



# Climate Action Plan UPDATE

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University of California, Santa Barbara  
Office of Sustainability

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## Introduction

The original Climate Action Plan was drafted during 2008 and 2009, and approved by the Chancellor’s Sustainability Committee in November 2009. Below is an update on the progress the UC Santa Barbara (UCSB) campus has made in greenhouse gas (GHG) emissions mitigation during the past twelve months and plans for future mitigation.

## 2008 and 2009 Emissions Inventory – Scope I and II

The 2008 emissions inventory was completed by UCSB staff and submitted to the California Climate Action Registry in December 2009. We had a delay in the 2008 submission due to having to change third-party verifiers just before the October deadline. The 2009 emissions inventory was completed June 2010. At the time of this report, the emissions were in the process of being third-party verified by SCS Engineers. Any changes to the emissions totals will be updated as an addendum at a later time.

UCSB saw a 12 percent decrease in the overall emissions from 2007 to 2008 (**Table 1**). The largest area of decrease (16 percent) was seen in purchased electricity. The energy manager believes this is a result of some energy efficiency measures that took place in 2008.

**Table 1.**  
**2008 Emissions\***

	CO2e	CO2	CH4	N2O	HFC	PFC	SF6
<b>DIRECT</b>							
<i>Mobile</i>	1,406.11	1,392.31	0.12	0.04			
<i>Stationary</i>	18,864.38	18,815.95	1.77	0.04			
<i>Fugitive</i>	29.76				1.89		
<b>Total</b>	<b>20,300.25</b>	<b>20,208.26</b>	<b>1.89</b>	<b>0.08</b>	<b>1.89</b>	<b>0.00</b>	<b>0.00</b>

	CO2e	CO2	CH4	N2O
<b>INDIRECT</b>				
<i>Purchased Electricity</i>	31,315.35	31,179.92	1.30	0.35
<b>Overall Total</b>	<b>51,615.60</b>			

\*metric tons (MT)

### Percent Change from 2007

	% change
<b>DIRECT</b>	
<i>Mobile</i>	3.47
<i>Stationary</i>	-5.07
<i>Fugitive</i>	n/a
<b>Total</b>	<b>-4.32</b>

	CO2e
<b>INDIRECT</b>	
<i>Purchased Electricity</i>	-16.41
<b>Overall Total</b>	<b>-12.04</b>

UCSB saw a 6 percent increase in the overall emissions from 2008 to 2009 (**Table 2**). However, this is still a seven percent decrease – with a 14 percent decrease in purchased electricity – from 2007. The increase, especially in stationary combustion, was most likely due to the opening and occupation of the San Clemente Villages Graduate Student Housing and parking structure (641,147 ft<sup>2</sup>) in the fall of 2008, and the opening of the Loma Pelona, Pollock Theater, Social Sciences and Media Studies Building, and the Gevirtz Graduate School of Education Building (218,837 ft<sup>2</sup>) in the summer of 2009.

**Table 2.**  
**2009 Emissions\***

	CO2e	CO2	CH4	N2O	HFC	PFC	SF6
<b>DIRECT</b>							
<i>Mobile</i>	1,262.91	1,250.39	0.11	0.03			
<i>Stationary</i>	21,292.72	21,238.26	2.00	0.04			
<i>Fugitive</i>	6.78				0.01		
<b>Total</b>	<b>22,562.41</b>	<b>22,488.65</b>	<b>2.11</b>	<b>0.07</b>	<b>0.01</b>	<b>0.00</b>	<b>0.00</b>

	CO2e	CO2	CH4	N2O
<b>INDIRECT</b>				
<i>Purchased Electricity</i>	32,093.47	31,954.68	1.33	0.36
<b>Overall Total</b>	<b>54,655.88</b>			

\*metric tons (MT)

**Percent Change from 2008**

	% change
<b>DIRECT</b>	
<i>Mobile</i>	-10.18
<i>Stationary</i>	12.87
<i>Fugitive</i>	-77.22
<b>Total</b>	<b>11.14</b>

	CO2e
<b>INDIRECT</b>	
<i>Purchased Electricity</i>	2.48
<b>Overall Total</b>	<b>5.89</b>

With the commencement of \$17 million dollars in energy efficiency retrofits at the end of 2009 (*see Mitigation Projects section*) and a slow-down in building construction projects, the campus will most likely see a continued downward trend in overall emissions, particularly on a per square-foot basis.

**Scope III Emissions**

Scope III emissions, which include employee commuting and business travel, are voluntary to report and are not verified by a third-party, but are a large percentage of our overall emissions and important for reducing the campus' emissions included in this plan. UCSB began calculating business travel in 2008 and commuting in 2009 and is in the process of determining a baseline in which to start mitigation strategies from.

The 2008 and 2009 business travel emissions were 32,639 MT and 22,900 MT, respectively. The decrease from 2008 to 2009 is due, in part, to better estimation of miles traveled, but also due to a moratorium on air travel as a result of budget cuts.

A survey of the transportation habits for our students, staff, and faculty was performed after many years of not having one, and it allowed us to calculate the commuter emissions for UCSB. The emissions were found to be 14,241 MT in 2009-2010.

### Mitigation Projects

In 2009, the UC system entered into a partnership – the Strategic Energy Partnership (SEP) – with the public utilities to fund energy efficiency retrofit projects on all the UC campuses. UCSB received \$17 million to complete the projects over the next two years. In late 2009, UCSB began its energy efficiency retrofits – **Table 3** contains a list of projects completed in 2009, including the amount of energy saved and reduction in GHG emissions.

**Table 3.**  
**2009 Energy Efficiency Projects**

Description	Total Savings Elect + Heat \$\$/YR	Electricity Saved KWH/yr	Nat Gas Saved Therms/yr	Greenhouse Gas Reduction CO2 Equiv. Metric Tons/Yr
<b>Relo. R Cen, ICA, Kerr, Alumni</b>				
	\$13,552	135,517	0	44
<b>Lighting Retrofit of State Buildings</b>				
	\$17,915	179,147	0	58
<b>Lighting Retrofit of Housing Buildings</b>				
	\$15,880	158,795	0	51
<b>Low PD Filters, 10 AHU only</b>				
	\$16,980	169,795	0	55
<b>Carrillo Dining VFD Kitchen Hoods</b>				
	\$6,752	52,854	1,833	27
<b>HSSB MBCx Application</b>				
	\$31,483	301,548	1,660	106
<b>Rec Cen Pool Pump VFD</b>				
	\$26,811	268,111	0	87
<b>Total</b>	<b>\$129,371</b>	<b>1,265,767</b>	<b>3,493</b>	<b>427</b>

**Table 4** includes projects scheduled to be completed in 2010. By the end of 2010, projects completed through the SEP will have saved UCSB approximately \$385,000 in energy costs; 2.9 million kilowatt-hours per year; 125,000 therms per year; and 1,600 metric tons of CO<sub>2</sub>-equivalent GHG emissions.

**Table 4.**  
**2010 Energy Efficiency Projects**

Install Date	Description	Total Savings Elect + Heat \$\$/YR	Electricity Saved KWH/yr	Nat Gas Saved Therms/yr	Greenhouse Gas Reduction CO2 Equiv. Metric Tons/Yr
Aug, 2010	Bio 2 AHU Upgrade	\$33,509	335,086	0	108
Jun, 2010	2010 Mesa Parking Lighting	\$21,243	212,430	0	69
Oct, 2010	2010 Transformer Reloc at: CPS 111	\$17,733	177,330	0	57
Nov, 2010	Chilled Loop , E-W Extension	\$27,011	270,111	0	87
Dec, 2010	2010 Bren Aircurity Lab Vent Upgrade	\$26,111	39,906	27,650	160
Dec, 2010	Bio 2 Heating Boilers	\$56,580	0	70,725	376
Dec, 2010	2010 Housing Lighting Retrofit	\$13,270	132,696	0	43
Dec, 2010	2010 De La Guerra VFD Kitchen Hoods	\$16,980	169,795	0	55
Dec, 2010	Bio 2 Monitoring Based Commissioning	\$43,395	252,223	22,716	202
	<b>Total</b>	<b>\$255,831</b>	<b>1,589,577</b>	<b>121,091</b>	<b>1,157</b>

## Offsets

To obtain points during the Leadership in Energy and Environmental Design (LEED™) certification process, two departments purchased renewable energy credits (REC) to offset their buildings' energy use for one to two years. During 2009, Bren Hall, which received a LEED for Existing Buildings™ Platinum certification, purchased 2000 megawatt-hours of wind power and San Clemente Villages Graduate Student Housing, which received a LEED for New Construction™ Gold certification, purchased 669 megawatt-hours of wind power. These RECs offset the overall CO<sub>2</sub>-equivalent GHG emissions for the UCSB campus by 2,265 metric tons.

Furthermore, San Clemente Villages purchased an additional 669 megawatt-hours of wind power for the 2010 calendar year. These RECs will be calculated into the 2010 GHG emissions report during the 2011 calendar year.

## Sustainability Policies

During the summer of 2009, the Chancellor's Sustainability Committee (CSC) drafted eight sustainability policies that were approved by the Chancellor in the fall of 2009. As of July 1, 2010, the policies went into effect on an interim basis while they go through the formal policy approval process over the next year. Below are brief descriptions of each of the policies. Policies that will have a direct impact on GHG reduction are starred (\*).

- Alternative Fuel Vehicles\* – 75% of the campus fleet purchases will be alternative fuel and/or ultra low emission vehicles by June 30, 2011; and 95% of the campus fleet purchases will be alternative fuel and/or ultra low emission vehicles by 2016.
- Bicycle Racks and Parking\* – All building construction projects must include bike paths and parking; and new buildings must include shower facilities for bike commuters.
- Energy Star® Purchasing\* - All applicable electronic equipment purchased must be Energy Star® rated with the Energy Star® features enabled.
- Green Building\* – All new construction and renovations over \$5 million must strive for LEED™ Gold certification.
- Paper Purchasing – All paper purchased on campus must have 30% recycled content or higher.
- Renewable Energy\* – 25% of campus will be powered by renewable sources by 2014; 45% of campus will be powered by renewable sources by 2020; 75% of campus will be powered by renewable sources by 2030, and 95% of campus will be powered by renewable sources by 2045.
- Sustainable Furniture – All furniture purchased must have “green” features. If a particular furniture piece does not have green options, Purchasing will work with Strategic Sourcing to identify another vendor with a sustainable alternative.
- Sustainable Laboratory Assessments\* – All laboratories on campus are strongly encouraged to have sustainability assessments by the LabRATS program; and new construction of laboratories must meet the LABS21 standards for sustainability.

The CSC plans to have additional policies for the Chancellor during the 2010-2011 academic year.

## Education and Outreach

Since late 2009, the UCSB Communication for Sustainability Committee has made an effort to promote the sustainability efforts to the campus community and the surrounding community. Below is a list of activities UCSB participated in to reach out to students, staff, faculty, and nearby communities.

- Increased press releases about campus sustainability efforts and achievements. (See <http://sustainability.ucsb.edu/news>.)
- Creation of the faculty Sustainability Champion, who teaches a freshman seminar and gives a community presentation on a sustainability-related topic.
- Use of eight sustainability message boards to notify the campus community of events and achievements.
- Formation of the Program for the Assessment and Certification for the Environment and Sustainability (PACES), which provides assessments of departmental sustainability efforts and recommendations for improvement.
- Collaborative participation in the Santa Barbara Earth Day event with several UCSB student environmental groups, the Environmental Studies Program, the Bren School of Environmental Science and Management, and the Cheadle Center for Biodiversity and Ecological Restoration.
- Creation of an email list to notify the surrounding community of sustainability events, efforts, and achievements.

## Future Plans

The SEP energy efficiency projects will continue through 2012. These make up the bulk of our emissions reduction strategies over the next two years. **Table 5** includes a list of the projects slated to be completed during 2011 and 2012. (*These are subject to change over the next several months.*)

**Table 5.**  
**2011-12 Energy Efficiency Projects**

Install Date	Description	Total Savings Elect + Heat \$\$/yr	Electricity Saved KWH/yr	Nat Gas Saved Therms/yr	Green House Gas Reduction CO2 Equiv. Metric Tons/yr
May, 2011	Santa Rosa MBCx				
		\$13,604	65,061	8,872	68
May, 2011	Santa Catalina MBCx				
		\$40,428	193,347	26,366	203
Jun, 2011	Bio 2 Lab Infrastructure Impr				
		\$9,243	11,310	10,140	60
Jun, 2011	Exhaust Stack Study/Modification at Bren, MSRB, CNSI				
		\$115,069	1,150,686	0	372
Aug, 2011	North Hall Data Center Renovations				
		\$29,578	295,779	0	96
Aug, 2011	North Hall Data Center Ventilation				
		\$9,393	93,925	0	30
Aug, 2011	400 ton VFD Chillers at Bio2 (3)				
		\$177,879	1,778,785	0	575
Dec, 2011	Campus-wide Lighting Retrofit				
		\$350,000	3,500,000	0	1,131
Dec, 2011	CNSI MBCx				
		\$41,005	362,050	6,000	149
Dec, 2011	Snidecor Hall MBCx				
		\$9,800	50,000	6,000	48
Dec, 2011	Psychology MBCx				
		\$10,400	80,000	3,000	42
Dec, 2011	Phelps Hall MBCx				
		\$11,000	70,000	5,000	49
Dec, 2011	University Center MBCx				
		\$16,256	37,455	15,638	97
Dec, 2011	Event Center MBCx				
		\$10,347	49,485	6,748	54
Dec, 2011	Recreation Center MBCx				
		\$29,518	99,040	24,517	166
Dec, 2012	Broida Exh Fan Upgrade EF-1,2,3 FE-1&2				
		\$15,472	51,225	12,937	88
Dec, 2012	UCSB Heating Loop				

		\$684,380	0	1,088,000	6,006
<b>Dec, 2012</b>	<b>Broida Aircurity Lab Vent Upgrade</b>				
		\$165,752	319,835	167,211	993
<b>Dec, 2012</b>	<b>Direct Drive Cooling Tower Fan</b>				
		\$12,809	128,089	0	41
<b>Dec, 2012</b>	<b>Energy Efficient Motors at Cheadle, Chem, HFH, Music, PSB N, Rob Gym</b>				
		\$10,888	108,875	0	35
<b>Dec, 2012</b>	<b>EH&amp;S MBCx</b>				
		\$2,275	10,880	1,484	11
<b>Dec, 2012</b>	<b>MRL MBCx</b>				
		\$12,150	117,271	529	41
<b>Dec, 2012</b>	<b>Chemistry MBCx</b>				
		\$34,071	235,817	13,112	146
<b>Dec, 2012</b>	<b>PSB N MBCx</b>				
		\$23,485	204,983	3,733	86
<b>Dec, 2012</b>	<b>Arts MBCx</b>				
		\$27,814	149,595	16,068	134
<b>Dec, 2012</b>	<b>North Hall MBCx</b>				
		\$7,686	47,821	3,630	35
<b>Dec, 2012</b>	<b>Music MBCx</b>				
		\$10,265	36,727	8,240	56
<b>Date / TBD</b>	<b>Carrillo Dining Commons MBCX</b>				
		\$40,428	193,347	26,366	203
<b>Date / TBD</b>	<b>De La Guerra Dining Commons MBCx</b>				
		\$5,157	24,661	3,363	26
	<b>Total</b>	<b>\$1,926,148</b>	<b>9,466,049</b>	<b>1,456,954</b>	<b>11,038</b>

## Conclusions

In order to reach our first milestone of 2000 level emissions (39,732 MT) in the next four years, we need to decrease our overall campus GHG emissions by 37% or 14,919 MT. As **Tables 4 and 5** show, the energy efficiency projects alone only account for 13,076 MT and do not account for any increases in energy use due to new construction. Therefore, additional energy reduction efforts through renewable energy projects, policy enforcement, behavioral change, and/or the purchase of offsets needs to take place in order to meet the 2014 goal.