

**UCSB Proposed Energy Projects, 2006 to 2008**

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Project Type	Description	Demand Saved KW	Energy Saved KWH/yr	Elect. Savings at \$0.11/KWH \$\$/YR	Heating Energy Saved Therms/yr	Heat Savings at \$1.00/therm \$\$/YR	Total Savings Elect + Heat \$\$/YR	Project Cost \$\$ (5)	Energy Grant \$\$	Energy Rebate \$\$	Payback with Rebates/Grants Yr (1)	Net Present Value \$\$ (2)	Internal Rate of Return %, (3,4)	Gas Emission CO2 lb/yr	SOx lb/yr	NOx lb/yr
<b>****Lighting Projects***</b>																
Lighting	Upgrade lighting systems on 19 campus Bldgs totaling 1.0 million GSF. Replace "power kut" electromagnetic ballasts with electronic ballasts and T8 lamps. Install two position dimming fixtures in 250 stairwells.	511	1,986,000	\$218,460	0	\$0	\$218,460	\$1,629,335	\$476,640	\$0	5.28	\$714,120	18%	2,542,080	21,449	10,923
<b>****HVAC Upgrade Projects***</b>																
Install low press drop & long life AHU filters on 63 air handlers.	Installing low pressure drop, long life filters will save energy and reduce the change out frequency. The reduced maintenance will allow UCSB's preventative maintenance staff to focus on higher priority work.	211	1,674,000	\$184,140	0	\$0	\$184,140	\$450,000	\$401,760	\$0	0.26	\$1,473,033	174%	2,142,720	18,079	9,207
Replace V-belt Drive Fans with Direct Drive fans	Replacing old V-belt drive fans (efficiency = 50%) with direct drive fans (efficiency = 72%) will upgrade UCSB's aging fans and save significant energy without changing the fan airflow.	339	2,519,000	\$277,090	0	\$0	\$277,090	\$1,725,000	\$372,323	\$0	4.88	\$1,023,561	21%	3,224,320	27,205	13,855
Bren Fume Hood Proximity Sensors	Install proximity sensors on 16 fume hoods. This will reduce the fume food airflow by 40% during nonuse periods.	12	96,580	\$10,624	38,882	\$38,882	\$49,506	\$80,000	\$62,061	\$0	0.36	\$394,225	406%	576,209	1,047	873
Engineering 1	Retrofit two ventilation systems in Engineering 1 to dual duct variable air volume.	25	289,617	\$31,858	13,770	\$13,770	\$45,628	\$748,800	\$83,278	\$0	14.59	-\$250,549	-3%	530,993	3,129	1,714
Cheadle Hall	Retrofit two ventilation systems in Cheadle to dual duct variable air volume.	56	388,647	\$42,751	16,420	\$16,420	\$59,171	\$1,116,000	\$109,695	\$0	17.01	-\$460,161	-6%	688,597	4,199	2,282
<b>****HVAC Commissioning Projects***</b>																
Dual Duct Controls Optimization	UCSB proposes optimizing the hot and cold deck temperature on supply air handlers at 11 bldg.'s serving 1,373,212 GSF. Metering, data gathering, and testing control strategies is required. Some retrofit of building economizer systems is required	20	1,139,194	\$125,311	116,802	\$116,802	\$242,113	\$320,000	\$390,209	\$0	0.00	\$2,009,719	2664%	2,817,744	12,315	7,293
Engineering 2 Monitoring Based Commissioning	Review the Engineering 2 Lab operation & control for seven supply and exhaust systems. UCSB estimates that 5 of the 7systems can be reduced to 50% speed from midnight to 7am.	0	221,286	\$24,341	52,019	\$52,019	\$76,360	\$120,000	\$105,128	\$0	0.19	\$619,551	519%	888,747	2,395	1,675
Building Metering	Install 16 new electric meters and 35 new gas new gas meters. Meters energy usage shall be trended using Johnson Metasys & Itron software	116	623,121	\$68,543	54,498	\$54,498	\$123,041	\$300,000	\$204,047	\$0	0.78	\$928,206	140%	1,431,952	6,735	3,907
<b>Totals</b>		<b>1,290</b>	<b>8,937,445</b>	<b>\$983,119</b>	<b>292,391</b>	<b>\$292,391</b>	<b>\$1,275,510</b>	<b>\$6,489,135</b>	<b>\$2,205,141</b>	<b>\$0</b>	<b>3.36</b>	<b>\$6,451,705</b>	<b>34%</b>	<b>14,843,361</b>	<b>96,554</b>	<b>51,729</b>

Notes:

1. Payback (years) = {Project Cost - CPUC Grants Funds - SCE Rebates} / {Annual Electrical & Heating Savings}.
2. Net Present Value is based on: 15 year term, 6% interest, Project Cost incurred in year 1, grants received 20% in year 1, 40% in year 2 & 40% in year 3, Energy Savings incurred in years 2 -15, and monetary inflation rate = fuel cost inflation rate. No change in maintenance costs.
3. Internal Rate of Return is based on: 15 year term, Project Cost incurred in year 1, grants received 20% in year 1, 40% in year 2 & 40% in year 3, Energy Savings incurred in years 2 -15, and monetary inflation rate = fuel cost inflation rate. No change in maintenance costs.
4. The 2006/08 UC/CSU/IOU grant program is currently in the initial phase. The UCSB share of grant funding is anticipated to be \$3.5++ million funded 20% in 2006, 40% in 2007, and 40% in 2007. Over 4.8 million in projects are shown here. The additional projects will be delayed until the next 2008/10 Grant project or partially funded through an alternative program such as the SCE Rebate Program. All projects (except one) are shown receiving grant funding at the 2006/08 rate of \$.24 per annual saved KWH and \$1.00 per annual heating therm saved. The " Additional 2005VFD's " project is approved under a 2005 SCE Rebate program but currently unfunded.
5. Per Department of Energy saving one KWH through conservation will save fossil power plant emissions of 1.28 Lb's of CO2, 0.0108 lb's of Sox, and 0.0055 lb's of NOx. Saving one therm of natural gas through conservation will save fossil power plant emissions of 11.64 Lb's of CO2, 0.0001 lb's of Sox, and 0.0088 lb's of NOx.

Metric	Metric	Metric
Tons/YR	Tons/YR	Tons/YR
6,747	44	24