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 — Date 10/12/09

Norm Tarbox, Vice President
Administrative Services — Date 10/12/09

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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.

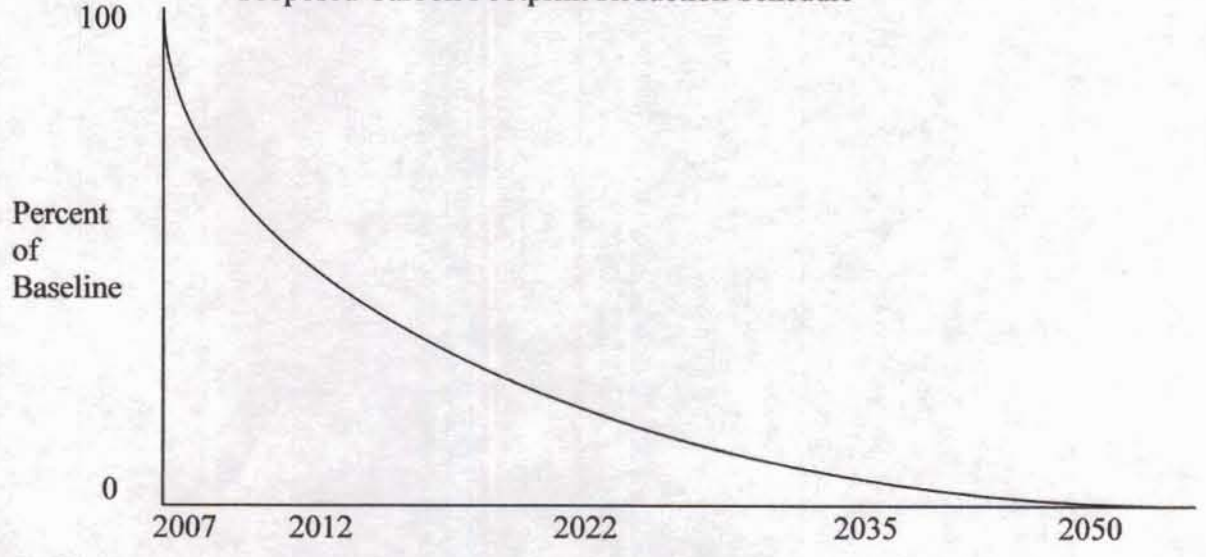
2. Vision:

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.

Chart 1.
Proposed Carbon Footprint Reduction Schedule



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 greenhouses 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	145,898.0	17,081,738	150,652.0	17,638,336
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 duel 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

	CY 2003	CY 2004	CY 2005	CY 2006	CY 2007
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

Location	Address	Elec Used FY 07 (kwh)	CO2 Equiv. (lbs)
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

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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 duel 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.