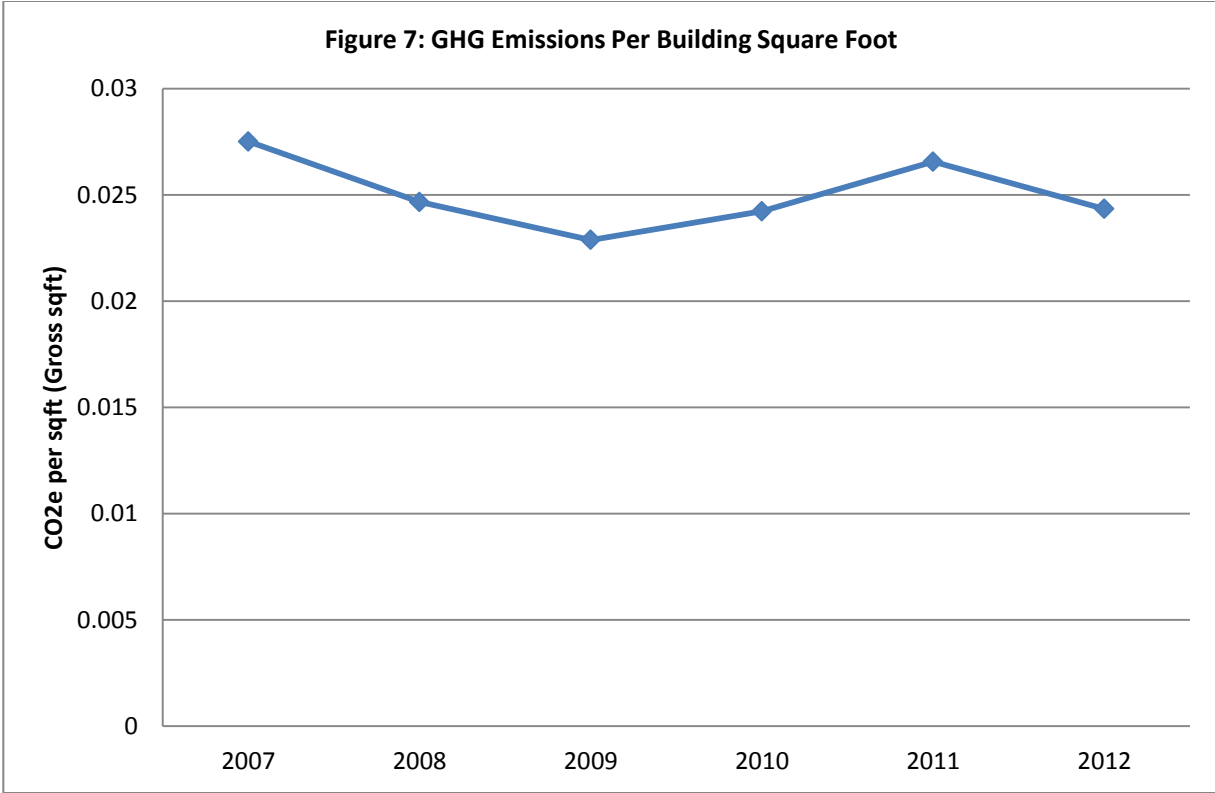
GHG EMISSIONS PER BUILDING SQUARE FOOT

As can be seen in Table 2 below, WSU added 193,895 square feet in FY 2012. Figure 7 depicts emissions per square foot and shows a decrease in emissions this past fiscal year. This decrease can partially be attributed to the completion of energy efficiency projects as discussed previously. However, it can also be attributed to the replacement of old buildings with new, more energy efficient, buildings.

Table 2: WSU Gross Building Square Footage by Year

Fiscal Year	Gross Building Square Footage
2007	2,469,079
2008	2,480,723
2009	2,642,600
2010	2,619,259
2011	2,405,678
2012	2,599,573

GREENHOUSE GAS (GHG) EMISSIONS



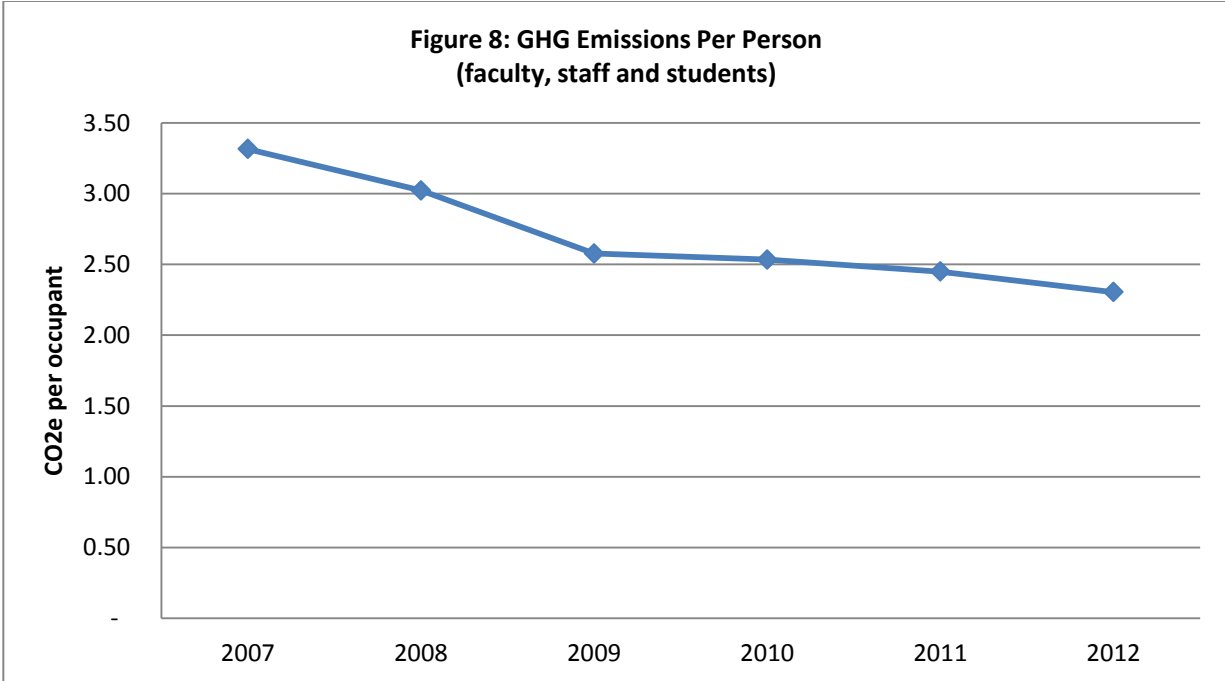
GHG EMISSIONS PER PERSON

Table 3 and Figure 8 show that while WSU's population again increased in FY 2012, emissions per person decreased.

Table 3: WSU Population by Year

Fiscal Year	Total Students, Faculty, and Staff
2007	20,492
2008	20,246
2009	23,460
2010	25,046
2011	26,099
2012	27,467

GREENHOUSE GAS (GHG) EMISSIONS



ENERGY CONSUMPTION AND CONSERVATION

Energy Consumption and Conservation

Energy consumption (electricity and natural gas) represents a considerable portion of the University's GHG emissions. Energy conservation also represents an opportunity for the University to save significant amounts of money. For these two reasons most of the initial sustainability effort is being expended towards making the University as energy efficient as possible.

UNIVERSITY ENERGY CONSUMPTION

Table 4 depicts WSU's electricity and natural gas consumption figures. As discussed previously, WSU saw a significant drop in consumption of both this fiscal year.

Table 4: WSU Energy Consumption

Fiscal Year	Electricity (kwh)	Natural Gas (MMBTU)
2007	38,714,341	174,846
2008	38,927,520	176,545
2009	38,905,072	170,782
2010	38,082,772	180,215
2011	37,717,473	181,921
2012	33,131,629	139,214

Over the past few years, Weber State University has subscribed to the Rocky Mountain Power Blue Sky program which supports renewable energy power production. This past fiscal year, WSU purchased approximately 13% of the University's electrical power from renewable energy resources (wind power) through that program.

ENERGY EFFICIENCY PROJECT STATUS

In 2009, AMERESCO (an energy services company) completed an investment grade audit for WSU that identified a number of projects that, once completed, would reduce energy consumption, improve efficiency, or otherwise save natural resources. Construction on these projects (see Table 5 below) began in July 2010. Due to the initiation and completion of some of these projects, WSU realized \$939,575 in utility savings this fiscal year.

WSU has completed construction on additional energy efficiency projects not outlined in Table 5. These projects were completed prior to the 2009 AMERESCO audit and have been mentioned in WSU's previous annual reports.

ENERGY CONSUMPTION AND CONSERVATION

Table 5: Energy Conservation/Efficiency Project Status (5/6/2013)

Interior Lighting - Campus Wide	Construction - 45% complete
DEC Chiller Replacement	Complete
Steam Powered Condensate Pumps	Construction - completed by fall 2013
Replace DHW Tanks with HX	Construction - completed by fall 2013
Steam Energy Upgrades Phase 1	Complete
Steam Tunnel Support Repair	Funded as part of steam repairs
Replace Piping Insulation on AHUs	Awaiting In-House Labor
Boiler 2 Economizer	Complete
VFDs for Central Plant Cooling Towers	Complete
Convert DX Units to CHW	Canceled
TE Convert Inlet Vanes to VFD	Awaiting In-House Labor
Davis 2 VAV Upgrade and IDEC	Engineering
Recomission Sky Suites, ED, SS	Complete
Domestic Water Conservation	Construction - 10% complete
Solar Water Heating - GYM	Complete
Solar PV Davis - Phase I	Complete
Solar PV Davis - Phase II	Construction - completed by fall 2013
Solar PV Union	Complete
Weatherproofing - SS, LI, SL	Complete
Computer Controls	In Progress
Greenhouse Temperature Controls	Canceled
Swimming Pool Cover	Complete
Electric Meters	Complete
Steam Meters	Construction - completed by fall 2013
Chilled Water Meters	Construction - completed by fall 2013
Irrigation Water Meters	Complete
High Efficiency Transformers	CI - 2 Years Out
HV Switches	Out for Bid
Exterior Lighting	Construction - completed by fall 2013
DEC Power Factor Correction	Complete
Building scheduling and commissioning	Ongoing

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

Additional Sustainability Projects & Programs

In addition to conserving and reducing the University's energy consumption, Weber State University has worked to reduce water consumption, reduce waste generation, encourage the use of alternative transportation, offset university-related travel, increase biodiversity protection, and incorporate the principles of sustainability into all new construction.

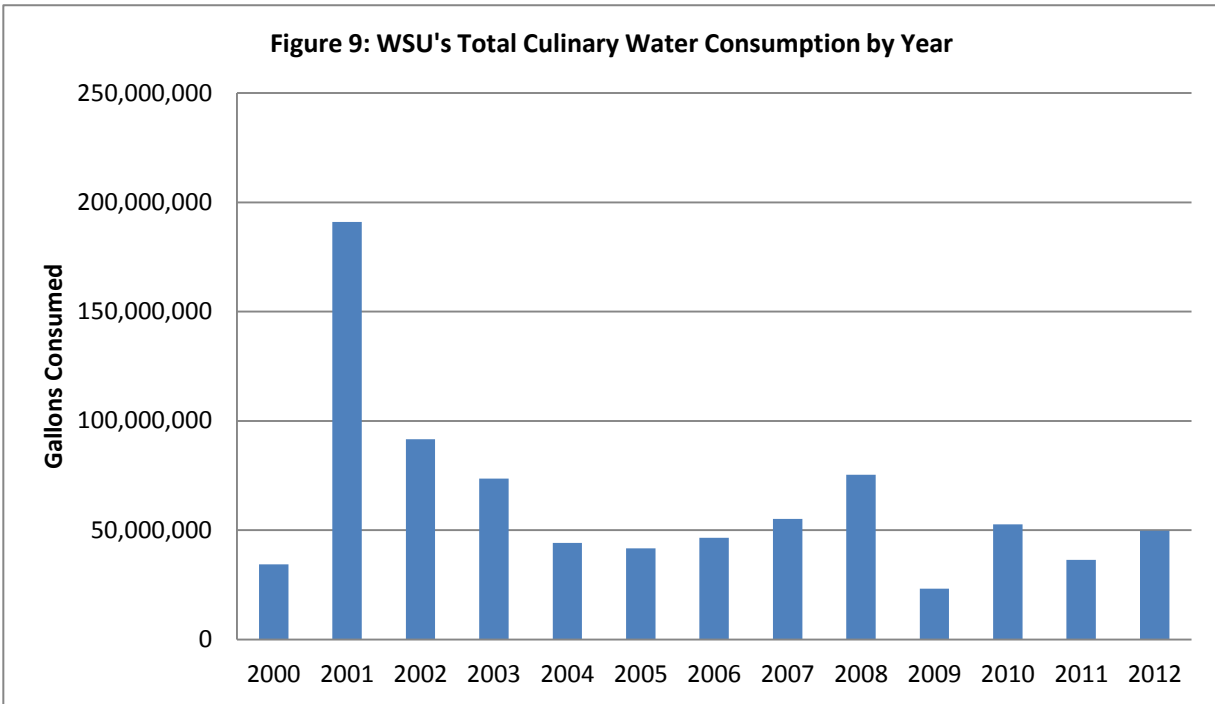
WATER CONSERVATION EFFORTS

Figure 9 depicts Weber State University's culinary water consumption over the past 13 years. The spikes in water consumption in years 2001, 2002, 2003, and 2008 are due to water main breaks that occurred in those years. In fiscal year 2010 WSU had a few smaller water main breaks that increased the University's water consumption above what would have been typical consumption. Culinary water consumption did increase in FY 2012 compared to FY 2011. A fire line break is partially responsible for this increase.

To help identify leaks, breaks, and other water line problems more quickly, WSU is currently in the process of installing culinary water sub-meters. This project, which will be completed in November 2013, will allow the University to track water consumption in real-time. Data, in fifteen minute increments, will be publically available from a website.

The University is also working to reduce culinary water consumption by installing low flow toilets, urinals, and faucets in every building. To date, the WSU Stewart Library has been upgraded with low flow fixtures.

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS



WASTE REDUCTION

Table 6 provides data on WSU's waste generation. As discussed earlier, previous annual reports did not include waste generated by the Shepherd Union because this data was omitted from Waste Management's reports to the University. This error has been corrected and Table 6 provides the updated numbers for all fiscal years including the Shepherd Union Waste.

As can be seen from Table 6, WSU's waste production numbers have been going down. This is likely due to the recycling program which generated 191 short tons of recycled materials this fiscal year (recycling rate of approximately 20%).

Table 6: WSU's Waste Generation in Short Tons

Year	Short Tons
2007	845
2008	834
2009	833
2010	807
2011	799
2012	769

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

Low recycling rates and high recycling contamination rates have been significant challenges for WSU. To help address these issues, the Energy & Sustainability Office implemented a pilot program to increase recycling in the Social Science, McKay Education, and Wattis Business Buildings in the fall of 2012.

The office installed more recycling bins, made sure that a recycling bin was located next to every trash bin, and installed better educational signs above all recycling and trash containers. Custodians also altered their schedules to increase the number of recycling pick-up days and decrease the number of trash pick-up days. Finally, the University's waste hauler, Waste Management, reduced the size of the trash dumpsters serving these buildings and increased the size of the recycling dumpsters.

Pilot Recycling and Trash Signs



Custodians in the three buildings have stated that recycling contamination rates are down significantly and that they are collecting more recycling. It is expected that WSU will see a decrease in its waste production and an increase in its recycling rate in the FY 2013 annual report.

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

In addition to the recycling pilot program, as discussed in the “Notable Energy & Sustainability News” section of this report, WSU’s Environmental Ambassadors focused a lot of their education efforts on recycling and waste reduction this year. The Ambassadors hosted a move-in waste reduction day, celebrated America Recycles Day, and organized the Recyclemania competition.

Also this past fiscal year, through a partnership between Facilities Management, the Shepherd Union, and Sodexo, Weber State University has made composting food waste on campus possible. During the summer of 2012, a large composting bin (AKA the Earth Tub) was installed off of the loading dock of the Shepherd Union Building. The Shepherd Union staff purchased the tub, Facilities Management installed it, and Sodexo maintains and manages the composting process. Currently Sodexo is only composting all pre-consumer food waste (i.e. kitchen preparation scraps). However, in the future, post-consumer food scraps (i.e. dining waste) will be composted as well. The final compost product has been used on WSU’s grounds by the landscaping department.

Earth Tub located off the loading dock of the Shepherd Union



In addition to the above, WSU been reducing waste production through the following on-going programs:

- a. Green waste composting: Landscape purchased a chipper in Fall 2009 and is using it to mulch and recycle green waste on both campuses. This has resulted in approximately a 12% waste reduction.
- b. Property Control recycling and salvage:
 - i. Materials processed through property control are made available to other departments or sold to the community. Sending items to the landfill is the last option.
 - ii. Electronics Recycling – Electronics are recycled as funds permit. Last year, WSU recycled 200 desktop computers and 150 CRT monitors.

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

ALTERNATIVE TRANSPORTATION

As discussed previously, bike infrastructure on the Ogden campus was greatly increased this year with the installation of 24 new bike racks and 3 bike fix-it stations. The Environmental Ambassadors hosted a Bike Festival on campus in April 2013 to celebrate the installation of the new bike racks and to provide a demonstration on how to use the fix-it stations.

New bike racks and fix-it station installed on the west side of Elizabeth Hall



In addition to bike infrastructure, WSU launched the U-Haul Car Share program in the fall of 2012. WSU currently has two cars available to rent by the hour. One is located in the paid parking lot at the Shepherd Union building and another is located in front of the community center at the University Village housing complex.

In the commuter survey conducted by the Energy & Sustainability Office several respondents noted that they would be more willing to take public transit if they had a car available to them during the day to run errands or deal with potential emergencies. The U-Haul Car Share program addresses these concerns and also provides on-campus housing residents with the option of not owning a car. Instead students can choose to just borrow a car only when they really need one. Rental rates and additional information can be found at:

<http://www.weber.edu/parking/CarSharing.html>

Previous year's accomplishments with regard to alternative transit promotion include the following:

- Via a partnership between WSU and Questar, construction on a new compressed natural gas (CNG) station was completed in February 2012. Compressed natural gas is a cleaner burning fossil fuel that is currently much cheaper than traditional gas. The new station lies just to the

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

west of University Village on Old Post Road. The shuttle bus fleet currently runs on CNG and new campus vehicle purchases are required to be at least a hybrid of CNG/gas. In addition to filling the shuttles, the station fills another important need, proximal and economical alternative fueling for the public traveling along the I-15 / 89 corridors. The self-serve station is open to the public.

New CNG station on Old Post Road



- In 2006, WSU prepared and published the University Transportation Master Plan that emphasizes mass transit, pedestrian movement, bicycles, and carpooling to reduce single occupancy vehicle movements. Initiatives identified in this plan are for the most part complete or are being vigorously pursued.
- WSU participates in the Ed Pass program with UTA, with ridership gradually increasing each year. This program now includes UTA busses, the Frontrunner light rail system, and the TRAX system in Salt Lake City. University personnel with the Ed Pass card can ride on all of these systems at no charge.
- The University converted its shuttle bus fleet to natural gas powered vehicles and reduced the length of shuttle bus routes to save fuel.

BIODIVERSITY PROTECTION

For the second year in a row, the Arbor Day Foundation has named Weber State University a 2012 Tree Campus USA for its commitment to effective community forestry management. WSU achieved the designation by meeting the required five core standards for sustainable campus forestry: a tree advisory committee, a campus tree-care plan, dedicated annual expenditures for its campus tree program, an Arbor Day observance and the sponsorship of student service-learning projects

ADDITIONAL SUSTAINABILITY PROJECTS & PROGRAMS

Arbor Day 2013 Celebration



NEW CONSTRUCTION

- The Hurst Center for Lifelong Learning received LEED silver certification and meets state high performance building energy efficiency standards.
- Elizabeth Hall, the new humanities building, was built to LEED silver certification standards and Utah's high performance building energy standards.
- A new residential housing complex has been designed and 2 of the 3 buildings have been completed and are occupied. The new residence halls will be LEED silver certified and have been designed to be much more energy efficient and sustainable, including the use of water source heat pumps, solar hot water heating, and state of the art control and energy management systems. Construction on the third residence hall will be completed in the summer of 2013.

CONTACT INFORMATION

Contact Information

Please feel free to contact us with any questions you might have! Additional information can be found at: www.weber.edu/sustainability

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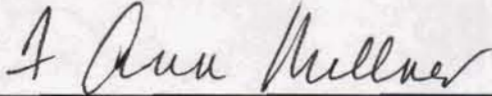
Weber State University

Climate Action Plan

October 2009

Weber State University Climate Action Plan

We have reviewed the Weber State University Climate Action Plan and warrant that it adequately represents our intended approach and actions to reduce our greenhouse gas footprint, particularly for carbon dioxide, so that the University can eventually become "carbon neutral." All appropriate parties representing the University have reviewed this document for completeness and sufficiency.



F. Ann Millner, President
Weber State University

10/12/09

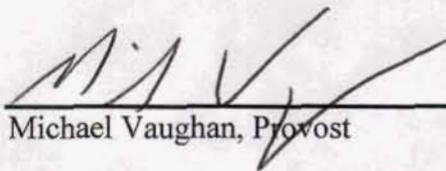
Date



Norm Tarbox, Vice President
Administrative Services

10/12/09

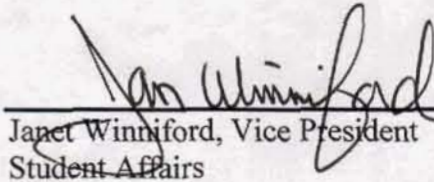
Date



Michael Vaughan, Provost

10/12/09

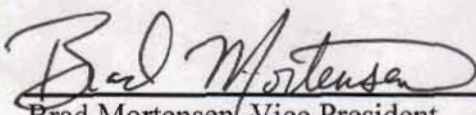
Date



Janet Winniford, Vice President
Student Affairs

10/12/09

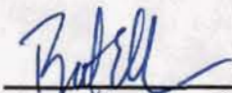
Date



Brad Mortensen, Vice President
University Advancement

10/12/09

Date



Bret Ellis, Vice President
Information Technology

10/12/09

Date

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Weber State University Climate Action Plan

1. Introduction:

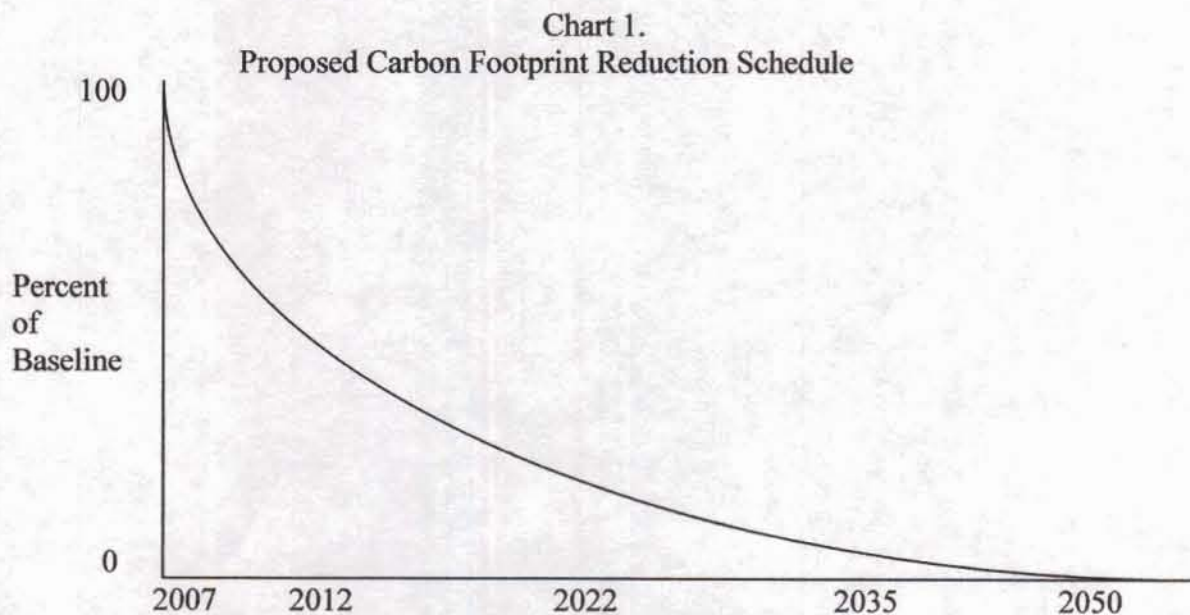
- A. The American College and University President's Climate Commitment (ACUPCC) is a bold endeavor to lead the way in American society towards carbon neutrality. Its impetus comes from the alarming rate of greenhouse gas accumulation in the atmosphere, and its apparent effect on global warming. The consequences of global warming, and its proximate cause related to greenhouse gas emissions can be debated; however, the evidence is mounting that the increased accumulation of greenhouse gas in the atmosphere is indeed contributing to global warming and could jeopardize plant and animal life if not adequately controlled and reduced.
- B. Acknowledging this threat, the ACUPCC signatories, of which Weber State University is one, have made a pledge to reduce greenhouse gas emissions until a state of carbon neutrality is achieved for each signatory institution. Carbon neutrality is defined as not emitting more carbon based products into the atmosphere than are controlled, managed or sequestered in other ways. The principal greenhouse gasses are carbon dioxide, methane, and nitrous oxide. Most greenhouse gas emissions are considered to be the result of man-made actions, primarily the burning of petroleum based products, such as oil, natural gas, and especially coal for energy needs.
- C. Achieving the goal of carbon neutrality will require a comprehensive effort involving every department and functional area that is a part of Weber State University, and will require a sustained and consistent effort. This plan will identify the specific goals and actions that are proposed to be taken. It will establish the timelines that seem realistic to attain those goals, and identify the department or function of the university who will manage the program to achieve the desired results. The plan will also be reviewed on an annual basis and be updated to reflect goals that have been met, and incorporate new technologies or procedures that can help accomplish the overall objective of carbon neutrality. Updates will include how those new technologies or procedures can be implemented to help the University achieve carbon neutrality.

2. Vision:

- A. Our vision is for Weber State University to achieve carbon neutrality by 2050. To achieve this vision, Weber State University will initiate and aggressively pursue programs that address energy consumption through demand reduction, energy efficiency, conservation, and exploitation of alternative energy sources. All of the students, faculty and staff will be engaged in this effort both on and off campus. Further, to achieve carbon neutrality, a total systems approach will be used to reduce carbon emissions throughout the supply and resource distribution chain,

from raw material acquisition, through manufacture and transportation, to end use, then reuse, recycling or disposal. Finally, active efforts will be undertaken to sequester carbon by appropriate landscape management, particularly by planting and maintaining many more healthy trees and shrubs, composting, and other similar practices. Only after the University has done all it can reasonably and economically afford to do will purchased carbon credits be explored to make up the difference that remains to achieve carbon neutrality.

- B. The long term goal is to achieve carbon neutrality by 2050, but to encourage and facilitate achieving that goal, several intermediate milestone goals have been established. The first intermediate goal is to achieve a 40 percent reduction in carbon dioxide emissions from the baseline year by 2012. Another 30 percent reduction will be obtained by the year 2022. An additional 20 percent reduction from the baseline year will be achieved by the year 2035, and the final 10 percent reduction to zero net emissions will be achieved by 2050. This timeline progression is shown in Chart 1.



3. Governing Structure:

- A. The University President's Council will be the governing body for execution of this plan, and will provide policy approval, program guidance and funding support as resources allow.
- B. The Faculty Senate Environmental Initiatives Committee (FS-EIC) will function as an advisory committee and generate policy recommendations. The FS-EIC

will specifically guide the development and implementation of a comprehensive climate action plan and all initiatives related to educational and training initiatives. The FS-EIC is composed of faculty, staff and administrators; and includes a member of the Board of Trustees, several student government representatives, and an outside community member.

- C. The Associate Vice President for Facilities and Campus Planning is designated as the ACUPCC point of contact for Weber State University and will serve as a technical advisor to the FS-EIC (as a non-voting member). The AVP for Facilities and Campus Planning will also be responsible to execute physical plant related aspects of the implementation plan. The AVP will assure that administrative and staff support is provided for development, updates and revisions to this plan. He/she will also monitor execution of plan elements and tasks, and will ensure annual reports are prepared, to include the annual emissions inventory.
- D. The appointed staff member from Facilities Management who serves on the University Planning Council will also liaison with FS-EIC and the President's Council. This person will assure that long term carbon reduction and sustainability issues are addressed in University planning efforts, and will communicate long term planning goals to the FS-EIC and other stakeholders.

4. Reporting Requirements:

This climate action plan, emissions inventory, and progress reports will be made available publicly through the WSU Library, will be posted on the WSU web site, and will be provided to the Association for the Advancement of Sustainability in Higher Education (AASHE) for posting and dissemination. AASHE is the national clearinghouse for higher education sustainability reporting and standardization. All signatories to the ACUPCC have agreed to submit their plans and annual carbon reporting data to AASHE for cross-sharing of information. Weber State University will use a calendar year as the basis for reporting and analysis. An annual update report that includes action items completed, updated emissions inventory data, and a progress report narrative will be generated and posted for each subsequent year within nine months of calendar year end. The carbon calculator spreadsheet promulgated by AASHE will be the tool used to calculate emissions.

5. Strategy:

- A. The strategy the University will employ to pursue carbon neutrality will rely on resources already available and other resources that can be acquired. It is recognized that achieving carbon neutrality will require a significant investment in facilities, infrastructure, vehicles and equipment as well as a major paradigm shift among the faculty, staff and students at Weber State University in attitudes

and understanding about the effect and mitigating opportunities of greenhouse gas emissions.

- B. Funding will be sought first from sources outside the University, such as federal, state or private foundation grants, to the maximum extent possible. Funding will also be sought through regular state funding mechanisms wherever possible. Charging students, either through tuition or fee increases, will be avoided unless students demand and approve an increase for the specific purpose of carbon emissions reductions.
- C. The paradigm shift in thinking and action that will be required from faculty, staff and students can be achieved through extensive education programs. Education will be provided in formal course offerings, as well as in seminars, campus communications outlets, a sustainability and energy conservation website, and other mediums. The educational element will be emphasized so that the effects of accumulating greenhouse gasses on the atmosphere will be fully explained, and the actions that society and individuals can take to reduce or mitigate the effects of these greenhouse gasses will be understood and communicated wherever Weber State Students may go after their formal education at Weber State ends. The net impact of this large, geographically dispersed, and diverse population cannot be calculated, but is in sum much larger than what the University can achieve from its own physical resources of plant and equipment. A further benefit of the educational program offerings will be to affect behavioral changes in faculty, staff and students that will result in further currently undefined reductions in carbon emissions and energy consumption.
- D. After the University has done all it can reasonably and economically do to reduce carbon emissions through equipment changes or modifications, behavioral changes, and facility modifications or upgrades, consideration will be given to purchasing carbon credits or acquiring other carbon offsets to achieve carbon neutrality. Because carbon credits and carbon offsets are expected to be available for purchase in an open market environment, and because of the worldwide demand for carbon neutrality, these credits and offsets are expected to be expensive to obtain. For that reason, Weber State University will do all it can reasonably do to reduce carbon emissions to the lowest extent possible before these offsets or credits are required.

6. Campus Emissions Inventory:

- A. While there are six greenhouse gasses that are deleterious to the environment in excessive quantities, as identified in the Kyoto protocol, only carbon dioxide (CO₂) reductions will be addressed in this plan. The other five gasses; methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆) exist in such small quantities or are so unlikely to originate on our campus that they will not have specific control

measures identified. If inventories of these gasses are discovered on campuses of WSU, they will be monitored and an action plan for reduction will be developed.

- B. In order to determine the effectiveness of the greenhouse gas emissions reduction program, a data baseline must be determined. An inventory of greenhouse gas emitters will be prepared and an analysis conducted to determine the amount of greenhouse gasses being emitted from each source as the starting point for reductions. Weber State University has not previously identified all of the sources of greenhouse gas emissions from the various campuses. To help identify the various emissions sources, they are categorized as shown below in "Scope Emissions". The greatest effort will be directed towards reduction of Scope 1 Emissions. This designation is consistent with direct greenhouse gas emissions occurring from sources that are owned or controlled by the institution, including on-campus stationary and mobile combustion of fossil fuels and fugitive emissions.
- C. Weber State University does not, at this time, have meters on individual facilities and infrastructure components to determine utility consumption by facility. Instead, the university relies on central plants for steam and chilled water that is then distributed throughout the main campus to most buildings. There are some outlying buildings, and other special circumstances, that require individual buildings to have stand-alone heating and air conditioning systems. To help identify and categorize these various sources of greenhouse gas emissions, the university commissioned a study in 2007 to develop an Energy Savings Investment Plan (ESIP). As part of the scope of work in developing that plan, each major facility of the university was analyzed for energy saving measures that could be adopted and the amount of energy that could be saved, with the consequent reduction in greenhouse gas emissions that could be achieved. The Energy Savings Investment Plan is therefore incorporated into this plan in its entirety and will serve as the basis for facility energy reduction strategies and their associated greenhouse gas emissions reductions. The ESIP will be updated as required, and any subsequent editions will remain a part of this plan.
- D. Two other plans developed and adopted by the University will also play a significant role in achieving carbon neutrality. The first is the Master Transportation Plan. This plan, completed in 2006, identifies various strategies and initiatives to reduce traffic and parking demand at the University. Many, if not all of the initiatives identified in that plan will also help reduce carbon emissions from motor vehicles used by students, faculty and staff as they travel to and from, or around, the University. Therefore, the Weber State University Master Transportation Plan is also incorporated into this Climate Action Plan in its entirety. Any future updates to the University Master Transportation Plan will also be incorporated into this plan.
- E. The other plan that also has a direct and significant bearing on carbon dioxide emissions and achieving carbon neutrality is the Landscape Master Plan

completed in 2004. This plan identifies the types of plants, trees and shrubs that will be planted on the campuses of the University, and identifies the irrigation systems that will be used to reduce water consumption and thereby also reduce the associated pumping costs. This plan requires more planting of trees and therefore identifies appropriate species for our climate that can help sequester carbon from the atmosphere. For these reasons, the Landscape Master Plan is also incorporated into this Climate Action Plan, along with any future updates to the landscape plan.

- F. Because the university does not have every individual facility metered for every utility, total consumption data has been aggregated and will be addressed for the university as a whole to establish an energy consumption and carbon emissions data baseline. Table 1 shows the energy consumption data for facilities and process energy for four years, leading up to our designated baseline year of 2007, with the associated carbon dioxide gas emissions that resulted from this level of energy consumption.

Table 1. Facilities Carbon Dioxide Baseline Information

All CO2 emissions are in thousands of pounds

	FY 04	Equivalent Carbon Dioxide Emissions	FY 05	Equivalent Carbon Dioxide Emissions	FY 06	Equivalent Carbon Dioxide Emissions	FY 07	Equivalent Carbon Dioxide Emissions	Total Carbon Dioxide Emissions
Electric Power in Kilowatt hours	31,069.6	65,246.2	29,542.2	62,038.7	32,413.2	68,067.8	38,714.3	81,300.1	276,652.8
Natural Gas in decatherms	488.0	57,097.9	177.2	20,734.7	164.2	19,214.8	174.8	20,457.0	151,821.8
Water in gallons	40,531.3		43,075.1		48,512.1		53,842.6		
Total CO2 Emissions		122,344.1		82,773.5		87,282.6		101,757.1	428,474.6

- G. **Scope 1 Emissions:** Scope 1 emissions are defined as those emissions occurring from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles, and “fugitive” emissions.

1. Central heat plant: The central heat plant, located on Edvalson Street, is the largest single user of fossil fuels on the institution. It is separately metered for natural gas. The consumption through this meter for FY 2006 and FY 2007 is shown in Table 2. The central heat plant is also dual fuel capable, and there are four underground fuel storage tanks with a total capacity of 75,000 gallons of diesel fuel adjacent to the central heat plant. Those tanks are maintained with normally no less than 50,000 gallons of diesel fuel for emergency use should natural gas supplies be disrupted. Consumption and subsequent emissions from combustion of diesel fuel from the Heat Plant is also identified in Table 3.

Table 2. Natural Gas Consumption by Metering Point (FY 07)

Building	Address	NG FY 06 (decatherms)	CO2 Eq (pounds)	NG FY 07 (decatherms)	CO2 Eq (pounds)
Annex 1	4464 So. Harrison	162.6	19,155	158.7	18,581
Annex 2	3670 Birch Ave.	101.5	11,884	109.6	12,832
Annex 4	4038 Tyler Ave.	69.9	8,184	69.3	8,114
Annex 5	4040 Tyler Ave.	58.7	6,873	56.1	6,568
Annex 8	1264 Edvalson St.	141.6	16,579	140.6	16,461
Annex 9	4022 Taylor Ave.	92.5	10,830	93.4	10,935
Annex 10	1250 Edvalson St.	133.5	15,630	116.5	13,640
Annex 11	3741 Custer St.	106.9	12,516	131.0	15,337
Annex 12	1346 Edvalson St.	44.0	5,152	30.8	3,606
Annex 13	4008 Taylor Ave.	100.8	11,802	108.5	12,703
Alumni Ctr	1245 E. 4100 So.	339.0	39,690	325.5	38,110
Fac Mgmt.	3690 Skyline Dr.	775.3	90,772	894.7	104,751
Rec & Dist.	3700 Skyline Dr.	1,731.3	202,701	1,693.9	198,322
Tech Ed	1505 Edvalson St.	18.5	2,166	8.4	983
Building 3 (general campus gas)	3750 Harrison Blvd.	988.7	115,757	8,165.8	956,052
Promontory	1285 E. 4100 So.	516.1	60,425	364.5	42,676
DEC	4300 Harrison Blvd.	4,107.0	480,848	3,931.4	460,288
TLC	915 W. Gordon Ave.	976.5	114,329	1,009.3	118,169
Davis	2750 N. Univ Pkwy.	7,643.6	894,913	6,643.1	777,774
West Center	5627 So. 3500 W.	186.4	21,824	138.3	16,192
Univ. Village		5695.5	666,838	4,926.0	576,744
Barnes Prop	122 N Flint	36.3	4,250	4.9	574
Central Plant	3800 Harrison	<u>145,898.0</u>	<u>17,081,738</u>	<u>150,652.0</u>	<u>17,638,336</u>
Total		169,923.5	19,894,734	179,772.3	21,047,749

2. Stand-alone building heating systems: Besides the central heat plant, there are 21 other separately metered facilities for natural gas at Weber State

University. The recorded natural gas consumption for FY 2006 and FY 2007 and subsequent emissions for these facilities is also included in Table 2.

3. Emergency power generators: To provide emergency power when normal electrical power supplies are interrupted, the institution has 24 fixed, stationary emergency electrical generators and 6 mobile emergency generators. These generators are operated regularly per the manufacturer's recommendation for testing, lubrication, and to assure they are serviceable when needed. Table 4 lists each generator, its fuel tank capacity, and the amount of time it has operated (based on the generator log book) and fuel consumption for 2007.

Table 3, Heat Plant Diesel Fuel Consumption

	2004	2005	2006	2007
Gallons	405	418	514	230
CO2 Eq. (lbs)	9,065	9,356	11,505	5,148

4. University vehicle fleet.

- a. Shuttle busses – As of December 2008, the University maintained a fleet of six diesel fueled busses that were used in the shuttle system on campus. The primary mission of the shuttle system is to transport students from the Dee Events Center parking lot to the main area of the Ogden campus. These busses start operating at 6:30 AM and continue operations until 10:00 PM in the evening, with different numbers of busses placed on the routes based on demand at various times during the day. The highest demand occurs in the morning hours. At that time, the shuttle busses operated on a circuitous route that included Harrison Blvd, Dixon Drive, Edvalson Street, and through some interior campus parking lots. Besides using the busses for transport from the Dee Events Center to the Ogden campus, students used the busses for transport from one location on the campus to another, such as from the McKay Education Building to the Marriott Allied Health Building. Stops for the shuttle bus routes included Promontory Tower, Browning Center, Social Science Building, Lind Lecture Hall, Science Laboratory, Marriott Allied Health, and the Stromberg Complex.
- b. In 2009, the shuttle bus service was limited to an express route between the Dee Events Center and a single stop as close to the center of the Ogden

campus as possible. All facilities on the Ogden campus are within a ten minute walk from the center of the campus. Shuttle bus operations around the perimeter of the campus were a convenience that is unnecessary and expensive, as well as contributing a significant amount of carbon

Table 4, Generator Fuel Consumption for 2007

Generator location	Starting hours	Ending hours	Hours run	Fuel Consumption rate Per/Hr
Facilities Management	468.9	500.9	32	3.8
Science Lab	1077.2	1106	28.8	4.6
Stadium	206.9	210.6	3.7	3.8
Marriot Allied Health	490.5	508.4	17.9	2.7
Dee Events Center	378.4	411.1	32.7	7.1
Swenson Building	570.7	576.8	6.1	3.8
Wasatch Hall	424.4	467.4	43	3.8
Promontory Tower	0	12	12	3.4
Stewart Library	653.9	682.4	28.5	3.8
Browning Center	632.2	648.9	16.7	10
Safety Annex	29.3	32.6	3.3	2.4
Visual Arts	196.8	232.5	35.7	11
Shepherd Union Building	19.3	22.6	3.3	16.5
Student Services	129.5	130.7	1.2	7.1
Miller Administration	420.7	424.1	3.4	4.8
Social Science	787.1	791.8	4.7	4.6
Wattis Building	94.4	129.4	35	3.8
McKay Education Building	85.5	221	135.5	1.2
Heat Plant	109.1	137.5	28.4	13.6
Building 4	456.9	474.7	17.8	0.9
Technical Education Bldg	246.6	314.2	67.6	26.4
Engineering Tech	208.5	212.9	4.4	5.8
Davis Campus Bldg 2	198.7	245.3	46.6	16.5
Alumni Center				
Total	7885.5	8493.8	608.3	
Portable generators				
Electronic Systems			10	0.8
Electronic Systems			10	0.8
Electronic Systems			10	0.8
Welder Vehicle Repair	195.3	235.3	40	0.8
Davis Campus			10	0.8
Electric Shop			10	0.8
Total			90	

emissions to the atmosphere. The service was reduced by limiting the route to an express service between just two points. As part of the reassessment, WSU converted the shuttle bus fleet to dual fuel (gasoline and natural gas) both to reduce the operating expenses and to also reduce carbon emissions. Two of the six diesel powered busses were sold and three new smaller dual fuel busses were acquired. To complete the conversion process, a rapid fill natural gas compressor station is needed and is being pursued through a federal grant. In the meantime, refueling facilities owned by Ogden City will be used as much as possible.

- c. Coach busses – Besides the shuttle bus fleet, the University also maintains a fleet of four diesel powered “over the road” busses that are used to transport athletic teams, clubs sports teams, and other University sponsored groups for travel. These busses are equipped for long distance travel with lavatories and audio/visual systems. These busses are only used on the shuttle routes in event of breakdown or non-availability of regular shuttle busses. These busses are used on a reservation basis and are driven by part-time drivers. A small fleet of these busses should be maintained since they are more economical to operate and generate less carbon emissions per passenger mile than does air travel or other methods of transportation for medium range distances.
- d. U-drive fleet – The University also maintains a fleet of 12 general purpose vehicles for check-out for business use. These vehicles consist of five each five passenger sedans and six each seven passenger or larger vans or sport utility vehicles. The fleet also includes one 15 passenger bus. All of the vehicles are gasoline powered. This fleet should be retained at the lowest number of vehicles consistent with demand, although hybrid type vehicles or smaller, more fuel efficient vehicles should be considered when replacement purchases are made.
- e. Campus service vehicles – The University also maintains a fleet of vehicles that are assigned to and maintained by individual departments. This fleet consists of 59 vehicles in the Facilities Management department, 12 vehicles in the Police Department, 12 vehicles in the College of Continuing Education, and 33 other vehicles assigned to other departments across campus. Table 6 provides a breakout of where vehicles are assigned. Overall this campus service vehicle fleet consists mostly of small pickup trucks, small vans, and a few sedans and other utility type vehicles. All of these vehicles are gasoline powered. Six of the vehicles are dual fuel capable, and could be operated on natural gas if a refueling station was conveniently available. When a natural gas refueling station is installed, all of the vehicles in this fleet should be converted to natural gas fuel. This conversion would reduce annual operating costs, because of the lower price of natural gas fuel, and would also reduce carbon emissions

because natural gas burns cleaner than gasoline. All of these vehicles should be carefully evaluated when replacement is required so that the smallest and most fuel efficient vehicle possible that is suitable to mission requirements is purchased.

Table 5. University Motor Vehicle Fuel Consumption

	<u>CY 2003</u>	<u>CY 2004</u>	<u>CY 2005</u>	<u>CY 2006</u>	<u>CY 2007</u>
Gasoline	44,602	43,614	46,514	47,175	46,680
CO2 Equiv	872,594	853,264	909,999	922,932	913,247
Diesel	36,507	38,036	37,125	34,516	30,272
CO2 Equiv	817,173	851,398	831,006	772,606	677,608
Total CO2 (pounds)	1,689,767	1,704,662	1,741,005	1,690,538	1,590,855

- f. The University is authorized a total vehicle fleet of 142 vehicles by the State of Utah Legislature. As of December 2008, there were 139 vehicles in the fleet.
5. Fugitive Emissions: Fugitive emissions are defined as emissions that are not physically controlled but result from the intentional or unintentional releases of GHGs. They commonly arise from the production, processing, transmission, storage and use of fuels and other chemicals, often through joints, seals, packing gaskets, spills, etc. The highest risk at Weber State University for fugitive emissions is from spills of fuels or other chemicals or laboratory gas releases. These fugitive emissions will be reported on an exception basis.
6. Other Equipment Emissions: Besides the vehicle fleet, there are other equipment items on campus that use petroleum based fuels and contribute to greenhouse gas emissions. This equipment includes lawn care equipment, leaf blowers, snow removal equipment, and other motorized equipment such as manlifts and backhoes. Except for the single backhoe, which is diesel powered, all of this equipment is gasoline powered. The fuel consumption figures for this equipment is included in the fuel consumptions figures shown in table 5.

H. **Scope 2 Emissions**: Scope 2 emissions are defined as indirect emissions generated in the production of electricity consumed by the institution.

1. Purchased utilities:

- a. Weber State University purchases its electric power from Rocky Mountain Power, a subsidiary of PacificCorp. Rocky Mountain Power generates approximately 93 percent of the power it delivers to customers from coal, or natural gas fired generating plants. Hydropower contributes about 6.7 percent of the power generated by Rocky Mountain Power, and wind and other renewable sources contribute .2 percent. Rocky Mountain Power is making a concerted effort to increase the renewable percentage of the power it generates and delivers, with several new wind and geothermal generation sources now in development or construction.

Table 6. University Vehicle Fleet Assignments

Department	Vehicles Assigned
Facilities Management	59
Police Department	12
Continuing Education	12
Mail Services	7
Receiving	5
Housing	5
Parking	3
Dee Events Center	2
Athletics	2
Book Store	2
Safety	1
Zoology	1
Automotive	1
Military Science	1
Emergency Care & Rescue	1
Shuttle Bus	1
Fleet Mgmt (leased to Library)	1

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- b. Weber State University receives its electric power through 20 separate meters. Most of the facilities on the Ogden campus are serviced through a University owned substation that enables the University to enjoy a very low rate for power. Whereas Table 1 provides summary data on the total amount of electric power consumed by the University for the last four years, Table 7 identifies the 20 separate meters, their locations, the amount of electricity used and the equivalent carbon dioxide produced assuming bituminous coal as the fuel source at the power plant.

- I. **Scope 3 Emissions:** Scope 3 emissions are defined as all other indirect emissions – those that are a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution.

Table 7 – Electricity Used and Equivalent CO2 Produced 2007

<u>Location</u>	<u>Address</u>	<u>Elec Used FY 07 (kwh)</u>	<u>CO2 Equiv. (lbs)</u>
Annex 1	4464 So. Harrison Blvd	12,778	26,833
Annex 2	3670 Birch Ave.	4,694	9,857
Annex 8	1264 Edvalson St.	6,255	13,135
Annex 9	4022 Taylor Ave.	12,326	25,885
Annex 10	1250 Edvalson St.	7,536	15,826
Annex 11	3741 Custer Ave.	25,649	53,863
Annex 12	1346 Edvalson St.	58,554	122,963
Annex 13	4008 Taylor Ave.	9,991	20,981
Facilities Mgmt	3730 Skyline Dr.	392,880	825,048
Greenhouse	1285 E. 4100 So.	827	1,737
Street Lighting	3800 Harrison Blvd.	3,286,800	6,902,280
Main Substation	3800 Harrison Blvd.	30,880,800	64,849,680
DEC Main	4300 Harrison Blvd.	2,028,169	4,259,155
Marquee	4550 Harrison Blvd.	7,880	16,548
Scoreboard	4300 Harrison Blvd.		
TLC	915 W. 1000 N. Layton	215,000	451,500
West Center	5627 S. 3500 W. Roy	23,882	50,152
Davis Campus	2800 Univ. Pk Blvd. Layton	1,740,320	3,654,672
Davis sign	915 W. 3000 N. Layton		
Total		38,714,341	81,300,116

1. University sponsored air travel. An effective method of determining university sponsored air travel does not currently exist. The University must develop a methodology to track and measure the amount of University sponsored air travel that is conducted each year. Only after the amount of air travel is understood can an effective means of measuring and controlling the impact of this travel on carbon emissions be developed.
2. University sponsored vehicle travel (self-driven). See the discussion on the u-drive fleet in paragraph G.4.d. above.
3. Commuter travel.
 - a. Weber State University is a commuter school. Over 95 percent of the students commute each day to attend classes at any of our campuses. Data

developed for the Master Transportation Plan revealed that approximately 72 percent of the campus population arrives on campus in a car by themselves. Only 11 percent used public transportation, and only 7 percent carpooled. The remainder arrived on campus via motorcycle, bicycle, walking, or by other means. Planning efforts to change the mode split percentages to encourage more use of public transportation, carpooling, bicycle and walking are identified in detail in the Master Transportation Plan and are incorporated here by reference.

- b. The Geography Department did a demographic survey to find out where students, faculty and staff reside in 2007. This data, when coupled with the mode split information in the Master Transportation Plan, is used to compute the vehicle miles driven by commuters to the University. This demographic data will need to be maintained and updated on a regular basis by surveys or other analysis to assess and compute the vehicle miles driven in future years. It is the most accurate means currently available to determine with reasonable assurance the vehicle miles driven by the University community.

Table 8. Total Direct Energy Consumption and Carbon Emissions CY 2007

Energy Source	Total Consumption	CO2 Emissions (lbs)
Electricity	38,714,341 Kwh	81,300,116
Natural Gas	179,772 Decatherms	21,047,749
Diesel	35,291 gal	789,953
Gasoline	46,780 gal	915,213
Total		104,053,031

7. Mitigation Strategies:

A. The following items are candidate initiatives to reduce greenhouse gasses and help the University achieve carbon neutrality. This list is not all inclusive and each item listed will require careful analysis and appropriate approval before it can be implemented.

1. Policy Initiatives:

- Sponsor an energy savings performance contract (ESPC) initiative with an energy services company (ESCO) for WSU
- Prohibit use of space heaters

- Purchase only energy star rated equipment
- All new buildings and renovations to LEED Silver standards, even if certification is not required (must meet state high performance building standards).
- Maximum and minimum indoor air temperature policy with night temperature setbacks
- Use of alternative energy sources from utility providers
- Telecommuting
- Selective application of 4/10 work week
- Continued support of Ed-Pass, including on Frontrunner
- Car pool and alternative vehicle reserved parking
- Incremental increase in parking fees as an incentive to use alternative forms of transportation
- Expand no parking zone on city streets surrounding the University
- Establish bike routes, dismount zones and additional bicycle parking areas on campus
- Update policy on bicycling on campus (to encourage, not discourage, bicycle riding)
- Purchase carbon credits and carbon offsets for those emissions that cannot be further mitigated.

2. Physical Plant Initiatives:

- Lighting design, retrofit and control in work spaces
- Plant more trees for carbon sequestration and consumption
- Mulch tree and other green waste and reuse.
- More economical or alternate energy vehicle fleet
 - Convert shuttle bus fleet to natural gas
 - Convert general purpose fleet to smaller, alternative fueled vehicles
- Examine solar/photovoltaic for implementation
 - Swimming pool preheat
 - Recharging emergency lighting batteries
 - Pilot project for PV electric generation
- Reuse irrigation and storm water
- Xeriscape landscaping
- Improve preventive maintenance program to assure peak operational performance of installed equipment
- Recommissioning of existing facilities
- Install building metering for all connected utilities
- Install "cool roofs" when reroofing to reduce cooling loads
- Low flow urinals and toilets when renovating buildings.
- Improved irrigation scheduling to reduce total and peak water use
- Custodial day cleaning
- Convert all possible air cooled chillers to chilled water system units serviced by the central chilled water system

3. University Operations Initiatives:

- Reduce use of printed media
- Use recycled paper in Printing Services and soy based inks
- Use recycled paper in departments across campus
- Amend classroom scheduling
- Turn off (or sleep mode) for computers and peripherals at night
- Increase recycling/composting
- Reduce process energy (computers, lab hoods, etc.)
- Recreation and activity scheduling to reduce energy

4. Human Behavioral Change Initiatives:

- Promote bicycling
- Promote walking
- Promote public transit
- Turn off lights and equipment when not in use
- Promote recycling

B. Each of these mitigation strategies will be discussed in turn.

8. Policy Initiatives

A. Sponsor an EPC initiative with an ESCO for WSU

1. An energy performance contract (EPC) is a contract whereby the cost of implementing energy efficiency and capital improvements is funded by the energy and maintenance cost savings generated by the improvements when the implementation costs are financed over a period of time. Payment is accomplished by reallocating a portion of the money a facility or institution is already paying in energy and maintenance costs. An EPC is usually performed with an energy services company (ESCO) whereby the ESCO identifies, designs, helps obtain capital funding, and then executes energy savings projects with guaranteed performance in the amount of energy saved and the return on investment that is generated from reduced energy bills. The ESCO is then paid for their services and construction costs out of the energy savings so produced. Because savings add up over time, EPC projects are designed to be self-funding, providing a way to upgrade facilities without exhausting capital budgets. At its core, an EPC is a financing vehicle that allows facility managers to make infrastructure improvements today that will be paid for from future energy savings.
2. The ESIP that the university completed revealed a potential of over \$6.5 million dollars in energy related capital improvement projects that could generate enough energy savings to allow a simple payback in as little as 10.3 years. Completing the projects identified in the ESIP would allow a projected reduction of over 9 million pounds of CO₂ from current emissions per year.

3. The goal of this initiative will be to implement an energy savings performance contract, including having all construction and equipment installation complete, by the end of calendar year 2010. The responsible department will be Facilities Management.

B. Prohibit Use of Space Heaters

1. Small space heaters are very inefficient heating devices, and if not of the proper kind, also create a higher risk of fire. Not only are small electric space heaters themselves inefficient, being electrically powered, they contribute to greenhouse gas emissions because we obtain our power predominantly from coal fired power plants. Small electric space heaters also cause imbalances in heating and cooling loads in buildings with central HVAC control systems, and may “trick” thermostats and other control devices. For these reasons, small electric space heaters should be banned from campus. When interior environmental conditions are unacceptable, service calls to Facilities Management should be made so the central control systems can be properly maintained and operated. If interior comfort is still a problem, or cannot be easily resolved, small lap blankets or an extra sweater could be used. There are also low wattage heat pads for under desk applications that are much more energy efficient and much safer.
2. The goal is to develop and implement a policy prohibiting purchase and use of small space heaters for use in university facilities, and to have all space heaters removed by July 2010. The responsible departments will be Purchasing and Facilities Management.

C. Purchase Only “Energy Star” Rated Equipment

1. “Energy Star” rated equipment has been tested and validated to use less energy than older or non-“Energy Star” rated equipment. This higher efficiency equipment, whether it be appliances, HVAC equipment, or other equipment uses much less energy and thus results in a reduced emissions footprint. While “Energy Star” rated equipment is sometimes more expensive than non-rated equipment, the life cycle cost of “Energy Star” equipment is generally less and thus less costly to operate overall because of the energy savings generated. A policy to only use “Energy Star” rated equipment will provide an excellent long term investment return to the University.
2. The goal is to develop and implement a policy allowing only purchase of “Energy Star” rated equipment for renovation, retrofit, or new construction of Weber State University facilities, furnishings, fixtures and equipment by the end of calendar year 2010. The responsible departments will be Purchasing and Facilities Management.

D. All New Buildings to LEED Silver Standards

1. Leadership in Energy and Environmental Design (LEED) is a rating system employed by the US Green Building Council that rates facilities in several categories relating to energy consumption and long term sustainability while minimizing the environmental impact. To obtain Silver status, a project must accrue points in various categories that exceed the minimums and assure the building performance will exceed common industry standards by a considerable margin. Silver certification does add 5 to 10 percent to the initial cost of a new facility, but the reduced operational and maintenance costs, and the reduced energy consumption that a Silver certified building promises results in a much lower overall cost of ownership over the life of the facility. Thus, a LEED Silver certification results in reduced energy consumption and lower energy use costs. A policy to build all new facilities to LEED Silver Certification will provide a very effective long term return on investment for a facility.
2. LEED certification is not an end in itself. Some LEED points are not cost effective, and do not warrant pursuit. The intent in pursuing LEED Silver certification for new facilities, and not to pursue higher level LEED certification, such as Gold or Platinum, is to focus on energy and carbon reduction and not expend limited funds on other LEED points that do not contribute measurably to energy reduction and carbon emission reduction. Silver certification is obtainable through energy reduction initiatives, particularly when coupled with the State of Utah High Performance Building Standards for energy consumption in new facilities.
3. The goal is to establish and implement a policy whereby all new University facilities must meet LEED Silver certification requirements, whether or not a certificate is sought. This policy should be published before the end of 2010. The responsible department will be Facilities Management.

E. Maximum and Minimum Indoor Temperature Standards with Night Setback

As part of the ESPC initiative, mentioned previously, the University has also initiated a study to investigate the feasibility and cost to install a modern, digital controls system for the lighting, alarm systems, electronic access, heating, ventilation, and air conditioning systems on all campuses. This new initiative, called an integrated facility management system, or IFMS, is intended to be complementary to the EPC. The IFMS will use a common protocol backbone, called BACnet, that will allow equipment from multiple and varied vendors to communicate through the common communications protocol and thus allow operators in the central plant to control individual pieces of equipment that are connected to the IFMS. The IFMS will allow the central plant operators to set back temperatures during periods when buildings and systems are not in use, particularly at night and on weekends when whole buildings can be set back to conserve energy. Further, the IFMS will allow operators to shut down or turn down equipment that is not being used during the academic day. For example if a classroom or laboratory is not being used for a block of two or three hours during

a day, the temperature can be set back, ventilation turned off, and lights and other appliances turned off during that block. The systems can be restarted a few minutes before the next scheduled usage period for the space, so it is comfortable for occupants when they arrive to use it. To fully implement the full potential of this system will require close coordination and collaboration between the building schedulers and the central plant operators. This project will require significant capital investment and will be managed by Facilities Management. The goal is to have the system implemented by the end of 2012.

F. Use of Alternative Energy Sources from Utility Providers

Because Weber State University is in an area where the principle source of electric power is from coal fired electrical generating plants, there is limited opportunity for alternative electrical energy sources on campus. However, our electric utility provider, Rocky Mountain Power, has instituted a "Blue Sky" program that promotes the use of wind generated electric power. Weber State University was one of the original signatories to the "Blue Sky" program and has already purchased 50 "blocks" of 100 KWh each of wind generated power. This represents approximately 5 percent of the University's total electric consumption, using calendar year 2007 as our baseline year. With other energy savings initiatives, as outlined in this plan, the University expects that block of wind generated power to eventually represent 10 percent of our total consumption. The University also has the opportunity to purchase additional blocks of wind generated power should we elect to do so. Facilities Management will monitor electrical consumption and make recommendations to the President's Council on when additional blocks of wind power should be acquired.

G. Telecommuting

1. Telecommuting is an alternative available to the University on a selective basis that can reduce the emissions footprint, primarily through reduced transportation emissions. It is recommended that a policy be established where, on a selective basis, telecommuting be allowed and encouraged for those staff and faculty that can do analysis, report generation, and planning from their homes using personal computers. This would require careful coordination with supervisors, and is not envisioned as a panacea or for regular and frequent application. But by allowing selective telecommuting, such as for particular work projects for those employees who can and do perform their work on computer networks, telecommuting offers an alternative that would reduce transportation emissions, and could result in lower emissions from stationary and purchased power sources by the University.
2. A strong precedent for expanding the scope of telecommuting has already been established by the University through their on-line delivery of classes. By delivering classes on-line, students are not required to commute, and schedules can be more flexible, thus reducing transportation related emissions and reducing congestion on campus.

H. Selective Application of Four Day/Ten Hour Work Weeks

Related to telecommuting, a policy and program permitting selective application of a four day/ten hour a day work week for some staff members would reduce commuting related emissions by 20% for those people involved. It would also have a small, but measureable impact on the overall energy consumption of the University in that offices and workspaces where these people work would not have to be lighted or have heating or cooling to personal comfort levels while the person was off. Most of our offices and workspaces are environmentally controlled and lighted for much more than 8 hours a day currently, so the additional two hours per work day would not have as much energy impact as keeping the spaces environmentally controlled and lighted for an extra day each week. This policy is predicated on having centrally managed heating, cooling and lighting using an integrated facility management system that can control the environment in individual workspaces and that would be centrally managed.

I. Continued Support for Ed-Pass, Including on Frontrunner

Weber State University has been a strong proponent of public transportation for students, faculty and staff for several years. In 2004, the University began participating in the Utah Transit Authority (UTA) Ed-Pass program, wherein the University pays a fee to UTA for free fare on buses and TRAX, the downtown Salt Lake City light rail system, for anyone with an Ed-Pass card. The Ed-Pass card is issued free by the University to all students, faculty and staff who request one. This program has slowly gained more ridership and support. With the opening of the Frontrunner light rail system that connects Ogden to downtown Salt Lake City, the University has continued to support the Ed-Pass system with access on Frontrunner. The University is also actively involved in developing and promoting mass transit, including a streetcar system or expedited bus routes connecting both campuses to Frontrunner stations. This subsidy and active promotion of mass transit systems should be continued to help reduce traffic congestion, reduce carbon emissions, and free up valuable university land for development in support of academic programs rather than parking lots.

J. Establish Car Pool and Alternative Fuel Vehicle Parking Areas

An opportunity to reduce vehicles on campus was identified in the University Master Transportation Plan published in September 2006. In this plan, preferential parking and/or reduced cost parking was proposed for those sharing rides to and from campus. There are several issues related to car pool and alternative fuel vehicle parking that must be addressed, including enforcement, specific rules and regulations, specific locations for this preferential parking, and the limited land area available for parking. Resolving these issues will decrease the drive-alone rate on Weber State University campuses, and will reduce the carbon emissions from commuter vehicular traffic. These issues should be

aggressively resolved and car pool and alternatively fueled vehicle parking implemented as soon as possible.

9. Physical Plant Initiatives

A. Lighting Design, Retrofit and Control in Work Spaces

1. Lighting is one of the largest energy use functions at Weber State University. More effective lighting management, for both interior and exterior lighting, is one very significant way to reduce energy consumption and thus reduce greenhouse gas generation.
2. To reduce interior lighting requirements, the University will design all new buildings with more natural lighting that can reach into the interior spaces of the new facility. This is accomplished by reducing the number of interior walls and promoting a more open architecture, by the use of skylights, and by using light tunnels to introduce natural daylight wherever possible. To further reduce interior lighting, the use of task lights is being promoted, versus the use of area wide lights. The intensity of interior lighting is also being reduced and will continue to be reduced to the minimums recommended by code and standard practice. The most cost effective interior lighting is being installed or retrofitted wherever possible. This new lighting currently consists of changing the T-12 electrical fixtures and ballasts to T-8 electrical fixtures and ballasts. Other systems will be installed if they are more efficient and cost effective. This new lighting will be installed as part of the Energy Savings Performance Contract initiative, during other renovation projects, and by in-house shop personnel whenever possible. Further, wherever appropriate, particularly for accent lighting, the use of high efficiency, low wattage LED lighting or other appropriate high efficiency lighting is being pursued.
3. Exterior and security lighting is also being examined and will be retrofitted where and when resources allow. The most efficient exterior lighting will be installed for walkway and street safety. Accent and security lights will be changed as resources allow to low wattage LED accent lights. The intent is to assure safe and adequate pedestrian walkway and roadway lighting at the lowest possible energy use and cost while protecting and enhancing the aesthetic values and features of the University campuses.

B. Plant More Trees

Trees are a tremendously valuable asset and Weber State University does not have enough trees on any of our campuses. Not only do trees process carbon dioxide into oxygen through photosynthesis, but they also store carbon in their plant structure, they provide free cooling and they are a tremendous aesthetic amenity on any university campus. Weber State University is committed to planting more trees on campus to enhance educational program offerings by introducing more

biodiversity. WSU will also plant more trees to help clean up the CO₂, create more attractive and inviting spaces for our students to enjoy, and provide natural shade and cooling to outdoor spaces and the exteriors of buildings.

C. Mulch Green and Other Waste

With trees and extensive greenery comes the requirement to trim and prune. The green waste collected from trimming, mowing, pruning, and other landscape maintenance activities will be mulched and reapplied to landscaping to retain moisture and provide a more pleasing appearance. Waste that cannot be mulched will be sent to a compost facility for composting and reapplication. WSU does not have sufficient vacant land space to compost its own green waste, so that activity will be done at a city or regional facility in the area. WSU proposes to create its own mulching facility where limbs and branches can be mulched and reapplied on campus. This will reduce transport and disposal costs, as well as acquisition costs for mulch.

D. Convert to More Economical or Alternate Energy Vehicle Fleet

1. The University vehicle fleet represents a large proportion of the overall University carbon footprint. The fleet consists of sedans, small pickup trucks, delivery trucks and vans, and busses. The fleet is fueled by both gasoline and diesel. To reduce the carbon footprint of the vehicle fleet, the most efficient bus routing will be employed, and busses will be restricted from idling whenever possible. The shuttle bus usage will be continuously monitored and will be adjusted as necessary, depending on ridership and service requirements generated by students. Shuttle busses will run on a reduced schedule during the summer and will not run when classes are not in session.
2. The University vehicle fleet will also be considered to use alternative fuels. The shuttle bus fleet is now being configured to allow use of natural gas fuel, as are several of the small pickup fleet. Three shuttle busses and seven small pickups are already dual fuel capable, but a refueling station for compressed natural gas (CNG) is not available near any of our campuses. To obtain the highest efficiency CNG use in University vehicles, a CNG filling station will be required to be installed on one or more of the campuses. That action is being pursued through available federal, state and local grants.
3. Other vehicle power sources are also under consideration and will be tested for effectiveness before implementation. Among the options being considered are electric powered vehicles, such as electric golf carts, and extremely small internal combustion fueled vehicles that get very high gas mileage. The average miles per vehicle for the general purpose fleet is only about 3,000 miles a year, with most daily trips of less than 10 miles. This kind of vehicle use suggests some alternative fueled vehicles could be cost effective and fully satisfy vehicle use requirements.

E. Examine Solar/Photovoltaic for Implementation

1. While not from a utility provider, the University is also exploring the opportunity to directly use sunlight from photovoltaic (PV) arrays in selected applications. One application currently under evaluation is to use PV powered exterior parking lot lights. These new technology lights are battery powered high intensity LED lights that are recharged during the day with small PV arrays. The current draw is so small from the LED lights that the system can be fully self-contained and will operate throughout the night. Other applications will be evaluated as they are identified.
2. Solar heating opportunities must also be explored. One obvious opportunity is the swimming pool in the Stromberg Complex. The swimming pool will be evaluated for solar hot water heating as part of the EPC initiative.

F. Reuse Irrigation and Storm Water

1. Weber State University has a long history of reusing captured irrigation and storm water. The Lindquist pond in the west center of the Ogden campus has been configured to allow reuse of impounded storm water for many years. It serves as the collection and detention basin for storm water from the Ogden campus and a large part of the neighborhoods to the south and east of the campus. The application of this water has been sporadic, but since 2004 additional efforts have been made to use this resource. The current operational plan that is in use is to use the pond water in the irrigation systems until the algae blooms start, usually around early July. When the algae blooms start, they cause clogging and high maintenance of the irrigation systems. To control the algae blooms, copper sulfate is introduced into the pond water to kill the algae. The copper sulfate is harmful to the landscape, particularly the turf, so its use precludes using the pond water for irrigation.
2. The University proposes to continue to use the water from the Lindquist pond as much as possible before the algae blooms emerge. Use of this water will reduce the use of water from Pine View Water Company, and will reduce pumping costs for water. Because of the new irrigation systems being installed throughout the Ogden campus, the application of this reclaimed water will be much more efficient than in the past.
3. The University does have water rights to reuse water from the Lindquist Pond for irrigation purposes.

G. Xeriscape Landscape

To assure the University does not use any more water for irrigation than is necessary, selective areas of both the Ogden and Davis campuses have been

designated as xeriscape areas where no irrigation is employed. These areas use native plants that can thrive on the natural rainfall. The use of these xeriscape areas for accent and emphasis will be continued and expanded as resources allow.

H. Improved Preventive Maintenance Program

Keeping mechanical systems, such as heating, ventilation and air conditioning systems and electrical generation and distribution systems well maintained is extremely important in assuring top efficiency of operation of these systems. To assure those systems are maintained according to manufacturer's recommendations to achieve the highest efficiency possible, a strong and aggressive preventive maintenance program will be performed. This program will assure that user performed maintenance items are scheduled and executed as recommended by the manufacturer.

I. Recommission Existing Facilities

Due to wear and tear on equipment, and simply just from use, performance tolerances on mechanical equipment will deteriorate over time. To bring mechanical systems back to peak performance efficiency, these systems should be recommissioned at regular intervals. Recommissioning assures that equipment items are working at peak efficiency in the installed system as a whole, and entails balancing and redistributing workloads, air flows, etc. The University will establish and execute a recommissioning program for all major facilities such that recommissioning will be done approximately every five years on each facility.

J. Install Building Metering for all Connected Utilities

An old management adage is: "Before one can manage something, it must first be measured." This adage applies particularly well to energy management. To know how much energy is being consumed in each facility will require each energy source for each facility to be measured. Only when the energy for each particular facility is measured and monitored, can anomalies and excess energy consumption per square foot be identified and corrected. The University will, as resources allow, individually meter and monitor utility system inputs to establish the energy consumption profile for each building. The systems to be measured in each building will include electrical, natural gas, chilled water, steam, and culinary water. All new facilities built on any campus of the University will have these measuring and monitoring capabilities built in during new construction. Existing facilities will be retrofitted as soon as resources allow, with the major buildings being the first ones so configured.

K. Install Energy Efficient Roofs When Retrofitting

The life expectancy of a roofing system is typically about 20 years. Many of the roofs on buildings at the Ogden campus of WSU are built up roofs with scoria as

the weathering element. These roofs are nearing the end of their useful life and will require replacement in the near future. The scoria roofs, because they have a dark reddish brown color, are prone to capturing and radiating heat from the summer sun into the building interiors. This adds to the air conditioning burden during the summer. In the winter, because of lower sun angles and snow covering, the scoria roofs do not provide a significant source of heat to the buildings. Therefore, to obtain the most energy efficient roofs, new roofing materials, such as single ply membrane "cool roofs", and other new roofing technologies will be employed to replace the scoria roofs. These new roof technologies significantly reduce the heat gain from roofs inside buildings, thus reducing air conditioning loads. They are also less maintenance intensive and have longer guarantees for performance.

L. Install Low Flow Urinals and Toilets When Renovating

A significant source of water consumption in any institutional setting is the toilets and urinals. The University will install low flow urinals and toilets when building new construction or when renovating existing facilities. Use of waterless urinals is not recommended because of the odor problem those appliances still have and the added costs of the filter elements. However, very low flow appliances will be employed wherever possible to reduce water consumption, and the associated costs of pumping that water.

M. Improved Irrigation Scheduling and Flow Control

1. The largest source of water consumption on the campuses of WSU is irrigation water. Irrigation water for the Ogden campus is obtained from Pine View reservoir. The University uses approximately 60 million gallons of water a year for irrigation on the Ogden campus. That water is supplied to the University through a gravity flow system from Pine View reservoir. However, when the water arrives at the University, it is pumped into a 500,000 gallon storage tank located several hundred feet up the hillside above the University. That water is then fed via gravity into the irrigation system for application.
2. The University is in the process of converting manually controlled irrigation systems throughout the Ogden campus to computerized irrigation systems that will allow better, more precise application of irrigation water and that are tied into a weather station. This automated system will reduce water consumption by precluding watering when it is not needed, and by only applying the amount of water needed for the weather and soil conditions. This will allow reduction of water use and reduce the costs of pumping water into the hillside storage tank or from the Lindquist pond as previously mentioned.

N. Convert Air Cooled Chillers to Water Cooled Chillers

To obtain the maximum efficiency in overall operation of the air conditioning systems on any campus of the University, air conditioning systems should be connected to the central chilled water systems that are or will be installed at each campus. Use of stand-alone air cooled chillers should be avoided to the maximum extent possible since those units are the least efficient systems. If facilities cannot be economically connected to the central chilled water systems, the first preferred alternative is to have a small, stand-alone water cooled chiller system. These water cooled systems are more efficient than stand-alone air cooled chillers.

10. University Operations Initiatives

A. Reduce Use of Printed Media

When a total systems approach is considered for carbon footprint reduction, significant systems savings can result from a reduction in the amount of printed media used. By relying on electronic dissemination of information and data management, significant reductions in the manufacture, storage, transportation, printing, and waste management of printed media can be realized. With the increasing popularity of electronic devices such as the Apple I-phone and Blackberry devices, instantaneous full-color dissemination of virtually any content can be transmitted immediately and to specific audiences. While this medium uses a small amount of energy, the net sum of energy consumed and thus the effective carbon reduction is significantly reduced on a systems basis. Further, when a hard copy of the information is required, it can be printed at the point of need and only in the amount minimally necessary.

B. Amend Classroom Scheduling

According to various sources, heating, cooling and lighting buildings and facilities in the United States accounts for 40% of the total energy consumed annually. To achieve maximum energy efficiency, and consequent greenhouse gas discharge reduction, every effort must be made to use those facilities as efficiently as possible and not heat, light or air condition spaces when they are not in use. At a university, a significant reduction in energy use can be obtained by efficiently scheduling classroom and laboratory spaces so that there are not intermittent periods during the day or evening when classes are not using the spaces. This normally requires classes to be scheduled immediately, one after another in the classroom or laboratory space. Heating, cooling, lighting and ventilation is then efficiently used during the periods of occupancy and can be turned off or significantly reduced during periods when the classrooms are not in use.

C. Custodial Day Cleaning

Converting custodial services to daytime is an effective way to reduce energy use. By cleaning in the daytime, the use of additional lighting, ventilation, heating and cooling at night to support the custodial crew is significantly reduced or eliminated altogether. The downside to this operational change is that the custodial crew may create a few more interruptions and create a little more noise while they do their work. To mitigate these impacts, new, quieter and higher performance cleaning equipment has been purchased, and custodial crews are receiving additional training to minimize the impact and interruptions they create for faculty and staff. Specific cleaning schedules, such as when classrooms and office spaces would be available for cleaning must be coordinated and rigorously followed. The custodial department at Weber State University is implementing this concept in all major academic classroom facilities at this time.

D. Turn Off Computer Equipment at Night

The best way to reduce energy consumption and the associated greenhouse gasses generated is to not use the energy in the first place. Simply turning off equipment that is not used or serves no purpose at night or during unoccupied times, such as weekends, can save significant amounts of energy. For example, desktop computers, printers and other such equipment should be turned off when the user will not be using the equipment for a few hours. This equipment should be turned off at night and on weekends. Equipment such as electronic message boards, televisions, and other devices that present information should also be turned off when buildings are unoccupied or minimally staffed. To effect these changes, a behavioral awareness program and appropriate controls must be installed as necessary to allow this equipment to be turned off at night. Facilities management will direct this behavioral modification program with implementation planned by the end of 2010.

E. Increase Recycling/Composting

1. WSU, with over 500 acres of property that it owns, including over 200 acres that is fully developed and landscaped, generates a large amount of green waste each year. The University does not have a composting facility, so will utilize regional composting facilities to process and reuse green waste that is generated from landscape maintenance activities.
2. In addition to the green waste that is generated, WSU also has a recycling program for paper, aluminum cans, scrap metals, and plastics. While the existing program for recycling has been successful, there is an inordinate amount of material that could be recycled still being sent to the landfill. A more aggressive and comprehensive recycling program will be implemented that will require more student, faculty and staff involvement and action. The first elements of this program have already been undertaken under the leadership and promotion of the FS-EIC.

F. Reduce Process Energy

While the energy used to heat, cool and light facilities represents about 40 percent of national energy use, and about the same percentage of total energy use by Weber State University, a significant portion of the overall energy consumed by the University is process energy. Process energy is defined as that energy used within a facility that is not used to heat, cool or light that facility, nor is it petroleum products used for transportation. Process energy includes energy used to operate electronic equipment, such as computers, telephones, and other electronic measuring or monitoring devices. It includes energy used by equipment such as fume hoods, welding equipment, cooking appliances and similar installed equipment, and other similar devices. Process energy must be managed by departments, not centrally, and is most effectively managed through an aggressive behavioral modification program. Essentially, operators must be reminded and prompted to turn off unnecessary equipment when it is not in use. Also, process energy equipment should be replaced as required with the most energy efficient equipment available when it is obsolete or needs replacement for other reasons.

G. Recreation and Activity Scheduling

1. A very important element of a university is the activities that provide cultural and athletic exposure and recreation. To the extent practical, these activities should be scheduled during those times where the energy consumption impact is the least. For outdoor sports and athletic events, that would be in the afternoons to avoid the use of stadium and other lights.
2. Besides the direct energy use, events and activities should also be scheduled to allow maximum utilization of public transit systems to minimize the amount of vehicular traffic needing parking and creating congestion.

H. Full Time Energy/Utility Manager

With the intense scrutiny as well as opportunity that comprehensive energy management offers to the University, a full time utility systems analyst/energy manager position has been authorized. This analyst will monitor energy consumption, billing accuracy and procedures, system operational efficiencies, behavioral programs to change energy consumption and otherwise reduce greenhouse gas emissions, and seek and promote energy saving processes, procedures and technologies. The position is funded from energy savings generated by their actions and programs. This person is assigned within Facilities Management but will exercise University-wide responsibility.

11. Human Behavioral Change Initiatives

A. Promote Bicycling

As a commuter university, over 80 percent of the faculty, students and staff regularly drive a motor vehicle to their destination campus. However, about 45 percent of the faculty, staff and students live within reasonable bicycling commuter distances. Demographic information shows a large percentage of students, faculty and staff live north of the Ogden campus and could benefit from designated bicycle routes to get to that campus through the neighborhoods. The University must work with Ogden City to promote trails and bicycle friendly routes to allow more students, faculty and staff to use bicycles as the mode of transportation to and from campus. Many of the initiatives and actions required to make our campuses more bicycle friendly have been identified in the Campus Transportation Master Plan and are being implemented as resources allow.

B. Promote Walking

Both campuses of Weber State University have been designed and are being built to provide a core area for easy pedestrian access, with vehicular parking and access around the perimeter of the pedestrian area. This development concept will be continued with clear and obvious pedestrian corridors established and maintained. But additional pedestrian corridors are necessary to connect other areas of the University. For example, a pedestrian/bicycle corridor is necessary from the University Village housing area to the Ogden main campus area, and sidewalks are necessary on streets to the north of the Ogden campus to promote pedestrian access to campus without having to walk in the street. This will require coordination with Ogden City and possibly grant money jointly requested by the city and university to provide the requisite funding.

C. Promote Public Transit Use

1. Both campuses of the University are well served by public transit systems. The Ogden campus is currently well served by Utah Transit Authority (UTA) busses, and an express connection with the Ogden Intermodal Center is in development by local government agencies. This express connection should be supported and encouraged since it will allow more students, faculty and staff to use the Frontrunner commuter rail system to connect to the Ogden campus. This connection has the potential to significantly reduce single occupancy vehicle traffic on campus.
2. The Davis campus provides a hub for UTA busses and is also located within two and a half road miles of the Clearfield Frontrunner station. This configuration and proximity should be used to promote commuter access to the Davis campus using public transportation services.
3. When these available access routes using public transit are coupled with the University subsidized Ed-Pass program, whereby students, faculty and staff can ride the UTA system at no charge, the opportunity to maximize use of public

transportation can be realized. The University should continue to actively promote public transportation use, and support aggressive advertising and promotional campaigns encouraging its use.

D. Turn Off Lights and Equipment

An important element in carbon footprint reduction and energy conservation is personal awareness of the number of appliances and devices that a person uses. When these appliances and devices are not needed, they should be turned off, as a conscious measure. This includes such things as work area lights, fans, radios, etc. To achieve this heightened awareness and propensity to act will require an aggressive and continuing campaign to educate and motivate the university community to remain aware and to recognize energy saving opportunities.

12. Educational, Research, Community Outreach Efforts

A. On Campus Educational Initiatives

The FS-EIC will sponsor various events, including film screenings, speaker events and panel discussions. Several events will be scheduled each year, and will be coordinated with community and national events, such as the annual Earth Day.

B. Curriculum Initiatives

The University, with the active support of the FS-EIC, will proceed with developing and offering an Environmental Studies minor. Creative initiatives will also be encouraged among faculty to include incentives to print papers double-sided and on recycled paper. Environmental issues will be encouraged to be incorporated in every class where it is cogent. Incentives and rewards will be encouraged, such as the restaurant gift certificate awarded to the most successful student in the GEOG 3050, Weather and Climate, class, where students monitor their own greenhouse gas emissions (gasoline, electricity and natural gas consumption converted to CO₂ equivalent), and then try to reduce them.

C. Outreach Initiatives

Outreach initiatives will be encouraged and supported to the maximum extent possible given resources available. Collaboration with other colleges and universities in the state and region will be encouraged. Collaboration with other community based initiatives, such as special tree plantings, "Bike to Work Day", and other local initiatives will be fully supported and given broad publicity on the campuses of the University.

13. Financing

- A. Financial support for all of these programs and initiatives will necessarily come from multiple sources. To the maximum extent possible, federal and state grants will be sought to address funding needs. In addition, grants and donations from private foundations and interested donors will be sought where possible.
- B. University resources will be used as they can be applied. Individual departments can do much to reduce energy consumption and thereby reduce the carbon footprint of the University by being very selective in the equipment and materials they order, and in the kind and extent of trips and research they perform, all within the constraints of existing departmental budgets.
- C. State operating and construction appropriations will also be used to improve and update the energy and environmental infrastructure of the University. Selective and careful consideration will be given to energy saving projects as candidates for state funding.

14. Tracking Progress

- A. An annual report will be provided to the President's Council, Student Senate and to the Faculty Senate at WSU. This report will identify energy consumption data, energy use trends, and other initiatives or actions taken in the preceding year to reduce carbon emissions. This annual report may also be posted on the University web site. The energy/utilities manager in Facilities Management will be the office of primary responsibility for this and all other annual reports.
- B. Besides the annual report to the President's Council and the Student and Faculty Senate, an annual report will be provided to AASHE in their prescribed format. This report will give detailed information on greenhouse gas emissions data for the University and will be shared on the internet with other institutions for their study and benefit.
- C. Finally, this plan and all associated plans will be reviewed and updated on an annual basis to incorporate new technologies, techniques and operating procedures that may enable the University to more aggressively reduce its greenhouse gas emissions and become carbon neutral. The FS-EIC will oversee and guide this review and update program.

In response to the June 4, 2013 letter from Senator Stuart Reid and Representative Brad Wilson, Co-chairs of the State Economic Development Task Force, please note Southern Utah University's report on current mitigation efforts and One-Year Plan for reducing the emission of air pollutants in accordance with House Bill 168.

Southern Utah University's current mitigation efforts:

- Conversion of Heat Plant from heavy fuel oil to natural gas
- Conversion of back up fuel from #5 heating oil to #2 diesel
- Regular boiler burner tune ups to ensure maximum fuel consumption efficiency
- Compliance with DEQ mandated Approval Order emission reporting
- Use of only ultra-low sulfur #2 diesel for fuel and equipment < 0.05%
- 50% reduction in parts washers on campus, using only low VOC solvent
- PM-10 and PM-2.5 levels reported annually
- Hazardous air pollutants (HAPs) monitored and reported, product use changed to eliminate HAPs on campus
- Energy conservation efforts, including solar production – see attached list
- Video conferencing used extensively for remote meetings to reduce travel
- Staff stipends provided for cell phones to reduce travel to access desk phones
- 4-10 work schedules approved where possible to reduce commutes
- Shift adjustments to reduce commute at peak times (0600-1430)
- Employee carpool from Parowan to Cedar City regularly
- Concerted effort to combine trips for parts or vehicle pick-ups, and St. George & Salt Lake City trips
- Building scheduling is concentrated to minimize operation time of large building mechanical systems

- Materials recycling – copper, steel, brass, cardboard, vehicle tires
- Use of non-aerosol cleaning products
- Use of Green Seal certified chemicals which reduces harmful chemicals in custodial work
- Micro-fiber cleaning cloths used and re-used, reducing the amount that goes to landfills for disposal
- Haz-Mat handled by trained personnel and disposed of by qualified disposal contractor
- All low VOC/ water borne paint purchased
- Use of water-based formula glue for carpet tile (minimal VOCs)
- New construction: designers select adhesives and sealants, paints and coatings, carpet and composite woods with low-emitting materials. Contractors ensure that construction waste, demolition, and land clearing wastes are recycled, composted and salvaged (LEED Gold standards)
- Use of tree chippings from campus to cover vacant lot after demolition of Juniper for dust mitigation
- Installation of 8 water bottle filling stations across campus to promote the use of reusable drinking water bottles
- Fleet Operations has been proactive in adopting alternative fuel vehicles which average approximately 50 miles per gallon compared to an average of 23 miles per gallon for a typical gasoline-powered sedan. They accrue about 35,000 miles per year which translates to 700 gallons of fuel consumed for each Prius in a year, less than half the fuel a standard sedan would consume. The Prius puts out about 60% less CO₂ and other greenhouse gases into the atmosphere.
 - 2009: Purchased three Toyota Prius hybrid electric vehicles (HEVs)
 - 2010: Added one more Prius to the fleet.
- Vehicle Battery Recycling: old batteries are shipped back to the factory for 100% recycling to eliminate lead exposure.
- Research conducted on CNG vehicles, but not shown to be conducive to Southern Utah area.
- Passenger vans are retained on campus for group travels to prevent individual vehicle travel.

Southern Utah University's One-Year Mitigation Plan

(For implementation during 2014, contingent upon funding):

- Promote awareness of air pollutant causes and mitigation methods. Offer incentives to staff walking to classes, work, lunch, or meetings; telecommuting one day of the month; carpooling; providing shifts in the evening when vehicle emissions are lower, etc. Funding required: \$5,000.
- Identify approximately 5,000 SF to be xeriscaped on campus which would reduce the use of fossil fuels necessary for mowers and other power maintenance equipment. Xeriscape is not wind pollinated which helps with air quality. It also reduces weed growth, requires less water, and controls pollen. Funding required for establishment of xeriscape garden areas: \$7,000.
- Continue preventive maintenance program for energy efficient equipment performance. No additional funds required.
- Plant 50 additional trees – each tree can filter up to 60 lbs. of pollutants from the air annually. Funding required for trees/ planting/ drip irrigation system: \$8,000.
- Install six (6) more bottle filling stations @ \$900 each for filling reusable drinking containers to reduce emissions from transport of bottled water and minimize the waste processing of discarded plastic containers. Funding for purchase of bottle filling stations: \$5,400.
- Require that contractors use dust control practices to eliminate dust particles in the air during campus construction projects. No additional funds required.
- Reduce office supply ordering to once a week to minimize the number of deliveries required each week to reduce emissions from delivery trucks. No additional funds required.
- Reduce the amount of insecticides and herbicides used by 10%. No additional funds required.
- Research low pollen flowers, shrubs, and trees for incorporation into campus (plant male species to reduce pollen). No additional funds required.
- Currently in compliance with EPA Rule 40 CFR Part 63. Staff have received 5 year certifications. The Supervisor of the Paint Shop is a certified trainer and in the next year will continue to provide training for SUU, Dixie State University, State Parks, and other entities.

Attached is a list of past and continuing SUU conservation projects.

SUU Energy Conservation Efforts

Leadership in Energy and Environmental Design (LEED) Certification: *In 2009, the State of Utah required that all new public buildings be certified at the level of LEED Silver (roughly 20% more energy efficient than the minimum building code). SUU went one step further . . .*

The Center for Health and Molecular Sciences at Southern Utah University recently received LEED Gold Certification from the U.S. Green Building Council, affirming its excellence in energy efficiency, sustainability and environmental quality. The building was carefully designed to include a host of eco-conscious features such as low-flow water systems, innovative LED lighting systems with auto shut-off sensors, metal shades and a green roof layered with soil and plants to minimize solar impact. Before the outer layer of brick was applied to the exterior, the entire structure was wrapped with an ‘air barrier’ membrane, which minimizes air infiltration, keeping the building warm in the winter and cool in the summer.

Water Usage: *Utah is the second driest state in the nation with one of the highest rates of water consumption – and water costs are rising.*

SUU Facilities Management has:

- Replaced natural turf in the football stadium with synthetic turf, saving an estimated 3,000,000 gallons of water annually.
- Installed 42 waterless urinals on the SUU campus, saving 40,000 gallons of fresh water annually on *each* urinal.
- Planted areas of xeriscaping and drought tolerant plants to lower the use of irrigation water and the use of fossil fuels for mowing and weedeating.
- Utilized the Maxi-com irrigation system to water only when necessary, lowering usage of irrigation water whenever it rains.
- Utilized reclaimed water from 800 W to the freeway for irrigation purposes. (Currently assessing the use of reclaimed water in other areas of campus.)
- Required for new construction that designers select water-efficient fixtures and appliances, including low-flow faucets and shower heads, waterless or ultra-low flow urinals, sensed flushometer toilets, etc.

Fuel Consumption: *Utah Clean Cities Program is always looking at more ways to use less*

SUU Facilities Management has:

- Employees from all shops combining trips for parts and supplies to reduce fuel consumption.
- Implemented Video Conference meetings to eliminate trips between Cedar City and Salt Lake City to reduce fuel consumption and carbon emissions.

Harmful emissions: *Utah has a goal for 80% Emission Reductions by 2050; the White House has a goal of 17% reduction of emissions over the next decade*

SUU Facilities Management does the following:

- **Preventive Maintenance Program** – Mechanical equipment in the buildings is most energy efficient when running in the way it was designed and built to operate. SUU’s Utility Services division performs routinely scheduled preventive maintenance inspections, cleaning, and tune-ups to keep mechanical equipment running at peak efficiency.

- **Refrigerant recovery/ reclaiming program** – recovers and recycles 100% of the refrigerant used on campus, reducing our impact on the ozone layer.
- **New Construction Indoor air quality management** - contractors ensure that Volatile Organic Compounds (VOC), dust, oils, and odors have been contained and removed before occupancy.
- **Heat Plant conversion to #2 oil for emergency back up** - reduces all aspects of emissions from the Heat Plant, including opacity, sulfur oxides, nitrous oxides, and volatile organic compounds.
- **Annual Heat Plant emission report**-Illustrates outstanding air quality compliance for the last six (6) years running, and current use is NO_x 92% below allowable emissions and SO₂ is 99% below allowable emissions.
- **Only use of Ultra-low sulfur diesel fuel on campus** –significantly reduces sulfur dioxide emissions on campus
- **Carpet Tile** – use water-based formula glue with minimal VOCs.
- **Plant an average of 50 trees each year** - One tree can filter up to 60 pounds of pollutants from the air each year.
- **Building Materials** – Contractors use local building materials and products to support local economy and reduce the environmental impacts from transportation.

Landscape, construction, paper and other waste materials: *Recycling Coalition of Utah is constantly working to reduce solid waste in Utah*

SUU Facilities Management does the following:

- **Plastic Water Bottle Elimination** – Installed six (6) bottle filling stations for refilling reusable drinking containers in order to eliminate bottled water waste and to reduce emissions from the transport of bottled water. (T-Fit program has handed out reusable water bottles to all staff.)
- **Metals recycling**- recycles several hundred pounds per year of copper, brass, steel, aluminum, and stainless, keeping them out of the landfills. Plans are underway to install additional bins that will further enable the separation of additional recyclable material.
- **Utilizing Micro-fiber Technologies** – Currently using cleaning cloths, dust mops and wet mop system with micro-fiber that can be cleaned and reused, reducing the amount that goes to landfills
- **Recycled paper** – We purchase paper products (toilet paper and paper towels) from Kimberly-Clark professional who uses a minimum of 40% post-consumer waste content for paper towel and minimum of 45% post-consumer waste content for toilet paper. Both products are manufactured with elemental chlorine-free (ECF) bleaching.
- **Carpet Tile** – use carpet tile that is recyclable and wastes very little because of the layout.
- **Entrance Mats** – Implemented entrance matting systems that reduce soil being brought into the buildings, reducing the need for carpet replacement.
- **Tire Recycling** – when Motor Pool receives new tires, the old ones are hauled to Salt Lake City where they are ground up and used for road surfaces and rubberized running tracks in schools and colleges.
- **Vehicle Battery Recycling** – when Motor Pool replaces batteries, the old batteries get shipped back to the factory and 100% of them get recycled.
- **Pallet Recycling** – Pallets are picked up from Receiving and refurbished and re-used.
- **Landscape Waste**
 - Re-use pruned tree limbs as mulch/wood chips to be spread on campus
 - Mowing grass clippings are mulched to become organic material for turf

- **Construction Waste** - Contractors ensure that construction waste, demolition, and land clearing wastes are recycled, composted, and salvaged.
- **Facilities Management Administration Building Efforts** – Recycle office and other scrap paper, constantly work to reduce the number of hard copies made, and participate in the ink cartridge recycling program through Surplus. Lights are shut off whenever a room is vacant. Landscaping around the building is primarily xeriscaping. The majority of daytime power to the building is generated by sun-tracking solar arrays.

Harmful chemicals: *DEQ's mission is to safeguard human health and quality of life by protecting and enhancing the environment.*

SUU Facilities Management does the following:

- **Uses “Green Seal” certified chemicals** – Converted to the Spartan product line which is both effective and cost competitive, reducing the use of harmful chemicals for custodial use.
- **New Construction**, for indoor air quality, designers select adhesives and sealants, paints and coatings, carpet, and composite woods with low-emitting materials.

Kilowatt Hours: *The State of Utah has a goal to increase energy efficiency 20% by 2015. SUU has contributed to that goal . . .*

SUU Facilities Management’s Renewable Energy Projects and Conservation Projects:

- **Photovoltaic Solar Array installation at the Facilities Management Administration Building** – Installation of a 4kW photovoltaic net metering system, produces power and relieves the campus electrical load (10,752 kilowatt hours of electricity per year, enough to offset the production of 14,407 lbs. of CO₂ that would otherwise be released to the atmosphere and saving the equivalent electrical power used by 3.07 homes in a year).
- **Photovoltaic Solar Panel installation at Facilities Management Shops**- Installation of 90 kilowatts of photovoltaic solar panels, producing an estimated 241,920 kilowatt-hours of electricity per year, enough to run 69.12 average homes and offset the production of over 331,430 pounds of CO₂ per year.
- **Hunter Conference Center Roof** – Replaced the roof and increased the R-value insulation from R-18 to R-40, saving on heating and cooling energy and costs.
- **Recommissioning projects** – Sharwan Smith, Student Center, Centrum- a fine point effort to restore building operating systems for increased energy efficiency.
- **Heat Plant Lighting Replacement** – Installed twenty-four (24) 90 watt high bay LED light fixtures that replaced an equal number of 320 watt metal halide fixtures.
- **CFL Purchase to eliminate incandescent lights on campus** - Purchased 500 compact fluorescent lamps for installation in the Hunter Conference Center and the Library as a step toward our goal of eliminating incandescent lights on campus, purchased as part of a program supplemented by Rocky Mountain Power.
- **Campus lighting standards developed**- for indoor and outdoor fixtures, addresses energy efficiency and errant night sky light pollution
- **Steam powered condensate pumps** – located in Multi Purpose, Sharwan Smith, Science, Library, Emma Eccles Education Building, and in the Heat Plant. Uses the pressure of existing live steam to move condensate back to the Heat Plant in the steam distribution system, in lieu of electrical powered pumps.

- **Building scheduling-** daily scheduling efforts to minimize operation times of large building mechanical systems
- **Extensive lighting retrofits** – High efficiency lighting products installed in the Bennion, Sharwan Smith, Student Center, Science, Centrum, Coliseum, Business, Technology, Multipurpose, Centurium, Library, Facilities Management Shops, and ELC, Music, and Randall Jones Theatre.
- **Sharwan Smith Retrofit** – Replaced 20 metal halide lamps (100 watts each) with CFLs that use 26 watts per lamp for energy savings and reduced maintenance and re-strike time.
- **LED Lighting Upgrades:** Several locations across campus have been fitted with 20 watt LED wall-pack fixtures that replace 150 Watt metal halide fixtures. In addition to energy savings, the amount of glare from errant light is greatly reduced with these new full cutoff fixtures. Retrofitted areas include the Technology Building, Sharwan Smith Building, Centrum, Facilities Management, Multipurpose Center, General Classroom, Auditorium, Randall Jones Theatre, Campus statue lighting, PE Parking Lot¹, and the Heat Plant. LED on Old Sorrell switched to 4) 39W LED Lights to replace 8) 400W metal halide lamps.
- **Utility tracking via sub-meter reading-** Helps utility management by allowing individual buildings to be metered.
- **Smart panel lighting controls and Honeywell light scheduling-** allows for precise lighting control of lights inside and outside of buildings, year round.
- **NEMA premium efficiency motors-** Established as a University standard to reduce electrical consumption and minimize utility demand charges due to low power factor.
- **Variable Frequency Drives-** allows variable speed operation of electric motors to significantly reduce their power consumption.
- **Reduced steam pressure operation in Heat Plant-** saves energy by not having to maintain pressures that are above what is required for campus distribution.
- **Lighting controls on tennis courts** – reduces run time with automatic timers that limit per time use and hours per day use, saving an average of **84 kWh per day of use**.
- **Pipe insulation repair and replacement** – The repair and replacement of insulation on steam, hot water, and chilled water lines saves thousands of BTU's per year.
- **Multi-Purpose Dance Lab lighting retrofit-** replacement of misapplied lighting fixtures to reduce power consumption and improve light quality.
- **Student Center Chiller replacement** – New chiller replacing old chiller that was failing. New machine saves 27,217kWh/year, a monetary savings of \$926 per year.
- **236 Walkway light retrofit** – replace **175 watt** metal halide lamp and ballast with **42 Watt** compact fluorescent lamp - resulting in an estimated **annual savings of over \$3,100**.
- **Steam Control Valves** - Insulation jackets have been installed on large steam control valves to eliminate heat loss. This has dramatically reduced the ambient temperatures in the associated mechanical rooms.
- **Concourse up-lighting** has been turned off in the Centrum arena in order to utilize daylight from the upper windows. Also, area lights have been reconfigured to reduce lighting in unnecessary areas.

- **Hunter Conference Center and Harris Center lighting** - all of the exterior down lights have been replaced with low wattage compact fluorescents, cutting the overall consumption from 100 watts per lamp to 13 watts per lamp.
- **Randall Jones Theater Compact Fluorescent Replacements** - 25 highly consumptive and maintenance intensive MR 16 lamps have been replaced with compact fluorescents at the Randall Jones Theater.
- **Water heater insulation jackets** have been installed on most water heaters on campus, reducing the loss of radiant heat from the heaters and reducing energy usage.
- **Lighting retrofit** of area lighting in the CAD lab and in the Wood lab in the Engineering and Technology building.
- **Lighting retrofit** in PE building replaced sixteen (16) 150 watt metal halide lamps with 27 watt CFL
- **Lighting retrofit** in Science – Elimination of eighteen (18) 150 watt incandescent lamps and replacement of four (4) more lamps with 13 watt CFL's.
- **Library** – Elimination of twelve (12) MR-16 high output lamps and replacement of twelve (12) 100 watt incandescent lamps with 13 watt CFL's.
- **Centurium** – replacement of twenty (20) 100 watt incandescent lamps with 7 watt LED lamps
- **Centrum** – insulation installed on 8” steam pressure reducing station and related piping to reduce errant heat loss.
- **Roofing** – use roofing materials that are light in color and reflective, reducing the solar gain.
- **Mountain Center** - Insulation and venting has increased energy efficiency. Have installed a new roof using these methods, which has yielded a **44%** decrease in propane consumption.
- **Re-caulking windows** – helps reduce energy waste.
- **Weather-stripping Installation** – placed on thresholds to better seal doors on many buildings, including: Randall Jones Theatre, Bennion Building, Harris Center, and Music Building to reduce energy waste.
- **Space Heater Exchange** - Purchase energy efficient and safety approved space heaters to replace those currently being used on campus.
- **Heat Island Effect** - To reduce “heat island” effect, we use natural shade on parking lots and landscaping areas, and a “green roof” of soil and plants on the new Frehner Museum of Natural History.

¹ Rocky Mountain Power inquired as to whether or not the power meter on the PE parking lot was billing correctly - a result of an energy saving project which consisted of replacing 18 - 400 watt metal halide lamps with 36 - 26 watt LED lamps, thus reducing the power usage in the parking lot from 26,280 kWh to 3,416 kWh per year. Equates to an annual 87% savings on that lot.

July 25, 2013

SUBJECT: H.B. 168 AIR QUALITY MITIGATION BY GOVERNMENT AGENCIES

Pursuant to the June 25, 2013 request from legislative staff, the following information is being provided as Snow College's current air quality mitigation efforts.

The following are items that Snow College is currently doing, or has done, to conserve energy, water, fuel, and waste.

- Replacing old fleet vehicles with electronic carts, or more fuel efficient vehicle models.
- Re-commissioning college buildings HVAC systems. Humanities building and Noyes Administration building were both re-commissioned this year.
- Schedule HVAC systems in sequence of building occupancy schedules.
- Upgrading lighting to T8s from T12s, about 90% of the campus has been upgraded. When we need to replace a T12 Ballast, we make the upgrade to T8 or LED where possible.
- Utilizing occupancy sensors for lighting control.
- Installing a centralized automated sprinkler system to conserve water usage and manpower.
- 20% of Snow College's landscape has been changed into zero maintenance or low maintenance landscaping in the last 5 years.
- Installed variable speed drives (VSD) on two air handlers at the Humanities building this year.
- Recycle cardboard, paper, plastics, aluminum, copper, steel, etc. in conjunction with Ephraim City.
- Used oil and antifreeze is also collected and picked up through State contract.
- Encourage use of non-aerosol products.
- Custodial department has switched to liquid concentrated cleaning products.
- Upgraded the campus' centralized heating system to include two natural gas fired boilers and one natural gas fired boiler with a variable speed drive.
- Yearly maintenance performed on steam distribution systems for energy savings performance.
- Zero idling; vehicles only allowed to idle at stop signs and stop lights.
- Facility and staff take advantage of opportunities to work at home from the web when not in class.
- Video conferencing encouraged to save time in travel and fuel, particularly between campuses.
- Several employees have added natural gas conversion kits to their personal vehicles.

Recent energy conservation projects on the **Richfield campus** include:

- Power factor correction panel for Sevier Valley Center
- Better building management through control scheduling
- Lighting retro fits from T12 to T8 with electronic ballasts; installed LED lights in the parking lot lights

- Reduced main chiller usage in Sevier Valley Center by installing small AC unit above offices
- Installed VSD's on main air handler in the Washburn building
- Replaced chiller and cooling tower with more efficient units in Washburn building
- All air handlers are equipped with CO₂ monitoring devices
- Use Rocky Mountain Power's Profiler to meter and monitor power usage monthly
- Installed new VAV boxes and re-commissioned the Washburn building
- Re-attached insulation in classroom/shop ceilings in Washburn building
- Added natural gas backup generator for Administration building
- Changed to the MERV filters on most air handlers
- Replaced two gas hot water boilers in the kitchen with one high efficient water heater
- Added controls to chillers in Sevier Valley Center to run in stages and not at 100%
- Encourage turning lights off when not in use
- Motion sensors to activate lights in restrooms, offices and some classrooms
- Wattstopper lighting controls added to Sevier Valley Center
- Added solar panel for power to control gate valve for secondary water for grounds maintenance

One Year Plans for Air Quality Mitigation, and Energy Conservation

- Encourage all facility and staff within reasonable distance and weather, to walk or bike to work.
- Encourage students and employees to car pool to work, school, and social events.
- Once a year energy saving project to install VSDs building air handlers and pumps where possible
- Install energy saving evaporator cooling pad on the Noyes building air cooled chiller to help aid the heat exchange process across the chillers condensing coils.
- Better utilization of classrooms and student housing on campus, especially during the summer months.
- Begin an energy saving campaign by encouraging employees and students to turn lights out when not in a room or office. Encourage moderate building temperatures to conserve energy.
- Encourage recycling.
- Re-commission the Greenwood Student Center's HVAC system.
- Re-commission Administration building (Richfield).
- Switch all outside lighting on the Richfield campus to LED (funded 2014 improvement)
- New fan wall to replace main air handler in Washburn building (Richfield) (funded 2014)
- Add VSDs to main air handlers in Sevier Valley Center (funded 2014)
- Continue to exchange A.H. to the MERV filters for energy efficiency and indoor emissions
- Explore adding an evaporative system for the main air handler in Sevier Valley Center
- Encourage more use of the Poly-Com system to lessen travel between campuses

Long Term Energy Savings Projects (5 to 10 year goals)

- Energy tracking devices installed on all campus buildings to track building loads and fuel usage.
- Lighting motion sensors installed in all offices and classrooms.

- Upgrade all student housing summer boilers to high efficient condensing boilers.
- Install solar panels for heating the Activity Center's domestic hot water and swimming pool.
- Complete energy efficient lighting upgrades for both campuses.
- Install high efficient chillers and boilers on new building projects and remodels.
- Have all of Snow Colleges HVAC systems re-commissioned and then begin the process over again; propose doing one or two buildings each year.

Other Considerations

- Instead of having a backup generator for emergency power, have solar powered emergency backup with a battery bank. This would apply to new construction.

Please feel free to contact me with any questions.

Marvin L. Dodge
Vice President
Finance and Administrative Services
Snow College

Sherry J. Ruesch
Executive Director of Campus Services
Phone: 435-652-7562
Email: ruesch@dixie.edu

July 31, 2013

Mr. Spencer Jenkins
Assistant Commissioner for Public Affairs
Utah State Board of Regents Office
60 S. 400 W.
Salt Lake City, Utah 84101

Dear Mr. Jenkins:

Re: House Bill 168, reducing the emission of air pollutants.

Dixie State University is committed to energy efficiency and operation using clean fuels. As fuel costs have increased and the citizens of Utah have voiced concerns about the State's air and water, Dixie has made changes to address these concerns.

Dixie State University's Current Mitigation Report

- A key item that Dixie State University has accomplished in recent months is creating a full time Energy Manager. This person oversees campus systems and activities to direct us in best practices to save energy and protect the environment.
- The Dixie State Main Campus is located in the center of St. George and utilizes St. George City Power. St. George is committed to clean air and has several sites that provide power in the high load portions of the summer. Gunlock Hydro power is produced by releasing irrigation water and generators up to 372 kW. The Millcreek Facility, a natural gas fired generation facility, has a capacity of 120 megawatts (MW). The Pine Valley hydro has a 600 KW generator.
- DSU Central Plant Boilers utilize natural gas as do the secondary and stand-alone systems on campus. Boilers are only used November-January, as St. George weather permits the use of outside air for comfort during at least two months of the year.
- Campus Services (Physical Plant) utilizes electric golf carts for many of the needed maintenance activities.
- Vehicle Fleet Services encourages individuals to use the vehicle that has the best gas mileage and still meets the needs for the specific task.

- The Grounds Department has eliminated many turf areas and changed to xeriscape where appropriate.
- All campus personnel utilize video conferencing to avoid trips when possible.
- Human Resources schedules initial job interviews utilizing Skype to reduce costs, travel related pollutants and travel time.
- Dixie State promotes recycling by providing multiple receptacles in offices and common areas. We also recycle batteries and petroleum based products.
- DSU Custodial Department uses Green Seal certified chemicals.

Energy Projects

- Dixie State University has completed multiple energy saving projects in the last three years. Starting in 2010, Dixie State University began making changes to the campus infrastructure that would affect energy use and efficiency. Dixie has continued this progression and made the following changes.
- DDC Scheduling and Temperature Controls:
This project involved adjusting temperature set points while the building is unoccupied. All occupied set points were adjusted to maximize energy efficiency. Programmable thermostats were installed in many locations that were not directly connected to the DDC System.
- Electrical and Computer Software Upgrades:
By installing Verdium Software to networked computers, IT Services is now able to turn off computers in offices, classrooms and laboratories when they are not in use. By installing Vending Miser controls to vending machines, electrical consumption was reduced.
- Building Envelope Upgrade:
Air leakage is defined as the “uncontrolled migration of conditioned air through the building envelope” caused by pressure differences due to wind, chimney (or stack) effect and mechanical systems. It has been shown to represent the single largest source of heat loss or gain through the building envelopes of nearly all types of buildings. The savings are realized as the amount of uncontrolled air is minimized through better sealing of the doors, windows and walls. As part of this project, window film was also installed in order to control solar heat gain and improve occupant comfort.
- Water Conservation:
By replacing older water fixtures with more efficient low-flow fixtures, the volume of water used on campus was significantly reduced. This not only impacts the amount of water purchased, it

also reduces sewer related costs. Water Tower Deduct Meters were also installed. The water that evaporates through the cooling towers is subtracted from the volume billed as sewer treatment.

- Central Plant Upgrades:
 - A. The oxygen in the flue gas was formally controlled manually. Too much oxygen results in heat being swept out of the boiler and expelled into the environment while too little oxygen results in inefficient fuel combustion. Automatic control now allows the boiler to operate at optimum efficiency over the full load range, reducing excess air, thus saving fuel. Hot water reset controls were also installed.
 - B. Re-setting the hot water supply temperature based on building demand as a function of the outside air temperature allows the hot and chilled water plants to operate more efficiently.
 - C. Chilled water production efficiency is a function of the temperature differential between the chilled water supply temperature and the temperature at which the heat is rejected. Controls have been installed to measure critical relative humidity spaces and raise chilled water supply temperature up until the relative humidity in critical spaces is at the high end of the tolerance window.
 - D. The Central Plant chilled water volume was change to variable flow. Energy is being saved by using a variable flow system. This reduces the pumping horsepower and maximizes the temperature difference of the chiller plant. All of the 3-way valves in the buildings have been changed to 2-way control valves with variable frequency drive pumps.
 - E. The pre-existing pumps had stuffing boxes that by design require water flow through the packing gland which consumes a significant amount of water. Replacing these pumps reduced energy costs.
- Liquid Pool Cover:

The Fitness Center Pool was losing water due to evaporation. The liquid pool cover uses a timer to inject an inert chemical which floats on the surface of the pool significantly reducing the loss of heat and water.
- Campus Lighting Retrofit:

This lighting project replaced interior lighting across campus with more energy efficient lamps and ballasts. Occupancy sensors were installed to help minimize burn hours. Lighting was also replaced at the Burns Basketball Arena and Hansen Football Stadium. These lighting systems are now controlled by schedule which reduces the amount of time they are left on. It also helps stop unscheduled use of the facilities.

- Exterior Light Replacement:
235 fixtures and lamps were replaced with energy efficient LED lamps. This project has not only saved in energy costs, but has also provided a safer night environment for our students
- Installation of Solar Modules:
60 225 Watt panels were installed on the roof of the existing Science Building where they could also be used not only for added power, but also as part of academic instruction.
- Holland Centennial Commons (LEED Gold, Pending)
Dixie State completed the construction of the Holland Centennial Commons, our first LEED Gold Building (Pending). The building is one of the most energy efficient in the State and utilizes the following:
 - A. Sustainable Site
 - B. Water Use Reduction
 - C. Recycled Products
 - D. Indoor Environmental Quality
 - E. Low Power Use 2-Stage HVAC System
 - F. Enhanced Exterior Envelope
 - G. Energy Efficient Lighting and Daylight Harvesting
 - H. Full Building Recycling Plan

Dixie State University's Mitigation Plan

- DSU will utilize the new Energy Controls Manager position to optimize the use of the automated energy controls system for greater energy efficiency and conservation. This includes working with Central Scheduling to consolidate evening and weekend events.
- The Energy Controls Manager will spearhead campus efforts in creating a more comprehensive institutional plan, utilizing energy controls and good environmental practices by faculty, staff and students, to optimize energy savings and efficiency thus reducing emissions and cost.
- The Energy Office will create a conservation plan to include brochures, procedures and other promotional information detailing good practices in conserving energy, resources and reducing emissions and waste.
- The Campus will enhance recycling efforts by increasing the number of recycling receptacles across campus.
- The Grounds Department will receive Capital Improvement Funds FY2014 which will purchase a computerized Irrigation System. This new system will allow water to be used only when it is

needed, thus reducing Dixie State's consumption of irrigation (secondary) water.

- Dixie State Planning Office will continue to work with the State of Utah Division of Facilities and Construction Management to review energy related projects. Roofing projects replace hot asphalt roof systems with light colored PVC and added insulation. These projects have proven to increase building efficiency.
- Dixie State University will implement educational efforts to reduce time to graduation by helping students meet university math and English requirements more quickly, thus reducing student travel, optimizing facility usage and reducing cost.

Please feel free to contact me regarding any questions you may have. Dixie State University Campus Services is proud of our recent accomplishments and we look forward to making even more positive changes.

Sincerely,



Sherry J. Ruesch

Executive Director of Campus Services

SALT LAKE COMMUNITY COLLEGE - AIR QUALITY MITIGATION REPORT

July 2013

Current Air Quality Mitigation Efforts:

Salt Lake Community College's (SLCC) goal is to be a positive model of environmental stewardship. Under Strategic Priority 3 of its Master Plan, it states:

Sustainability: The College will serve as a positive model of environmental stewardship through its operations and continued development of physical facilities. In support of this goal, the College shall:

- Create and maintain [an] energy-efficient campus with:
 - On-campus energy generation
 - Recycling and composting areas
 - High performance building skins
 - Appropriate solar orientation
 - Daylighting of interior spaces
 - Low VOC finishes for healthy indoor environments
 - Buildings designed as educational tools

- Promote water efficiency and strong connection to natural ecology through:
 - Xeriscaping of campus grounds
 - Use of [secondary] water from on-campus wells and canals
 - Use of native and regionally appropriate plants and materials

References: SLCC Master Plan- Strategic Priorities

<http://www.slcc.edu/masterplan/overview/strategic-priorities.html>

Measures taken by SLCC to mitigate the emission of air pollutants include:

a) Flexible work schedules to reduce driving during peak times - SLCC employees may elect to work an adjusted work schedule, for example four 10-hour shifts, with the approval of their supervisor.

Reference: SLCC HR Memo dated 06/19/13

http://www.slcc.edu/hr/docs/Adjusted_work_schedule_revised.pdf

b) Telecommuting - Depending upon the nature of their job, SLCC employees may elect (with the approval of their supervisor) to telecommute.

References:

(1) SLCC Telecommuting Handbook dated 06/26/08

http://www.slcc.edu/hr/docs/Telecommuting_Handbook.pdf

(2) SLCC Telecommuting Request Form dated 09/13/06

http://www.slcc.edu/hr/docs/Telecommuting_Agreement_Form.pdf

c) Electronic communication, including teleconferencing:

(1) Electronic Mail / UEN - SLCC uses an electronic mail system to communicate with faculty, staff and students on campus and with colleagues around the world The College is a designated regional fiber hub in the Utah Educational Network (UEN) statewide system. . . . There are interactive classrooms connected to this statewide hub on most campuses.

Reference: SLCC Faculty Handbook 2012-2013, pp. 40-41

<http://www.slcc.edu/facultyservices/docs/2012-2013%20Faculty%20Forms/2012-2013%20fac%20hndbk.pdf>

(2) eLearning - To accommodate student needs, SLCC offers several eLearning options with more than 200 course offerings via several eLearning formats including Online, Online Plus, Hybrid, Interactive Videoconferencing, and Emporium, with the majority of the current offerings now offered completely online. Approximately 13% of the FTE of the College is now facilitated through one of these eLearning delivery formats. Additional course design and development is currently underway to increase eLearning offerings to fulfill the facilities master plan goal of 25% FTE via eLearning.

d) Encouraging ride sharing - SLCC does not currently have a ride-share program.

e) Encouraging use of public or alternative forms of transportation:

(1) UTA Ed-Pass. UTA (the Utah Transit Authority) constructed a multi-bus stop/shelter on the north side of the Taylorsville Redwood Road Campus (RRC), making use of UTA services more convenient. The main campus at RRC is currently serviced by two east/west routes and two north/south routes which link into UTA TRAX service. At the beginning of each semester, ridership is encouraged with printed information and signage available at each of the campuses. Information is also available on the OneCard website. SLCC students are encouraged to use UTA with the availability of a discounted UTA Ed-Pass (for use on TRAX, UTA buses and Frontrunner). During fall semester 2012, students purchased 1452 30-day passes and 539 semester passes. In addition, a new BRT (Bus Rapid Transit) center is planned for the south side of RRC which will provide a dedicated rapid connection between SLCC-RRC and UTA TRAX services.

(2) B-Line Shuttle. In addition to the discounted UTA Ed-Pass, SLCC encourages use of public transportation by offering free shuttle service (the B-line) to students, faculty, and staff between the Taylorsville Redwood Road, South City, and Meadowbrook campuses. The B-line runs 7:00am – 8:00pm Monday-Thursday and 7:00-5:00pm on Fridays during regular semester days and services approximately 700 riders per week. Current service began August 2, 2012, and plans are being developed to expand the B-line south from the Taylorsville Redwood Road campus to the Jordan and Miller campuses within the next year.

f) Energy conservation:

(1) ESCO – During 2011-2012, SLCC implemented comprehensive energy conservation measures including lighting upgrades, an enhanced energy management system, mechanical upgrades, and built a new substation. Internal energy monitoring and conservation measures have also been implemented, including: LED lighting retrofits, building schedule optimization, sub metering initiatives, and behavioral modifications. Impact: The ESCO project saves approximately 3,000,000 KWH/annually of electricity and 62,000 Therms/annually of natural gas resulting in a combined projected annual savings of approximately \$455,223.

(2) LEED Certifications – Air quality impact was included in building and operation specifications for the last three buildings constructed on SLCC campuses and required at least a Silver LEED certification. As an example,

the new Instructional and Administration Building was designed with a multi-stage cooling system that utilizes economizer and evaporative cooling first which uses a lot less electricity than the third last stage of mechanical cooling. Impact: Reduction in amount of electricity required to cool building.

(3) Low NOx and SOx Boilers - Three boilers on the Taylorsville Redwood Road campus were replaced with two low NOx and SOx units. Impact: Reduction in natural gas usage.

(4) Water Heaters - Instant on-demand water heaters were installed in the Gunderson Facilities Building for domestic water needs. The units run only when there is a demand for hot water. They reduce the need to store hot water and to keep it at temperature. Impact: Reduction in natural gas usage.

(5) Low-Flow Shower Heads were installed in the Lifetime Activities Center (LAC) to reduce water usage which also reduces the amount of hot water used. Impact: Reduction in water and natural gas usage.

(6) Low-flow Urinals were installed in restrooms. Impact: Reduction in water usage.

(7) VFD's have been installed on most of SLCC's cooling towers, allowing for decreased fan speeds when demand is not at maximum. Impact: Reduction in electricity usage.

(8) Cooling and Heating Schedule Modifications - The cooling and heating schedule has been modified to provide a comfortable set point only during business hours. Impact: Reduction in electricity and natural gas usage.

(9) Classroom Consolidation – During the summer semester, all Saturday classes are consolidated into the SI and LAC buildings on the Taylorsville Redwood Road campus. No Saturday classes are scheduled on any of the other campuses.

(10) Window Replacement – South City campus windows were replaced with newer, higher efficiency windows to reduce heat loss. Impact: Reduced air pollution with reduction in natural gas used by boilers in the winter and lower chiller demand in the summer.

(11) Individual Employee Responsibility for Energy Conservation - In 2001, SLCC adopted heating and lighting energy conservation measures and encouraged employee support.

Reference: Energy Cost and Conservation Measures, dated December 2010
http://www.slcc.edu/facilities/docs/energy_conservation_2010.pdf

g) Using alternative energy sources:

(1) Solar Panels - Solar arrays were installed on the Automotive Training Center on the Miller Campus and on the Science and Industry Building (S&I) on the Redwood Campus. The Miller array was installed in mid-2012, has a capacity of 20 KW, and provides a portion of the building's energy needs. The S&I array was installed in early 2010 and has an installed capacity of 8 KW. Impact: Solar electricity generation decreases amount of fossil fuel used.

(2) Tritium Exit Signs - The majority of exit signs have been replaced with Tritium lit units. These do not consume any electricity and do not have batteries that need disposal. Impact: Lowers electrical consumption and battery waste.

(3) Fleet/Motor Pool - Seven percent (7%) of SLCC's fleet/motor pool (both licensed and non-licensed vehicles) use CNG, and a CNG pump has been installed on site to service them. Seven percent (7%) of the fleet is electric, 4% is propane, 7% is E-85 and 13% use biofuel. In 2013, SLCC's Department of Public Safety replaced all evening campus safety and parking services vehicles with CNG vehicles.

h) Recycling and using recycled products:

(1) Recycling - SLCC has been recycling paper and cardboard since 1995. In partnership with SLCC's Environmental Club, Student Life and Leadership and Facilities Division Crafts, SLCC expanded its recycling program to capture larger volumes of recyclable items that can be separated or scrapped, rather than being disposed of as waste, e.g., clean paper and cardboard, empty plastic and aluminum containers. Recycling containers are placed in many common areas on all campuses to encourage participation. Other recycled items include newspapers, broken pallets, sawdust, plastic, carpet, used motor fluids, batteries, toner cartridges, refrigerants, electronic waste, steel, cell phones, eye glasses, and tires. SLCC has one of the most comprehensive college recycling programs in the United States. Since 2010, SLCC has recycled an annual average of approximately 500,000 lbs and 1,500 gallons of materials.

(2) Water Bottle Refill Stations – Refill stations have been installed on the Taylorsville Redwood Road and Jordan campuses. Impact: Reduction of plastic waste.

(3) Purchasing Recycled Product - Currently 44% of the paper products purchased by SLCC contain recycled materials.

Impact:

(a) Energy savings over the past five years due to recycling: 4,800+ kilowatts, 40,000+ gallons oil, 200,000+ gallons crude oil.

(b) CO₂ emissions over the same time period have been reduced by over 1.5 million lbs.

(c) SLCC was awarded the: (1) Thomas A. Martin Recycler of the Year presented by Recycling Coalition of Utah (2011) and (2) Utah Green Business Award, presented by the Utah Business magazine (2011). The Recycling Coalition of Utah recently awarded SLCC the recognition of Most Valuable Recycling Program (2012) and SLCC's recycling program received SLCC's 2013 Excellence in Innovation award for Sustainability and Recycling.

References:

(1) <http://www.slcc.edu/facilities/recycling.aspx>

(2) <http://www.slcc.edu/facilities/recycle/totals/2009-2013%20Recycling%20Yearly%20Totals.pdf>

i) Using non-aerosol products - SLCC does not currently have a policy on use of non-aerosol products. Aerosol can recycle and disposal began in FY2011.

j) Reducing idling - SLCC subscribes to the Utah Governor's Executive Order EO/005/2012 on Automotive Idling Reduction issued on May 31, 2012 which states that [except where specifically exempted,] "[e]very driver of a . . . fleet vehicle shall turn off the vehicle's engine when the vehicle will be stopped for more than 30 seconds."

Reference: <http://www.rules.utah.gov/execdoks/2012/ExecDoc152817.htm>

k) Low-maintenance landscaping - SLCC's Facilities Design Standards state that: ". . . Xeriscaping concepts are recommended in an effort to reduce water consumption."

As stated above, the SLCC Master Plan includes goals to promote water efficiency. Use of secondary water saves an estimated \$50,000 per watering season. Drought tolerant grasses and desert plants are used in approximately 20% of current landscaping. Weather stations which measure evapotranspiration (ET) (the sum of evaporation and plant transpiration) have been installed on both the Taylorsville RRC and Jordan campuses. Use of the weather stations helps provide landscape irrigation based on need, rather than on a defined schedule.

References:

(1) SLCC's Facilities Design Standard:

<http://www.slcc.edu/facilities/docs/designguidelines.pdf>

(2) SLCC Master Plan- Strategic Priorities

<http://www.slcc.edu/masterplan/overview/strategic-priorities.html>

(3) Evapotranspiration

<http://en.wikipedia.org/wiki/Evapotranspiration>

l) Other Technology Used to Reduce Emission of Air Pollutants:

(1) The majority of product used in all SLCC paint shops is low in volatile organic compounds which do not adversely affect air quality.

(2) SLCC has replaced the majority of its HVAC chiller units with units that use no chlorofluorocarbon (CFC) materials. There are only a few units still in operation that use a CFC refrigerant.

FY14 Air Quality Mitigation Plans:

Initiatives are planned for FY14 in the following areas:

e) Encouraging use of public or alternative forms of transportation: B-Line Shuttle - Plans are being developed to expand the B-line south from the Taylorsville Redwood Road campus to the Jordan and Miller campuses within the next year.

f) Energy conservation:

(1) LEED Certifications – All future building will require a silver level minimum LEED certification.

(2) VFD's will be installed on remaining campus cooling towers and on condenser pumps on the Redwood Road campus east chiller loop.

(3) Boilers – An instant demand boiler is planned to replace a 1971 boiler on the Redwood Road campus which will decrease natural gas consumption by 16% and lower NOx and SOx output by more than 16%. In addition, thermal insulation will be added to steam and condensate lines to reduce heat loss and demand on the boilers, which will also lower emissions.

(4) Chiller Sequencing - Chiller plant sequencing on the Taylorsville Redwood Road campus will be implemented in September 2013. Sequencing will reduce electrical energy consumption by running the chillers more efficiently and make it easier and cheaper to meet demand.

(5) Electrical Metering will be added to the Jordan campus to provide data on electrical consumption. This will help to isolate high electrical consumption buildings in order to identify opportunities for improved efficiencies and reduced electrical consumption.

(6) Automation and Occupant Sensors - System automations, addition of occupant sensors in rooms as they are remodeled (to shut off lights and to turn HVAC systems to unoccupied mode), occupancy schedule modifications, and control repairs will be done throughout FY14 to reduce energy usage. Impact: With HVAC systems calibrated and tuned for maximum efficiency, campus boilers and chillers will not consume as much natural gas and electrical demand, effectively lowering air emissions.

(7) VAV Control Upgrades - Outdated pneumatic building controls for the VAV's on the Rampton Technology Building will be upgraded. The new electronic controls and VAV boxes will provide better control of the space, reduce boiler and chiller usage, effectively reducing energy consumption and associated air pollution.

(8) Roof Replacement – The roof on the Lifetime Activities Center will be replaced and extra insulation will be added, reducing heat and cooling loss, effectively reducing natural gas and electricity use and reducing associated air pollution.

(9) More Water Bottle Refill Stations are planned for all campuses to reduce plastic waste.

g) Using alternative energy sources:

(1) Solar Panel Upgrade on LAC – A large 330 KW solar photovoltaic array will be designed and installed on the Lifetime Activities Center. The project is being funded through a utility incentive program. Impact: A substantial amount of the energy required by the LAC will be generated by the solar panel and will offset power plant emissions and mitigate effect on air quality.

(2) Fleet/Motor Pool – Of the seven vehicles on order for FY2014, one is CNG-ready and three are bio-diesel.

h) Recycling and using recycled products:

(1) Additional recycle bins will be installed on the South City Campus and in the new Instructional and Administration building on the Taylorsville Redwood Road Campus.

(2) Application will be submitted to purchase a waste refuse truck to enhance the College's green waste management programs.

k) Low-maintenance landscaping – The new IAB building on the Taylorsville Redwood Road campus, as well as future campus construction and expansions, will incorporate drought tolerant landscaping.



UTAH VALLEY UNIVERSITY
FACILITIES DEPARTMENT

July 2, 2013

Economic Development Task Force

Attention Jennifer Christopherson

In compliance with House Bill 168, "Air Quality Mitigation by Government Entities", the following is Utah Valley University's report on current mitigation efforts and a plan for the future.

Current efforts

Currently UVU has implemented several steps to improve air quality in Utah County. UVU has installed newer and more efficient boilers to reduce emissions as well as conserve resources. UVU has also been partnering with UTA to encourage ridership to reduce vehicle emissions. UVU offers the Eco pass to students and staff for \$50.00 per year. This allows students and staff to be able to ride UTA busses and Front Runner at a much reduced rate. UVU also has a sustainability committee that meets monthly to discuss and implement more efforts to try to improve air quality as well as reduce waste and better conservation of resources.

UVU has also instituted many energy reduction measures and two ESCO projects to decrease energy consumption on campus. While Rocky Mountain Power rates have increased 24.2% since 2008, UVU's Rocky Mountain Power energy costs have only increased 22.6%.

New buildings on the UVU campus are also built to a LEED silver status or equivalent, which ensures future energy reductions and air quality improvements.

Plan for the future

The plan for the future for UVU to help improve air quality is to,

1. Continue to have the sustainability committee work on new ideas to improve air quality
2. Continue to work with UTA to encourage more student and staff ridership by,
 - a. Establishing satellite campus' near Front Runner stops
 - b. Continue the Eco Pass
 - c. Currently UVU is working with UTA, Mountainlands Association of Governments and UDOT to establish a Buss Rapid Transit system that will serve UVU as well as Utah County. UVU will continue to work to implement the Buss Rapid Transit system.
 - d. Develop a car sharing system. UVU is currently working with UTA and other State, County and City agencies to implement a car sharing system.

- e. Develop a car pooling system for UVU students and staff to reduce vehicle emissions.

These are plans that UVU is working on to help improve the air quality of Utah County. Please feel free to contact us at any time to discuss any further ideas to help improve air quality in the State of Utah.

Sincerely

A handwritten signature in black ink, appearing to read "Jim Michaelis". The signature is fluid and cursive, with a prominent loop at the end.

Jim Michaelis

Associate Vice President Facilities/Planning

Utah Valley University