



UC STRATEGIC ENERGY PLAN

University of California, Riverside

FINAL

Prepared for

**University of California
Office of the President**

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PREFACE

This report was produced by Newcomb Anderson McCormick for the University of California, Office of the President (UCOP) and the University of California, Riverside.

Valuable assistance and direction was provided for this project by George Getgen, Dirk VanUlden, Clifton Bowen, Matthew St. Clair and John Rolle of the UC Office of the President, and Pat Simone, Rick Aten, Jeff Adams, Ronnie E. Lewis, and John Prine of UC Riverside.

1. EXECUTIVE SUMMARY

1.1 Policy on Sustainable Practices

The Regents of the University of California adopted a Policy on Sustainable Practices in March 2007 which states that the University will develop a Strategic Energy Plan (SEP) for implementing energy efficiency projects in existing buildings. The initial goal for the retrofit projects is to reduce systemwide, growth adjusted energy consumption by 10% or more by 2014 from the year 2000 base consumption level.

In addition, the Policy directs the campuses to pursue the goal of reducing greenhouse gas (GHG) emissions to year 2000 levels by 2014 and to 1990 levels by 2020. This target is not growth adjusted. The 2020 target follows the AB32 directive on GHG emissions. Because electricity and gas purchases are expected to represent perhaps three quarters of a campus' GHG emissions, the energy and GHG reduction goals are closely linked. It is anticipated that the Strategic Energy Plan projects will be one of the main tools the campus uses to meet its GHG targets.

1.2 Energy Use and Greenhouse Gas Reduction Targets

Table 1.1 lists past, current and projected energy purchases by UC Riverside, starting with the baseline year 2000. The energy purchases are divided by the gross building area of the campus to establish an Energy Use Index to evaluate the growth adjusted energy use targets.

The energy purchases are also converted to GHG emissions, using emissions factors for electricity generation and natural gas use. Individual campuses are preparing plans for meeting the GHG goals, due by December 2008. Those plans will address the historical campus emissions in detail. At present the emissions factors for the different electricity providers operating in 2000 and 1990 are not available. For this Strategic Energy Plan the GHG emissions factors are based on the statewide emissions factors for 2000. The 1990 utility purchases are not currently available from university or utility records so the 2020 target is undefined.

The UC Riverside energy purchases in the most recent year (FY 06-07) are also shown in Table 1.1. The cost of this energy in this year is \$6,971,662 for electricity and \$3,040,961 for natural gas, for a combined cost of \$10,012,623. The Energy Use Index and GHG emissions for this year can be compared with the 2000 baseline to see progress to date on achieving the 2014 target.

Table 1.1 also shows growth in building area and energy use projected to the year 2014 without investment in new energy efficiency, based on new construction identified in the Five Year Capital Program (2007-08 to 2011-12). Actual growth could be higher. In addition, allowance was made for the anticipated changes in electricity and gas purchases due to the operation of the cogeneration system, which was just starting up during FY 06-07. The cogeneration system will have a major net effect on the source energy use of the campus and a smaller effect on the GHG emissions. Finally this growth number includes the energy savings anticipated by the end of 2008 for the Partnership projects funded in the 2006-08 Program.

1.3 Strategic Energy Plan Projects

This Strategic Energy Plan provides initial identification of potential for energy efficiency retrofit projects at all buildings over 50,000 square feet at University of California Riverside, summarized in Table 1.2. This includes primarily lighting, HVAC, commissioning and central plant measures. A number of other measures that apply in all sizes of buildings are identified as well. The potential for energy efficiency in new construction and renovated buildings is also addressed, based on the same Capital Program. A number of these efficiency projects were initially identified and evaluated by the campuses. A separate line item shows the potential from addition of photovoltaic power to additional roof areas on campus. This report does not represent an investment grade audit so the numbers are expected to be refined in the engineering process before the campus submits them for funding. All projects except photovoltaics were evaluated using the campus energy recharge rates.

The Strategic Energy Plan attempts to be comprehensive in its identification of potential energy projects. As a result the total potential savings is significant and the payback periods for some of the measures are fairly long. During implementation the campus will select measures to implement which meet its investment and physical plant needs.

For the purposes of this report, incentives have been projected based on \$0.24/kWh and \$1.00/therm annual savings. The actual incentive rate has yet to be determined and depends on the utility. Energy savings have been calculated on a project by project basis, with incentives based on the building level savings. The photovoltaic projects would be implemented using the California Solar Initiative incentives.

The magnitude of project investment is many times greater than the programs, which have been constrained by the limited capital available from the campuses. A new funding mechanism will offer bond money from the Office of the President to pay upfront the University portion of the project cost, with the 15 year bond to be repaid by the campus through utility savings.

The effect of these potential projects on meeting the efficiency and GHG targets is illustrated in Table 1.1. In this table the energy savings are reported as they would be measured at the utility meters, taking into account the effect of the TES at the central plant. The indication is that the 2014 energy goals can be met with an aggressive program of project implementation, and that a more aggressive program will be required to meet the 2014 GHG emissions goals. The 2020 goals cannot be addressed until the 1990 baseline is established. Table 1.1B shows the effect of the projects planned and committed to by the campus for implementation as Tier 1 and Tier 2 Projects.

The economics of these projects are described in Table 1.2, which lists the potential projects according to the funding source for the facility and the type of project. This table also lists the solar incentives and the net simple paybacks to the site, factoring in the incentives, and the committed savings for the planned and committed projects. Since UC Riverside made initial commitments based on a preliminary list, the updated project savings are also included for the corresponding projects, which yield greater savings than initially committed to.

Table 1.1A: Summary of Baseline and Projected Energy Usage, Emissions, and Goals, All Potential Projects

Year	Energy Use Basis	Electricity (kWh/yr)	Natural Gas (th/yr)	Campus Area (GSF)	Source Energy Use Index (kBtu/sf-yr)	Source Energy Use Index vs. 2000 Baseline 2014 Target: 90%	GHG Emissions (tonne CO2 eq.)	GHG Emissions vs. 2000 Baseline 2014 Target: 100%
1990 Baseline	FY 89-90 Data Not Available							
2000 Baseline	FY 99-00 Historical Use per UCOP	75,737,057	3,134,115	3,018,255	361	100%	44,313	100%
Most Recent Year	FY 06-07 Historical Use per UCOP	122,614,026	3,582,579	4,002,296	403	112%	63,845	144%
2014 Projected	With Projected Growth and 2006-2008 Partnership Projects	146,035,007	4,801,049	5,133,420	385	107%	78,868	178%
2014 Projected	Add Potential Strategic Energy Plan Efficiency Projects	96,783,153	2,607,917	5,133,420	244	68%	49,230	111%
2014 Projected	Add Potential Full Roof PV	90,122,278	2,607,917	5,133,420	231	64%	46,792	106%
2020	Growth Not Projected							

Notes:
Source Energy 10,239 Btu/kWh Electric
 100,000 Btu/th Gas
Emissions 0.000366 tonne CO2 eq/kWh
 0.005295 tonne CO2 eq/th

Table 1.1B: Summary of Baseline and Projected Energy Usage, Emissions, and Goals, All Committed Projects

Year	Energy Use Basis	Electricity (kWh/yr)	Natural Gas (th/yr)	Campus Area (GSF)	Source Energy Use Index (kBtu/sf-yr)	Source Energy Use Index vs. 2000 Baseline 2014 Target: 90%	GHG Emissions (tonne CO2 eq.)	GHG Emissions vs. 2000 Baseline 2014 Target: 100%
2000 Baseline	FY 99-00 Historical Use per UCOP	75,737,057	3,134,115	3,018,255	361	100%	44,313	100%
Most Recent Year	FY 06-07 Historical Use per UCOP	122,614,026	3,582,579	4,002,296	403	112%	63,845	144%
2014 Projected	With Projected Growth and 2006-2008 Partnership Projects	146,035,007	4,801,049	5,133,420	385	107%	78,868	178%
2014 Projected	Add Committed Strategic Energy Plan Efficiency Projects (Tier 1 and Tier 2)	130,203,558	3,889,559	5,133,420	335	93%	68,248	154%

Notes:

Source Energy	10,239	Btu/kWh Electric
	100,000	Btu/th Gas
Emissions	0.000366	tonne CO2 eq/kWh
	0.005295	tonne CO2 eq/th

Table 1.2: SEP Project Savings and Economics Summary

Efficiency Projects	Purchased Utility Savings				Project Cost (\$)	Anticipated Incentive (\$)	Net Project Cost (\$)	Net Simple Payback Period (yr)
	Electricity (kWh/yr)	Demand (kW)	Gas (th/yr)	Monetary (\$/yr)				
State Funded								
MBCx	2,582,223	294	366,305	505,026	2,420,444	912,776	\$ 1,507,668	3.0
HVAC Retrofits	25,138,312	2,459	1,068,121	2,793,276	52,289,133	7,081,897	\$ 45,207,236	16.2
Lighting Retrofits	3,578,792	898	-	268,409	3,337,870	858,912	\$ 2,478,958	9.2
Other Retrofits	3,365,185	461	87,683	326,919	2,542,908	877,790	\$ 1,665,118	5.1
New Construction	2,945,261	334	197,283	388,585	3,267,110	864,689	\$ 2,402,421	6.2
Deferred Maintenance & Capital Renewal	5,454,600	624	213,068	590,202	10,395,000	1,479,558	\$ 8,915,442	15.1
Subtotals	43,064,373	5,070	1,932,459	\$ 4,872,418	\$ 74,252,464	\$ 12,075,622	\$ 62,176,842	12.8
Non State Funded								
MBCx	670,541	77	114,298	\$ 147,443	\$ 736,257	\$ 252,368	\$ 483,889	3.3
HVAC Retrofits	2,865,707	407	44,304	252,586	4,858,667	731,675	\$ 4,126,992	16.3
Lighting Retrofits	1,725,262	572	-	\$ 129,395	\$ 1,594,678	\$ 414,062	\$ 1,180,616	9.1
Other Retrofits	74,425	40	2,344	\$ 7,574	\$ 79,002	\$ 19,737	\$ 59,265	7.8
New Construction	851,546	95	99,729	\$ 148,635	\$ 1,194,957	\$ 284,152	\$ 910,805	6.1
Subtotals	6,187,481	1,191	260,674	\$ 685,634	\$ 8,463,561	\$ 1,701,994	\$ 6,761,567	9.9
Total Efficiency Projects	49,251,854	6,261	2,193,133	\$ 5,558,052	\$ 82,716,025	\$ 13,777,616	\$ 68,938,409	12.4

Campus Planned & Committed Projects*	Electricity (kWh/yr)	Demand (kW)	Gas (th/yr)	Monetary (\$/yr)	Project Cost (\$)	Anticipated Incentive (\$)	Net Project Cost (\$)	Net Simple Payback Period (yr)
Tier 1 & 2 Project Totals (As Committed)	10,183,511	831	900,339	\$ 1,427,216	\$ 12,280,369	\$ 3,344,381	\$ 8,935,988	6.3
Tier 1 & 2 Project Totals (Updated Projects)	15,831,449	1,676	911,490	\$ 1,962,125	\$ 27,903,335	\$ 4,711,038	\$ 23,192,297	11.8
% of Planned vs Potential	32%	27%	42%	35%	34%	34%	34%	

* The campus originally selected placeholder projects in buildings, which are represented by 'As Committed'. Placeholder projects were replaced with identified SEP projects in the draft report and savings for a potential HVAC project in the selected buildings are included in the 'Updated Projects' figures.

Table 1.2: SEP Project Savings and Economics Summary (continued)

Renewable Projects	Purchased Utility Savings			Note
	Electricity (kWh/yr)	Demand (kW)	Gas (th/yr)	Monetary (\$/yr)
Photovoltaics UCR, 1st MW	1,713,000	1,000	-	\$ (34,260)
Photovoltaics, UCR Remaining Potential	4,947,875	2,888	-	\$ (197,915)
Subtotals	6,660,875	3,888	-	\$ (232,175)

Total Projects	Purchased Utility Savings			Project Cost (\$)	Anticipated Incentive (\$)	Net Project Cost (\$)	Net Simple Payback Period (yr)
	Electricity (kWh/yr)	Demand (kW)	Gas (th/yr)	Monetary (\$/yr)			
State Funded Efficiency Projects	43,064,373	5,070	1,932,459	\$ 4,872,418	\$ 12,075,622	\$ 62,176,842	12.8
Non State Funded Efficiency Projects	6,187,481	1,191	260,674	\$ 685,634	\$ 1,701,994	\$ 6,761,567	9.9
Renewable Projects	6,660,875	3,888	-	\$ (232,175)			
TOTAL	55,912,729	10,149	2,193,133	\$ 5,325,877	\$ 13,777,616	\$ 68,938,409	12.9

The campus has reviewed a preliminary version of the initial list of potential projects in this report and has initiated a planning process for engineering, scheduling and implementation of the projects over the next six years. It is anticipated that the list of potential projects will be continuously tuned and updated as projects are built, savings are measured, new technologies become commercially available, and campus loads change over the course of the next six years.

2. INTRODUCTION

2.1 Strategic Energy Plan Methodology

The University of California Office of the President has contracted with Newcomb Anderson McCormick (NAM) to create a Strategic Energy Plan for nine campuses and five medical centers. This Plan will identify potential energy saving projects throughout these campuses that can be implemented over the next six years, and will evaluate their contribution to helping the campuses meet the system-wide goals of reduced energy consumption and reduced greenhouse gas emissions.

In conjunction with the campus sub-consultant selection process, Newcomb Anderson McCormick assembled a team of highly respected engineering firms and experts to perform the work at the campus and assemble the Strategic Energy Plan. The team for UC Riverside included:

Team Member	Role
Newcomb Anderson McCormick	Program Manager, SEP Aggregation
DEC Engineers	Campus Field Auditor, Efficiency Projects
Michael Wall Engineering	Renewable Energy Projects, Power Quality
Bart Wallace	Lighting Field Auditor

A kickoff meeting was held at the campus on February 29, 2008, with good representation from the campus and appropriate auxiliaries. The kickoff meeting introduced the SEP team and process, collected valuable input and provided an understanding of the campus' priorities and needs. Additionally, the list of 50,000 square foot and larger buildings to be included in the SEP was reviewed and substitutions and additions were made to align the effort of the SEP with campus priorities and the best opportunities for energy savings. The resulting list of buildings (referred to as SEP Building List, or SEP Buildings) became the basis for the field work and building specific project identification.

Following the kickoff meeting the field investigation phase ensued. Collectively, the team performed audits and analysis of all SEP buildings and other specific opportunities to identify the list of projects included in this report. The energy efficiency projects identified by the Campus Field Auditor were focused on the SEP Buildings' mechanical and lighting systems, with field data collected on standardized field data templates (included in Appendix A). Renewable energy potential was investigated by Michael Wall Engineering, along with a brief power quality and reliability investigation, while Newcomb Anderson McCormick's efforts focused on historical data collection, campus wide projects, projects outside of the SEP buildings and green house gas emission impacts.

During the analysis phase, the previously compiled field data was analyzed to develop projects with consistency and reasonableness in mind, using the most detailed methods of analysis possible in the time available. To this end, a standardized analysis tool was used to analyze the majority of the air handler related projects. The analysis tool provides results which incorporate factors typical of a more detailed investigation as opposed to a strategic level project analysis, including system specifics, site specific weather data, operating schedules, control strategies and typical system setpoints as determined by field investigation. Analysis of other projects was performed using project-specific engineering

calculations and followed recognized engineering principles. Reasonable engineering judgment was applied to all project analyses.

Construction costs of recommended projects are built up from contractor quotes, Means manuals, experience from past project cycles, and a variety of other sources. Project costs are the sum of the construction cost and contingency (10%), engineering and design (15%), construction management (5%) and project management (6%). While individual projects' final costs and savings may vary from the results presented in this report, it is anticipated that the aggregate level of accuracy by campus or by utility service territory will be reasonable.

A preliminary list of energy efficiency projects, delivered to UCOP on March 28, was the initial step in delivery of the Strategic Energy Plan results. This list of projects was reviewed, prioritized and scheduled by the individual campuses and returned to UCOP. The compiled results were then used to determine the level of savings commitment for the Investor Owned Utilities to use in support of their filings to the CPUC for the UC/CSU/IOU Partnership Program. The results will also assist UCOP in planning for a bond to finance the campus contributions for the construction of these projects.

As of the writing of this report, the details of the Partnership Program have not been defined for the 2009-2011 cycle, and discussions are ongoing with the Municipal utilities to solicit similar participation and incentive levels for the campuses. While these crucial details are not confirmed, this Strategic Energy Plan was in large part commissioned to determine overall potential for projects, and is a critical step in securing the incentive funding levels from both the IOU and Municipal utilities, and for UCOP funding. Consequently, this report assumes that many of the aspects of the current plan will be carried forward, including the incentive rates of \$0.24/kWh and \$1.00/therm of annual savings. These rates are used in the analyses of all projects in this report, including those at campuses served by Municipally Owned Utilities.

Following delivery of the Preliminary List, the projects in this Strategic Energy Plan report were aggregated and assembled. The projects from the Preliminary List are included, with some refinements following additional quality control checks. Projects have been compared to historical energy use and project costs have been refined. Other projects have been added following the development of the Preliminary List, including renewable electric generation projects (such as photovoltaics, which qualify for different utility programs) and projects which save electricity supplied by Municipally Owned Utilities whose energy efficiency programs are not regulated by the CPUC (including SMUD, LADWP and the City of Riverside). Details for these projects replace the placeholder savings previously projected.

The projects included in this SEP are the result of a survey of the campus, discussions with campus personnel, and preliminary engineering of projects. This effort is not an investment grade audit. This means that the projects will require additional detailed cost estimating and refinement of savings before the campuses or the utilities can commit to specific construction budgets and energy saving calculations.

This effort was designed to identify significant physical modifications required to make buildings energy efficient. It did not concentrate on operational details that might be found in an investment grade audit, such as a broken economizer, or an improper control sequence.

However, the Strategic Energy Plan does recommend the monitoring-based commissioning (MBCx) of each of these buildings over the next six years. This process will ensure that the operational problems of each building are identified and corrected, so that all measures that might be identified in an investment grade audit will ultimately be included.

The equivalent energy and cost savings for projects presented in the Preliminary List were been simplified to meet the financial criteria established for the UCOP funding mechanism, and to be consistent with utility incentive requirements. For HVAC projects, chilled water and hot water (or steam) savings calculated at the buildings were converted to electric (kWh) and natural gas (therm) savings using marginal central plant efficiencies, and summed with direct electric and natural gas savings, which include cooling or heating from local sources. For all other projects, the electric and gas savings were calculated directly, without involving the intricacies of the central plant. The sums of these savings for each project became the equivalent electric and gas savings, and are used for the basis of the utility incentive. The published FY06-07 recharge rates, as provided by UCOP, were applied to the equivalent electric and gas savings to estimate the energy cost savings of projects. Using the recharge rate builds in a level of conservatism for future energy savings, as no utility rate escalation is built in, and meets UCOP bond funding requirements. Operational and maintenance savings have generally been discounted in financial analysis of measures, as UCOP funding will involve only the purchased utility budgets as a repayment source.

The equivalent energy savings methodology remains unchanged from the preliminary list to this SEP report. However, the central plant and any cogeneration impacts are incorporated to reflect a purchased utility cost savings and give a more true estimate of utility cost savings for the campus.

The following tables show the recharge rates and marginal central plant efficiencies used in this report. The individual campuses may charge themselves different prices internally, or may calculate marginal utility costs differently, and so can use other pricing in their internal project evaluation.

Table 2.1: Recharge Rates - Non-State Funded and Auxiliaries FY 06-07¹

Campus	\$/kWh	\$/Therm
Riverside	\$0.075	\$0.850

¹ The electric recharge rate was updated for the final report via discussions with the campus

Table 2.2: Marginal Central Plant Efficiencies

Campus	Plant kWh/ Bldg ton-hr	Plant Therm /Bldg ton-hr	Plant Therm/ Bldg MMBTU
Riverside	0.8	0	12.5

Table 2.3: Central Plant & Cogeneration Impacts on Purchased Utilities

Campus	Building Energy Saved	Purchased Utility Savings	Notes
Riverside	Steam	12.5 th gas/MBtu	Steam is delivered by natural gas fired boilers.
	Chilled Water	0.8 kWh/tonh	
	Electricity	1 kWh/kWh	No cogenerated electricity

2.2 General Project Identification Categories and Approach

The following is a general description of the projects that were identified by the Strategic Energy Plan. More detailed scope and savings information is included in the Project Descriptions section of the report.

In general, projects were selected for this report that will bring campus systems up to the state of the art technology. This is intended to identify all of the possible energy savings available through retrofit projects. This results in some projects with longer paybacks where the existing system may be moderately efficient, but not necessarily state of the art. However, it defines a maximum savings target for the buildings evaluated. The campuses can decide on the appropriate level of investment based on their individual needs and their performance in meeting energy savings and green house gas emissions goals.

2.2.1 Lighting Projects

The report identifies the potential to convert existing T12 and 32W T8 fluorescent fixtures to 28W T8 lamps with premium efficiency ballasts with low ballast factor, at 42 W per two lamp fixture. Several campuses have alternative standards, including UC Santa Barbara, which is emphasizing dimming ballasts. Also recommended are increased penetration of occupancy sensor controls, daylight harvesting, new stairwell fixtures, and replacement of interior HID fixtures with fluorescent. Fluorescent conversion is also generally recommended for parking structures.

2.2.2 HVAC Projects

A variety of HVAC projects are recommended for implementation at campus buildings. The general intention of these retrofits is to make all air handlers of 10 hp and above meet basic efficiency standards: variable air volume with economizers, operating only the hours necessary, with direct digital controls, demand control ventilation where warranted, and static pressure reset. Laboratory air handlers would also be converted to variable air volume, with variable flow fume hoods and minimum ventilation controls set at 6 air changes per hour. In some cases further savings will be achieved through air quality monitoring and automatic sash closers. Kitchen hoods are recommended for conversion to variable air volume as well. A variety of other chiller and boiler projects are recommended for other buildings that are not served by a central plant.

2.2.3 Monitoring Based Commissioning Projects

This report includes a monitoring-based commissioning project at every Strategic Energy Plan building. This is an integral element of the retrofit projects that are recommended at most buildings. The combination of retrofits and commissioning will capture the majority of the energy saving potential of the HVAC systems. Monitoring based commissioning is also recommended for all main central plants where it has not yet been implemented.

2.2.4 New Construction and Renovation from Capital Program

This report includes a number of planned construction and renovation projects at each campus. It is assumed that a Savings By Design process will be in place to generate a

design which outperforms Title 24 by at least 30%. The campus contribution to the resulting construction costs are assumed to come from UCOP bond funding. This removes the capital constraint from the construction budget and allows more efficient buildings to be designed and built.

2.2.5 Deferred Maintenance and Capital Renewal Projects

The campuses each spend up to \$10 million per year on deferred maintenance and capital renewal projects. This report estimates that about 12% of these projects have an energy savings component. It is recommended that utility incentives be employed to make these measures marginally more efficient. It is also recommended that UCOP bond funds be used where possible to supplement project funding to allow construction of energy saving projects that otherwise might not be funded.

2.2.6 Campus Wide Projects

Campus wide projects include the replacement of pre-2001 refrigerators with Energy Star units, replacement of lab freezers with more efficient units, and the installation of occupancy sensor controls on vending machines. The campus wide use of power management software is recommended to reduce the energy consumption of network computers when they are not in use. The replacement of CRT monitors with LCD monitors is recommended as well. Finally, an estimate of the potential energy savings from computer server virtualization was included.

2.2.7 Other Projects

Several other miscellaneous projects were evaluated, including swimming pool projects. Pool covers with powered take up spools were recommended where they are not currently used. Variable speed drives are recommended for pool filter pumps during off hours operation. Solar collectors are also recommended for pools where adjacent roof space is available. In addition, boiler replacement was evaluated for swimming pool and other boilers for thermal loads not served by the central plant.

2.3 Campus Overview

University of California, Riverside opened for classes in 1954 in the city of Riverside. The campus currently has over 16,000 students, 5,500 staff members, and 1,000 faculty members. UCR has over 200 buildings spread across 1,200 acres. The campus is continuing to expand, with over \$730 million invested in construction since 1999.

2.4 Central Plant

This campus has a central plant with gas fired boilers and electrically driven chillers. A satellite plant houses additional chillers. The plant has no cogeneration.

The steam plant has four boilers with operating capacities of 30,000 lb/hr for three and 40,000 lb/hr for one. The boilers were derated to this output when low NOx burners were installed in 1991. The large boiler has both a selective catalytic reduction (SCR) unit with anhydrous ammonia injection and an economizer for lower emissions and higher efficiency. It operates more hours than the other boilers. There is room in the plant for one additional

large boiler. The operating pressure of the boilers is about 100 psig. Steam is distributed throughout the campus through tunnels to most buildings. Approximately 80% of the condensate is returned in the range of 140 to 150°F. No steam or chilled water is supplied to dormitories.

The chilled water system comprises five electric centrifugal chillers in the steam plant with a total capacity of 6,250 tons and two similar chillers in the satellite plant with a total capacity of 4,000 tons. All of the chillers feed into the same loop and all are operated at 4,160 volts, constant speed. The chillers at the steam plant are arranged in a series configuration, able to cool chilled water from 60 to 38°F.

There are two chilled water storage tanks with a combined capacity of 5 million gallons. A third tank is planned. The chillers are never run from noon through 6 pm during any time of year. During summer days the chillers may operate the other 18 hours per day to charge the tank and cool the campus. During winter days the chillers may only operate from 10 pm to 5 am.

Electricity is purchased from Riverside Public Utilities through a flat rate schedule. The thermal energy storage system is operated under a commitment to Riverside Utilities, which paid for a portion of the chilled water tanks.

This plant is properly configured to take advantage of the historically low electric rate from Riverside Utilities. Should electric rates increase in the future to state wide levels cogeneration could become cost effective. The existence of the high pressure steam distribution system as the thermal load for a potential cogeneration plant would likely lead to the selection of gas turbines as prime movers for cogeneration (as opposed to engines). This could require the addition of some absorption chiller capacity to increase the summer steam load.

There are several opportunities for energy efficiency projects in the central plant which have not been quantified in this report. These include adding VFDs to the cooling tower fans, which currently operate with two speed motors, and adding VFDs to the boiler forced draft fans.

2.5 Strategic Energy Plan Buildings

The following 32 buildings were investigated as part of this SEP effort, and were selected using the criteria described above. The total gross area of the SEP buildings represents 3,392,130 square feet, or 65% of the campus gross area (exclusive of parking).

Table 2.4: SEP Buildings

Building Key	Building Name	Basic Gross Area - Non-assignable Parking Area
05CP5186	BIOLOGIC SCI	54,300
05CP5194	ENGINEERING2	157,987
05CP5224	BOOKSTORE	32,139
05CP5261	BOURNS	157,189
05CP5301	INSECTARY	8,783
05CP5307	HUM & SOC SC	105,966
05CP5322	RIVERA LIB	225,413
05CP5323	SPIETH	100,927
05CP5334	PE	66,335
05CP5335	GEOLOGY	96,019
05CP5341	BOYCE	124,321
05CP5342	WEBBER	48,565
05CP5343	ABER INVER	203,939
05CP5354	WATKINS	62,237
05CP5380	CAMPUS SURGE	72,340
05CP5411	ARTS	106,659
05CP5414	PHYSICAL SCI	134,709
05CP5417	ENTOMOLOGY	69,417
05CP5418	SCIENCE LIB	175,719
05CP5480	HINDERAKER	44,873
05CP5497	OLMSTED	92,594
05CP5501	BATCHELOR	105,334
05CP5502	LOTHIAN HALL	246,791
05CP5504	PHYSICS	89,541
05CP5508	PIERCE	141,355
05CP5511	STU REC CTR	86,048
05CP5523	SPROUL	78,834
05CP5588	STAT COMP	41,939
05CP5715	UNV PLZA APT	72,544
05CP5722	UCR EXTEN CT	127,802
05CP5991	STONEHAVEN	158,511
05CP5998	INTER VILLAG	103,000

2.6 Recent Energy Project Inventory

The campus has actively participated in the UC/CSU/IOU Partnership Programs. The projects in Table 2.5 were implemented during the 2004-05 Partnership cycle. Since they were implemented no later than calendar year 2005, the associated energy savings are considered to be reflected in the historical energy use data gathered for 2006-07. Therefore, no adjustment has been made to the campus' baseline energy use.

Table 2.5: 2004-05 UC/CSU/IOU Project History

Building	Project Description	Electric Savings (kWh/yr)	Gas Savings (th/yr)
Boyce Hall	Boyce Hall Fume Hood Occupancy Sensor		59,475
Entomology Building	Entomology Bld Fume Hood Occupancy Sensor		23,003
Insectary Building	Insectary Bld Fume Hood Occupancy Sensors		3,487
Science Lab	Science Lab Fume Hood Occupancy Sensor		82,848

The projects in Table 2.6 are planned, or may have begun during the current 2006-08 UC/CSU/IOU Partnership, but were not substantially complete prior to the FY06-07 historical energy use baseline. Since they are scheduled for implementation, the SEP has considered these projects in a couple of ways. First, the recommendations in this report do not include these projects, thereby avoiding duplication of measures. Second, the 2006-07 baseline energy use has been adjusted by the anticipated energy savings for baseline energy use to compare the proposed projects to, and for the comparison of, building benchmarks. Details of savings for each project in SEP buildings and the associated adjustment in baseline energy are reflected on the building summary sheets later in this report.

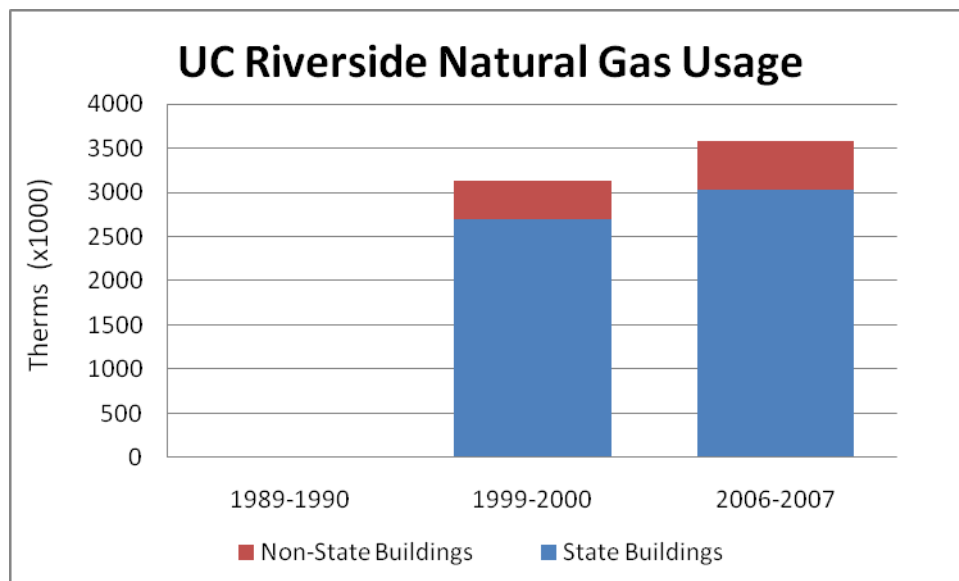
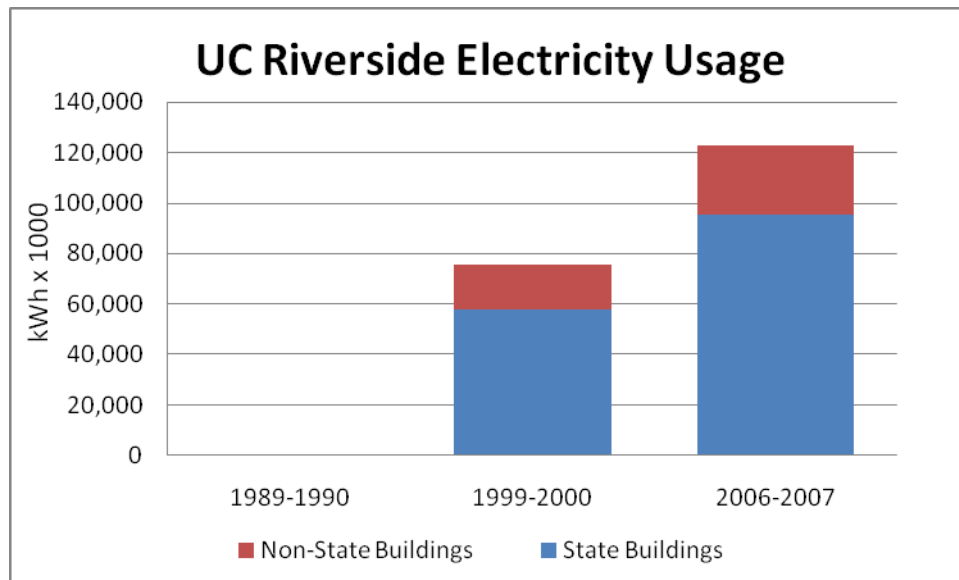
Table 2.6: 2006-08 UC/CSU/IOU Project History

Building	Project Description	Electric Savings (kWh/yr)	Gas Savings (th/yr)
SEP Buildings			
Boyce Hall	Boyce Hall - Heat recovery ventilation	0	94,038
Physical Science	Physical Science - Office exhaust into air intake plenum	0	6,584
Non-SEP Buildings			
Central Steam Plant	Central Steam Plant - Add economizer to #4 boiler	0	78,073

3. HISTORICAL CAMPUS ENERGY USE

3.1 FY 99-00 and 06-07 Energy Baseline

Purchased electricity and natural gas consumption for the University of California, Riverside are provided in the graphs below. The University of California Office of the President has provided information on purchases for fiscal years 1999-2000, 2005-2006, and 2006-2007¹. Reliable information is not currently available for the fiscal year 1989-1990. The information is divided between state-funded buildings (shown in blue) and non state-funded buildings (shown in red). Savings from energy efficiency projects will use the fiscal year 2006-2007 as the baseline for comparison.



¹ Campus PU Costs & Usage State & NonSt.xls

4. HISTORIC BUILDING ENERGY USE

4.1 Existing Metering Infrastructure

Three types of metered historical energy use data were requested from UC Riverside energy management personnel – total annual, total monthly, and interval data for one summer and one winter week. An effort was made to obtain this data for each of the four utilities present on the UC Riverside campus – electric, gas, chilled water, and steam. However, building-level meter data was only available for electricity and gas consumption at a handful of buildings.

The percentage of SEP buildings on the UC Riverside campus for which metered electricity and gas consumption was available is shown in Table 4.1. This table also shows estimates of the percentage of non-metered buildings, applying the assumption that if data was not provided it was because the building lacked a functioning meter. This may slightly overestimate the number of buildings without meters, as other causes for missing data were occasionally reported by energy management personnel throughout the UC system.

Table 4.1: Building Electric and Gas Meters

SEP Buildings									
Metered				No Metered Data Available				SEP Buildings with Local Gas	Total SEP Buildings
Electric		Gas		Electric		Gas			
3	9%	2	22%	29	91%	7	78%	9	32

The number of SEP buildings for which chilled water and hot water consumption was available is shown in Table 4.2. Again, it is assumed that the SEP buildings with no metered data lacked a functioning meter.

Table 4.2: Building BTU Meters

SEP Buildings									
Metered				No Metered Data Available				SEP Buildings with Distributed Heat	SEP Buildings with Distributed Cooling
Heating		Cooling		Heating		Cooling			
0	0%	0	0%	23	100%	23	100%	23	23

We recommend that all SEP buildings that currently lack metered data be outfitted with a meter for each utility. The Monitoring Based Commissioning (MBCx) measures that we have outlined in Section 8.3 should provide meters for all of the SEP buildings. However, additional meters are appropriate for buildings that are below the 50,000 SF threshold that are large energy consumers.

4.2 Individual Building Metering

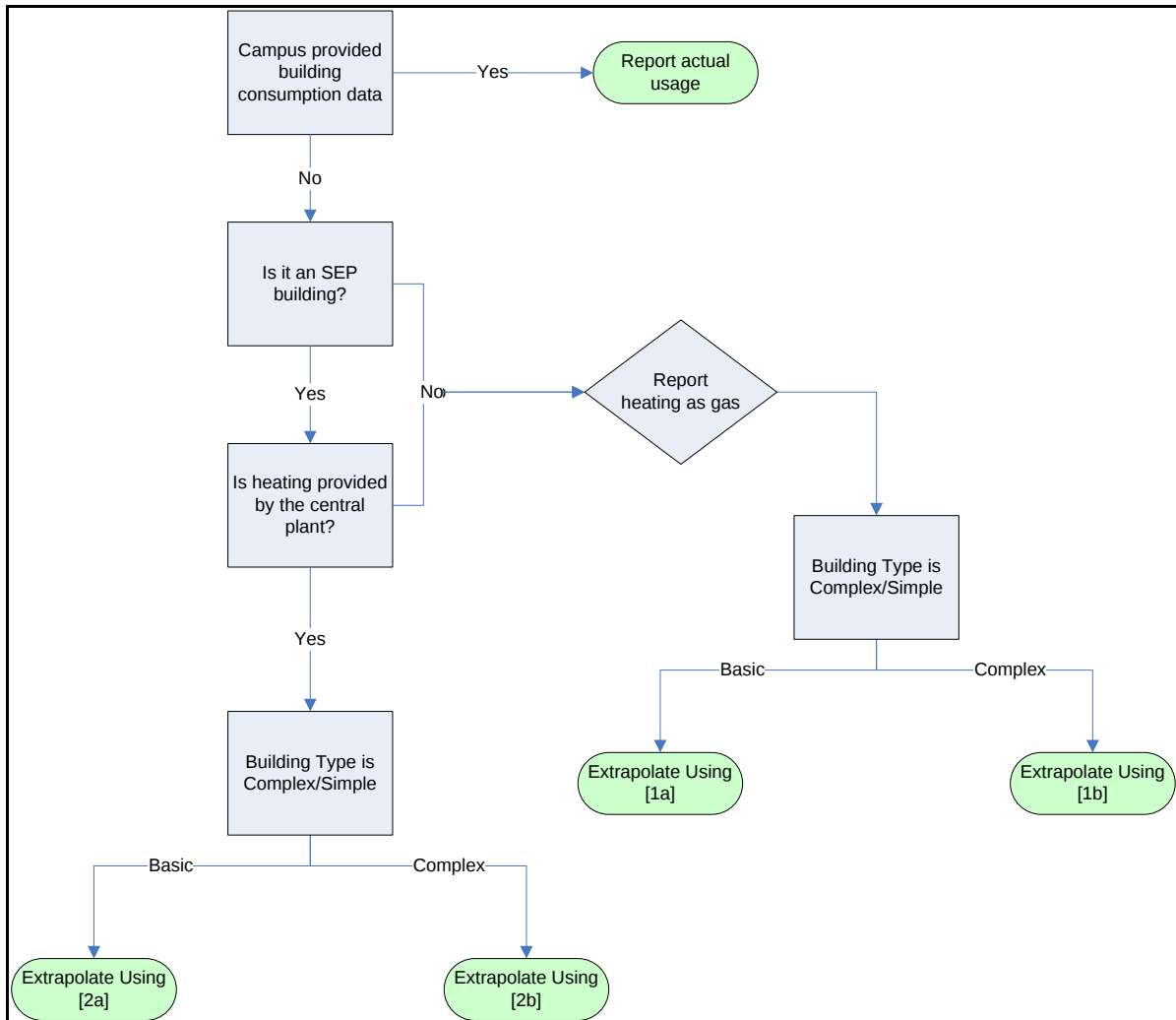
Where available, the annual historical energy use for the SEP buildings has been incorporated in this study. Where no meter data was available, an estimate of building energy use was made based on campus average values. The sample of buildings with metered data was too small to allow a reliable estimate of the campus average; therefore a campus average was estimated for electricity, gas and steam consumption based on total campus energy purchase data. For chilled water consumption, a median value from the sample of other campuses was applied. The sources of baseline building energy estimate data for UC Riverside are summarized in Table 4.3.

Table 4.3: Sources of Data Used for Baseline Building Energy Estimates

PREFERRED METHOD		
Use actual metered consumption		
ALTERNATE METHOD		
Extrapolate use using average values from the following sources		
	<i>Basic Buildings</i>	<i>Complex Buildings</i>
Electricity	derived from total campus electricity purchase	derived from total campus electricity purchase
Gas	derived from total campus gas purchase [1a]	derived from total campus gas purchase [1b]
Steam (SEP buildings only)	derived from total campus gas purchase [2a]	derived from total campus gas purchase [2b]
Hot Water (SEP buildings only)	no hot water distribution	
Chilled Water (SEP buildings only)	median value from other campuses	median value from other campuses

Using the various sources described in Table 4.3, factors with units of energy use – kWh, therm, MMBtu, or ton-hour – per gross square foot were developed for each of the energy use categories in the left column of the table. A procedure was required to apply the appropriate factors to each building. For SEP buildings, this procedure relied on the building classification – “basic” or “complex” – as well as field data that described the types of utilities present at the building. A sample of the decision structure applied to each building to determine the appropriate energy use factors for steam and gas is shown in Figure 4.1. Similar structures were used to apply appropriate factors for electricity and chilled water.

Figure 4.1: Decision Structure for Estimating Building Steam and Gas Consumption*



* [1a] – [2b] refer to the factors described in Table 4.3

The building energy consumption estimated by applying campus averages to building area provides a rough measure of the baseline building energy use for buildings that lacked metered data. Significant differences between individual buildings within the Basic and Complex categories are not captured by the baseline energy extrapolation method. However, given its consistency with total campus energy use, this method provides a reasonable basis for comparison of energy savings estimates.

4.3 Building Energy Use Targets

The metered annual electricity and gas use is shown for the buildings where it is available in Figures 4.2 and 4.3. Data was only available for buildings classified as Basic. Energy use at Complex buildings is expected to be higher, on average. Despite the small sample of buildings there is a broad range of energy use intensities, with a factor of two between the lowest and the highest. Although there are significant differences from one building to

another, the performance of some buildings at a relatively low energy use per square foot indicates that there is room to move higher use buildings in that direction.

Figure 4.2: Electricity Use Index for UC Riverside Buildings with Meter Data

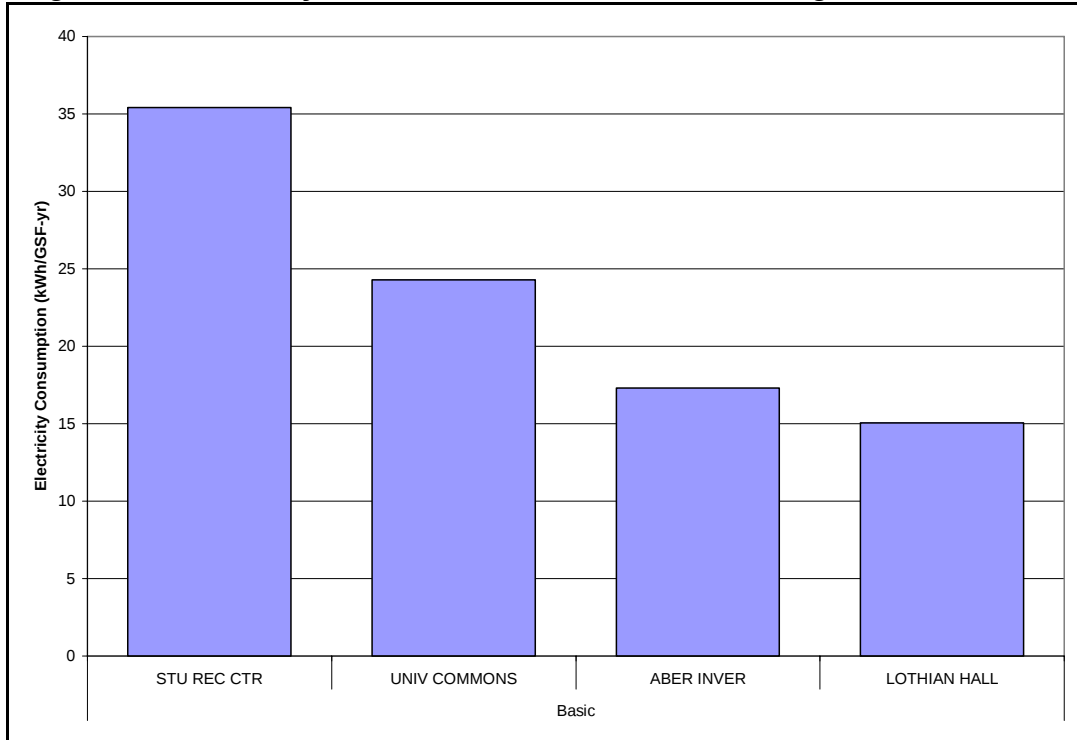
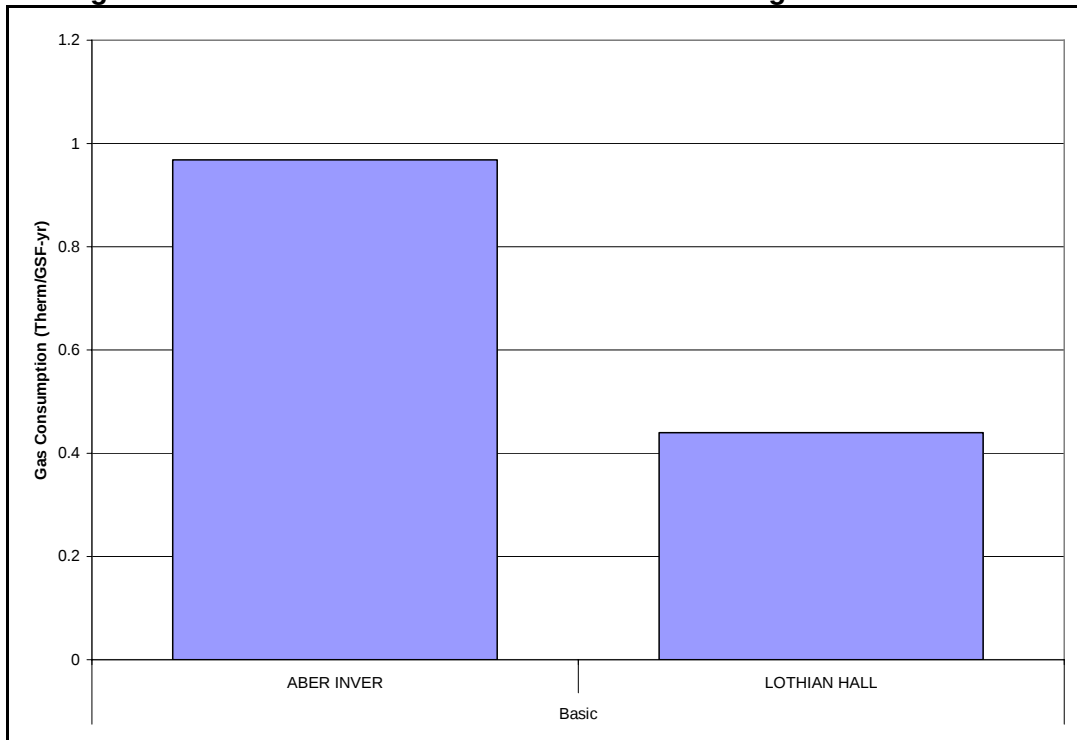


Figure 4.2: Gas Use Index for UC Riverside Buildings with Meter Data



5. UTILITIES

5.1 Providers & Tariffs

In the baseline 2006-07 Fiscal Year, electricity at UC Riverside was provided by Riverside Public Utilities, for both the commodity and transmission, through a flat rate schedule. The campus purchases natural gas commodity and transportation from Southern California Gas (SCG).

5.2 Procurement Options

UC Riverside currently purchases electricity from the local municipal utility. The campus has limited procurement options, but the campus is taking advantage of opportunities and should continue to explore other avenues if and when available. For natural gas, the campus could explore options to purchase the gas commodity through another supplier.

6. CAMPUS ELECTRIC INFRASTRUCTURE

Although the term “power quality” can be used to describe a variety of electrical generation and distribution system attributes, for the purposes of this study, issues that could result in additional energy charges from the utility were the focus. Primarily, these are conditions that cause a differential between campus and/or facility kW and kVA usage. When this differential is large enough, the utility will apply an additional charge, commonly referred to as a VAR charge. A review of the UC Riverside campus utility charges and discussion with facilities personnel confirms that there are no power quality issues of this type on campus.

7. RENEWABLE ENERGY GENERATION

7.1 Technologies

Sustainable energy sources are available in many types and forms, including photovoltaics, fuel cells, and wind power. The use of direct solar heating as an alternative energy source is discussed under Section 8 of this report.

Fuel cell infrastructure and operational requirements typically give this type of generation project an unacceptably long payback, unless the cell was designed to be installed as part of curriculum or research requirements. As such, fuel cell use was discounted. Additionally, wind patterns in and around the buildings at the campus were not conducive to a reliable pattern that could sustain sufficient power generation to make a wind power project viable.

Photovoltaic sources were identified as the most cost-effective and readily available means of sustainable energy. The remaining evaluation of sustainable energy on campus is focused on this technology. The most efficient, least intrusive form of this technology is a relatively flat, non-penetrating array mounted on a rooftop or parking structure canopy. This resource is available from several sources around the globe, and is not considered proprietary. Available square footage for power production assumes maximum exposure at a low angle of incidence, along with regular access and maintenance of the equipment. Due to the potential for substantial variance in the availability of incentives and funding for installation due to existing public utility agreements, third-party power contracts, and the potential for existing renewable resources already in use at the campus, no incentives are included to offset construction costs.

7.2 Existing Equipment

There are currently no major renewable energy installations at the University of California, Riverside.

7.2.1 Potential Projects

There are 3.9 MW of potential rooftop photovoltaic available to be developed at the existing campus buildings. The University's cost of Power Purchase Agreement photovoltaic power used in this report is assumed to be \$0.02/kWh above available retail power for investor owned utility customers for the first 1 MW of photovoltaic power, assuming the third party receives the utility incentives, tax credits and so on. The University's cost of PPA PV power for all capacity beyond the first 1 MW is assumed to be \$0.04/kWh above available retail power for IOU customers. It is assumed that the campus will have access to the Renewable Energy Credits associated with this power, at least in time for the 2014 and 2020 target dates.

The study identified a total photovoltaic potential of 3.9 MW of system capacity at an estimated construction cost of \$35M. System locations and details are listed in the table below. Based on the California Energy Commission's Clean Power Estimator tool, the annual output of the system is estimated at 6,660,875 kWh.

Table 7.1: Photovoltaic Project Potential

Building Name	Building Number	Gross Roof Area (sf)	Available Roof Area (sf)	PV Power Density (W/sf)*	PV System Capacity (kW)	Estimated Annual Power Output (kWh/yr)**	Estimated PV System Construction Cost***
ENGINEERING2	05CP5194	36,320	25,424	8.5	216	370,186	\$1,944,936
BOURNS	05CP5261	58,669	29,102	8.5	247	423,740	\$2,226,303
RIVERA LIB	05CP5322	72,744	57,555	8.5	489	838,030	\$4,402,958
PE	05CP5334	31,782	25,426	8.5	216	370,215	\$1,945,089
WATKINS	05CP5354	40,224	32,180	8.5	274	468,557	\$2,461,770
ARTS	05CP5411	33,268	22,358	8.5	190	325,544	\$1,710,387
SCIENCE LIB	05CP5418	14,722	7,972	8.5	68	116,076	\$609,858
OLMSTED	05CP5497	48,750	38,890	8.5	331	566,258	\$2,975,085
BACHELOR	05CP5501	33,862	21,712	8.5	185	316,138	\$1,660,968
LOTHIAN HALL	05CP5502	32,777	20,024	8.5	170	291,559	\$1,531,836
PHYSICS	05CP5504	36,346	25,442	8.5	216	370,448	\$1,946,313
UNIV COMMONS	05CP5510	37,560	30,048	8.5	255	437,514	\$2,298,672
STU REC CTR	05CP5511	69,930	46,042	8.5	391	670,395	\$3,522,213
SPROUL	05CP5523	24,000	17,828	8.5	152	259,585	\$1,363,842
UNV PLZA APT	05CP5715	25,590	20,472	8.5	174	298,083	\$1,566,108
UCR EXTEN CT	05CP5722	36,020	21,612	8.5	184	314,682	\$1,653,318
UCR EXTEN CT PKG		20,500	15,375	8.5	131	223,868	\$1,241,531
UCR Campus Total			457,462		3,888	6,660,875	\$35,061,187

* Based upon CEC typical PV module rating.

** Based upon 1713 equivalent full load sun-hours per year, calculated using Clean Power Estimator (<http://www.consumerenergycenter.org/renewables/estimator/index.html>) for a Simple Commercial PV System, 5 degree tilt, south facing system in zip code 92521.

*** Based upon \$9.00 per watt for roof installation, or \$9.50 per watt for parking structure installation, exclusive of tax credits, rebates, or incentives.

8. RECOMMENDED ENERGY EFFICIENCY PROJECT DESCRIPTIONS

The projects identified in this SEP are described below, and the project titles are referenced for each applicable project on the individual Project Summary pages later in this report. While there are often alternative technologies or approaches to projects that can be considered for a given retrofit, this report's recommendations focus on projects that can be implemented cost effectively with available technologies and methods. Where appropriate, alternate approaches and considerations are discussed for projects considered but not included as a recommendation of this SEP.

For ease of reference, all SEP projects have been assigned an SEP ID Number. The SEP ID number consists of one letter followed by four digits, and is a unique number that will help easily locate projects. The SEP ID number has been included on the Building Overview pages later in this report, and the Project Summary section of this report is organized by SEP ID number to allow easy location of a project.

8.1 Lighting Projects

The Strategic Energy Plan includes a projection of the magnitude of lighting energy efficiency projects in each SEP building, and, where the information was available, in smaller buildings as well. The plan addresses fluorescent building lighting in some detail. It also identifies potential energy savings in interior HID lighting, as well as parking garage lighting and some outdoor lighting.

8.1.1 Lighting Project 1. Interior Linear Fluorescent Lighting

The standard project for fluorescent light fixtures is to use a state of the art lamp and ballast combination to limit each pair of fluorescent lamps and ballast to approximately 42 watts. This can be achieved through different combinations of lamps and ballasts according to each individual campus's preference. Unless a campus expressed a specific preference, the default retrofit used for the analysis was to replace existing 32W T8 lamps and any remaining T12 lamps and their associated ballasts with 28W T8 lamps and premium efficiency ballasts with low ballast factors. The resulting fixtures typically operate at slightly lower light levels relative to the existing levels, but their improved color rendition has been shown to increase or maintain the perceived light level. Campuses can factor in color temperature, lamp life, lamp standardization, ballast standardization and a number of issues into their design.

8.1.2 Lighting Project 2. Interior Lighting Controls

Another standard lighting project is to install occupancy control in rooms that do not currently have occupancy control. The analysis accounts for the fact that most campuses already have occupancy sensors in some buildings, primarily in offices and classrooms. Some campuses have early generation occupancy sensors in classrooms, many of which have been disabled at the request of faculty and staff. Newer "dual technology" occupancy sensors, which detect both motion and heat, are much more reliable than the older technology, which was prone to turning off lights when occupants were not moving.

Occupancy sensors are recommended in this report for all classrooms, offices, meeting rooms, restrooms, lecture halls, auditoriums, storage areas, some library spaces, and a

portion of residential areas. They are not recommended in this report for laboratories, animal quarters, greenhouses, food service areas, museums, or medical service areas. On average, occupancy sensors are assumed to reduce lighting energy use by 25%, per utility incentive standards.

The lighting recommendations also include daylight harvesting. Daylight harvesting should be applied to fixtures near skylights or windows, in areas that are overlit when sunlight is entering the building. Daylighting controls are assumed to apply to 10% of the fluorescent fixtures in classrooms, lecture halls, libraries, athletic areas, and common spaces, and 5% of fixtures in offices. For those fixtures, the daylighting controls are assumed to reduce energy use by 75% after occupancy sensor control.

8.1.3 Lighting Project 3. Stairwell Lighting

There is a significant energy savings potential from the lighting in stairwells. The standard project for these fixtures is to replace them with bi-level fluorescent fixtures. Bi-level fixtures are controlled by occupancy sensors that reduce lighting levels to a low standby mode when the space is unoccupied. The fixtures are specifically designed to meet fire code requirements for stairwells.

It is recommended that UC replace every stairwell fixture in the system with this technology.

8.1.4 Lighting Project 4. Interior High Bay Lighting

Interior high intensity discharge (HID) fixtures are identified for conversion to fluorescent sources, generally T8 or T5 lamps, with occupancy sensor control. These are typically located in gymnasiums, sports facilities, swimming pools, and other high ceiling areas. Fluorescent has become the standard design for efficient lighting in high bay applications because of the relatively efficient output of the fluorescent sources, the higher output capacity of the T5 lamps, better color rendition, and the instant-on capability that permits occupancy control.

8.1.5 Lighting Project 5. Parking Garage and Outdoor Pole Lighting

Fluorescent lighting is a common conversion for parking garage lighting as well. A number of garages are lit with high pressure sodium (HPS) fluorescent fixtures, so the conversion to two or three lamp T8 fluorescent fixtures provides a significant energy savings and much improved color rendition. The lumen level is not necessarily maintained in these conversions, but occupant satisfaction is maintained. Some campuses are experimenting with bi-level garage lighting, controlled by occupancy sensors. This can be applied to HID as well as fluorescent light sources. Others have chosen to replace HID lighting with induction lighting, which is a more expensive technology that has much longer lamp life than any other technology.

Campuses also have a significant amount of outdoor pole lighting, along sidewalks, in parking lots, and on the roofs of parking garages. Pole lighting is commonly LPS, HPS, or HID technology. LPS and HPS fixtures can be retrofitted with fluorescent technology, and metal halide fixtures with pulse start metal halide or fluorescent technology.

One campus, UC Santa Barbara, has chosen to replace existing HPS pole street lights with new LED technology. LED technology is currently quite expensive, but has great potential for energy savings.

8.1.6 Campus Specific Lighting Survey Details

Campus staff reported that nearly all linear fluorescent lighting in campus buildings has been upgraded from T12 to first generation T8. A few buildings still have T12 lighting throughout, along with a few scattered classrooms. One notable exception to the linear fluorescent lighting standard is Bournes, which is lit by HID fixtures throughout. Occupancy sensors have been installed in approximately 25% of campus buildings, most commonly in offices, but not in classrooms.

Many residential halls have a significant amount of T12 and incandescent light fixtures. There are no occupancy sensors in any residential buildings, with the exception of the stairwells in Lothian and Aberdeen, which have bi-level stairwell fixtures.

The energy density of the lighting was estimated based on sampling done by SEP lighting auditors. Areas with T8 lighting were estimated to have 1.27 watts per square foot, and areas with T12 lighting were estimated at 1.75 watts per square foot. Energy densities in this range were found to be typical of most UC campuses. The difference in energy density between T8 and T12 lighting is partially accounted for by the differing efficiencies of the fixtures, but also by the layouts of the design. It is assumed based on sampling results that areas with T12 lighting have a higher fixture density because they are in older buildings.

All gyms are lit by HID fixtures.

8.1.7 Other Projects & Technologies to Consider

Potential Lighting Alternate 1. Integrated Classroom Lighting System

The Integrated Classroom Lighting System (ICLS) has been developed and promoted by the California Energy Commission's PIER Program. ICLS combines direct-indirect fluorescent fixtures with occupancy and daylight sensors, and plug-and-play interconnection cables, to provide a highly energy-efficient system that offers teachers more control and flexibility than conventional systems. ICLS has been demonstrated to demand an average of 0.6 to 0.85 watts per square foot, compared to more conventional systems, which typically draw between 0.8 and 1.4 watts per square foot.

PIER has found that the cost of installing ICLS in new construction projects is often equal to or lower than for conventional systems, because the system is available as an integrated package. New construction or renovation costs have been in the range of \$3,000 to \$4,000 per classroom. Installing ICLS as a retrofit is less cost-effective at current prices. UC Berkeley installed a few ICLS systems with an added dimming feature, at a cost of approximately \$9,000 per classroom. Although the cost of ICLS can be high relative to conventional systems, it is expected to drop to competitive levels within the next six years.

Potential Lighting Alternate 2. LED Exterior and Interior Lights

LED lighting is a technology with significant energy-saving potential. Although the current cost of LEDs is significantly higher than more conventional systems, costs are expected to drop significantly within the next few years. With their anticipated drop in cost and extremely high efficiency, LEDs should be seriously considered for applications at the UC campuses within the next six years.

Historically, LEDs have been used for specialized lighting applications that required bright point sources of light, but products are quickly emerging to address more standard commercial and residential lighting needs. Every UC campus is now using LED exit signs in their buildings, and LED stop lights have also become standard. UC Santa Barbara is currently planning to replace nearly 400 high pressure sodium (HPS) pole fixtures with LED pole fixtures, a project that will save an estimated 40% of the lights' energy use. UC Davis has installed bathroom vanity lights in two residence halls that use LED technology. The vanity light combines a one watt LED nightlight with an occupancy sensor controlling the overhead light.

Other emerging LED technologies applicable to the UC system include exterior pathway lights, exterior wall packs, office and classroom task lighting, and cabinet undermount fixtures.

Potential Lighting Alternate 3. Wireless Lighting Controls

A promising technology for lighting control is the wireless mesh network fixture controller being developed by Adura Technologies of San Francisco. This is a technology which was developed at the UC Berkeley Center for the Built Environment. Several test sites have been installed in UC Berkeley buildings.

The controller under development is a device to be installed in every light fixture in a ceiling grid. It can turn one or two ballasts in a fixture on or off. The controller measures power use by the fixture so it can report back on actual operations. Wireless sensors are installed in the building in appropriate locations to measure occupancy, ambient light, and so on.

The wireless mesh network allows the controllers and sensors to communicate with each other. An internet portal in the building gives access to web based software which is used to configure the system. A variety of logic applications can be used to control fixtures individually or in groups. One set of ambient light sensors might be used to turn off or reduce output from all fixtures on a west face. Occupancy sensors can be programmed to control any set of fixtures. The controllers themselves are programmed to respond to certain sensors as well as time control settings. Once programmed the mesh network can operate itself optimally with no external input. Or it can be used to control fixtures according to a web based signal, such as a demand response incident.

Wireless mesh network lighting controllers promise extensive lighting control (time scheduling, occupancy sensor, daylight harvesting, and demand response) with power measurement and a relatively low first price. No wiring outside of the fixture is required, saving time and complexity.

One feature not likely to be offered is dimming control, but with relatively low power fixtures, as well as individual ballast switching, this offers diminishing returns. This product is expected to be commercially available in one to two years.

8.2 HVAC Projects

8.2.1 Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume

This project converts constant volume air handlers with terminal boxes to variable air volume. This project concentrates on larger air handlers which may be dual duct, multizone, reheat, or other constant volume configuration. These air handlers serve the zones through terminal boxes which may be mixing boxes or reheat boxes, often including pressure independent devices and sound attenuators.

The project involves installing VFDs on the supply and return fans to allow the air flow to vary according to the load. In addition, a retrofit kit (damper, actuator, flow measuring station) is installed on each of the terminal boxes to convert it into a pressure independent variable volume device. This kit includes direct digital controls, which increases the cost but greatly increases the functionality. A large multizone air handler could fit in this category as well, with a retrofit kit installed in each zone duct and a two position actuator applied to the existing mixing dampers.

The retrofit allows the zone temperatures to be properly controlled with less simultaneous heating and cooling energy use. In addition, reduced air flow requirements and lower operating static pressures will result in fan energy savings.

In some cases, the air handlers have existing variable volume devices such as variable inlet vanes (VIV) or varicone flow devices, which are generally less efficient than modern VFDs, and may not be working optimally. In these cases, the project would replace the existing flow control device with a variable frequency drive, and the existing flow control is reflected in the project costs and savings.

The savings are calculated for this project through a bin simulation adjusted for local weather, operating hours, building load characteristics, air handler flows and configuration, and temperature control strategies.

The cost for implementing this project includes variable frequency drives for the supply and return fans, retrofit kits with DDC for each zone terminal box, and a control strategy to optimize the air flow and static pressure from the supply fan.

This project does not apply to air handlers that serve patient areas in the medical centers, as they are required by OSHPD to operate at constant volume all of the time. It does not apply to laboratory air handlers, where more elaborate air flow control devices are needed.

8.2.2 Air Handler Project 2. Convert Constant Volume Air Handlers to Variable Air Volume

This project converts constant volume air handlers that do not use terminal boxes to variable air volume. This project concentrates on medium size air handlers which may be single zone, dual duct, multizone, reheat or other constant volume configuration. These air handlers do not serve zones through terminal boxes but through simpler reheat coils or

mixing devices that do not have pressure independent controls. Large single zone air handlers without specific zone temperature control will fall into this category as well.

The project involves installing VFDs on the supply and return fans to allow the air flow to vary according to the load. A retrofit kit is not installed at each zone temperature controller because there are not standardized boxes, the zones tend to be smaller and more numerous. Older construction tends to include plaster ceilings and other access constraints.

In the case of a single zone air handler the VFD controls will be integrated into the current temperature controls to reduce the air flow to a minimum flow rate when the thermostat is not calling for full heating or cooling. For the other air handlers with zone temperature controls the retrofit includes DART wireless supply air temperature sensors or equivalent. This wireless control system allows the fan speed to be slowed to a minimum flow rate whenever the zone temperatures are satisfied.

The retrofit allows the zone temperatures to be properly controlled with less simultaneous heating and cooling energy use. In addition, reduced air flow requirements and lower operating static pressures will result in fan energy savings.

In some cases, the air handlers have existing variable volume devices such as variable inlet vanes (VIV) or varicone flow devices, which are generally less efficient than modern VFDs, and may not be working optimally. In these cases, the project would replace the existing flow control device with a variable frequency drive, and the existing flow control is reflected in the project costs and savings.

The savings are calculated for this project through a bin simulation adjusted for local weather, operating hours, building load characteristics, air handler flows and configuration, and temperature control strategies.

The cost for implementing this project includes variable frequency drives for the supply and return fans, wireless remote supply air temperature sensors for representative zone supply registers and a control strategy to optimize the air flow and static pressure from the supply fan.

This project does not apply to air handlers that serve patient areas in the medical centers, as they are required by OSHPD to operate at constant volume all of the time. It does not apply to laboratory air handlers, where more elaborate air flow control devices are needed.

8.2.3 Air Handler Project 3. Demand Control Ventilation

This project adds a carbon dioxide sensor to air handlers that serve areas with highly variable occupancies, such as lecture halls, theaters, gymnasiums. Measurement of the carbon dioxide level is used to reset the minimum outside air flow function of the outside air economizer according to occupancy requirements. The project includes a carbon dioxide sensor which is usually located inside the lecture hall or building space. This will result in the heating and cooling of less outside air when it is not needed for ventilation.

The minimum flow of outside air into the air handler has typically been designed according to full occupancy of the space. For example, if there are 200 seats in a lecture hall the minimum outside air flow may have been determined by multiplying 15 cfm per person (or

seat) times 200 seats, or 3,000 cfm. The outside air economizer would be adjusted never to drop below this level.

In the modified case the minimum outside air flow will be allowed to drop to lower levels as long as adequate ventilation is maintained for the number of people in the room, as indicated by the carbon dioxide levels. This is a standard control sequence required by Title 24 for new construction in high density spaces. Title 24 requires a minimum outside air flow rate of at least 0.15 cfm/sf, regardless of occupancy. This level of ventilation removes contaminants not related to human occupants. This level of outside air supply is typically found in office areas, so carbon dioxide sensors do not offer significant energy savings potential for offices and other areas that are never densely occupied.

The savings are calculated for this project through a bin simulation adjusted for local weather, operating hours, building load characteristics, air handler flows and configuration, and temperature control strategies.

The cost for implementing this project includes a carbon dioxide sensor, which can be factory calibrated with no need for additional calibration during its service life, and integration into the economizer control sequence. The campus can choose to monitor and log the carbon dioxide levels.

This project does not apply to air handlers serving office areas or other relatively low density areas. It does not apply to patient handling or laboratory air handlers where other outside air requirements exist.

8.2.4 Air Handler Project 4. Static Pressure Reset on Variable Air Volume Air Handlers

This project adds a static pressure reset capability to existing VAV air handlers that do not have direct digital zone controls. The current design static pressure setpoint may be the appropriate pressure to operate at during hours of high air conditioning load, but it is not necessarily needed during other hours of operation. This project automatically resets the static pressure to a level that maintains comfort conditions but is typically lower than the original setpoint.

There are two technologies commonly used to apply this control strategy. If the VAV system has direct digital controls at the room thermostats it is possible to use information from these thermostats to automatically reset the supply static pressure. It can be continuously reset so that a small portion of the VAV boxes are calling for full cooling. This would be an indicator that the pressure is operating at as low a point possible. For air handlers with DDC at the zones, this is a control sequence change which could be addressed in the commissioning project. The cost for reprogramming is relatively minor and so is not included in this section as a project.

Other VAV air handlers do not have DDC at the zone level, and so do not provide this type of feedback. An alternative control strategy will be used to address this situation, SAV with InCITe offered by Federspiel Controls. This system uses air flow measurement at the air handler to quantify the building load and resets the supply air pressure accordingly. This control sequence has been installed in several UC buildings over the last several years. The cost and savings for applying SAV with InCITe to air handlers without DDC zone controls are included in this project.

This approach to resetting supply pressure setpoints reduces fan energy use during part load conditions, while continuously meeting comfort requirements. The savings are calculated through a bin simulation adjusted for local weather, operating hours, building load characteristics, air handler flows and configurations and temperature control strategies.

The cost of implementing this control involves either reprogramming the DDC system or installing the SAV with InCITe system. Either process requires fine tuning for optimal performance.

This measure should apply to all existing VAV air handlers except in laboratories or other areas where static pressure control of the spaces is critical. It also applies to air handlers

8.2.5 Air Handler Project 5. Reduce Air Handler Operating Hours

This project shuts down air handlers during nights and weekends, when the areas they serve are not in use. This applies to classroom buildings, offices, lounges, gyms and libraries. These air handlers may operate continuously now in order to cool a server or telecom closet. Or they may operate to condition the building in case someone comes in to work during non-business hours.

The building needs can typically be met by means other than running the air handlers continuously. In the case of the cooling needs of servers, the first choice would be to locate these servers in data centers where they receive cooling as needed, conditioned power, UPS backup, and continuous staffing. If there are servers or telecom equipment which cannot be relocated outside the building, they should be conditioned during nights and weekends by either split heat pumps, or dedicated chilled water coils where chilled water is continuously available.

In the case where the comfort of faculty, staff or students is critical during non-standard hours, these requirements can be met in several ways with existing control systems. For example, the space temperature of the buildings can be monitored during the nights and weekends so when it drifts outside a given comfort zone (perhaps 65° to 80°F) the air handler can operate as long as necessary to reestablish temperature control. The air handler would then shut off again until the building drifts outside of the setback temperature control points again. Some faculty or staff could also be given phone in access to the building control system to allow them to request air handler operation for several hours at a time when they find the temperature unacceptable.

The intention of this project is to provide a similar level of service to the University occupants that they currently enjoy, but at a lower energy use. The cost of this modification will be based on the number of spot cooling devices which may be necessary to serve specific building hot spots. The programming portion for the DDC system is not particularly expensive, as this is a standard control sequence. Temperature monitoring may be needed in older air handlers without direct digital control. Specific application notes are listed below.

8.2.6 Air Handler Project 6. Convert Air Handlers to Direct Digital Control

This measure involves replacing pneumatic controls on larger air handlers with direct digital controls. The intention is that no air handlers with supply fans of 10 hp or larger be left

operating with pneumatic controls. The continued use of pneumatic controls creates problems in terms of calibration and drift, inadequate control sequences, inability to monitor and verify proper operation, incompatibility with demand response and inability to commission with lasting effect.

8.2.7 Air Handler Project 7. Outside Air Ventilation Heat Recovery

An energy recovery system is recommended in some facilities to capture heat or cooling from exhaust air and reuse some of it to precondition the make-up air before supplying it to the building. The type of heat exchangers or HVAC coils used to transfer this energy from the exhaust flow to the supply air can vary according to building design. Installation of a heat exchanger can result in significant energy savings in buildings that require a supply of 100% outside air. This was recommended for specific buildings in locations that experience significant variances in outdoor air temperature over the course of a year.

8.2.8 Air Handler Project 8. Kitchen Hood VFD

Demand ventilation controls are recommended for the university's larger dining facilities' commercial kitchen hood exhaust fans (typically 3 hp and up). Standard exhaust hoods consume a significant amount of energy because they constantly run at maximum flow and require make-up air that must be heated or cooled. By installing VAV hoods controlled by infrared smoke sensors and temperature sensors, supply and exhaust fan speeds can be adjusted to match actual cooking activity under the hood, reducing the excess energy consumed in between meal preparation times. These controls have already been installed in several UC campus dining facilities with positive results that have led to further installation requests.

8.2.9 Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume

The intention of this project is to convert laboratories to variable air volume systems and reduce the large outside air heating, cooling and fan power loads. Many existing labs are constant volume reheat systems, with a fixed air flow coming from the air handlers being reheated at the laboratory and exhausted through the constant volume hoods or room general exhaust. Most new laboratories utilize VAV air handlers and fume hoods. The intention of this project is to update the configuration of the existing labs so that they can operate as efficiently as the new labs. The UC EH&S Laboratory Safety Design Guide Second Edition September 2007 states "All laboratories should contain a fully integrated laboratory variable air volume (VAV) airflow/pressure control system to control room temperature, ventilation rate and room pressurization."

This project starts with a review of the air balance requirements of the facility. The air flow needs of each room are determined according to the function of the room, the number of hoods and the internal and external heat loads. This air balance may be significantly reduced from the existing design because of better understanding of actual loads or better design parameters. The minimum air changes typically needed in a laboratory are 6 air changes per hour for a room with a 10 foot ceiling, per the EH&S Design Guide. A given lab may need higher minimums, depending upon the density of hoods.

The mechanical work includes converting the air handlers to VAV with the addition of VFDs to the supply fans. This may be appropriate for the exhaust fans as well, depending upon how they are ducted together. The hoods are converted to variable flow through the addition of an exhaust flow control valve and the sealing off of the sash bypass. If there are a small number of hoods in a larger room, these do not need to be converted to VAV, where the general exhaust requirements for the room are great enough that it makes no difference whether the air leaves through the hood or the general exhaust duct. The room supply air and general exhaust typically require new flow control valves or dampers as well to allow pressure control of each room. The exhaust fans may need stepping control and/or VFDs to maintain proper exhaust pressure in the duct and proper discharge velocity on the roof. The control systems should include supply temperature reset, utilizing either a DDC sequence or a controller such as DART, described above.

8.2.10 Laboratory Air Handler Project 2. Rebalance Variable Air Volume Laboratory (or Vivarium) Air Handlers

A number of newer laboratories at the campuses were designed and built with VAV fume hoods and air handlers. Some of these have presented opportunity for efficiency improvement through rebalance of their systems to provide desired minimum air change rates (6 ACH). The current air change rate may be higher if the labs were designed for standard heat loads that did not end up being installed in most places. In some buildings air changes were provided for future hoods that were not installed.

This project will readjust the air balance in the existing labs to meet the air flow requirements as the buildings are currently operating. Should the operations of a given laboratory change in the future, the air change rate can be adjusted just for that room through a similar process.

The work involved in implementing this project is the recalculation of air change minimum air flows for each lab, based on the current building loads and 6 ACH minimum. Where the building has a DDC system, the new minimum air flows are set for the boxes and the operation is observed for stability and temperature control. Where there is no DDC system a more involved air balance will be necessary, probably manually setting the minimum flows on the zone supply boxes. The existing static pressure controllers should provide the reduced air flow and fan savings when the minimum air flows occur. The control systems should include supply temperature reset, utilizing either a DDC sequence or a controller such as DART, described above.

8.2.11 Laboratory Air Handler Project 3. Reduce Minimum Air Change Requirements through Continuous Monitoring

The first two Laboratory Air Handler Projects will reduce air change rates according to the needs of the individual rooms, with minimum flows set for 6 air changes per hour. This project will further reduce the minimum air flow setpoints in laboratory areas, with monitoring provided to raise the air change rate should a chemical spill be detected. The plan from the UC Irvine campus is to drop minimum air flow setpoints to 4 ACH during hours when the laboratories are normally occupied and to 2 ACH during other hours. This will further reduce the use of electricity to circulate the air, as well as heating and cooling requirements for the 100% outside air flow.

The approach at UC Irvine is comprised of a chemical monitoring system that monitors the concentration of a number of common gases. The currently proposed system is an Aircuity system which uses a central monitoring station physically connected by sampling tubing to perhaps 20 rooms. The air quality in each laboratory is sampled periodically, typically once every 15 minutes. Detection of high gas concentrations caused by a spill would automatically increase the air change rate in the affected lab. A push button in each lab could be manually activated to do the same.

Implementation of this measure requires approval of the campus Environmental and Health Safety department, which exists at UC Irvine. This may be considered by other campuses in the future, and has not been included as a project at UCR.

8.3 Monitoring Based Commissioning Projects

8.3.1 Monitoring Based Commission for All SEP Buildings

Monitoring Based Commissioning (MBCx) is recommended for all campus buildings of 50,000 sf and greater over the course of the next two utility funding cycles (six years). This process includes installing networked whole building meters on the buildings to automatically track electricity, steam, hot water, chilled water and/or natural gas use. It also includes a commissioning effort to review building operations, the functionality of controls, the appropriateness of sequences of operations, time scheduling, and numerous other building operation parameters. The process of identifying the SEP projects was a building survey, as opposed to an investment grade energy audit. The operational changes which would normally be identified in a detailed audit should be identified and resolved through the commissioning process.

Where capital projects have been identified for buildings, for example, convert to variable air volume or install variable flow fume hoods, it is recommended that the commissioning process be integrated with the retrofit process, even though it is included separately in the project list. This is a hybrid MBCx process which will result in the most expedient change in building operations. In the case where no retrofit projects have been identified the commissioning process can be implemented at any time. It is possible that the commissioning process will result in the identification of additional retrofit measures which can be funded and installed in a later process.

The budgets for the MBCx projects were projected based on the 2006-2008 Partnership Program applications. The average cost for MBCx in Basic buildings was \$0.61 per square foot. For Complex buildings the average cost is \$1.22 per square foot.

The projected MBCx energy savings for the SEP buildings are determined relative to the 2006-2008 Partnership Program applications. There is a 70% multiplier applied to all savings projections because the buildings already in the MBCx program were selected specifically for their potential, while the proposed SEP buildings are only selected based on size.

Basic building applications average electricity savings of 10% or 1.1 kWh/sf-yr, and gas savings of 15% or 0.15 th/sf-yr. Energy savings are projected to SEP buildings according to historical energy use of the building, if it is known. If historical energy use is not known,

savings are projected on the basis of the building area. In both cases a 70% savings scaling factor is applied.

Complex building applications average electricity savings of 9% or 2.7 kWh/sf-yr, and gas savings of 21% or 0.29 th/sf-yr. Energy savings are projected to SEP buildings according to historical energy use of the building, if it is known. If historical energy use is not known, savings are projected on the basis of the building area. In both cases a 70% savings scaling factor is applied.

In addition, MBCx was recommended for all central plants which have not previously been commissioned through the Partnership program.

8.4 Capital Program Projects

8.4.1 New Construction and Renovation from Capital Program

There is a significant opportunity to integrate energy efficiency with new construction and renovation of campus facilities. This is currently implemented through the Savings By Design process administered by the statewide investor owned utilities, as well as SMUD. It is anticipated that this program will be continued in the 2009-2014 utility portfolio. It is hoped that it can be integrated with the UC CSU IOU Partnership Program to become more effective.

The anticipated program modifications include the following: encourage energy savings of greater than 25% relative to Title 24 to earn the maximum incentive levels of \$0.25 per kWh and \$1.00 per therm; use the Partnership minimum required campus contribution of 20% rather than the Savings By Design requirement of 50%; remove the \$150,000 or \$450,000 cap per project; consider some up front engineering funding.

On the UC side the current process is hampered by severe competition for construction funds to implement the efficiency measures. Even when funds are set aside in the design budgets to meet the current UC goal of 20% below Title 24, efficiency measures are sometimes lost in "value engineering" during the construction process. There are typically not enough funds available to allow construction of buildings with the energy efficiency measures justified by life cycle costing.

The opportunity to use the energy efficiency bond money in new construction and renovation projects would create significantly more opportunities for the installation of energy efficiency in these projects. The potential cost and savings is projected for this analysis, assuming each project could reduce energy use by approximately 30% below Title 24 and assuming that the total investment to achieve this performance would result in a simple payback period of 7 years. It is possible that this performance level can be achieved with a shorter payback, or that higher percentage savings can be achieved with this payback period.

The potential cost and savings for this measure is based on the planned construction for the campuses, as detailed in the *2007-08 to 2011-12 Capital Program* document from the UCOP website. This includes construction and renovation projects on all campuses, independent of building funding source. The total project cost and savings were projected for individual projects, based on average performance numbers from existing UC buildings.

A projected 30% savings in Basic buildings is 3.3 kWh/sf-yr and 0.3 th/sf-yr. A projected 30% savings in Complex buildings is 8.9 kWh/sf-yr and 0.4 th/sf-yr.

These savings were projected to the building areas identified in the Capital Program document. Where building area was not directly identified, it was estimated from the project budget based on a projected construction cost of \$611 per gross square foot. This is based on the average construction cost of the projects where stated (\$917 per assignable square foot) and the observed ratio of gross square feet to assignable square feet from the UCOP comprehensive building list (1.5).

The *2007-08 to 2011-12 Capital Program* identifies hundreds of planned projects. Savings By Design projects for the Strategic Energy Plan were not calculated for projects which are currently on the UCOP list of Savings By Design projects underway through the current program. It was assumed that these projects are too advanced in the design process to switch to a deeper savings investment based on the proposed SEP process. In addition projects were not included on the SEP list if they are shown with an occupancy date of 2007-08 or 2008-09. It is assumed that these projects are too far along in design to allow significant changes. Once the new SEP program is underway, there may be an opportunity to include some of these projects, or to replace recommended measures that could not be supported in the original budget.

Also excluded from the SEP project list are buildings listed for occupancy in 2014-15 or later, parking structures, and general infrastructure projects. Several buildings were added to the list by request of a campus.

The projects listed include new buildings and renovation of existing buildings. In some cases the projects are not defined, but fall under general budgets, such as Campus Approved Projects Under \$5 Million. The total list assumes that energy efficiency is an integral part of each of these projects.

8.5 Deferred Maintenance and Capital Renewal Projects

There is a significant budget spent on deferred maintenance and capital renewal projects each year. This is an investment in returning buildings and equipment to proper operating condition. This often includes roof replacement, window replacement and chiller or boiler replacement. This project comes from a different source than the capital project funding.

Each campus produces a list based on a combination of priorities, although energy savings are typically not a factor. Although projects typically may save a nominal amount of energy, the replacement of this type of equipment typically has a long simple payback if calculated on energy savings only. Certainly some capital investment could be used to increase the efficiency of a project by improving the U value of a roof, increasing the performance of glazing or improving the efficiency of a chiller or boiler.

The budget that each campus has to spend on these projects is highly variable. It can be in the range of \$10 million per year in a good year.

It has been estimated that about 12% of these projects have an energy savings component. An increment of \$0.25 to \$0.5 million per year of deferred maintenance and capital renewal

projects is used in the SEP project list. The campuses could elect to include one or more of these projects per year in their SEP commitment.

8.6 Campus Wide Projects

8.6.1 Campus Wide Project 1. Refrigerators

It is recommended that all pre-2001 refrigerator units be replaced by Energy Star units. Old refrigerators can consume twice the electricity of a current Energy Star unit. Refrigerators are especially prevalent in universities where they are widely used in both academic and residential settings. Electricity and cost savings were calculated using the Energy Star calculator adapted for replacement of pre-2001 residential-type refrigerators on campuses.

Refrigerators in Housing – The number of refrigerators in housing per campus were estimated based on the total number of apartment-type housing and suite-type housing available on each campus. Where available, we used the numbers of housing refrigerators to be replaced, as specified by the campus.

Refrigerators on Campus – The number of refrigerators on campus was estimated based data provided by the UCB BETS database and prorated by the number of enrolled students at each campus. The BETS database provides an inventory of refrigerators that were purchased before 2001.

8.6.2 Campus Wide Project 2. Lab Freezers

It is recommended that all pre-2001 lab freezers be replaced by energy efficient units. According to New Brunswick Science (NBS), current energy efficient units consume half the amount of electricity of the industry average. Due to this significant waste of energy, Energy Star is currently developing standards for the industry. These units are especially prevalent in universities where they are widely used in research settings. Electricity and cost savings are calculated using data for ultra-low temperature (-86°F) upright lab freezers provided by NBS. While the Energy Star standards are currently being developed, this calculation can serve as an estimate for -20° to -30°F lab freezers as well by using an average industry installed cost of \$7,000. The number of ultra-low temperature lab freezers on each campus was estimated based on data provided by the UCB BETS database and prorated by the number of enrolled students at each campus.

8.6.3 Campus Wide Project 3. Server Virtualization

Server Virtualization maximizes the utilization of servers by installing virtualization software on existing servers and allows the elimination of idling or under-utilized physical servers. Energy savings potential was calculated based on deemed values provided by the SCE "Virtual Machine" calculator, version 6. The baseline server assumed the default values provided by the SCE calculator, whereas the proposed VM server used an average of two servers' specifications, "HP DL 585" and "Dell Blade 1955", servers that UC Berkeley are considering for future VM projects. The number of "virtualizable servers" per campus was estimated using data provided by the UC Berkeley IT Department and then prorated by the number of enrolled students per campus in Fall 2006. This includes both the decentralized servers across campus and servers that are in the data center servers. A ratio of ten

baseline servers consolidated onto one virtual machine was used based on a conservative estimate from past partnership projects.

Note that this project is based on the reduction in the number of servers operating and their local air conditioning load. Where a large air handler was operating continuously to cool a server, this measure was included in the HVAC projects.

8.6.4 Campus Wide Project 4. Network Computer Power Management Software/CRT

Network computer power management software is recommended to power down computers that are on the network when they are not being used. Network PC power management software energy savings potential was calculated based on deemed values provided by the Verdiem PG&E work paper. Installed cost was estimated by the retail price of the software with installation, and with additional maintenance and support costs. For each campus, the number of computers on campus was estimated based on data provided by UC Berkeley's BETS database and prorated by the number of enrolled students per campus in Fall 2006. The BETS database showed the number of computers on campus older than 5 years. To be conservative, we estimated that half of these computers represented the number of managed, networked-computers on which power management software could be installed. However, we recommend that power management software be installed on all managed, networked-computers.

CRT monitor to LCD monitor conversions were also recommended for each campus. Both the energy savings potential and cost were based on the Energy Star calculator for LCDs, adapted to represent conventional 17" CRT monitors to be replaced by Energy Star 17" LCDs. We recommend, however, that all CRTs be replaced with Energy Star LCDs to maximize energy savings.

8.6.5 Campus Wide Project 5. Install Controllers on Vending Machines

Vending machines and sliding-door coolers can easily be retrofit to use approximately 40 percent less energy using inexpensive controllers. To examine the potential for this efficiency measure, counts of sliding door coolers and two types of vending machines, refrigerated and non-refrigerated, were collected from the UC campuses. Information about existing measures to reduce the energy consumption of these machines (e.g. requiring service providers to use Energy Star machines) was also gathered to avoid duplication of those efforts. For campuses that were not able to provide vending machine data, typical values determined for the rest of the UC system were applied.

Based on the reported or estimated number of vending machines on each campus and the estimated annual energy usage of a machine, the existing energy consumption of all vending machines was calculated for each campus. For campuses that had not implemented controls or had done so only to a limited extent, full use of controllers on all campus vending machines and sliding-door coolers is recommended. The energy and cost savings associated with implementing this measure are calculated based on typical energy savings listed in the Database for Energy Efficient Resources (2005) and reported by equipment manufacturers.

8.7 Other Projects

8.7.1 Swimming Pools

The Strategic Energy Plan includes energy savings and cost estimates for a number of energy efficiency measures for swimming pools. Four potential measures have been identified for campus pools and information is provided for each individual pool when appropriate.

8.7.2 Pool Project 1. Variable Speed Drives and High Efficiency Motors for Filter Pumps

Pool filter pumps are often continuously run at a constant flow rate regardless of usage and cleanliness standards. Codes typically require certain circulation rates when the pool is occupied. This measure includes installing a variable speed drive with control system and, when appropriate, replacing the motor with a premium efficiency motor. The energy savings calculations for this project assume that the pump will be slowed down to 50% of its normal speed during unoccupied hours (8 hours per day for most pools).

8.7.3 Pool Project 2. Pool Covers

Heated pools and spas lose approximately 70% of their energy to evaporation. Since evaporation is the major source of heat loss for pools, covering the pool when it is not in use is an effective manner of minimizing water and heat loss. This project includes standard insulating pool blankets, storage reels, and a power winder. Energy savings are modeled using the RETScreen4 software. The calculations assume that pool covers will be used eight hours per day.

8.7.4 Pool Project 3. Solar Water Heating

Solar water heating can significantly reduce pool operating cost by decreasing heating requirements. This measure is for a solar pool heating system of unglazed collectors with a total collecting area equal to 60% of the size of the area of the pool. Energy savings are modeled using RETScreen4 software. The calculations assume that pool covers are installed and used to minimize heat loss.

8.7.5 Pool Project 4. Boiler Replacement

This project replaces standard boilers for pool heating with dedicated high efficiency condensing boilers. The energy savings calculations for this measure assume 80% thermal efficiency for the currently installed boiler. Although some condensing boilers for pool heating claim up to 98% thermal efficiency, a conservative estimate of 90% thermal efficiency was used for the replacement boiler. The baseline energy consumption for this measure assumes that both pool covers and solar water heating are used. Information is not provided for pools that are heated using the central loop or a non-dedicated boiler.

8.7.6 Domestic Solar Hot Water

The use of solar hot water heating was explored as a possible measure to reduce energy use in campus residences. Total domestic hot water consumption was estimated for large residence halls and apartment buildings based on occupancy data collected from the

campuses. Then, using data on the solar resource available on each campus and an assumed fraction of total water use to be provided, a solar hot water system was sized to meet demand. The cost of an appropriate system – active, closed-loop, with glazed flat-plate collectors – was then estimated to determine the cost effectiveness of this measure.

Paybacks for domestic solar hot water were close to 80 years and therefore this measure was not recommended. However, in certain circumstances domestic solar hot water may prove more attractive. For example, where a solar hot water system has already been in use, adding or upgrading panels while preserving existing storage and pipes may offer a cost-effective measure. Also, access to state or federal tax credits and/or utility incentives – currently in pilot phase – could greatly increase the attractiveness of this measure.

8.8 Custom Projects

8.8.1 UC Riverside Custom Project 1: Install Solar Window Film

The campus expressed an interest in installing window film on older buildings. Modern solar window films applied to existing windows to reduce the heat gain, thereby reducing the air conditioning load. This project bases the costs and savings on increments of 10,000 sf of window area. Actual window area may vary by building, and savings and simple paybacks will scale accordingly.

8.8.2 UC Riverside Custom Project 2: Replace Chilled Water Coils

Chilled water coils in air handlers are most commonly specified to achieve a drop in chilled water temperature across the coil (delta T) of 10°F to 15°F. The greater the Delta T achieved across the chilled water coil, the less chilled water flow that is required, which translates into savings in pumping energy and increased capacity of the chilled water thermal energy storage system. Replacement of chilled water coils in air handlers with coils designed for a 30° delta T should be considered as a long term strategy. Individual chilled water coil replacements will improve the overall campus chilled water system delta T, but it is difficult to predict the impact of an individual coil on the overall system. The savings for this project are estimated based on a campus wide 5° delta T improvement. Costs are estimated based on an incremental cost and 10 year simple payback which is an engineering estimate assuming the work is done in conjunction with other retrofits in air handlers.

8.8.3 UC Riverside Custom Project 3: Heat Recovery on 100% OSA Air Handler

The new heat recovery system (air to air heat exchanger) will capture the building exhaust air and reuses some of the energy to precondition the outside air before supplying to the building. The heat recovery ventilation provides fresh air and improved climate control, while also saving energy by reducing the heating and/or cooling requirements depending upon the weather conditions.

8.8.4 UC Riverside Custom Project 4: Replace Central Steam System with Heating Hot Water System

The campus central steam system provides heating to a large portion of the campus, and this high pressure steam distribution system has inherent losses associated with it that will

increase as the system ages. The campus has expressed an interest to convert the central steam system to heating hot water, which will reduce the distribution losses and gain other operational advantages (reduced maintenance etc.). This strategy is good long term strategy, but is not justified based strictly on energy savings and simple payback at this time. As such, the project has not been quantified. The campus should consider this project in the long term plan, and revisit the possibility of implementation as the existing boilers reach the end of their useful lives where the incremental cost can justify the project.

8.8.5 UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler

Lab buildings with 100% OSA air handlers require extensive cooling and heating of the outside air to meet space conditioning requirements, which contributes to a lab buildings energy intensive nature. Pre-conditioning the air with evaporative cooling or indirect evaporative cooling takes advantage of the wet bulb depression in Riverside during cooling hours and reduces the mechanical cooling load. The project is presented in this report for the lab buildings in lieu of heat recovery, which could be considered as an alternate.

9. BUILDING OVERVIEW & PROJECTS

The following pages provide an overview of the recommended projects and summary of information for the associated buildings. The section is organized sequentially according to the Building Key, and each contains the following information for each SEP Building.

- Basic information about the building is contained in the header.
- Annual historical energy use by utility for the FY 06/07 baseline, whether metered or extrapolated.
- Monthly historical energy use by utility, where data is available.
- Hourly load profiles by utility for one summer week and one winter week, where data is available.
- Currently planned energy projects being implemented as part of the 2006-08 UC/CSU/IOU Partnership cycle, and their associated savings as approved for the incentive application.
- Projects identified by the Strategic Energy Plan, and the projected savings and economics. The SEP ID Number is a key reference to find the applicable Project Summary.
- Benchmarking information, calculating the baseline and projected energy uses after implementation of currently planned energy projects and after implementation of the projects identified in this SEP.



BIOLOGIC SCI

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5186
Funding Source: STATE
Year Built: 2006

Basic Gross Area (sf): 54,300
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,940,600			64,900	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



BIOLOGIC SCI

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5186
Funding Source: STATE
Year Built: 2006

Basic Gross Area (sf): 54,300
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2001	LAB HOODS & AHU'S - CV TO VAV CONVERSION									Committed Tier: Backup	
		592,036	34.0	3,268	0	100,964	\$85,183	\$2,233,267	\$202,324	\$2,030,943	23.8
E3003	Monitoring Based Commissioning									Committed Tier: Tier 2	
		102,627	12.0	0	11,023	0	\$19,409	\$91,818	\$35,653	\$56,165	2.9
E3157	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts									Committed Tier: Backup	
		13,461	4.0	0	0	0	\$1,010	\$12,087	\$3,231	\$8,856	8.8
Totals		708,124	50.0	3,268	11,023	100,964	\$105,602	\$2,337,172	\$241,208	\$2,095,964	19.8

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,940,600	64,900	35.7	1.2	485.4	N/A
Implement Partnership Projects	1,940,600	64,900	35.7	1.2	485.4	0.0%
Implement SEP Projects	1,151,705	13,027	21.2	0.2	241.2	50.3%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



ENGINEERING2

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5194
Funding Source: STATE
Year Built: 2005

Basic Gross Area (sf): 157,987
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
5,646,400	15,100.0			1,752,100
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



ENGINEERING2

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5194
Funding Source: STATE
Year Built: 2005

Basic Gross Area (sf): 157,987
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3004	Monitoring Based Commissioning										Committed Tier: Tier 2
		298,595	34.0	0	32,071	0	\$56,470	\$267,143	\$103,734	\$163,409	2.9
Totals		298,595	34.0	0	32,071	0	\$56,470	\$267,143	\$103,734	\$163,409	2.9

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	7,048,080	188,750	44.6	1.2	576.3	N/A
Implement Partnership Projects	7,048,080	188,750	44.6	1.2	576.3	0.0%
Implement SEP Projects	6,749,485	156,679	42.7	1.0	536.6	6.9%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



BOOKSTORE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5224
Funding Source: STATE
Year Built: 1991

Basic Gross Area (sf): 32,139
Building Type:
Primary Asset Type: Retail
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
574,300	1,500.0			178,200
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



BOOKSTORE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5224
Funding Source: STATE
Year Built: 1991

Basic Gross Area (sf): 32,139
Building Type:
Primary Asset Type: Retail
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3184	Bookstore-Retrofit all 4-foot T12 fixtures with T8 lamps and reduced light output (RLO) electronic ballasts (28W T8 lamps in the 4-foot fixtures); Install occupancy sensors in offices.										
		37,998	12.0	0	0	0	\$2,850	\$20,317	\$9,120	\$11,197	3.9
Totals		37,998	12.0	0	0	0	\$2,850	\$20,317	\$9,120	\$11,197	3.9

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	716,860	18,750	22.3	0.6	286.7	N/A
Implement Partnership Projects	716,860	18,750	22.3	0.6	286.7	0.0%
Implement SEP Projects	678,862	18,750	21.1	0.6	274.6	4.2%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



BOURNS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5261
Funding Source: STATE
Year Built: 1995

Basic Gross Area (sf): 157,189
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
5,617,800	15,000.0			1,743,200
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



BOURNS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5261
Funding Source: STATE
Year Built: 1995

Basic Gross Area (sf): 157,189
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2002	LAB HOODS & AHU'S - CV TO VAV CONVERSION										
		1,235,598	86.0	4,671	0	231,332	\$156,179	\$4,021,836	\$399,347	\$3,622,489	23.2
E3005	Monitoring Based Commissioning										
		297,087	34.0	0	31,909	0	\$56,185	\$265,795	\$103,210	\$162,585	2.9
E3104	Replace LAB HID's with new, linear fluorescent industrials; replace existing corridor HID recessed cans with new CFL cans										
		268,266	31.0	0	0	0	\$20,120	\$260,115	\$64,384	\$195,731	9.7
E3195	Evaporative Precooling for 100% OSA Systems										
		308,026	79.0	0	0	0	\$23,102	\$331,953	\$73,926	\$258,027	11.2
Totals		2,108,977	230.0	4,671	31,909	231,332	\$255,586	\$4,879,698	\$640,867	\$4,238,832	16.6

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	7,012,360	187,500	44.6	1.2	576.1	N/A
Implement Partnership Projects	7,012,360	187,500	44.6	1.2	576.1	0.0%
Implement SEP Projects	4,718,317	97,204	30.0	0.6	369.2	35.9%

Assumed Incentives:	Central Plant Efficiencies:	Source Energy Use Conversion Factors:
Electricity \$0.24 per annual kWh Natural Gas \$1 per annual therm Cap 80% project cost	th/MMBTU: 12.5 kWh/ton-hr: 0.8 th/ton-hr: 0.0	10.239 kBTU per kWh 100 kBTU per th



INSECTARY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5301
Funding Source: STATE
Year Built: 1959

Basic Gross Area (sf): 8,783
Building Type:
Primary Asset Type: 01C1014 - Inactive
Secondary Asset Type: 01C1015 - Unfinish

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
	400.0			48,700
N/A	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



INSECTARY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5301
Funding Source: STATE
Year Built: 1959

Basic Gross Area (sf): 8,783
Building Type:
Primary Asset Type: 01C1014 - Inactive
Secondary Asset Type: 01C1015 - Unfinish

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3199	Evaporative Precooling for 100% OSA Systems										
		280,296	72.0	0	0	0	\$21,022	\$302,069	\$67,271	\$234,798	11.2
Totals		280,296	72.0	0	0	0	\$21,022	\$302,069	\$67,271	\$234,798	11.2

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	38,960	5,000	4.4	0.6	102.3	N/A
Implement Partnership Projects	38,960	5,000	4.4	0.6	102.3	0.0%
Implement SEP Projects	-241,336	5,000	-27.5	0.6	-224.4	319.3%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



HUM & SOC SC

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5307
Funding Source: STATE
Year Built: 1996

Basic Gross Area (sf): 105,966
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,893,600	5,100.0			587,600
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



HUM & SOC SC

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5307
Funding Source: STATE
Year Built: 1996

Basic Gross Area (sf): 105,966
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3006	Monitoring Based Commissioning										Committed Tier: Tier 2
		81,594	9.0	0	11,126	0	\$17,941	\$89,590	\$30,709	\$58,881	3.3
E3152	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		248,756	61.0	0	0	0	\$18,657	\$224,446	\$59,701	\$164,745	8.8
Totals		330,350	70.0	0	11,126	0	\$36,598	\$314,036	\$90,410	\$223,626	6.1

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,363,680	63,750	22.3	0.6	288.6	N/A
Implement Partnership Projects	2,363,680	63,750	22.3	0.6	288.6	0.0%
Implement SEP Projects	2,033,330	52,624	19.2	0.5	246.1	14.7%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



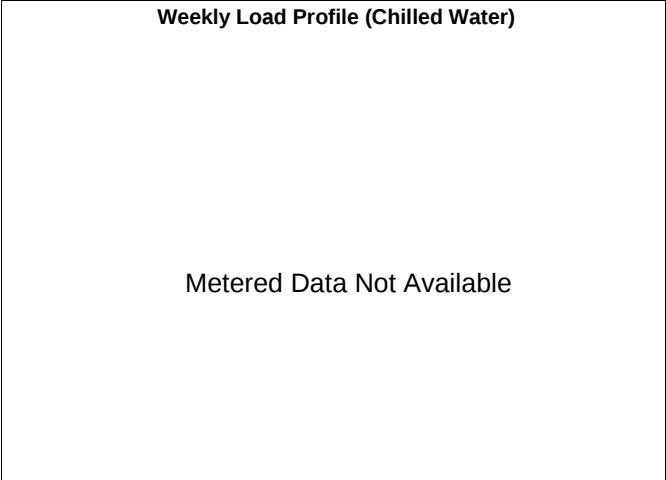
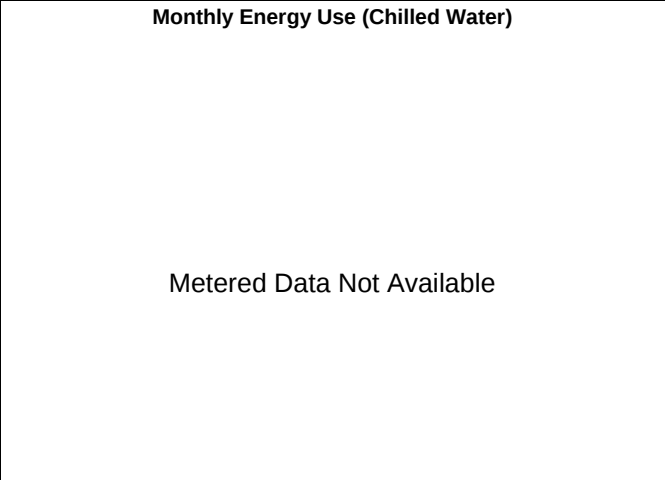
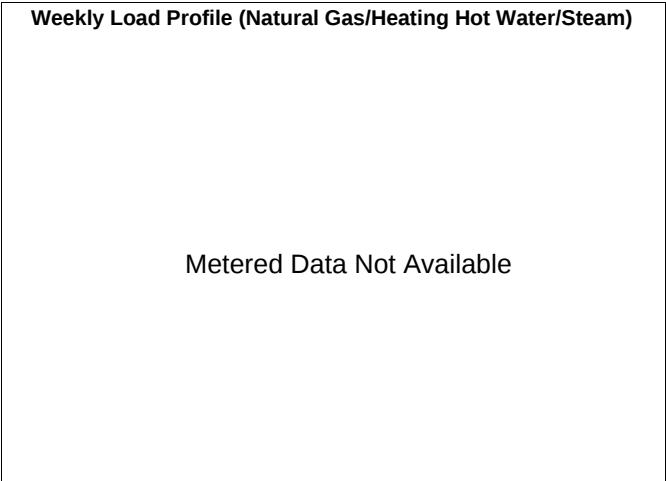
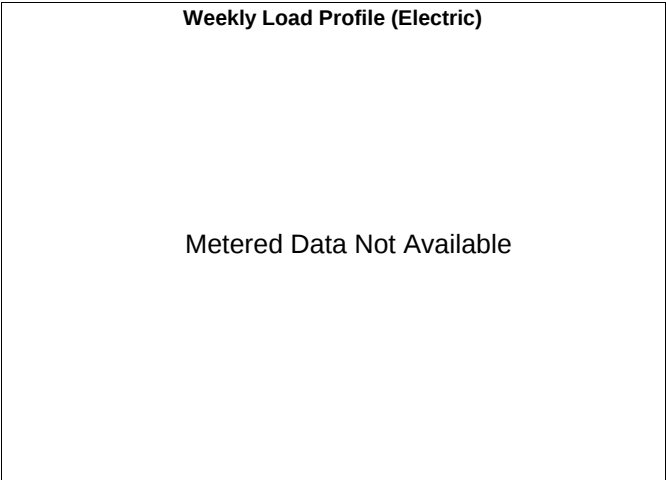
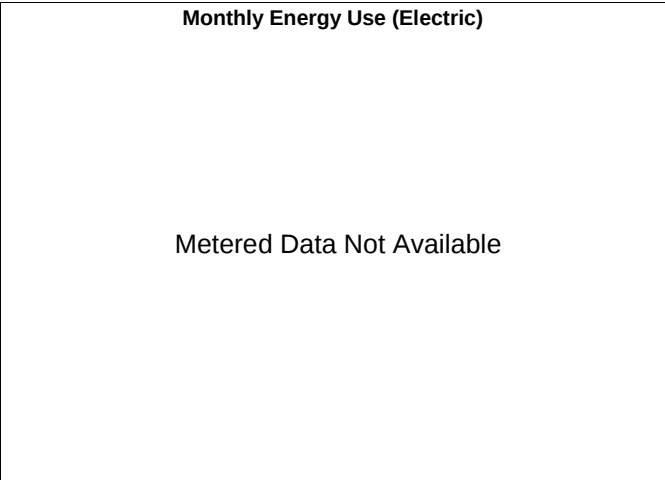
RIVERA LIB

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5322
Funding Source: STATE
Year Built: 1960

Basic Gross Area (sf): 225,413
Building Type: BASIC
Primary Asset Type: Library
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
4,028,100	10,800.0			1,249,900
Extrapolated	Extrapolated	N/A	N/A	Extrapolated





RIVERA LIB

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5322
Funding Source: STATE
Year Built: 1960

Basic Gross Area (sf): 225,413
Building Type: BASIC
Primary Asset Type: Library
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2003	AHU'S - CV TO VAV RETROFIT										
		219,430	27.0	4,354	0	235,526	\$76,850	\$555,059	\$152,309	\$402,750	5.2
E3141	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate										
		311,360	77.0	0	0	0	\$23,352	\$334,402	\$74,726	\$259,676	11.1
Totals		530,790	104.0	4,354	0	235,526	\$100,202	\$889,461	\$227,035	\$662,426	6.6

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	5,028,020	135,000	22.3	0.6	288.3	N/A
Implement Partnership Projects	5,028,020	135,000	22.3	0.6	288.3	0.0%
Implement SEP Projects	4,308,809	80,575	19.1	0.4	231.5	19.7%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



SPIETH

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5323
Funding Source: STATE
Year Built: 1958

Basic Gross Area (sf): 100,927
Building Type: COMPLEX
Primary Asset Type: Laboratory
Secondary Asset Type: Office Support

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,607,100	9,700.0			1,119,300
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



SPIETH

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5323
Funding Source: STATE
Year Built: 1958

Basic Gross Area (sf): 100,927
Building Type: COMPLEX
Primary Asset Type: Laboratory
Secondary Asset Type: Office Support

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2004	MZDDAHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		117,729	19.0	1,365	0	80,267	\$28,149	\$275,479	\$60,729	\$214,750	7.6
E2005	LAB HOODS & AHU'S - CV TO VAV CONVERSION										Committed Tier: Backup
		911,104	52.0	3,715	0	299,309	\$125,763	\$3,515,922	\$322,570	\$3,193,352	25.4
E3007	Monitoring Based Commissioning										Committed Tier: Tier 2
		190,752	22.0	0	20,488	0	\$36,075	\$170,660	\$66,268	\$104,392	2.9
E3144	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors where appropriate										Committed Tier: Backup
		121,350	33.0	0	0	0	\$9,101	\$116,267	\$29,124	\$87,143	9.6
E3191	HEAT RECOVERY										Committed Tier: Backup
		610,659	3.0	0	31,331	407,106	\$103,515	\$243,908	\$256,054	\$48,782	0.5
Totals		1,951,594	129.0	5,080	51,819	786,682	\$302,603	\$4,322,237	\$734,745	\$3,648,419	12.1

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	4,502,540	121,250	44.6	1.2	576.9	N/A
Implement Partnership Projects	4,502,540	121,250	44.6	1.2	576.9	0.0%
Implement SEP Projects	1,921,600	5,931	19.0	0.1	200.8	65.2%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



PE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5334
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 66,335
Building Type: BASIC
Primary Asset Type: Athletics
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,185,400	3,200.0			367,800
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



PE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5334
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 66,335
Building Type: BASIC
Primary Asset Type: Athletics
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2006	AHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		124,087	22.0	2,324	0	131,120	\$41,866	\$295,993	\$84,006	\$211,987	5.1
E3008	Monitoring Based Commissioning										Committed Tier: Tier 2
		51,078	6.0	0	6,965	0	\$11,231	\$56,083	\$19,224	\$36,859	3.3
E3107	Replace Gym MH high bays with fluorescent high bays plus occupancy sensors										Committed Tier: Backup
		132,149	16.0	0	0	0	\$9,911	\$47,735	\$31,716	\$16,019	1.6
Totals		307,314	44.0	2,324	6,965	131,120	\$63,009	\$399,811	\$134,946	\$264,865	4.2

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,479,640	40,000	22.3	0.6	288.7	N/A
Implement Partnership Projects	1,479,640	40,000	22.3	0.6	288.7	0.0%
Implement SEP Projects	1,067,430	3,985	16.1	0.1	170.8	40.8%

Assumed Incentives:

Electricity	\$0.24 per annual kWh
Natural Gas	\$1 per annual therm
Cap	80% project cost

Central Plant Efficiencies:

th/MMBTU:	12.5
kWh/ton-hr:	0.8
th/ton-hr:	0.0

Source Energy Use Conversion Factors:

10.239 kBTU per kWh	100 kBTU per th
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GEOLOGY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5335
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 96,019
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,431,700	9,200.0			1,064,900
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



GEOLOGY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5335
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 96,019
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2007	LABHOODS & AHU'S - CV TO VAV CONVERSION										Committed Tier: Backup
		1,030,415	59.0	5,596	0	252,537	\$151,891	\$1,763,198	\$365,737	\$1,397,461	9.2
E3009	Monitoring Based Commissioning										Committed Tier: Tier 2
		181,476	21.0	0	19,492	0	\$34,321	\$162,360	\$63,046	\$99,314	2.9
E3198	Evaporative Precooling for 100% OSA Systems										Committed Tier: Backup
		199,355	51.0	0	0	0	\$14,952	\$214,840	\$47,845	\$166,995	11.2
Totals		1,411,246	131.0	5,596	19,492	252,537	\$201,163	\$2,140,399	\$476,628	\$1,663,770	8.3

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	4,283,620	115,000	44.6	1.2	576.6	N/A
Implement Partnership Projects	4,283,620	115,000	44.6	1.2	576.6	0.0%
Implement SEP Projects	2,670,344	25,558	27.8	0.3	311.4	46.0%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



BOYCE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5341
Funding Source: STATE
Year Built: 1974

Basic Gross Area (sf): 124,321
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
4,443,200	21,304.0			1,378,700
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



BOYCE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5341
Funding Source: STATE
Year Built: 1974

Basic Gross Area (sf): 124,321
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

2006-2008 Partnership Projects

Project Description	Planned Electric Savings (kWh/yr)	Planned Gas Savings (th/yr)	Cost (\$)
Boyce Hall - Heat recovery ventilation	0	94,038	

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2008	LAB FUMEHOOD & DDAHU'S - CV TO VAV CONVERSION										Committed Tier: Backup
		1,187,559	68.0	10,159	0	458,788	\$224,534	\$3,514,806	\$500,089	\$3,014,717	13.4
E3148	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate										Committed Tier: Backup
		157,182	42.0	0	0	0	\$11,789	\$143,723	\$37,724	\$105,999	9.0
E3196	Evaporative Precooling for 100% OSA Systems										Committed Tier: Backup
		364,235	93.0	0	0	0	\$27,318	\$392,528	\$87,416	\$305,112	11.2
Totals		1,708,976	203.0	10,159	0	458,788	\$263,640	\$4,051,057	\$625,229	\$3,425,828	13.0

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	5,546,160	266,300	44.6	2.1	671.0	N/A
Implement Partnership Projects	5,546,160	172,262	44.6	1.4	595.3	11.3%
Implement SEP Projects	3,470,154	45,275	27.9	0.4	322.2	45.9%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



WEBBER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5342
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 48,565
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,735,600	4,600.0			538,600
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



WEBBER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5342
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 48,565
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2009	FUMEHOOD & MZAHU - CV TO VAV CONVERSION										
		471,822	27.0	3,654	0	129,679	\$81,991	\$1,400,548	\$183,811	\$1,216,737	14.8
E3150	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate										
		61,716	17.0	0	0	0	\$4,629	\$55,973	\$14,812	\$41,161	8.9
E3203	Evaporative Precooling for 100% OSA Systems										
		130,405	33.0	0	0	0	\$9,780	\$140,535	\$31,297	\$109,238	11.2
Totals		663,943	77.0	3,654	0	129,679	\$96,400	\$1,597,055	\$229,920	\$1,367,136	14.2

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,166,480	57,500	44.6	1.2	575.2	N/A
Implement Partnership Projects	2,166,480	57,500	44.6	1.2	575.2	0.0%
Implement SEP Projects	1,398,794	11,825	28.8	0.2	319.3	44.5%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



ABER INVER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5343
Funding Source: HOUSING
Year Built: 1959

Basic Gross Area (sf): 203,939
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Food Service

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,528,000			121,900	
Metered	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



ABER INVER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5343
Funding Source: HOUSING
Year Built: 1959

Basic Gross Area (sf): 203,939
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Food Service

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2010	DDMZAHU'S - CV TO VAV RETROFIT										
		1,297,689	106.0	3,385	0	0	\$133,292	\$3,378,244	\$353,758	\$3,024,486	22.7
E3011	Monitoring Based Commissioning										
		157,033	18.0	0	21,414	0	\$34,530	\$172,423	\$59,102	\$113,321	3.3
E3012	SBD, New/Renov - Aberdeen-Inverness Refurbishment										
		69,930	8.0	0	6,552	0	\$12,206	\$98,136	\$23,335	\$74,801	6.1
E3151	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and Install occupancy sensors where appropriate										
		199,858	77.0	0	0	0	\$14,989	\$245,194	\$47,966	\$197,228	13.2
E3183	UC Riverside Aberdeen Inverness Kitchen Hood Controls										
		16,895	10.0	0	636	0	\$1,943	\$18,711	\$4,691	\$14,020	7.2
Totals		1,741,405	219.0	3,385	28,602	0	\$196,961	\$3,912,708	\$488,852	\$3,423,856	17.4

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,528,000	121,900	17.3	0.6	236.9	N/A
Implement Partnership Projects	3,528,000	121,900	17.3	0.6	236.9	0.0%
Implement SEP Projects	1,786,595	50,986	8.8	0.3	114.7	51.6%

Assumed Incentives:

Electricity	\$0.24 per annual kWh
Natural Gas	\$1 per annual therm
Cap	80% project cost

Central Plant Efficiencies:

th/MMBTU:	12.5
kWh/ton-hr:	0.8
th/ton-hr:	0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh	100 kBtu per th
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WATKINS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5354
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 62,237
Building Type: COMPLEX
Primary Asset Type: Office
Secondary Asset Type: College Lecture Cla

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
2,224,300	6,000.0			690,200
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



WATKINS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5354
Funding Source: STATE
Year Built: 1953

Basic Gross Area (sf): 62,237
Building Type: COMPLEX
Primary Asset Type: Office
Secondary Asset Type: College Lecture Cla

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3013	Monitoring Based Commissioning										Committed Tier: Tier 2
		117,628	13.0	0	12,634	0	\$22,246	\$105,238	\$40,865	\$64,373	2.9
E3149	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		107,093	25.0	0	0	0	\$8,032	\$123,317	\$25,702	\$97,615	12.2
Totals		224,721	38.0	0	12,634	0	\$30,278	\$228,554	\$66,567	\$161,988	5.4

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,776,460	75,000	44.6	1.2	577.3	N/A
Implement Partnership Projects	2,776,460	75,000	44.6	1.2	577.3	0.0%
Implement SEP Projects	2,551,739	62,366	41.0	1.0	520.0	9.9%

Assumed Incentives:

Electricity	\$0.24 per annual kWh
Natural Gas	\$1 per annual therm
Cap	80% project cost

Central Plant Efficiencies:

th/MMBTU:	12.5
kWh/ton-hr:	0.8
th/ton-hr:	0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh	100 kBtu per th
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CAMPUS SURGE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5380
Funding Source: STATE
Year Built: 2001

Basic Gross Area (sf): 72,340
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Library

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,292,700			43,300	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



CAMPUS SURGE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5380
Funding Source: STATE
Year Built: 2001

Basic Gross Area (sf): 72,340
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Library

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2011	Replace (E) Pkg AC Units w/ VAVAHU's & Connect to CHW & Steam										Committed Tier: Backup
		1,079,206	415.0	-1,644	1,211	-264,548	\$48,887	\$1,983,753	\$188,877	\$1,794,876	36.7
E3014	Monitoring Based Commissioning										Committed Tier: Tier 2
		55,702	6.0	0	7,596	0	\$12,248	\$61,161	\$20,964	\$40,197	3.3
E3117	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		76,273	23.0	0	0	0	\$5,720	\$85,500	\$18,306	\$67,194	11.7
Totals		1,211,181	444.0	-1,644	8,807	-264,548	\$66,856	\$2,130,414	\$228,147	\$1,902,267	28.5

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,292,700	43,300	17.9	0.6	242.8	N/A
Implement Partnership Projects	1,292,700	43,300	17.9	0.6	242.8	0.0%
Implement SEP Projects	293,157	55,043	4.1	0.8	117.6	51.6%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



ARTS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5411
Funding Source: STATE
Year Built: 2001

Basic Gross Area (sf): 106,659
Building Type: BASIC
Primary Asset Type: Laboratory
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,906,000	5,100.0			591,400
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



ARTS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5411
Funding Source: STATE
Year Built: 2001

Basic Gross Area (sf): 106,659
Building Type: BASIC
Primary Asset Type: Laboratory
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3015	Monitoring Based Commissioning										Committed Tier: Tier 2
		82,127	9.0	0	11,199	0	\$18,058	\$90,176	\$30,909	\$59,267	3.3
E3193	Evaporative Precooling for 100% OSA Systems										Committed Tier: Backup
		31,477	8.0	0	0	0	\$2,361	\$33,922	\$7,554	\$26,368	11.2
Totals		113,604	17.0	0	11,199	0	\$20,419	\$124,098	\$38,463	\$85,635	4.2

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,379,120	63,750	22.3	0.6	288.2	N/A
Implement Partnership Projects	2,379,120	63,750	22.3	0.6	288.2	0.0%
Implement SEP Projects	2,265,516	52,551	21.2	0.5	266.8	7.4%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



PHYSICAL SCI

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5414
Funding Source: STATE
Year Built: 2005

Basic Gross Area (sf): 134,709
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
4,814,400	12,900.0			1,493,900
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



PHYSICAL SCI

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5414
Funding Source: STATE
Year Built: 2005

Basic Gross Area (sf): 134,709
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

2006-2008 Partnership Projects

Project Description	Planned Electric Savings (kWh/yr)	Planned Gas Savings (th/yr)	Cost (\$)
Physical Science - Office exhaust into air intake plenum	0	6,584	

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2012	LAB HOODS & AHU'S - CV TO VAV CONVERSION										Committed Tier: Backup
		2,716,481	155.0	8,567	0	529,387	\$326,524	\$10,319,585	\$860,685	\$9,458,900	29.0
E3016	Monitoring Based Commissioning										Committed Tier: Tier 1
		254,600	29.0	0	27,346	0	\$48,150	\$227,782	\$88,450	\$139,332	2.9
E3200	Evaporative Precooling for 100% OSA Systems										Committed Tier: Backup
		606,308	155.0	0	0	0	\$45,473	\$653,406	\$145,514	\$507,892	11.2
Totals		3,577,389	339.0	8,567	27,346	529,387	\$420,147	\$11,200,773	\$1,094,649	\$10,106,124	24.1

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	6,009,520	161,250	44.6	1.2	576.5	N/A
Implement Partnership Projects	6,009,520	154,666	44.6	1.1	571.6	0.8%
Implement SEP Projects	2,008,621	20,233	14.9	0.2	167.7	70.7%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBTU per kWh 100 kBTU per th



ENTOMOLOGY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5417
Funding Source: STATE
Year Built: 2002

Basic Gross Area (sf): 69,417
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
2,480,900	6,600.0			769,800
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



ENTOMOLOGY

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5417
Funding Source: STATE
Year Built: 2002

Basic Gross Area (sf): 69,417
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2013	LAB FUMEHOODS & AHU'S - CV TO VAV CONVERSION										
		954,490	55.0	4,477	0	202,030	\$131,277	\$1,646,118	\$323,830	\$1,322,288	10.1
E3017	Monitoring Based Commissioning										
		131,198	15.0	0	14,092	0	\$24,813	\$117,379	\$45,580	\$71,799	2.9
E3118	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate										
		82,299	23.0	0	0	0	\$6,172	\$79,282	\$19,752	\$59,530	9.6
E3197	Evaporative Precooling for 100% OSA Systems										
		159,634	41.0	0	0	0	\$11,973	\$172,034	\$38,312	\$133,722	11.2
Totals		1,327,621	134.0	4,477	14,092	202,030	\$174,234	\$2,014,813	\$427,474	\$1,587,339	9.1

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,096,740	82,500	44.6	1.2	575.6	N/A
Implement Partnership Projects	3,096,740	82,500	44.6	1.2	575.6	0.0%
Implement SEP Projects	1,607,495	12,446	23.2	0.2	255.0	55.7%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



SCIENCE LIB

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5418
Funding Source: STATE
Year Built: 1998

Basic Gross Area (sf): 175,719
Building Type: BASIC
Primary Asset Type: Library
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,140,000	8,400.0			974,400
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



SCIENCE LIB

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5418
Funding Source: STATE
Year Built: 1998

Basic Gross Area (sf): 175,719
Building Type: BASIC
Primary Asset Type: Library
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3143	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate										
		254,148	63.0	0	0	0	\$19,061	\$290,245	\$60,996	\$229,249	12.0
Totals		254,148	63.0	0	0	0	\$19,061	\$290,245	\$60,996	\$229,249	12.0

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,919,520	105,000	22.3	0.6	288.1	N/A
Implement Partnership Projects	3,919,520	105,000	22.3	0.6	288.1	0.0%
Implement SEP Projects	3,665,372	105,000	20.9	0.6	273.3	5.1%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



HINDERAKER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5480
Funding Source: STATE
Year Built: 1960

Basic Gross Area (sf): 44,873
Building Type:
Primary Asset Type: Office
Secondary Asset Type: 01C1016 - Alteratio

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
801,900	2,100.0			248,800
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



HINDERAKER

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5480
Funding Source: STATE
Year Built: 1960

Basic Gross Area (sf): 44,873
Building Type:
Primary Asset Type: Office
Secondary Asset Type: 01C1016 - Alteratio

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2014	DDMZAHU - CV TO VAV RETROFIT										Committed Tier: Backup
		210,193	33.0	1,716	0	122,599	\$41,353	\$339,758	\$95,435	\$244,323	5.9
E3119	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		82,630	19.0	0	0	0	\$6,197	\$101,677	\$19,831	\$81,846	13.2
Totals		292,823	52.0	1,716	0	122,599	\$47,550	\$441,435	\$115,266	\$326,169	6.9

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,000,940	26,250	22.3	0.6	286.9	N/A
Implement Partnership Projects	1,000,940	26,250	22.3	0.6	286.9	0.0%
Implement SEP Projects	610,038	4,800	13.6	0.1	149.9	47.8%

Assumed Incentives:

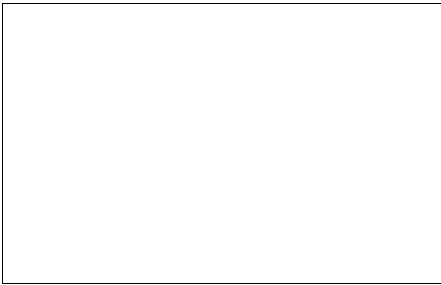
Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



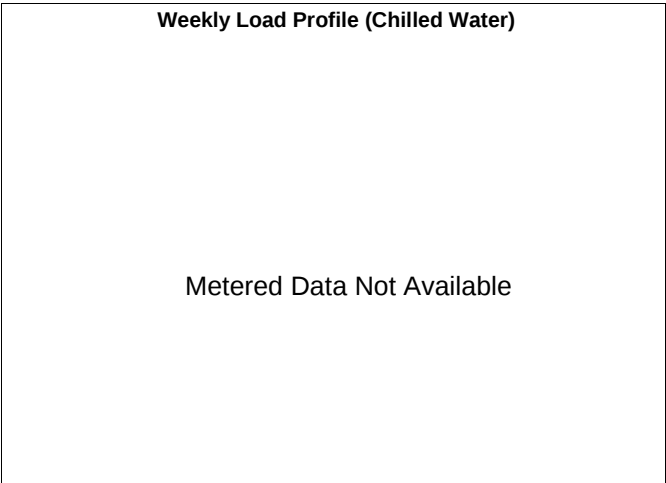
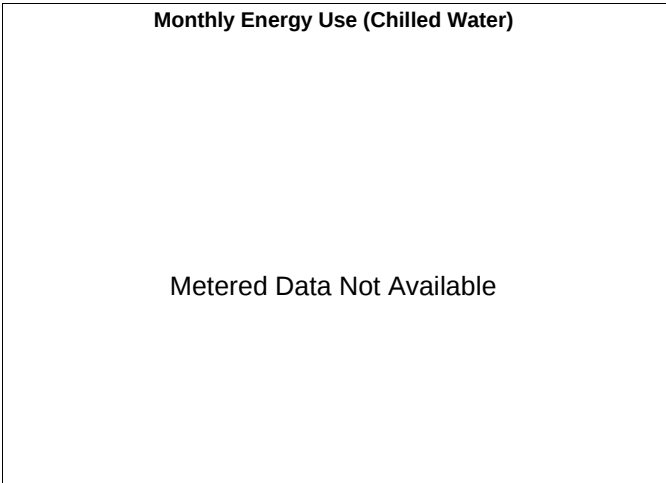
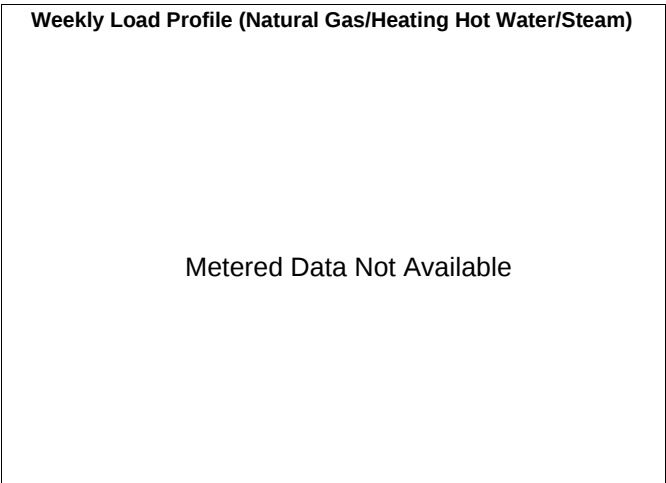
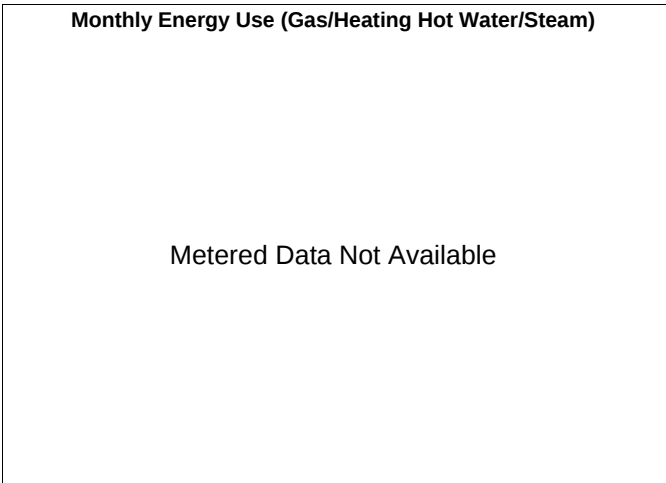
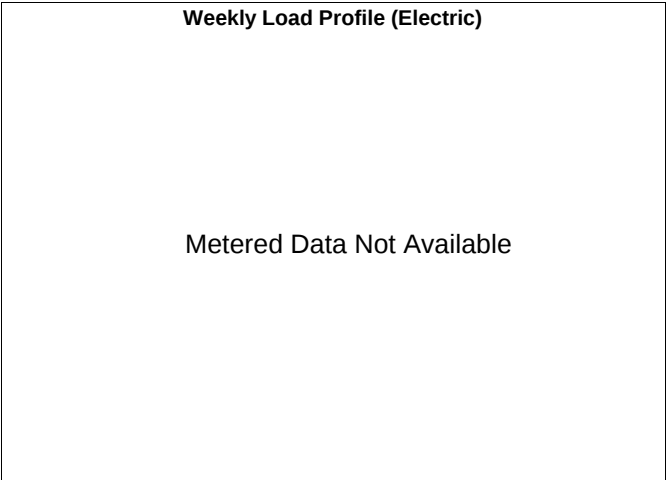
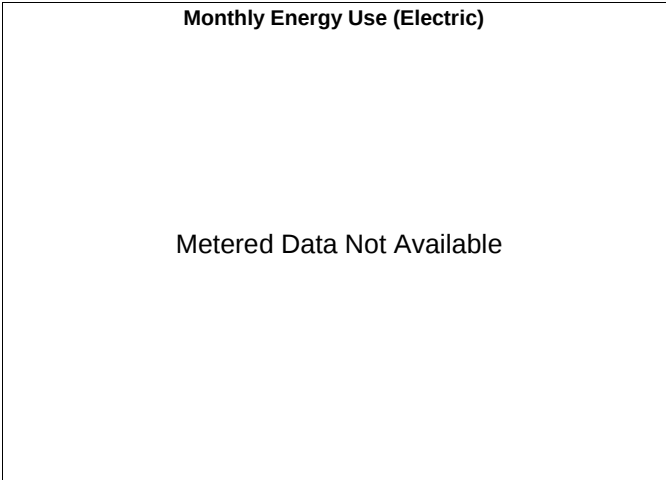
OLMSTED

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5497
Funding Source: STATE
Year Built: 1963

Basic Gross Area (sf): 92,594
Building Type: BASIC
Primary Asset Type: Office Support
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,654,600	4,400.0			513,400
Extrapolated	Extrapolated	N/A	N/A	Extrapolated



OLMSTED

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5497
Funding Source: STATE
Year Built: 1963

Basic Gross Area (sf): 92,594
Building Type: BASIC
Primary Asset Type: Office Support
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2015	DDMZAHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		169,162	25.0	2,864	0	170,726	\$53,361	\$189,922	\$109,178	\$80,744	1.5
E3018	Monitoring Based Commissioning										Committed Tier: Tier 2
		71,297	8.0	0	9,722	0	\$15,677	\$78,285	\$26,833	\$51,452	3.3
E3123	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		130,510	33.0	0	0	0	\$9,788	\$138,938	\$31,322	\$107,616	11.0
Totals		370,969	66.0	2,864	9,722	170,726	\$78,826	\$407,145	\$167,333	\$239,812	3.0

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,065,320	55,000	22.3	0.6	287.8	N/A
Implement Partnership Projects	2,065,320	55,000	22.3	0.6	287.8	0.0%
Implement SEP Projects	1,557,770	9,478	16.8	0.1	182.5	36.6%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



BATCHELOR

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5501
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 105,334
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,764,600	10,100.0			1,168,200
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



BATCHELOR

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5501
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 105,334
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2016	FUMEHOOD & AHU'S - CV TO VAV CONVERSION										Committed Tier: Backup
		1,008,723	58.0	6,170	0	331,378	\$161,093	\$5,011,504	\$382,843	\$4,628,661	28.7
E3019	Monitoring Based Commissioning										Committed Tier: Tier 2
		199,081	23.0	0	21,383	0	\$37,651	\$178,112	\$69,162	\$108,950	2.9
E3020	SBD, New/Renov - Batchelor Hall Building Systems Renewal										Committed Tier: Tier 1
		280,040	32.0	0	13,119	0	\$34,942	\$392,980	\$80,329	\$312,651	8.9
E3116	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install daylighting controls where appropriate										Committed Tier: Backup
		111,102	33.0	0	0	0	\$8,333	\$102,799	\$26,664	\$76,135	9.1
E3194	Evaporative Precooling for 100% OSA Systems										Committed Tier: Backup
		293,786	75.0	0	0	0	\$22,034	\$316,607	\$70,509	\$246,098	11.2
Totals		1,892,732	221.0	6,170	34,502	331,378	\$264,052	\$6,002,002	\$629,507	\$5,372,495	20.3

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	4,699,160	126,250	44.6	1.2	576.6	N/A
Implement Partnership Projects	4,699,160	126,250	44.6	1.2	576.6	0.0%
Implement SEP Projects	2,541,326	14,623	24.1	0.1	260.9	54.8%

Assumed Incentives:	Central Plant Efficiencies:	Source Energy Use Conversion Factors:
Electricity \$0.24 per annual kWh Natural Gas \$1 per annual therm Cap 80% project cost	th/MMBTU: 12.5 kWh/ton-hr: 0.8 th/ton-hr: 0.0	10.239 kBtu per kWh 100 kBtu per th



LOTHIAN HALL

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5502
Funding Source: HOUSING
Year Built: 1963

Basic Gross Area (sf): 246,791
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Food Service

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,712,000			147,600	
Metered	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



LOTHIAN HALL

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5502
Funding Source: HOUSING
Year Built: 1963

Basic Gross Area (sf): 246,791
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Food Service

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2017	REPLACE OLD UNITS WITH VAV AHU'S										
		446,271	69.0	0	617	0	\$34,126	\$955,486	\$107,722	\$847,764	24.8
E3021	Monitoring Based Commissioning										
		190,029	22.0	0	25,913	0	\$41,785	\$208,653	\$71,520	\$137,133	3.3
E3156	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate										
		406,265	158.0	0	0	0	\$30,470	\$299,399	\$97,504	\$201,895	6.6
E3182	UC Riverside Lothian Hall Kitchen Hood Controls										
		57,530	30.0	0	1,239	0	\$5,631	\$60,291	\$15,046	\$45,245	8.0
Totals		1,100,095	279.0	0	27,769	0	\$112,012	\$1,523,828	\$291,792	\$1,232,037	11.0

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,712,000	147,600	15.0	0.6	213.8	N/A
Implement Partnership Projects	3,712,000	147,600	15.0	0.6	213.8	0.0%
Implement SEP Projects	2,611,905	119,831	10.6	0.5	156.9	26.6%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



PHYSICS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5504
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 89,541
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,200,100	8,600.0			993,000
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



PHYSICS

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5504
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 89,541
Building Type: COMPLEX
Primary Asset Type: Office Support
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

		Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
SEP ID Number	Project Name	Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2018	LAB FUMEHOODS & DDMZAHU'S - CV TO VAV CONVERSION								Committed Tier: Backup		
		759,254	43.0	4,897	0	220,970	\$122,233	\$1,950,970	\$285,860	\$1,665,110	13.6
E2019	AHU (S-8) - CV TO VAV RETROFIT								Committed Tier: Backup		
		118,264	18.0	704	0	46,838	\$19,160	\$66,760	\$46,176	\$20,584	1.1
E3139	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate								Committed Tier: Backup		
		120,553	31.0	0	0	0	\$9,041	\$122,861	\$28,933	\$93,928	10.4
E3201	Evaporative Precooling for 100% OSA Systems								Committed Tier: Backup		
		174,623	45.0	0	0	0	\$13,097	\$188,187	\$41,910	\$146,277	11.2
Totals		1,172,694	137.0	5,601	0	267,808	\$163,531	\$2,328,779	\$402,879	\$1,925,899	11.8

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,994,500	107,500	44.6	1.2	576.8	N/A
Implement Partnership Projects	3,994,500	107,500	44.6	1.2	576.8	0.0%
Implement SEP Projects	2,607,560	37,488	29.1	0.4	340.0	41.0%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



PIERCE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5508
Funding Source: STATE
Year Built: 1966

Basic Gross Area (sf): 141,355
Building Type: COMPLEX
Primary Asset Type: 01C1014 - Inactive
Secondary Asset Type: Office Support

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
5,051,900	13,500.0			1,567,600
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



PIERCE

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5508
Funding Source: STATE
Year Built: 1966

Basic Gross Area (sf): 141,355
Building Type: COMPLEX
Primary Asset Type: 01C1014 - Inactive
Secondary Asset Type: Office Support

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2020	LAB FUMEHOODS & DDMZAHU'S - CV TO VAV CONVERSION										
		2,176,527	124.0	6,065	0	612,871	\$264,452	\$6,739,032	\$715,850	\$6,023,182	22.8
E3022	Monitoring Based Commissioning										
		267,161	30.0	0	28,695	0	\$50,526	\$239,020	\$92,814	\$146,206	2.9
E3140	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors where appropriate										
		155,571	44.0	0	0	0	\$11,668	\$137,475	\$37,337	\$100,138	8.6
E3202	Evaporative Precooling for 100% OSA Systems										
		543,354	139.0	0	0	0	\$40,752	\$585,561	\$130,405	\$455,156	11.2
Totals		3,142,613	337.0	6,065	28,695	612,871	\$367,397	\$7,701,088	\$976,406	\$6,724,682	18.3

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	6,305,980	168,750	44.6	1.2	576.2	N/A
Implement Partnership Projects	6,305,980	168,750	44.6	1.2	576.2	0.0%
Implement SEP Projects	2,673,070	64,243	18.9	0.5	239.1	58.5%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



STU REC CTR

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5511
Funding Source: OTHER
Year Built: 1994

Basic Gross Area (sf): 86,048
Building Type: BASIC
Primary Asset Type: Athletics
Secondary Asset Type: Office

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
3,047,990			51,500	
Metered	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



STU REC CTR

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5511
Funding Source: OTHER
Year Built: 1994

Basic Gross Area (sf): 86,048
Building Type: BASIC
Primary Asset Type: Athletics
Secondary Asset Type: Office

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2021	AHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		1,121,747	232.0	0	976	0	\$85,168	\$524,937	\$270,195	\$254,742	3.0
E3024	Monitoring Based Commissioning										Committed Tier: Backup
		66,257	8.0	0	9,035	0	\$14,569	\$72,750	\$24,937	\$47,813	3.3
E3109	Replace MH high bays with fluorescents and occupancy sensors in gym and racquetball courts										Committed Tier: Backup
		308,347	38.0	0	0	0	\$23,126	\$112,348	\$74,003	\$38,345	1.7
Totals		1,496,351	278.0	0	10,011	0	\$122,863	\$710,035	\$369,135	\$340,900	2.8

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	3,047,990	51,500	35.4	0.6	422.5	N/A
Implement Partnership Projects	3,047,990	51,500	35.4	0.6	422.5	0.0%
Implement SEP Projects	1,551,639	41,489	18.0	0.5	232.8	44.9%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBTU per kWh 100 kBTU per th



SPROUL

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5523
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 78,834
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: College Lecture Cla

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,408,700	3,800.0			437,100
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



SPROUL

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5523
Funding Source: STATE
Year Built: 1965

Basic Gross Area (sf): 78,834
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: College Lecture Cla

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2022	DDAHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		422,876	60.0	1,814	0	463,144	\$78,778	\$1,031,303	\$213,089	\$818,214	10.4
E3025	Monitoring Based Commissioning										Committed Tier: Tier 2
		60,702	7.0	0	8,278	0	\$13,348	\$66,651	\$22,846	\$43,805	3.3
E3145	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate										Committed Tier: Backup
		122,818	30.0	0	0	0	\$9,211	\$141,049	\$29,476	\$111,573	12.1
Totals		606,396	97.0	1,814	8,278	463,144	\$101,337	\$1,239,003	\$265,411	\$973,592	9.6

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,758,380	47,500	22.3	0.6	288.6	N/A
Implement Partnership Projects	1,758,380	47,500	22.3	0.6	288.6	0.0%
Implement SEP Projects	781,469	16,547	9.9	0.2	122.5	57.6%

Assumed Incentives:

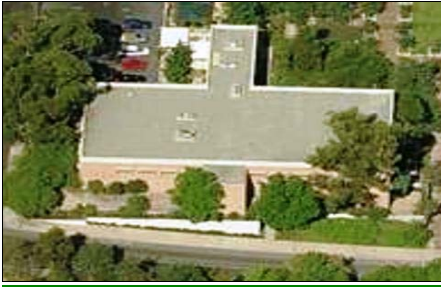
Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



STAT COMP

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5588
Funding Source: STATE
Year Built: 1974

Basic Gross Area (sf): 41,939
Building Type:
Primary Asset Type: Office
Secondary Asset Type: Laboratory

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
749,400	3,500.0			232,600
Extrapolated	Extrapolated	N/A	N/A	Extrapolated

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



STAT COMP

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5588
Funding Source: STATE
Year Built: 1974

Basic Gross Area (sf): 41,939
Building Type:
Primary Asset Type: Office
Secondary Asset Type: Laboratory

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E2023	DDAHU'S - CV TO VAV RETROFIT										Committed Tier: Backup
		167,400	32.0	2,946	0	206,082	\$56,221	\$625,422	\$116,569	\$508,853	9.1
E3146	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install daylighting controls where appropriate										Committed Tier: Backup
		42,032	13.0	0	0	0	\$3,152	\$42,654	\$10,088	\$32,566	10.3
E3190	HEAT RECOVERY										Committed Tier: Backup
		350,829	1.0	0	18,000	233,886	\$59,470	\$185,936	\$147,105	\$38,831	0.7
Totals		560,261	46.0	2,946	18,000	439,968	\$118,844	\$854,011	\$273,762	\$580,250	4.9

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	935,480	43,750	22.3	1.0	332.7	N/A
Implement Partnership Projects	935,480	43,750	22.3	1.0	332.7	0.0%
Implement SEP Projects	23,245	-11,075	0.6	-0.3	-20.7	106.2%

Assumed Incentives:

Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



UNV PLZA APT

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5715
Funding Source: HOUSING
Year Built: 1987

Basic Gross Area (sf): 72,544
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Vehicle Storage

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,296,300			43,400	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



UNV PLZA APT

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5715
Funding Source: HOUSING
Year Built: 1987

Basic Gross Area (sf): 72,544
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Vehicle Storage

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3026	Monitoring Based Commissioning										Committed Tier: Backup
		55,859	6.0	0	7,617	0	\$12,282	\$61,333	\$21,023	\$40,310	3.3
E3153	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate										Committed Tier: Backup
		105,681	40.0	0	0	0	\$7,926	\$98,556	\$25,363	\$73,193	9.2
Totals		161,540	46.0	0	7,617	0	\$20,209	\$159,890	\$46,386	\$113,503	5.6

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,296,300	43,400	17.9	0.6	242.8	N/A
Implement Partnership Projects	1,296,300	43,400	17.9	0.6	242.8	0.0%
Implement SEP Projects	1,134,760	35,783	15.6	0.5	209.5	13.7%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



UCR EXTEN CT

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5722
Funding Source: STATE
Year Built: 1968

Basic Gross Area (sf): 196,641
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Residential

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
2,283,800			76,400	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



UCR EXTEN CT

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5722
Funding Source: STATE
Year Built: 1968

Basic Gross Area (sf): 196,641
Building Type: BASIC
Primary Asset Type: Office
Secondary Asset Type: Residential

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3027	Monitoring Based Commissioning										
		98,408	11.0	0	13,419	0	\$21,638	\$108,051	\$37,037	\$71,014	3.3
E3105	Replace fire stair fixtures with bi-level fixtures; retrofit classroom fixtures with 28W T8 lamps and RLO ballasts; retrofit café fixtures with CFL; install occupancy sensors where appropriate										
		173,573	45.0	0	0	0	\$13,018	\$86,598	\$41,658	\$44,940	3.5
Totals		271,981	56.0	0	13,419	0	\$34,656	\$194,649	\$78,695	\$115,954	3.3

Building Benchmarking	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,283,800	76,400	11.6	0.4	157.8	N/A
Implement Partnership Projects	2,283,800	76,400	11.6	0.4	157.8	0.0%
Implement SEP Projects	2,011,819	62,981	10.2	0.3	136.8	13.3%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



STONEHAVEN

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5991
Funding Source: HOUSING
Year Built: 2000

Basic Gross Area (sf): 158,511
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: 01C1014 - Inactive

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
2,832,500			94,800	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



STONEHAVEN

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5991
Funding Source: HOUSING
Year Built: 2000

Basic Gross Area (sf): 158,511
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: 01C1014 - Inactive

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3028	Monitoring Based Commissioning										
		122,053	14.0	0	16,644	0	\$26,838	\$134,015	\$45,937	\$88,078	3.3
E3147	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate										
		138,485	53.0	0	0	0	\$10,386	\$188,828	\$33,236	\$155,592	15.0
Totals		260,538	67.0	0	16,644	0	\$37,225	\$322,843	\$79,173	\$243,670	6.5

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	2,832,500	94,800	17.9	0.6	242.8	N/A
Implement Partnership Projects	2,832,500	94,800	17.9	0.6	242.8	0.0%
Implement SEP Projects	2,571,962	78,156	16.2	0.5	215.4	11.3%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th



INTER VILLAG

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5998
Funding Source: HOUSING
Year Built: 2001

Basic Gross Area (sf): 103,000
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Recreation

Historical Energy Use (06/07)

Electricity (kWh/yr)	Steam (MMBTU/yr)	Hot Water (MMBTU/yr)	Natural Gas (th/yr)	Chilled Water (ton-hr/yr)
1,840,600			61,600	
Extrapolated	N/A	N/A	Extrapolated	N/A

Monthly Energy Use (Electric)

Metered Data Not Available

Weekly Load Profile (Electric)

Metered Data Not Available

Monthly Energy Use (Gas/Heating Hot Water/Steam)

Metered Data Not Available

Weekly Load Profile (Natural Gas/Heating Hot Water/Steam)

Metered Data Not Available

Monthly Energy Use (Chilled Water)

Metered Data Not Available

Weekly Load Profile (Chilled Water)

Metered Data Not Available



INTER VILLAG

Campus: RIVERSIDE
Location: RIVERSIDE
Building Key: 05CP5998
Funding Source: HOUSING
Year Built: 2001

Basic Gross Area (sf): 103,000
Building Type: BASIC
Primary Asset Type: Residential
Secondary Asset Type: Recreation

Strategic Energy Plan Projects

SEP ID Number	Project Name	Building Savings					Purchased Utility Cost Savings (\$/yr)	Cost			Simple Payback (yr)
		Electric (kWh/yr)	Peak Demand (kW)	HW/Steam (MMBTU/yr)	Gas (th/yr)	Chilled Water (ton-hr/yr)		Project Cost (\$)	Gross Potential Incentive (\$)	Net Cost (\$)	
E3029	Monitoring Based Commissioning										
		79,310	9.0	0	10,815	0	\$17,439	\$87,084	\$29,849	\$57,235	3.3
E3121	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate										
		91,412	35.0	0	0	0	\$6,856	\$126,336	\$21,939	\$104,397	15.2
Totals		170,722	44.0	0	10,815	0	\$24,295	\$213,420	\$51,788	\$161,632	6.7

Building Benchmarking

	Equivalent Electricity (kWh/yr)	Equivalent Natural Gas (th/yr)	Equivalent Electric Energy Use Index (kWh/sf-yr)	Equivalent Natural Gas Energy Use Index (th/sf-yr)	Source Energy Use Index (kBtu/sf-yr)	Percent Savings (%)
Baseline	1,840,600	61,600	17.9	0.6	242.8	N/A
Implement Partnership Projects	1,840,600	61,600	17.9	0.6	242.8	0.0%
Implement SEP Projects	1,669,878	50,785	16.2	0.5	215.3	11.3%

Assumed Incentives:

Electricity \$0.24 per annual kWh
 Natural Gas \$1 per annual therm
 Cap 80% project cost

Central Plant Efficiencies:

th/MMBTU: 12.5
 kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Source Energy Use Conversion Factors:

10.239 kBtu per kWh 100 kBtu per th

10. PROJECT SUMMARIES

The following pages provide a concise project summary for each SEP project. The section, organized by SEP ID Number, includes the following summary information, and additional information for each project can be found in the Appendices.

- Basic information including the project SEP ID Number, name, and project location.
- Project prioritization, as committed to by the campus upon review of the preliminary project list. Tier 1 projects formed a committed energy savings level to the Investor Owned Utilities. Tier 2 projects reflect the campus' planned projects to achieve approximately 150% of the committed energy savings. Backup projects serve as potential projects the campus may consider or substitute for other projects at any time. It should be noted that energy savings for select projects may have been refined since the preliminary project list, as discussed in Section 2 of this report.
- The Calculation File Name provides a reference for the file name, and path if applicable, of the energy calculation which is included as a soft copy in the appendix of this report.
- The Project Description Reference provides the titles of the projects (Air Handler Project 1, Lighting Project 3, etc) as defined in the Energy Efficiency Project Description section earlier in this report.
- Building Energy Savings. The project energy savings are summarized at the building level, which include chilled water and heating hot water or steam, if supplied from a central plant, as well as the direct gas or electric savings. The total cost savings are estimated based on the purchased utility savings (including central plant and cogeneration impacts) and campus recharge rates.
- Incentive Calculation Basis. The projected utility incentive is provided using the equivalent electric and gas savings, which convert chilled water and heating hot water or steam savings to electric or gas savings using the central plant efficiencies. The incentive shown in this section is the gross potential incentive, without consideration of a project cost cap.
- Project Cost Summary. Details are displayed for the cost buildup, including appropriate multipliers and soft costs. If the source of a cost is the construction cost, contingency, engineering, construction management and project management is added. If the bare costs are known, the applicable city multipliers, tax, and O&P included obtaining the estimated construction cost, to which the soft costs are added.
- Project Economics Summary. The project costs, savings and resulting simple payback are calculated. The utility incentive stated here takes into consideration the project cost cap, and is highlighted if it is capped by the project cost. The monetary savings is based on the purchased utility savings and campus recharge rate.

PROJECT DETAIL REPORT

SEP Project ID Number: E2001

Project: LAB HOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BIOLOGIC SCI

Building Key: 05CP5186

Basic Gross Area (sf): 54,300

Calculation File: 05CP5186 - Biologic - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	592,036
Peak Demand (kW):	34.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	100,964
HW/Steam (MMBTu/yr):	3,268

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 672,807

Equivalent Gas Savings (th/yr): 40,850

Anticipated Gross Incentive: \$202,324

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Rebalance (\$1.75 per square foot)	32,381	\$0.00	\$0	\$1.75	\$61,257
Autosash closure	24	\$2,700.00	\$63,439	\$1,800.00	\$46,699
AHU DDC Upgrade: CAV - RH to VAV - RH (17 points)	1	\$8,776.29	\$8,592	\$5,368.42	\$5,803
Zone Level Controller & DDC - cooling with re-heat	121	\$3,212.24	\$380,519	\$1,964.91	\$257,012
Fume Hood Conversion - CAV to VAV	24	\$11,250.00	\$264,330	\$11,250.00	\$291,870
Raw Costs:			\$716,880		\$662,641
City: San Bernardino Sales Tax: 8.25%			\$59,143		N/A
City Index Material Multiplier: 97.9%			\$93,123		\$79,517
City Index Labor Multiplier: 108.1%			\$869,145		\$742,158
Contingency: 10.00%			\$86,915		\$74,216
Totals:			\$956,060		\$816,374
Engineering: 15.00%			\$265,865		
Construction Phase: 5.00%			\$88,622		
Project Management: 6.00%			\$106,346		
Total Project Cost:			\$2,233,267		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$2,233,267	Total Purchased Electricity Savings (kWh/yr):	672,807
Rebate/Incentive*:	\$202,324	Total Purchased Gas Savings (th/yr):	40,850
Net Project Cost:	\$2,030,943	Total Purchased Annual Cost Savings (\$/yr):	\$85,183
Net Simple Payback Period (yrs):	23.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2002

Project: LAB HOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BOURNS

Building Key: 05CP5261

Basic Gross Area (sf): 157,189

Calculation File: 05CP5261 - Bourns - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,235,598
Peak Demand (kW):	86.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	231,332
HW/Steam (MMBTu/yr):	4,671

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,420,664

Equivalent Gas Savings (th/yr): 58,388

Anticipated Gross Incentive: \$399,347

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
AHU DDC Upgrade: DD CAV to VAV (92 points)	4	\$11,873.81	\$46,498	\$7,263.16	\$31,406
Autosash closure	73	\$2,700.00	\$192,961	\$1,800.00	\$142,043
Rebalance (\$1.75 per square foot)	65,040	\$0.00	\$0	\$1.75	\$123,039
Zone Level Controller & DDC - cooling with re-heat	39	\$3,212.24	\$122,647	\$1,964.91	\$82,839
50 hp VFD	2	\$7,650.00	\$14,979	\$1,375.00	\$2,973
40 hp VFD	2	\$7,025.00	\$13,755	\$1,100.00	\$2,378
25 hp VFD	2	\$3,925.00	\$7,685	\$1,100.00	\$2,378
20 hp VFD	2	\$3,375.00	\$6,608	\$820.00	\$1,773
10 hp VFD	2	\$1,975.00	\$3,867	\$545.00	\$1,178
Fume Hood Conversion - CAV to VAV	73	\$11,250.00	\$804,004	\$11,250.00	\$887,771

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

City: San Bernardino		Raw Costs:	\$1,213,003	\$1,277,779
		Sales Tax: 8.25%	\$100,073	N/A
City Index Material Multiplier:	97.9%	Contractor O&P: 12.00%	\$157,569	\$153,333
City Index Labor Multiplier:	108.1%	Subtotals:	\$1,470,645	\$1,431,112
		Contingency: 10.00%	\$147,064	\$143,111
		Totals:	\$1,617,709	\$1,574,224
		Engineering: 15.00%	\$478,790	
		Construction Phase: 5.00%	\$159,597	
		Project Management: 6.00%	\$191,516	
		Total Project Cost:	\$4,021,836	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,021,836	Total Purchased Electricity Savings (kWh/yr):	1,420,664
Rebate/Incentive*:	\$399,347	Total Purchased Gas Savings (th/yr):	58,388
Net Project Cost:	\$3,622,489	Total Purchased Annual Cost Savings (\$/yr):	\$156,179
Net Simple Payback Period (yrs):	23.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incenti funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2003

Project: AHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE
 Location: RIVERSIDE
 Building: RIVERA LIB
 Building Key: 05CP5322
 Basic Gross Area (sf): 225,413
 Calculation File: 05CP5322 - Rivera Library - AHU's CV TO VAV.xls
 Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup
 Start Preliminary Engineering:
 Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	219,430
Peak Demand (kW):	27.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	235,526
HW/Steam (MMBTu/yr):	4,354

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 407,851

Equivalent Gas Savings (th/yr): 54,425

Anticipated Gross Incentive: \$152,309

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
5 hp VFD	1	\$1,675.00	\$1,640	\$455.00	\$492
Zone Level Controller & DDC - dual duct	40	\$4,015.30	\$157,239	\$2,456.14	\$106,203
CO2 SENSORS & CONTROLS	2	\$8,000.00	\$15,664	\$6,000.00	\$12,972
AHU DDC Upgrade: DD CAV to VAV (46 points)	2	\$11,873.81	\$23,249	\$7,263.16	\$15,703
7.5 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
3 hp VFD	1	\$1,525.00	\$1,493	\$455.00	\$492
15 hp VFD	1	\$2,275.00	\$2,227	\$820.00	\$886
Raw Costs:			\$203,446		\$137,338
City: San Bernardino Sales Tax: 8.25%			\$16,784		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$26,428	\$16,481
City Index Labor Multiplier: 108.1%			Subtotals:	\$246,657	\$153,818
Contingency: 10.00%			\$24,666		\$15,382
Totals:			\$271,323		\$169,200
Engineering: 15.00%			\$66,078		
Construction Phase: 5.00%			\$22,026		
Project Management: 6.00%			\$26,431		
Total Project Cost:			\$555,059		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$555,059	Total Purchased Electricity Savings (kWh/yr):	407,851
Rebate/Incentive*:	\$152,309	Total Purchased Gas Savings (th/yr):	54,425
Net Project Cost:	\$402,750	Total Purchased Annual Cost Savings (\$/yr):	\$76,850
Net Simple Payback Period (yrs):	5.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2004

Project: MZDDAHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SPIETH

Building Key: 05CP5323

Basic Gross Area (sf): 100,927

Calculation File: 05CP5323 - Spieth (Auditorium) - MZDDAHU - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	117,729
Peak Demand (kW):	19.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	80,267
HW/Steam (MMBTu/yr):	1,365

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 181,943

Equivalent Gas Savings (th/yr): 17,063

Anticipated Gross Incentive: \$60,729

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
2 hp VFD	1	\$700.00	\$685	\$400.00	\$432
7.5 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
AHU DDC Upgrade: DD CAV to VAV (23 points)	1	\$11,873.81	\$11,624	\$7,263.16	\$7,851
Zone Level Controller & DDC - dual duct	20	\$4,015.30	\$78,620	\$2,456.14	\$53,102
CO2 SENSORS & CONTROLS	1	\$8,000.00	\$7,832	\$6,000.00	\$6,486
Raw Costs:			\$100,695		\$68,461
City: San Bernardino			Sales Tax: 8.25%	\$8,307	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$13,080	\$8,215
City Index Labor Multiplier: 108.1%			Subtotals:	\$122,082	\$76,676
			Contingency: 10.00%	\$12,208	\$7,668
			Totals:	\$134,291	\$84,344
			Engineering: 15.00%	\$32,795	
			Construction Phase: 5.00%	\$10,932	
			Project Management: 6.00%	\$13,118	
			Total Project Cost:	\$275,479	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$275,479	Total Purchased Electricity Savings (kWh/yr):	181,943
Rebate/Incentive*:	\$60,729	Total Purchased Gas Savings (th/yr):	17,063
Net Project Cost:	\$214,750	Total Purchased Annual Cost Savings (\$/yr):	\$28,149
Net Simple Payback Period (yrs):	7.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2005

Project: LAB HOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SPIETH

Building Key: 05CP5323

Basic Gross Area (sf): 100,927

Calculation File: 05CP5323 - Spieth - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume. Steam savings scaled to match historical use

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	911,104
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	299,309
HW/Steam (MMBTu/yr):	3,715

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,150,551

Equivalent Gas Savings (th/yr): 46,438

Anticipated Gross Incentive: \$322,570

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Fume Hood Conversion - CAV to VAV	42	\$11,250.00	\$462,578	\$11,250.00	\$510,773
10 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
Autosash closure	42	\$2,700.00	\$111,019	\$1,800.00	\$81,724
Rebalance (\$1.75 per square foot)	59,939	\$0.00	\$0	\$1.75	\$113,390
AHU DDC Upgrade: DD CAV to VAV (92 points)	4	\$11,873.81	\$46,498	\$7,263.16	\$31,406
50 hp VFD	1	\$7,650.00	\$7,489	\$1,375.00	\$1,486
30 hp VFD	1	\$4,775.00	\$4,675	\$1,100.00	\$1,189
Zone Level Controller & DDC - cooling with re-heat	150	\$3,212.24	\$471,717	\$1,964.91	\$318,610
40 hp VFD	1	\$7,025.00	\$6,877	\$1,100.00	\$1,189

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

City: San Bernardino		Raw Costs:	\$1,112,786	\$1,060,355
		Sales Tax: 8.25%	\$91,805	N/A
City Index Material Multiplier:	97.9%	Contractor O&P: 12.00%	\$144,551	\$127,243
City Index Labor Multiplier:	108.1%	Subtotals:	\$1,349,142	\$1,187,598
		Contingency: 10.00%	\$134,914	\$118,760
		Totals:	\$1,484,057	\$1,306,358
		Engineering: 15.00%	\$418,562	
		Construction Phase: 5.00%	\$139,521	
		Project Management: 6.00%	\$167,425	
		Total Project Cost:	\$3,515,922	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,515,922	Total Purchased Electricity Savings (kWh/yr):	1,150,551
Rebate/Incentive*:	\$322,570	Total Purchased Gas Savings (th/yr):	46,438
Net Project Cost:	\$3,193,352	Total Purchased Annual Cost Savings (\$/yr):	\$125,763
Net Simple Payback Period (yrs):	25.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incenti funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2006

Project: AHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PE

Building Key: 05CP5334

Basic Gross Area (sf): 66,335

Calculation File: 05CP5334 - Physical Education - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	124,087
Peak Demand (kW):	22.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	131,120
HW/Steam (MMBTu/yr):	2,324

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 228,983

Equivalent Gas Savings (th/yr): 29,050

Anticipated Gross Incentive: \$84,006

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
1 hp VFD	4	\$350.00	\$1,371	\$400.00	\$1,730
3 hp VFD	2	\$1,525.00	\$2,986	\$455.00	\$984
5 hp VFD	2	\$1,675.00	\$3,280	\$455.00	\$984
AHU DDC Upgrade: SZ CAV to VAV (84 points)	4	\$10,841.30	\$42,455	\$6,631.58	\$28,675
Zone Level Controller & DDC - cooling with re-heat	8	\$3,212.24	\$25,158	\$1,964.91	\$16,993
CO2 SENSORS & CONTROLS	4	\$8,000.00	\$31,328	\$6,000.00	\$25,944
Raw Costs:			\$106,577		\$75,309
City: San Bernardino			Sales Tax: 8.25%	\$8,793	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$13,844	\$9,037
City Index Labor Multiplier: 108.1%			Subtotals:	\$129,214	\$84,346
			Contingency: 10.00%	\$12,921	\$8,435
			Totals:	\$142,135	\$92,780
			Engineering: 15.00%	\$35,237	
			Construction Phase: 5.00%	\$11,746	
			Project Management: 6.00%	\$14,095	
Total Project Cost:				\$295,993	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$295,993	Total Purchased Electricity Savings (kWh/yr):	228,983
Rebate/Incentive*:	\$84,006	Total Purchased Gas Savings (th/yr):	29,050
Net Project Cost:	\$211,987	Total Purchased Annual Cost Savings (\$/yr):	\$41,866
Net Simple Payback Period (yrs):	5.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2007

Project: LABHOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: GEOLOGY

Building Key: 05CP5335

Basic Gross Area (sf): 96,019

Calculation File: 05CP5335 - Geology - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,030,415
Peak Demand (kW):	59.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	252,537
HW/Steam (MMBTu/yr):	5,596

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,232,445

Equivalent Gas Savings (th/yr): 69,950

Anticipated Gross Incentive: \$365,737

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Fume Hood Conversion - CAV to VAV	34	\$11,250.00	\$374,468	\$11,250.00	\$413,483
Reprogram (E) AHU Controllers	2	\$0.00	\$0	\$6,000.00	\$12,972
Rebalance (\$1.75 per square foot)	57,352	\$0.00	\$0	\$1.75	\$108,496
25 hp VFD	6	\$3,925.00	\$23,055	\$1,100.00	\$7,135
Autosash closure	34	\$2,700.00	\$89,872	\$1,800.00	\$66,157
Raw Costs:			\$487,395		\$608,242
City: San Bernardino			Sales Tax: 8.25%	\$40,210	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$63,313	\$72,989
City Index Labor Multiplier: 108.1%			Subtotals:	\$590,918	\$681,231
			Contingency: 10.00%	\$59,092	\$68,123
			Totals:	\$650,010	\$749,354
			Engineering: 15.00%	\$209,905	
			Construction Phase: 5.00%	\$69,968	
			Project Management: 6.00%	\$83,962	
Total Project Cost:				\$1,763,198	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,763,198	Total Purchased Electricity Savings (kWh/yr):	1,232,445
Rebate/Incentive*:	\$365,737	Total Purchased Gas Savings (th/yr):	69,950
Net Project Cost:	\$1,397,461	Total Purchased Annual Cost Savings (\$/yr):	\$151,891
Net Simple Payback Period (yrs):	9.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2008

Project: LAB FUMEHOOD & DDAHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BOYCE

Building Key: 05CP5341

Basic Gross Area (sf): 124,321

Calculation File: 05CP5341 - Boyce (S-1 & S-2) - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,187,559
Peak Demand (kW):	68.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	458,788
HW/Steam (MMBTu/yr):	10,159

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,554,589

Equivalent Gas Savings (th/yr): 126,988

Anticipated Gross Incentive: \$500,089

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
50 hp VFD	2	\$7,650.00	\$14,979	\$1,375.00	\$2,973
Fume Hood Conversion - CAV to VAV	73	\$11,250.00	\$804,004	\$11,250.00	\$887,771
Rebalance (\$1.75 per square foot)	65,040	\$0.00	\$0	\$1.75	\$123,039
Autosash closure	73	\$2,700.00	\$192,961	\$1,800.00	\$142,043
Upgrade (E) Controller (Add Points)	2	\$0.00	\$0	\$6,000.00	\$12,972
Raw Costs:			\$1,011,943		\$1,168,799
City: San Bernardino		Sales Tax: 8.25%	\$83,485		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$131,451		\$140,256
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,226,880		\$1,309,055
		Contingency: 10.00%	\$122,688		\$130,905
		Totals:	\$1,349,568		\$1,439,960
		Engineering: 15.00%	\$418,429		
		Construction Phase: 5.00%	\$139,476		
		Project Management: 6.00%	\$167,372		
		Total Project Cost:	\$3,514,806		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,514,806	Total Purchased Electricity Savings (kWh/yr):	1,554,589
Rebate/Incentive*:	\$500,089	Total Purchased Gas Savings (th/yr):	126,988
Net Project Cost:	\$3,014,717	Total Purchased Annual Cost Savings (\$/yr):	\$224,534
Net Simple Payback Period (yrs):	13.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2009

Project: FUMEHOOD & MZAHU - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: WEBBER

Building Key: 05CP5342

Basic Gross Area (sf): 48,565

Calculation File: 05CP5342 - Webber Hall - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	471,822
Peak Demand (kW):	27.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	129,679
HW/Steam (MMBTu/yr):	3,654

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 575,565

Equivalent Gas Savings (th/yr): 45,675

Anticipated Gross Incentive: \$183,811

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Rebalance (\$1.75 per square foot)	27,183	\$0.00	\$0	\$1.75	\$51,423
Reprogram (E) AHU's	2	\$0.00	\$0	\$6,000.00	\$12,972
Fume Hood Conversion - CAV to VAV	29	\$11,250.00	\$319,399	\$11,250.00	\$352,676
Autosash closure	29	\$2,700.00	\$76,656	\$1,800.00	\$56,428
Raw Costs:			\$396,054		\$473,500
City: San Bernardino			Sales Tax: 8.25%	\$32,674	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$51,447	\$56,820
City Index Labor Multiplier: 108.1%			Subtotals:	\$480,176	\$530,320
			Contingency: 10.00%	\$48,018	\$53,032
			Totals:	\$528,194	\$583,352
			Engineering: 15.00%	\$166,732	
			Construction Phase: 5.00%	\$55,577	
			Project Management: 6.00%	\$66,693	
Total Project Cost:				\$1,400,548	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,400,548	Total Purchased Electricity Savings (kWh/yr):	575,565
Rebate/Incentive*:	\$183,811	Total Purchased Gas Savings (th/yr):	45,675
Net Project Cost:	\$1,216,737	Total Purchased Annual Cost Savings (\$/yr):	\$81,991
Net Simple Payback Period (yrs):	14.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2010

Project: DDMZAHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ABER INVER

Building Key: 05CP5343

Basic Gross Area (sf): 203,939

Calculation File: 05CP5343 - Aber Inver - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume. Gas savings scaled to match historical, modelled CHW savings removed to avoid overlap (chillers in building)

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,297,689
Peak Demand (kW):	106.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	3,385

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,297,689

Equivalent Gas Savings (th/yr): 42,313

Anticipated Gross Incentive: \$353,758

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
CO2 SENSORS & CONTROLS	11	\$8,000.00	\$86,152	\$6,000.00	\$71,346
3 hp VFD	6	\$1,525.00	\$8,958	\$455.00	\$2,951
5 hp VFD	2	\$1,675.00	\$3,280	\$455.00	\$984
10 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
15 hp VFD	6	\$2,275.00	\$13,363	\$820.00	\$5,319
20 hp VFD	2	\$3,375.00	\$6,608	\$820.00	\$1,773
25 hp VFD	2	\$3,925.00	\$7,685	\$1,100.00	\$2,378
AHU DDC Upgrade: DD CAV to VAV (253 points)	11	\$11,873.81	\$127,869	\$7,263.16	\$86,366
Zone Level Controller & DDC - multi zone	250	\$4,015.30	\$982,745	\$2,456.14	\$663,772

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

City: San Bernardino		Raw Costs:	\$1,238,594	\$835,478
		Sales Tax: 8.25%	\$102,184	N/A
City Index Material Multiplier:	97.9%	Contractor O&P: 12.00%	\$160,893	\$100,257
City Index Labor Multiplier:	108.1%	Subtotals:	\$1,501,671	\$935,735
		Contingency: 10.00%	\$150,167	\$93,573
		Totals:	\$1,651,838	\$1,029,308
		Engineering: 15.00%	\$402,172	
		Construction Phase: 5.00%	\$134,057	
		Project Management: 6.00%	\$160,869	
		Total Project Cost:	\$3,378,244	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,378,244	Total Purchased Electricity Savings (kWh/yr):	1,297,689
Rebate/Incentive*:	\$353,758	Total Purchased Gas Savings (th/yr):	42,313
Net Project Cost:	\$3,024,486	Total Purchased Annual Cost Savings (\$/yr):	\$133,292
Net Simple Payback Period (yrs):	22.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incenti funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2011

Project: Replace (E) Pkg AC Units w/ VAVAHU's & Connect to CHW & Steam

Campus: RIVERSIDE

Location: RIVERSIDE

Campus Prioritization and Schedule

Building: CAMPUS SURGE

Project Tier: Backup

Building Key: 05CP5380

Start Preliminary Engineering:

Basic Gross Area (sf): 72,340

Scheduled Completion:

Calculation File: 05CP5380 - Campus Surge - Replace (E) Pkg AC Units - VAVAHU's.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,079,206
Peak Demand (kW):	415.0
Gas (th/yr):	1,211
Chilled Water (ton-hr/yr):	-264,548
HW/Steam (MMBTu/yr):	-1,644

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 867,568

Equivalent Gas Savings (th/yr): -19,339

Anticipated Gross Incentive: \$188,877

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
CHW & HHW Pumps	4	\$5,000.00	\$19,580	\$3,000.00	\$12,972
Connection to Site CHW & Steam	1	\$20,000.00	\$19,580	\$50,000.00	\$54,050
New VAV AHU (Ductwork, Elec., etc.)	2	\$150,000.00	\$293,700	\$60,000.00	\$129,720
Demo (E) Units (Duct, Pipe, etc.)	17	\$0.00	\$0	\$7,500.00	\$137,828
AHU DDC Upgrade: CAV - RH to VAV - RH (34 points)	2	\$8,776.29	\$17,184	\$5,368.42	\$11,607
Zone Level Controller & DDC - cooling with re-heat	100	\$3,212.24	\$314,478	\$1,964.91	\$212,407
Raw Costs:			\$664,522		\$558,583
City: San Bernardino		Sales Tax: 8.25%	\$54,823		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$86,321		\$67,030
City Index Labor Multiplier: 108.1%		Subtotals:	\$805,667		\$625,613
		Contingency: 10.00%	\$80,567		\$62,561
		Totals:	\$886,233		\$688,174
		Engineering: 15.00%	\$236,161		
		Construction Phase: 5.00%	\$78,720		
		Project Management: 6.00%	\$94,464		
		Total Project Cost:	\$1,983,753		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,983,753	Total Purchased Electricity Savings (kWh/yr):	867,568
Rebate/Incentive*:	\$188,877	Total Purchased Gas Savings (th/yr):	-19,036
Net Project Cost:	\$1,794,876	Total Purchased Annual Cost Savings (\$/yr):	\$48,887
Net Simple Payback Period (yrs):	36.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2012

Project: LAB HOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICAL SCI

Building Key: 05CP5414

Basic Gross Area (sf): 134,709

Calculation File: 05CP5414 - Physical Science - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume. Steam savings scaled to match historical use

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	2,716,481
Peak Demand (kW):	155.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	529,387
HW/Steam (MMBTu/yr):	8,567

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,139,991

Equivalent Gas Savings (th/yr): 107,088

Anticipated Gross Incentive: \$860,685

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
AHU DDC Upgrade: CAV - RH to VAV - RH (68 points)	4	\$8,776.29	\$34,368	\$5,368.42	\$23,213
Zone Level Controller & DDC - cooling with re-heat	420	\$3,212.24	\$1,320,809	\$1,964.91	\$892,108
Fume Hood Conversion - CAV to VAV	143	\$11,250.00	\$1,574,966	\$11,250.00	\$1,739,059
Rebalance (\$1.75 per square foot)	70,919	\$0.00	\$0	\$1.75	\$134,161
Autosash closure	143	\$2,700.00	\$377,992	\$1,800.00	\$278,249
Raw Costs:			\$3,308,135		\$3,066,791
City: San Bernardino			Sales Tax: 8.25%	\$272,921	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$429,727	\$368,015
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,010,783	\$3,434,806
			Contingency: 10.00%	\$401,078	\$343,481
			Totals:	\$4,411,861	\$3,778,286
			Engineering: 15.00%	\$1,228,522	
			Construction Phase: 5.00%	\$409,507	
			Project Management: 6.00%	\$491,409	
Total Project Cost:				\$10,319,585	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$10,319,585	Total Purchased Electricity Savings (kWh/yr):	3,139,991
Rebate/Incentive*:	\$860,685	Total Purchased Gas Savings (th/yr):	107,088
Net Project Cost:	\$9,458,900	Total Purchased Annual Cost Savings (\$/yr):	\$326,524
Net Simple Payback Period (yrs):	29.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2013

Project: LAB FUMEHOODS & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENTOMOLOGY

Building Key: 05CP5417

Basic Gross Area (sf): 69,417

Calculation File: 05CP5417 - Entomology - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	954,490
Peak Demand (kW):	55.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	202,030
HW/Steam (MMBTu/yr):	4,477

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,116,114

Equivalent Gas Savings (th/yr): 55,963

Anticipated Gross Incentive: \$323,830

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Rebalance (\$1.75 per square foot)	42,567	\$0.00	\$0	\$1.75	\$80,526
Autosash closure	32	\$2,700.00	\$84,586	\$1,800.00	\$62,266
60 hp VFD	4	\$8,375.00	\$32,797	\$1,600.00	\$6,918
Reprogramming (E) AHU's	2	\$0.00	\$0	\$6,000.00	\$12,972
Fume Hood Conversion - CAV to VAV	32	\$11,250.00	\$352,440	\$11,250.00	\$389,160
Raw Costs:			\$469,822		\$551,842
City: San Bernardino					
Sales Tax: 8.25%			\$38,760		N/A
City Index Material Multiplier: 97.9%					
Contractor O&P: 12.00%			\$61,030		\$66,221
Subtotals:			\$569,612		\$618,063
Contingency: 10.00%			\$56,961		\$61,806
Totals:			\$626,574		\$679,869
Engineering: 15.00%			\$195,966		
Construction Phase: 5.00%			\$65,322		
Project Management: 6.00%			\$78,387		
Total Project Cost:			\$1,646,118		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,646,118	Total Purchased Electricity Savings (kWh/yr):	1,116,114
Rebate/Incentive*:	\$323,830	Total Purchased Gas Savings (th/yr):	55,963
Net Project Cost:	\$1,322,288	Total Purchased Annual Cost Savings (\$/yr):	\$131,277
Net Simple Payback Period (yrs):	10.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2014

Project: DDMZAHU - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: HINDERAKER

Building Key: 05CP5480

Basic Gross Area (sf): 44,873

Calculation File: 05CP5480 - Hinderaker Hall - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	210,193
Peak Demand (kW):	33.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	122,599
HW/Steam (MMBTu/yr):	1,716

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 308,272

Equivalent Gas Savings (th/yr): 21,450

Anticipated Gross Incentive: \$95,435

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
CO2 SENSORS & CONTROLS	1	\$8,000.00	\$7,832	\$6,000.00	\$6,486
20 hp VFD	1	\$3,375.00	\$3,304	\$820.00	\$886
30 hp VFD	1	\$4,775.00	\$4,675	\$1,100.00	\$1,189
AHU DDC Upgrade: MZ CAV to VAV (23 points)	1	\$11,873.81	\$11,624	\$7,263.16	\$7,851
Zone Level Controller & DDC - dual duct	25	\$4,015.30	\$98,274	\$2,456.14	\$66,377
Raw Costs:			\$125,710		\$82,790
City: San Bernardino		Sales Tax: 8.25%	\$10,371		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$16,330		\$9,935
City Index Labor Multiplier: 108.1%		Subtotals:	\$152,411		\$92,725
		Contingency: 10.00%	\$15,241		\$9,273
		Totals:	\$167,652		\$101,998
		Engineering: 15.00%	\$40,447		
		Construction Phase: 5.00%	\$13,482		
		Project Management: 6.00%	\$16,179		
		Total Project Cost:	\$339,758		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$339,758	Total Purchased Electricity Savings (kWh/yr):	308,272
Rebate/Incentive*:	\$95,435	Total Purchased Gas Savings (th/yr):	21,450
Net Project Cost:	\$244,323	Total Purchased Annual Cost Savings (\$/yr):	\$41,353
Net Simple Payback Period (yrs):	5.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2015

Project: DDMZAHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: OLMSTED

Building Key: 05CP5497

Basic Gross Area (sf): 92,594

Calculation File: 05CP5497 - OLMSTEAD HALL - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	169,162
Peak Demand (kW):	25.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	170,726
HW/Steam (MMBTu/yr):	2,864

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 305,743

Equivalent Gas Savings (th/yr): 35,800

Anticipated Gross Incentive: \$109,178

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Zone Level Controller & DDC - dual duct	7	\$4,015.30	\$27,517	\$2,456.14	\$18,586
AHU DDC Upgrade: SZ CAV to VAV (42 points)	2	\$10,841.30	\$21,227	\$6,631.58	\$14,337
5 hp VFD	1	\$1,675.00	\$1,640	\$455.00	\$492
CO2 SENSORS & CONTROLS	2	\$8,000.00	\$15,664	\$6,000.00	\$12,972
20 hp VFD	1	\$3,375.00	\$3,304	\$820.00	\$886
Raw Costs:			\$69,352		\$47,273
City: San Bernardino			Sales Tax: 8.25%	\$5,722	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$9,009	\$5,673
City Index Labor Multiplier: 108.1%			Subtotals:	\$84,082	\$52,946
			Contingency: 10.00%	\$8,408	\$5,295
			Totals:	\$92,491	\$58,241
			Engineering: 15.00%	\$22,610	
			Construction Phase: 5.00%	\$7,537	
			Project Management: 6.00%	\$9,044	
Total Project Cost:				\$189,922	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$189,922	Total Purchased Electricity Savings (kWh/yr):	305,743
Rebate/Incentive*:	\$109,178	Total Purchased Gas Savings (th/yr):	35,800
Net Project Cost:	\$80,744	Total Purchased Annual Cost Savings (\$/yr):	\$53,361
Net Simple Payback Period (yrs):	1.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2016

Project: FUMEHOOD & AHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BATCHELOR

Building Key: 05CP5501

Basic Gross Area (sf): 105,334

Calculation File: 05CP5501 - Batchelor - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume. Steam savings scaled to match historical use

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,008,723
Peak Demand (kW):	58.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	331,378
HW/Steam (MMBTu/yr):	6,170

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,273,825

Equivalent Gas Savings (th/yr): 77,125

Anticipated Gross Incentive: \$382,843

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Zone Level Controller & DDC - dual duct	150	\$4,015.30	\$589,647	\$2,456.14	\$398,263
Rebalance (\$1.75 per square foot)	56,203	\$0.00	\$0	\$1.75	\$106,322
Autosash closure	62	\$2,700.00	\$163,885	\$1,800.00	\$120,640
Fume Hood Conversion - CAV to VAV	62	\$11,250.00	\$682,853	\$11,250.00	\$753,998
AHU DDC Upgrade: DD CAV to VAV (299 points)	13	\$11,873.81	\$151,118	\$7,263.16	\$102,069
10 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
5 hp VFD	10	\$1,675.00	\$16,398	\$455.00	\$4,919
2 hp VFD	1	\$700.00	\$685	\$400.00	\$432
3 hp VFD	1	\$1,525.00	\$1,493	\$455.00	\$492

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

City: San Bernardino		Raw Costs:	\$1,608,012	\$1,487,723
		Sales Tax: 8.25%	\$132,661	N/A
City Index Material Multiplier:	97.9%	Contractor O&P: 12.00%	\$208,881	\$178,527
City Index Labor Multiplier:	108.1%	Subtotals:	\$1,949,554	\$1,666,250
		Contingency: 10.00%	\$194,955	\$166,625
		Totals:	\$2,144,509	\$1,832,875
		Engineering: 15.00%	\$596,608	
		Construction Phase: 5.00%	\$198,869	
		Project Management: 6.00%	\$238,643	
		Total Project Cost:	\$5,011,504	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,011,504	Total Purchased Electricity Savings (kWh/yr):	1,273,825
Rebate/Incentive*:	\$382,843	Total Purchased Gas Savings (th/yr):	77,125
Net Project Cost:	\$4,628,661	Total Purchased Annual Cost Savings (\$/yr):	\$161,093
Net Simple Payback Period (yrs):	28.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incenti funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2017

Project: REPLACE OLD UNITS WITH VAV AHU'S

Campus: RIVERSIDE

Location: RIVERSIDE

Building: LOTHIAN HALL

Building Key: 05CP5502

Basic Gross Area (sf): 246,791

Calculation File: 05CP5502 - Lothian Hall - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	446,271
Peak Demand (kW):	69.0
Gas (th/yr):	617
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 446,271

Equivalent Gas Savings (th/yr): 617

Anticipated Gross Incentive: \$107,722

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
AHU DDC Upgrade: SZ CAV to VAV (231 points)	11	\$10,841.30	\$116,750	\$6,631.58	\$78,856
Zone Level Controller & DDC - cooling with re-heat	20	\$3,212.24	\$62,896	\$1,964.91	\$42,481
DEMOLITION	11	\$0.00	\$0	\$3,000.00	\$35,673
VAV AHU'S (Duct, Elec., etc.)	11	\$15,000.00	\$161,535	\$7,500.00	\$89,183
Raw Costs:			\$341,181		\$246,193
City: San Bernardino		Sales Tax: 8.25%	\$28,147		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$44,319		\$29,543
City Index Labor Multiplier: 108.1%		Subtotals:	\$413,647		\$275,736
		Contingency: 10.00%	\$41,365		\$27,574
		Totals:	\$455,012		\$303,310
		Engineering: 15.00%	\$113,748		
		Construction Phase: 5.00%	\$37,916		
		Project Management: 6.00%	\$45,499		
		Total Project Cost:	\$955,486		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$955,486	Total Purchased Electricity Savings (kWh/yr):	446,271
Rebate/Incentive*:	\$107,722	Total Purchased Gas Savings (th/yr):	771
Net Project Cost:	\$847,764	Total Purchased Annual Cost Savings (\$/yr):	\$34,126
Net Simple Payback Period (yrs):	24.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2018

Project: LAB FUMEHOODS & DDMZAHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICS

Building Key: 05CP5504

Basic Gross Area (sf): 89,541

Calculation File: 05CP5504 - Physics - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	759,254
Peak Demand (kW):	43.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	220,970
HW/Steam (MMBTu/yr):	4,897

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 936,030

Equivalent Gas Savings (th/yr): 61,213

Anticipated Gross Incentive: \$285,860

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
25 hp VFD	1	\$3,925.00	\$3,843	\$1,100.00	\$1,189
Autosash closure	14	\$2,700.00	\$37,006	\$1,800.00	\$27,241
7.5 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
40 hp VFD	1	\$7,025.00	\$6,877	\$1,100.00	\$1,189
AHU DDC Upgrade: DD CAV to VAV (92 points)	4	\$11,873.81	\$46,498	\$7,263.16	\$31,406
Zone Level Controller & DDC - dual duct	90	\$4,015.30	\$353,788	\$2,456.14	\$238,958
Fume Hood Conversion - CAV to VAV	14	\$11,250.00	\$154,193	\$11,250.00	\$170,258
Rebalance (\$1.75 per square foot)	55,621	\$0.00	\$0	\$1.75	\$105,221
20 hp VFD	6	\$3,375.00	\$19,825	\$820.00	\$5,319

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

City: San Bernardino		Raw Costs:	\$623,963	\$581,369
		Sales Tax: 8.25%	\$51,477	N/A
City Index Material Multiplier:	97.9%	Contractor O&P: 12.00%	\$81,053	\$69,764
City Index Labor Multiplier:	108.1%	Subtotals:	\$756,493	\$651,134
		Contingency: 10.00%	\$75,649	\$65,113
		Totals:	\$832,142	\$716,247
		Engineering: 15.00%	\$232,258	
		Construction Phase: 5.00%	\$77,419	
		Project Management: 6.00%	\$92,903	
		Total Project Cost:	\$1,950,970	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,950,970	Total Purchased Electricity Savings (kWh/yr):	936,030
Rebate/Incentive*:	\$285,860	Total Purchased Gas Savings (th/yr):	61,213
Net Project Cost:	\$1,665,110	Total Purchased Annual Cost Savings (\$/yr):	\$122,233
Net Simple Payback Period (yrs):	13.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incenti funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2019

Project: AHU (S-8) - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICS

Building Key: 05CP5504

Basic Gross Area (sf): 89,541

Calculation File: 05CP5504 - Physics AHU (S-8 Auditorium) - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	118,264
Peak Demand (kW):	18.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	46,838
HW/Steam (MMBTu/yr):	704

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 155,734

Equivalent Gas Savings (th/yr): 8,800

Anticipated Gross Incentive: \$46,176

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
CO2 SENSORS & CONTROLS	1	\$8,000.00	\$7,832	\$6,000.00	\$6,486
Zone Level Controller & DDC - cooling with re-heat	1	\$3,212.24	\$3,145	\$1,964.91	\$2,124
AHU DDC Upgrade: SZ CAV to VAV (21 points)	1	\$10,841.30	\$10,614	\$6,631.58	\$7,169
2 hp VFD	1	\$700.00	\$685	\$400.00	\$432
7.5 hp VFD	1	\$1,975.00	\$1,934	\$545.00	\$589
Raw Costs:			\$24,209		\$16,800
City: San Bernardino			Sales Tax: 8.25%	\$1,997	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,145	\$2,016
City Index Labor Multiplier: 108.1%			Subtotals:	\$29,351	\$18,816
			Contingency: 10.00%	\$2,935	\$1,882
			Totals:	\$32,286	\$20,698
			Engineering: 15.00%	\$7,948	
			Construction Phase: 5.00%	\$2,649	
			Project Management: 6.00%	\$3,179	
			Total Project Cost:	\$66,760	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$66,760	Total Purchased Electricity Savings (kWh/yr):	155,734
Rebate/Incentive*:	\$46,176	Total Purchased Gas Savings (th/yr):	8,800
Net Project Cost:	\$20,584	Total Purchased Annual Cost Savings (\$/yr):	\$19,160
Net Simple Payback Period (yrs):	1.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2020

Project: LAB FUMEHOODS & DDMZAHU'S - CV TO VAV CONVERSION

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PIERCE

Building Key: 05CP5508

Basic Gross Area (sf): 141,355

Calculation File: 05CP5508 - Pierce Hall - VAV Fumehood.xls

Project Description Reference(s): Laboratory Air Handler Project 1. Convert Laboratory Air Handlers and Fume Hoods to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	2,176,527
Peak Demand (kW):	124.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	612,871
HW/Steam (MMBTu/yr):	6,065

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 2,666,824

Equivalent Gas Savings (th/yr): 75,813

Anticipated Gross Incentive: \$715,850

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Fume Hood Conversion - CAV to VAV	86	\$11,250.00	\$947,183	\$11,250.00	\$1,045,868
75 hp VFD	2	\$11,500.00	\$22,517	\$1,600.00	\$3,459
Autosash closure	86	\$2,700.00	\$227,324	\$1,800.00	\$167,339
Rebalance (\$1.75 per square foot)	83,512	\$0.00	\$0	\$1.75	\$157,984
AHU DDC Upgrade: DD CAV to VAV (115 points)	5	\$11,873.81	\$58,122	\$7,263.16	\$39,257
30 hp VFD	3	\$4,775.00	\$14,024	\$1,100.00	\$3,567
25 hp VFD	12	\$3,925.00	\$46,111	\$1,100.00	\$14,269
Zone Level Controller & DDC - dual duct	215	\$4,015.30	\$845,160	\$2,456.14	\$570,844
Raw Costs:			\$2,160,441		\$2,002,587
City: San Bernardino			Sales Tax: 8.25%	\$178,236	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$280,641	\$240,310
City Index Labor Multiplier: 108.1%			Subtotals:	\$2,619,319	\$2,242,897
			Contingency: 10.00%	\$261,932	\$224,290
			Totals:	\$2,881,251	\$2,467,187
			Engineering: 15.00%	\$802,266	
			Construction Phase: 5.00%	\$267,422	
			Project Management: 6.00%	\$320,906	
Total Project Cost:				\$6,739,032	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$6,739,032	Total Purchased Electricity Savings (kWh/yr):	2,666,824
Rebate/Incentive*:	\$715,850	Total Purchased Gas Savings (th/yr):	75,813
Net Project Cost:	\$6,023,182	Total Purchased Annual Cost Savings (\$/yr):	\$264,452
Net Simple Payback Period (yrs):	22.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2021

Project: AHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STU REC CTR

Building Key: 05CP5511

Basic Gross Area (sf): 86,048

Calculation File: 05CP5511 - Student Recreational Center (AHU-1 thru AHU-4) - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,121,747
Peak Demand (kW):	232.0
Gas (th/yr):	976
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,121,747

Equivalent Gas Savings (th/yr): 976

Anticipated Gross Incentive: \$270,195

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
10 hp VFD	3	\$1,975.00	\$5,801	\$545.00	\$1,767
15 hp VFD	1	\$2,275.00	\$2,227	\$820.00	\$886
25 hp VFD	1	\$3,925.00	\$3,843	\$1,100.00	\$1,189
30 hp VFD	2	\$4,775.00	\$9,349	\$1,100.00	\$2,378
40 hp VFD	1	\$7,025.00	\$6,877	\$1,100.00	\$1,189
AHU DDC Upgrade: SZ CAV to VAV (84 points)	4	\$10,841.30	\$42,455	\$6,631.58	\$28,675
Zone Level Controller & DDC - cooling with re-heat	30	\$3,212.24	\$94,343	\$1,964.91	\$63,722
CO2 SENSORS & CONTROLS	4	\$8,000.00	\$31,328	\$6,000.00	\$25,944
Raw Costs:			\$196,223		\$125,751
City: San Bernardino			Sales Tax: 8.25%	\$16,188	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$25,489	\$15,090
City Index Labor Multiplier: 108.1%			Subtotals:	\$237,901	\$140,841
			Contingency: 10.00%	\$23,790	\$14,084
			Totals:	\$261,691	\$154,926
			Engineering: 15.00%	\$62,493	
			Construction Phase: 5.00%	\$20,831	
			Project Management: 6.00%	\$24,997	
Total Project Cost:				\$524,937	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$524,937	Total Purchased Electricity Savings (kWh/yr):	1,121,747
Rebate/Incentive*:	\$270,195	Total Purchased Gas Savings (th/yr):	1,220
Net Project Cost:	\$254,742	Total Purchased Annual Cost Savings (\$/yr):	\$85,168
Net Simple Payback Period (yrs):	3.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2022

Project: DDAHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE
 Location: RIVERSIDE
 Building: SPROUL
 Building Key: 05CP5523
 Basic Gross Area (sf): 78,834
 Calculation File: 05CP5523 - Sproul Hall - CV TO VAV.xls

Campus Prioritization and Schedule

Project Tier: Backup
 Start Preliminary Engineering:
 Scheduled Completion:

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume. Steam savings scaled to match historical use

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 422,876
 Peak Demand (kW): 60.0
 Gas (th/yr): 0
 Chilled Water (ton-hr/yr): 463,144
 HW/Steam (MMBTu/yr): 1,814

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 793,391

Equivalent Gas Savings (th/yr): 22,675

Anticipated Gross Incentive: \$213,089

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
20 hp VFD	2	\$3,375.00	\$6,608	\$820.00	\$1,773
AHU DDC Upgrade: DD CAV to VAV (92 points)	4	\$11,873.81	\$46,498	\$7,263.16	\$31,406
Zone Level Controller & DDC - cooling with re-heat	90	\$3,212.24	\$283,030	\$1,964.91	\$191,166
10 hp VFD	2	\$1,975.00	\$3,867	\$545.00	\$1,178
7.5 hp VFD	2	\$1,975.00	\$3,867	\$545.00	\$1,178
5 hp VFD	1	\$1,675.00	\$1,640	\$455.00	\$492
15 hp VFD	1	\$2,275.00	\$2,227	\$820.00	\$886
CO2 SENSORS & CONTROLS	4	\$8,000.00	\$31,328	\$6,000.00	\$25,944
Raw Costs:			\$379,066		\$254,024
City: San Bernardino			Sales Tax: 8.25%	\$31,273	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$49,241	\$30,483
City Index Labor Multiplier: 108.1%			Subtotals:	\$459,579	\$284,507
			Contingency: 10.00%	\$45,958	\$28,451
			Totals:	\$505,537	\$312,957
			Engineering: 15.00%	\$122,774	
			Construction Phase: 5.00%	\$40,925	
			Project Management: 6.00%	\$49,110	
Total Project Cost:				\$1,031,303	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,031,303	Total Purchased Electricity Savings (kWh/yr):	793,391
Rebate/Incentive*:	\$213,089	Total Purchased Gas Savings (th/yr):	22,675
Net Project Cost:	\$818,214	Total Purchased Annual Cost Savings (\$/yr):	\$78,778
Net Simple Payback Period (yrs):	10.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E2023

Project: DDAHU'S - CV TO VAV RETROFIT

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STAT COMP

Building Key: 05CP5588

Basic Gross Area (sf): 41,939

Calculation File: 05CP5588 - Statics & Computers - CV TO VAV.xls

Project Description Reference(s): Air Handler Project 1. Convert Constant Volume Air Handlers and Terminal Boxes to Variable Air Volume.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	167,400
Peak Demand (kW):	32.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	206,082
HW/Steam (MMBTu/yr):	2,946

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 332,266

Equivalent Gas Savings (th/yr): 36,825

Anticipated Gross Incentive: \$116,569

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
15 hp VFD	3	\$2,275.00	\$6,682	\$820.00	\$2,659
AHU DDC Upgrade: DD CAV to VAV (69 points)	3	\$11,873.81	\$34,873	\$7,263.16	\$23,554
Zone Level Controller & DDC - dual duct	48	\$4,015.30	\$188,687	\$2,456.14	\$127,444
Raw Costs:			\$230,242		\$153,658
City: San Bernardino			Sales Tax: 8.25%	\$18,995	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$29,908	\$18,439
City Index Labor Multiplier: 108.1%			Subtotals:	\$279,145	\$172,097
			Contingency: 10.00%	\$27,915	\$17,210
			Totals:	\$307,060	\$189,307
			Engineering: 15.00%	\$74,455	
			Construction Phase: 5.00%	\$24,818	
			Project Management: 6.00%	\$29,782	
Total Project Cost:				\$625,422	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$625,422	Total Purchased Electricity Savings (kWh/yr):	332,266
Rebate/Incentive*:	\$116,569	Total Purchased Gas Savings (th/yr):	36,825
Net Project Cost:	\$508,853	Total Purchased Annual Cost Savings (\$/yr):	\$56,221
Net Simple Payback Period (yrs):	9.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3001

Project: Solar Pool Water Heater - UCR Pool

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC Riverside Pools TLH Checked by AML.xls

Project Description Reference(s): Pool Project 3. Solar Water Heating .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	10,398
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 10,398

Anticipated Gross Incentive: \$10,398

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Solar Water Heating System	1	\$29,053.80	\$28,444	\$37,813.86	\$40,877
		Raw Costs:	\$28,444		\$40,877
City: San Bernardino		Sales Tax: 8.25%	\$2,347		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$3,695		\$4,905
City Index Labor Multiplier: 108.1%		Subtotals:	\$34,485		\$45,782
		Contingency: 10.00%	\$3,449		\$4,578
		Totals:	\$37,934		\$50,360
		Engineering: 15.00%	\$13,244		
		Construction Phase: 5.00%	\$4,415		
		Project Management: 6.00%	\$5,298		
		Total Project Cost:	\$111,250		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$111,250	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$10,398	Total Purchased Gas Savings (th/yr):	12,998
Net Project Cost:	\$100,852	Total Purchased Annual Cost Savings (\$/yr):	\$11,048
Net Simple Payback Period (yrs):	9.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3002

Project: Pool Covers - UCR Pool

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC Riverside Pools TLH Checked by AML.xls

Project Description Reference(s): Pool Project 2. Pool Covers.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	25,264
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 25,264

Anticipated Gross Incentive: \$25,264

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Power Winder	1	\$6,000.00	\$5,874	\$3,000.00	\$3,243
Cover and Storage Reel	1	\$25,446.00	\$24,912	\$0.00	\$0
Raw Costs:			\$30,786		\$3,243
City: San Bernardino Sales Tax: 8.25%			\$2,540		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,999	\$389
City Index Labor Multiplier: 108.1%			Subtotals:	\$37,325	\$3,632
			Contingency: 10.00%	\$3,732	\$363
			Totals:	\$41,057	\$3,995
			Engineering: 15.00%	\$6,758	
			Construction Phase: 5.00%	\$2,253	
			Project Management: 6.00%	\$2,703	
Total Project Cost:			\$56,766		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$56,766	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$25,264	Total Purchased Gas Savings (th/yr):	31,580
Net Project Cost:	\$31,502	Total Purchased Annual Cost Savings (\$/yr):	\$26,843
Net Simple Payback Period (yrs):	1.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3003

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BIOLOGIC SCI

Building Key: 05CP5186

Basic Gross Area (sf): 54,300

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2

Start Preliminary Engineering: 1/1/2010

Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	102,627
Peak Demand (kW):	12.0
Gas (th/yr):	11,023
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 102,627

Equivalent Gas Savings (th/yr): 11,023

Anticipated Gross Incentive: \$35,653

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$16,562		\$49,685
		Contingency: 10.00%	\$1,656		\$4,969
		Totals:	\$18,218		\$54,654
		Engineering: 15.00%	\$10,931		
		Construction Phase: 5.00%	\$3,644		
		Project Management: 6.00%	\$4,372		
		Total Project Cost:	\$91,818		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$91,818	Total Purchased Electricity Savings (kWh/yr):	102,627
Rebate/Incentive*:	\$35,653	Total Purchased Gas Savings (th/yr):	13,779
Net Project Cost:	\$56,165	Total Purchased Annual Cost Savings (\$/yr):	\$19,409
Net Simple Payback Period (yrs):	2.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3004

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENGINEERING2

Building Key: 05CP5194

Basic Gross Area (sf): 157,987

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2

Start Preliminary Engineering: 1/1/2009

Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	298,595
Peak Demand (kW):	34.0
Gas (th/yr):	32,071
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 298,595

Equivalent Gas Savings (th/yr): 32,071

Anticipated Gross Incentive: \$103,734

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$48,186		\$144,558
		Contingency: 10.00%	\$4,819		\$14,456
		Totals:	\$53,005		\$159,014
		Engineering: 15.00%	\$31,803		
		Construction Phase: 5.00%	\$10,601		
		Project Management: 6.00%	\$12,721		
		Total Project Cost:	\$267,143		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$267,143	Total Purchased Electricity Savings (kWh/yr):	298,595
Rebate/Incentive*:	\$103,734	Total Purchased Gas Savings (th/yr):	40,089
Net Project Cost:	\$163,409	Total Purchased Annual Cost Savings (\$/yr):	\$56,470
Net Simple Payback Period (yrs):	2.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3005

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BOURNS
Building Key: 05CP5261
Basic Gross Area (sf): 157,189
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2010
Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 297,087
Peak Demand (kW): 34.0
Gas (th/yr): 31,909
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 297,087

Equivalent Gas Savings (th/yr): 31,909

Anticipated Gross Incentive: \$103,210

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$47,943		\$143,828
		Contingency: 10.00%	\$4,794		\$14,383
		Totals:	\$52,737		\$158,211
		Engineering: 15.00%	\$31,642		
		Construction Phase: 5.00%	\$10,547		
		Project Management: 6.00%	\$12,657		
		Total Project Cost:	\$265,795		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$265,795 **Total Purchased Electricity Savings (kWh/yr):** 297,087
Rebate/Incentive*: \$103,210 **Total Purchased Gas Savings (th/yr):** 39,886
Net Project Cost: \$162,585 **Total Purchased Annual Cost Savings (\$/yr):** \$56,185
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3006

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: HUM & SOC SC

Building Key: 05CP5307

Basic Gross Area (sf): 105,966

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2009
Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	81,594
Peak Demand (kW):	9.0
Gas (th/yr):	11,126
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 81,594

Equivalent Gas Savings (th/yr): 11,126

Anticipated Gross Incentive: \$30,709

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$16,160		\$48,479
		Contingency: 10.00%	\$1,616		\$4,848
		Totals:	\$17,776		\$53,327
		Engineering: 15.00%	\$10,665		
		Construction Phase: 5.00%	\$3,555		
		Project Management: 6.00%	\$4,266		
		Total Project Cost:	\$89,590		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$89,590	Total Purchased Electricity Savings (kWh/yr):	81,594
Rebate/Incentive*:	\$30,709	Total Purchased Gas Savings (th/yr):	13,908
Net Project Cost:	\$58,881	Total Purchased Annual Cost Savings (\$/yr):	\$17,941
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3007

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: SPIETH
Building Key: 05CP5323
Basic Gross Area (sf): 100,927
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 190,752
Peak Demand (kW): 22.0
Gas (th/yr): 20,488
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 190,752

Equivalent Gas Savings (th/yr): 20,488

Anticipated Gross Incentive: \$66,268

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$30,783		\$92,348
		Contingency: 10.00%	\$3,078		\$9,235
		Totals:	\$33,861		\$101,583
		Engineering: 15.00%	\$20,317		
		Construction Phase: 5.00%	\$6,772		
		Project Management: 6.00%	\$8,127		
		Total Project Cost:	\$170,660		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$170,660 **Total Purchased Electricity Savings (kWh/yr):** 190,752
Rebate/Incentive*: \$66,268 **Total Purchased Gas Savings (th/yr):** 25,610
Net Project Cost: \$104,392 **Total Purchased Annual Cost Savings (\$/yr):** \$36,075
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3008

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: PE
Building Key: 05CP5334
Basic Gross Area (sf): 66,335
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2009
Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 51,078
Peak Demand (kW): 6.0
Gas (th/yr): 6,965
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 51,078

Equivalent Gas Savings (th/yr): 6,965

Anticipated Gross Incentive: \$19,224

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$10,116		\$30,348
		Contingency: 10.00%	\$1,012		\$3,035
		Totals:	\$11,128		\$33,383
		Engineering: 15.00%	\$6,677		
		Construction Phase: 5.00%	\$2,226		
		Project Management: 6.00%	\$2,671		
		Total Project Cost:	\$56,083		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$56,083 **Total Purchased Electricity Savings (kWh/yr):** 51,078
Rebate/Incentive*: \$19,224 **Total Purchased Gas Savings (th/yr):** 8,706
Net Project Cost: \$36,859 **Total Purchased Annual Cost Savings (\$/yr):** \$11,231
Net Simple Payback Period (yrs): 3.3

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3009

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: GEOLOGY
Building Key: 05CP5335
Basic Gross Area (sf): 96,019
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2010
Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 181,476
Peak Demand (kW): 21.0
Gas (th/yr): 19,492
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 181,476

Equivalent Gas Savings (th/yr): 19,492

Anticipated Gross Incentive: \$63,046

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$29,286		\$87,857
		Contingency: 10.00%	\$2,929		\$8,786
		Totals:	\$32,215		\$96,643
		Engineering: 15.00%	\$19,329		
		Construction Phase: 5.00%	\$6,443		
		Project Management: 6.00%	\$7,731		
		Total Project Cost:	\$162,360		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$162,360 **Total Purchased Electricity Savings (kWh/yr):** 181,476
Rebate/Incentive*: \$63,046 **Total Purchased Gas Savings (th/yr):** 24,365
Net Project Cost: \$99,314 **Total Purchased Annual Cost Savings (\$/yr):** \$34,321
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3010

Project: SBD, New/Renov - Boyce Hall and Webber Hall Renovations

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2009
Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,248,096
Peak Demand (kW):	142.0
Gas (th/yr):	59,473
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,248,096

Equivalent Gas Savings (th/yr): 59,473

Anticipated Gross Incentive: \$359,016

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$460,873		\$460,873
		Contingency: 10.00%	\$46,087		\$46,087
		Totals:	\$506,960		\$506,960
		Engineering: 15.00%	\$152,088		
		Construction Phase: 5.00%	\$50,696		
		Project Management: 6.00%	\$60,835		
		Total Project Cost:	\$1,277,540		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,277,540	Total Purchased Electricity Savings (kWh/yr):	1,248,096
Rebate/Incentive*:	\$359,016	Total Purchased Gas Savings (th/yr):	74,341
Net Project Cost:	\$918,524	Total Purchased Annual Cost Savings (\$/yr):	\$156,797
Net Simple Payback Period (yrs):	5.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3011

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: ABER INVER
Building Key: 05CP5343
Basic Gross Area (sf): 203,939
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 157,033
Peak Demand (kW): 18.0
Gas (th/yr): 21,414
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 157,033

Equivalent Gas Savings (th/yr): 21,414

Anticipated Gross Incentive: \$59,102

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$31,101		\$93,302
		Contingency: 10.00%	\$3,110		\$9,330
		Totals:	\$34,211		\$102,632
		Engineering: 15.00%	\$20,526		
		Construction Phase: 5.00%	\$6,842		
		Project Management: 6.00%	\$8,211		
		Total Project Cost:	\$172,423		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$172,423 **Total Purchased Electricity Savings (kWh/yr):** 157,033
Rebate/Incentive*: \$59,102 **Total Purchased Gas Savings (th/yr):** 26,768
Net Project Cost: \$113,321 **Total Purchased Annual Cost Savings (\$/yr):** \$34,530
Net Simple Payback Period (yrs): 3.3

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3012

Project: SBD, New/Renov - Aberdeen-Inverness Refurbishment

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ABER INVER

Building Key: 05CP5343

Basic Gross Area (sf): 203,939

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	69,930
Peak Demand (kW):	8.0
Gas (th/yr):	6,552
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 69,930

Equivalent Gas Savings (th/yr): 6,552

Anticipated Gross Incentive: \$23,335

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$35,403		\$35,402
		Contingency: 10.00%	\$3,540		\$3,540
		Totals:	\$38,943		\$38,942
		Engineering: 15.00%	\$11,683		
		Construction Phase: 5.00%	\$3,894		
		Project Management: 6.00%	\$4,673		
		Total Project Cost:	\$98,136		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$98,136	Total Purchased Electricity Savings (kWh/yr):	69,930
Rebate/Incentive*:	\$23,335	Total Purchased Gas Savings (th/yr):	8,190
Net Project Cost:	\$74,801	Total Purchased Annual Cost Savings (\$/yr):	\$12,206
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3013

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: WATKINS
Building Key: 05CP5354
Basic Gross Area (sf): 62,237
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 117,628
Peak Demand (kW): 13.0
Gas (th/yr): 12,634
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 117,628

Equivalent Gas Savings (th/yr): 12,634

Anticipated Gross Incentive: \$40,865

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$18,982		\$56,947
		Contingency: 10.00%	\$1,898		\$5,695
		Totals:	\$20,880		\$62,642
		Engineering: 15.00%	\$12,528		
		Construction Phase: 5.00%	\$4,176		
		Project Management: 6.00%	\$5,011		
		Total Project Cost:	\$105,238		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$105,238 **Total Purchased Electricity Savings (kWh/yr):** 117,628
Rebate/Incentive*: \$40,865 **Total Purchased Gas Savings (th/yr):** 15,793
Net Project Cost: \$64,373 **Total Purchased Annual Cost Savings (\$/yr):** \$22,246
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3014

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUS SURGE

Building Key: 05CP5380

Basic Gross Area (sf): 72,340

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2

Start Preliminary Engineering: 1/1/2010

Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	55,702
Peak Demand (kW):	6.0
Gas (th/yr):	7,596
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 55,702

Equivalent Gas Savings (th/yr): 7,596

Anticipated Gross Incentive: \$20,964

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$11,032		\$33,096
		Contingency: 10.00%	\$1,103		\$3,310
		Totals:	\$12,135		\$36,406
		Engineering: 15.00%	\$7,281		
		Construction Phase: 5.00%	\$2,427		
		Project Management: 6.00%	\$2,912		
		Total Project Cost:	\$61,161		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$61,161	Total Purchased Electricity Savings (kWh/yr):	55,702
Rebate/Incentive*:	\$20,964	Total Purchased Gas Savings (th/yr):	9,495
Net Project Cost:	\$40,197	Total Purchased Annual Cost Savings (\$/yr):	\$12,248
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3015

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: ARTS
Building Key: 05CP5411
Basic Gross Area (sf): 106,659
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2010
Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 82,127
Peak Demand (kW): 9.0
Gas (th/yr): 11,199
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 82,127

Equivalent Gas Savings (th/yr): 11,199

Anticipated Gross Incentive: \$30,909

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$16,266		\$48,796
		Contingency: 10.00%	\$1,627		\$4,880
		Totals:	\$17,893		\$53,676
		Engineering: 15.00%	\$10,735		
		Construction Phase: 5.00%	\$3,578		
		Project Management: 6.00%	\$4,294		
		Total Project Cost:	\$90,176		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$90,176
Rebate/Incentive*: \$30,909
Net Project Cost: \$59,267
Net Simple Payback Period (yrs): 3.3

Total Purchased Electricity Savings (kWh/yr): 82,127
Total Purchased Gas Savings (th/yr): 13,999
Total Purchased Annual Cost Savings (\$/yr): \$18,058

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3016

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICAL SCI

Building Key: 05CP5414

Basic Gross Area (sf): 134,709

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 1
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 254,600
Peak Demand (kW): 29.0
Gas (th/yr): 27,346
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 254,600

Equivalent Gas Savings (th/yr): 27,346

Anticipated Gross Incentive: \$88,450

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$41,086		\$123,259
		Contingency: 10.00%	\$4,109		\$12,326
		Totals:	\$45,195		\$135,585
		Engineering: 15.00%	\$27,117		
		Construction Phase: 5.00%	\$9,039		
		Project Management: 6.00%	\$10,847		
		Total Project Cost:	\$227,782		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$227,782 **Total Purchased Electricity Savings (kWh/yr):** 254,600
Rebate/Incentive*: \$88,450 **Total Purchased Gas Savings (th/yr):** 34,183
Net Project Cost: \$139,332 **Total Purchased Annual Cost Savings (\$/yr):** \$48,150
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3017

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENTOMOLOGY

Building Key: 05CP5417

Basic Gross Area (sf): 69,417

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2

Start Preliminary Engineering: 1/1/2010

Scheduled Completion: 6/1/2010

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	131,198
Peak Demand (kW):	15.0
Gas (th/yr):	14,092
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 131,198

Equivalent Gas Savings (th/yr): 14,092

Anticipated Gross Incentive: \$45,580

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$21,172		\$63,517
		Contingency: 10.00%	\$2,117		\$6,352
		Totals:	\$23,289		\$69,869
		Engineering: 15.00%	\$13,974		
		Construction Phase: 5.00%	\$4,658		
		Project Management: 6.00%	\$5,589		
		Total Project Cost:	\$117,379		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$117,379	Total Purchased Electricity Savings (kWh/yr):	131,198
Rebate/Incentive*:	\$45,580	Total Purchased Gas Savings (th/yr):	17,615
Net Project Cost:	\$71,799	Total Purchased Annual Cost Savings (\$/yr):	\$24,813
Net Simple Payback Period (yrs):	2.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3018

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
 Location: RIVERSIDE
 Building: OLMSTED
 Building Key: 05CP5497
 Basic Gross Area (sf): 92,594
 Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
 Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
 Start Preliminary Engineering: 1/1/2009
 Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 71,297
 Peak Demand (kW): 8.0
 Gas (th/yr): 9,722
 Chilled Water (ton-hr/yr): 0
 HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 71,297

Equivalent Gas Savings (th/yr): 9,722

Anticipated Gross Incentive: \$26,833

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$14,121		\$42,362
		Contingency: 10.00%	\$1,412		\$4,236
		Totals:	\$15,533		\$46,598
		Engineering: 15.00%	\$9,320		
		Construction Phase: 5.00%	\$3,107		
		Project Management: 6.00%	\$3,728		
		Total Project Cost:	\$78,285		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$78,285 Total Purchased Electricity Savings (kWh/yr): 71,297
 Rebate/Incentive*: \$26,833 Total Purchased Gas Savings (th/yr): 12,153
 Net Project Cost: \$51,452 Total Purchased Annual Cost Savings (\$/yr): \$15,677
 Net Simple Payback Period (yrs): 3.3

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3019

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BATCHELOR
Building Key: 05CP5501
Basic Gross Area (sf): 105,334
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 199,081
Peak Demand (kW): 23.0
Gas (th/yr): 21,383
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 199,081

Equivalent Gas Savings (th/yr): 21,383

Anticipated Gross Incentive: \$69,162

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$32,127		\$96,381
		Contingency: 10.00%	\$3,213		\$9,638
		Totals:	\$35,340		\$106,019
		Engineering: 15.00%	\$21,204		
		Construction Phase: 5.00%	\$7,068		
		Project Management: 6.00%	\$8,482		
		Total Project Cost:	\$178,112		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$178,112 **Total Purchased Electricity Savings (kWh/yr):** 199,081
Rebate/Incentive*: \$69,162 **Total Purchased Gas Savings (th/yr):** 26,729
Net Project Cost: \$108,950 **Total Purchased Annual Cost Savings (\$/yr):** \$37,651
Net Simple Payback Period (yrs): 2.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3020

Project: SBD, New/Renov - Batchelor Hall Building Systems Renewal

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BATCHELOR

Building Key: 05CP5501

Basic Gross Area (sf): 105,334

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program. Steam savings reduced to avoid overlap with other projects

Campus Prioritization and Schedule

Project Tier: Tier 1
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 280,040
Peak Demand (kW): 32.0
Gas (th/yr): 13,119
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 280,040

Equivalent Gas Savings (th/yr): 13,119

Anticipated Gross Incentive: \$80,329

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$141,768		\$141,767
		Contingency: 10.00%	\$14,177		\$14,177
		Totals:	\$155,945		\$155,944
		Engineering: 15.00%	\$46,783		
		Construction Phase: 5.00%	\$15,594		
		Project Management: 6.00%	\$18,713		
		Total Project Cost:	\$392,980		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$392,980 **Total Purchased Electricity Savings (kWh/yr):** 280,040
Rebate/Incentive*: \$80,329 **Total Purchased Gas Savings (th/yr):** 16,399
Net Project Cost: \$312,651 **Total Purchased Annual Cost Savings (\$/yr):** \$34,942
Net Simple Payback Period (yrs): 8.9

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3021

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: LOTHIAN HALL

Building Key: 05CP5502

Basic Gross Area (sf): 246,791

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	190,029
Peak Demand (kW):	22.0
Gas (th/yr):	25,913
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 190,029

Equivalent Gas Savings (th/yr): 25,913

Anticipated Gross Incentive: \$71,520

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$37,636		\$112,907
		Contingency: 10.00%	\$3,764		\$11,291
		Totals:	\$41,400		\$124,198
		Engineering: 15.00%	\$24,840		
		Construction Phase: 5.00%	\$8,280		
		Project Management: 6.00%	\$9,936		
		Total Project Cost:	\$208,653		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$208,653	Total Purchased Electricity Savings (kWh/yr):	190,029
Rebate/Incentive*:	\$71,520	Total Purchased Gas Savings (th/yr):	32,391
Net Project Cost:	\$137,133	Total Purchased Annual Cost Savings (\$/yr):	\$41,785
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3022

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: PIERCE
Building Key: 05CP5508
Basic Gross Area (sf): 141,355
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2009
Scheduled Completion: 6/1/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	267,161
Peak Demand (kW):	30.0
Gas (th/yr):	28,695
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
 Electricity \$0.24 per annual kWh th/MMBTU: 12.5
 Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
 th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 267,161

Equivalent Gas Savings (th/yr): 28,695

Anticipated Gross Incentive: \$92,814

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$43,113		\$129,340
		Contingency: 10.00%	\$4,311		\$12,934
		Totals:	\$47,424		\$142,274
		Engineering: 15.00%	\$28,455		
		Construction Phase: 5.00%	\$9,485		
		Project Management: 6.00%	\$11,382		
		Total Project Cost:	\$239,020		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$239,020	Total Purchased Electricity Savings (kWh/yr):	267,161
Rebate/Incentive*:	\$92,814	Total Purchased Gas Savings (th/yr):	35,869
Net Project Cost:	\$146,206	Total Purchased Annual Cost Savings (\$/yr):	\$50,526
Net Simple Payback Period (yrs):	2.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3023

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UNIV COMMONS

Building Key: 05CP5510

Basic Gross Area (sf): 53,390

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	41,110
Peak Demand (kW):	5.0
Gas (th/yr):	5,606
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 41,110

Equivalent Gas Savings (th/yr): 5,606

Anticipated Gross Incentive: \$15,472

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$8,142		\$24,426
		Contingency: 10.00%	\$814		\$2,443
		Totals:	\$8,956		\$26,869
		Engineering: 15.00%	\$5,374		
		Construction Phase: 5.00%	\$1,791		
		Project Management: 6.00%	\$2,149		
		Total Project Cost:	\$45,139		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$45,139	Total Purchased Electricity Savings (kWh/yr):	41,110
Rebate/Incentive*:	\$15,472	Total Purchased Gas Savings (th/yr):	7,008
Net Project Cost:	\$29,667	Total Purchased Annual Cost Savings (\$/yr):	\$9,040
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3024

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STU REC CTR

Building Key: 05CP5511

Basic Gross Area (sf): 86,048

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	66,257
Peak Demand (kW):	8.0
Gas (th/yr):	9,035
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 66,257

Equivalent Gas Savings (th/yr): 9,035

Anticipated Gross Incentive: \$24,937

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$13,122		\$39,367
		Contingency: 10.00%	\$1,312		\$3,937
		Totals:	\$14,434		\$43,304
		Engineering: 15.00%	\$8,661		
		Construction Phase: 5.00%	\$2,887		
		Project Management: 6.00%	\$3,464		
		Total Project Cost:	\$72,750		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$72,750	Total Purchased Electricity Savings (kWh/yr):	66,257
Rebate/Incentive*:	\$24,937	Total Purchased Gas Savings (th/yr):	11,294
Net Project Cost:	\$47,813	Total Purchased Annual Cost Savings (\$/yr):	\$14,569
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3025

Project: Monitoring Based Commissioning

Campus: RIVERSIDE
Location: RIVERSIDE
Building: SPROUL
Building Key: 05CP5523
Basic Gross Area (sf): 78,834
Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls
Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Tier 2
Start Preliminary Engineering: 1/1/2011
Scheduled Completion: 6/1/2011

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 60,702
Peak Demand (kW): 7.0
Gas (th/yr): 8,278
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 60,702

Equivalent Gas Savings (th/yr): 8,278

Anticipated Gross Incentive: \$22,846

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$12,022		\$36,067
		Contingency: 10.00%	\$1,202		\$3,607
		Totals:	\$13,224		\$39,674
		Engineering: 15.00%	\$7,935		
		Construction Phase: 5.00%	\$2,645		
		Project Management: 6.00%	\$3,174		
		Total Project Cost:	\$66,651		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$66,651 **Total Purchased Electricity Savings (kWh/yr):** 60,702
Rebate/Incentive*: \$22,846 **Total Purchased Gas Savings (th/yr):** 10,348
Net Project Cost: \$43,805 **Total Purchased Annual Cost Savings (\$/yr):** \$13,348
Net Simple Payback Period (yrs): 3.3

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3026

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UNV PLZA APT

Building Key: 05CP5715

Basic Gross Area (sf): 72,544

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	55,859
Peak Demand (kW):	6.0
Gas (th/yr):	7,617
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 55,859

Equivalent Gas Savings (th/yr): 7,617

Anticipated Gross Incentive: \$21,023

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$11,063		\$33,189
		Contingency: 10.00%	\$1,106		\$3,319
		Totals:	\$12,169		\$36,508
		Engineering: 15.00%	\$7,302		
		Construction Phase: 5.00%	\$2,434		
		Project Management: 6.00%	\$2,921		
		Total Project Cost:	\$61,333		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$61,333	Total Purchased Electricity Savings (kWh/yr):	55,859
Rebate/Incentive*:	\$21,023	Total Purchased Gas Savings (th/yr):	9,521
Net Project Cost:	\$40,310	Total Purchased Annual Cost Savings (\$/yr):	\$12,282
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3027

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UCR EXTEN CT

Building Key: 05CP5722

Basic Gross Area (sf): 196,641

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	98,408
Peak Demand (kW):	11.0
Gas (th/yr):	13,419
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 98,408

Equivalent Gas Savings (th/yr): 13,419

Anticipated Gross Incentive: \$37,037

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$19,490		\$58,469
		Contingency: 10.00%	\$1,949		\$5,847
		Totals:	\$21,439		\$64,316
		Engineering: 15.00%	\$12,863		
		Construction Phase: 5.00%	\$4,288		
		Project Management: 6.00%	\$5,145		
		Total Project Cost:	\$108,051		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$108,051	Total Purchased Electricity Savings (kWh/yr):	98,408
Rebate/Incentive*:	\$37,037	Total Purchased Gas Savings (th/yr):	16,774
Net Project Cost:	\$71,014	Total Purchased Annual Cost Savings (\$/yr):	\$21,638
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3028

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STONEHAVEN

Building Key: 05CP5991

Basic Gross Area (sf): 158,511

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	122,053
Peak Demand (kW):	14.0
Gas (th/yr):	16,644
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 122,053

Equivalent Gas Savings (th/yr): 16,644

Anticipated Gross Incentive: \$45,937

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$24,173		\$72,519
		Contingency: 10.00%	\$2,417		\$7,252
		Totals:	\$26,590		\$79,771
		Engineering: 15.00%	\$15,954		
		Construction Phase: 5.00%	\$5,318		
		Project Management: 6.00%	\$6,382		
		Total Project Cost:	\$134,015		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$134,015	Total Purchased Electricity Savings (kWh/yr):	122,053
Rebate/Incentive*:	\$45,937	Total Purchased Gas Savings (th/yr):	20,805
Net Project Cost:	\$88,078	Total Purchased Annual Cost Savings (\$/yr):	\$26,838
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3029

Project: Monitoring Based Commissioning

Campus: RIVERSIDE

Location: RIVERSIDE

Building: INTER VILLAG

Building Key: 05CP5998

Basic Gross Area (sf): 103,000

Calculation File: SEP MBCx Analysis MZ 080326 Final.Checked by LCK.xls

Project Description Reference(s): Monitoring Based Commission for All SEP Buildings.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	79,310
Peak Demand (kW):	9.0
Gas (th/yr):	10,815
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 79,310

Equivalent Gas Savings (th/yr): 10,815

Anticipated Gross Incentive: \$29,849

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$15,708		\$47,123
		Contingency: 10.00%	\$1,571		\$4,712
		Totals:	\$17,279		\$51,835
		Engineering: 15.00%	\$10,367		
		Construction Phase: 5.00%	\$3,456		
		Project Management: 6.00%	\$4,147		
		Total Project Cost:	\$87,084		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$87,084	Total Purchased Electricity Savings (kWh/yr):	79,310
Rebate/Incentive*:	\$29,849	Total Purchased Gas Savings (th/yr):	13,519
Net Project Cost:	\$57,235	Total Purchased Annual Cost Savings (\$/yr):	\$17,439
Net Simple Payback Period (yrs):	3.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3030

Project: SBD, New/Renov - Canyon Crest Dining Commons, Phase 1

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CANYON CREST DINING COMMONS

Building Key: 05CTBD1

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	167,063
Peak Demand (kW):	19.0
Gas (th/yr):	15,653
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 167,063

Equivalent Gas Savings (th/yr): 15,653

Anticipated Gross Incentive: \$55,748

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$84,574		\$84,574
		Contingency: 10.00%	\$8,457		\$8,457
		Totals:	\$93,031		\$93,031
		Engineering: 15.00%	\$27,909		
		Construction Phase: 5.00%	\$9,303		
		Project Management: 6.00%	\$11,164		
		Total Project Cost:	\$234,439		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$234,439	Total Purchased Electricity Savings (kWh/yr):	167,063
Rebate/Incentive*:	\$55,748	Total Purchased Gas Savings (th/yr):	19,566
Net Project Cost:	\$178,691	Total Purchased Annual Cost Savings (\$/yr):	\$29,161
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3031

Project: SBD, New/Renov - Canyon Crest Residence Halls, Phase 1

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CANYON CREST RESIDENT HALLS

Building Key: 05CTBD2

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	362,131
Peak Demand (kW):	41.0
Gas (th/yr):	33,929
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 362,131

Equivalent Gas Savings (th/yr): 33,929

Anticipated Gross Incentive: \$120,840

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$183,323		\$183,323
		Contingency: 10.00%	\$18,332		\$18,332
		Totals:	\$201,655		\$201,655
		Engineering: 15.00%	\$60,497		
		Construction Phase: 5.00%	\$20,166		
		Project Management: 6.00%	\$24,199		
		Total Project Cost:	\$508,171		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$508,171	Total Purchased Electricity Savings (kWh/yr):	362,131
Rebate/Incentive*:	\$120,840	Total Purchased Gas Savings (th/yr):	42,411
Net Project Cost:	\$387,331	Total Purchased Annual Cost Savings (\$/yr):	\$63,209
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3032

Project: SBD, New/Renov - Canyon Crest Residence Halls, Phase 2

Campus: RIVERSIDE

Location: RIVERSIDE

Campus Prioritization and Schedule

Building: CANYON CREST RESIDENT HALLS

Project Tier: Backup

Building Key: 05CTBD2

Start Preliminary Engineering:

Basic Gross Area (sf):

Scheduled Completion:

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	237,213
Peak Demand (kW):	27.0
Gas (th/yr):	22,225
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 237,213

Equivalent Gas Savings (th/yr): 22,225

Anticipated Gross Incentive: \$79,156

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$120,085		\$120,085
		Contingency: 10.00%	\$12,009		\$12,009
		Totals:	\$132,094		\$132,094
		Engineering: 15.00%	\$39,628		
		Construction Phase: 5.00%	\$13,209		
		Project Management: 6.00%	\$15,851		
		Total Project Cost:	\$332,876		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$332,876	Total Purchased Electricity Savings (kWh/yr):	237,213
Rebate/Incentive*:	\$79,156	Total Purchased Gas Savings (th/yr):	27,781
Net Project Cost:	\$253,720	Total Purchased Annual Cost Savings (\$/yr):	\$41,405
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3033

Project: SBD, New/Renov - Engineering Building Unit 3

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENGINEERING BUILDING UNIT 3

Building Key: 05CTBD3

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,032,570
Peak Demand (kW):	118.0
Gas (th/yr):	49,203
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,032,570

Equivalent Gas Savings (th/yr): 49,203

Anticipated Gross Incentive: \$297,020

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$381,290		\$381,290
		Contingency: 10.00%	\$38,129		\$38,129
		Totals:	\$419,419		\$419,419
		Engineering: 15.00%	\$125,826		
		Construction Phase: 5.00%	\$41,942		
		Project Management: 6.00%	\$50,330		
		Total Project Cost:	\$1,056,936		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$1,056,936	Total Purchased Electricity Savings (kWh/yr):	1,032,570
Rebate/Incentive*:	\$297,020	Total Purchased Gas Savings (th/yr):	61,504
Net Project Cost:	\$759,916	Total Purchased Annual Cost Savings (\$/yr):	\$129,721
Net Simple Payback Period (yrs):	5.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3034

Project: SBD, New/Renov - West Campus Graduate and Professional Center Phase 1

Campus: RIVERSIDE

Location: RIVERSIDE

Building: WEST CAMPUS GRADUATE AND PRO

Building Key: 05CTBD4

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	299,700
Peak Demand (kW):	34.0
Gas (th/yr):	28,080
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 299,700

Equivalent Gas Savings (th/yr): 28,080

Anticipated Gross Incentive: \$100,008

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$151,722		\$151,721
		Contingency: 10.00%	\$15,172		\$15,172
		Totals:	\$166,894		\$166,893
		Engineering: 15.00%	\$50,068		
		Construction Phase: 5.00%	\$16,689		
		Project Management: 6.00%	\$20,027		
		Total Project Cost:	\$420,572		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$420,572	Total Purchased Electricity Savings (kWh/yr):	299,700
Rebate/Incentive*:	\$100,008	Total Purchased Gas Savings (th/yr):	35,100
Net Project Cost:	\$320,564	Total Purchased Annual Cost Savings (\$/yr):	\$52,313
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3035

Project: First Electric Savings Component of DM and CR Projects 2009

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3036

Project: Second Electric Savings Component of DM and CR Projects 2009

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3037

Project: Natural Gas Component of DM and CR Projects 2009

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	28,409
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$346,500	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$28,409	Total Purchased Gas Savings (th/yr):	35,511
Net Project Cost:	\$318,091	Total Purchased Annual Cost Savings (\$/yr):	\$30,185
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3038

Project: First Electric Savings Component of DM and CR Projects 2010

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Tier 1
Start Preliminary Engineering: 3/28/2008
Scheduled Completion: 12/31/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 454,550
Peak Demand (kW): 52.0
Gas (th/yr): 0
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3039

Project: Second Electric Savings Component of DM and CR Projects 2010

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3040

Project: Natural Gas Component of DM and CR Projects 2010

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Tier 1
Start Preliminary Engineering: 3/28/2008
Scheduled Completion: 12/31/2009

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 0
Peak Demand (kW): 0.0
Gas (th/yr): 28,409
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$346,500 **Total Purchased Electricity Savings (kWh/yr):** 0
Rebate/Incentive*: \$28,409 **Total Purchased Gas Savings (th/yr):** 35,511
Net Project Cost: \$318,091 **Total Purchased Annual Cost Savings (\$/yr):** \$30,185
Net Simple Payback Period (yrs): 10.5

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3041

Project: First Electric Savings Component of DM and CR Projects 2011

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3042

Project: Second Electric Savings Component of DM and CR Projects 2011

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3043

Project: Natural Gas Component of DM and CR Projects 2011

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	28,409
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$346,500	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$28,409	Total Purchased Gas Savings (th/yr):	35,511
Net Project Cost:	\$318,091	Total Purchased Annual Cost Savings (\$/yr):	\$30,185
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3044

Project: First Electric Savings Component of DM and CR Projects 2012

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3045

Project: Second Electric Savings Component of DM and CR Projects 2012

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3046

Project: Natural Gas Component of DM and CR Projects 2012

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	28,409
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$346,500	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$28,409	Total Purchased Gas Savings (th/yr):	35,511
Net Project Cost:	\$318,091	Total Purchased Annual Cost Savings (\$/yr):	\$30,185
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3047

Project: First Electric Savings Component of DM and CR Projects 2013

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3048

Project: Second Electric Savings Component of DM and CR Projects 2013

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3049

Project: Natural Gas Component of DM and CR Projects 2013

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	28,409
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$346,500	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$28,409	Total Purchased Gas Savings (th/yr):	35,511
Net Project Cost:	\$318,091	Total Purchased Annual Cost Savings (\$/yr):	\$30,185
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3050

Project: First Electric Savings Component of DM and CR Projects 2014

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3051

Project: Second Electric Savings Component of DM and CR Projects 2014

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	454,550
Peak Demand (kW):	52.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 454,550

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$109,092

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$250,000		\$250,000
		Contingency: 10.00%	\$25,000		\$25,000
		Totals:	\$275,000		\$275,000
		Engineering: 15.00%	\$82,500		
		Construction Phase: 5.00%	\$27,500		
		Project Management: 6.00%	\$33,000		
		Total Project Cost:	\$693,000		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$693,000	Total Purchased Electricity Savings (kWh/yr):	454,550
Rebate/Incentive*:	\$109,092	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$583,908	Total Purchased Annual Cost Savings (\$/yr):	\$34,091
Net Simple Payback Period (yrs):	17.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3052

Project: Natural Gas Component of DM and CR Projects 2014

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Deferred Maintenance and Capital Renewal Projects - Checked MZ 032708.xls

Project Description Reference(s): Deferred Maintenance and Capital Renewal Projects.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	28,409
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 28,409

Anticipated Gross Incentive: \$28,409

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$125,000		\$125,000
		Contingency: 10.00%	\$12,500		\$12,500
		Totals:	\$137,500		\$137,500
		Engineering: 15.00%	\$41,250		
		Construction Phase: 5.00%	\$13,750		
		Project Management: 6.00%	\$16,500		
		Total Project Cost:	\$346,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$346,500	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$28,409	Total Purchased Gas Savings (th/yr):	35,511
Net Project Cost:	\$318,091	Total Purchased Annual Cost Savings (\$/yr):	\$30,185
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3053

Project: UC Riverside Energy Recovery System

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC Riverside Energy Recovery System-EWB.xls

Project Description Reference(s): Air Handler Project 7. Outside Air Ventilation Heat Recovery.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	28,416
Peak Demand (kW):	0.0
Gas (th/yr):	27,135
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 28,416

Equivalent Gas Savings (th/yr): 27,135

Anticipated Gross Incentive: \$33,955

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
UC Riverside Energy Recovery System	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$111,936		\$74,624
		Contingency: 10.00%	\$11,194		\$7,462
		Totals:	\$123,130		\$82,086
		Engineering: 15.00%	\$30,782		
		Construction Phase: 5.00%	\$10,261		
		Project Management: 6.00%	\$12,313		
		Total Project Cost:	\$258,572		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$258,572	Total Purchased Electricity Savings (kWh/yr):	28,416
Rebate/Incentive*:	\$33,955	Total Purchased Gas Savings (th/yr):	33,919
Net Project Cost:	\$224,617	Total Purchased Annual Cost Savings (\$/yr):	\$30,962
Net Simple Payback Period (yrs):	7.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3054

Project: SBD, New/Renov - Academic Facilities Renewal Step 1

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	71,898
Peak Demand (kW):	8.0
Gas (th/yr):	6,736
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 71,898

Equivalent Gas Savings (th/yr): 6,736

Anticipated Gross Incentive: \$23,992

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$36,397		\$36,396
		Contingency: 10.00%	\$3,640		\$3,640
		Totals:	\$40,037		\$40,036
		Engineering: 15.00%	\$12,011		
		Construction Phase: 5.00%	\$4,004		
		Project Management: 6.00%	\$4,804		
		Total Project Cost:	\$100,891		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$100,891	Total Purchased Electricity Savings (kWh/yr):	71,898
Rebate/Incentive*:	\$23,992	Total Purchased Gas Savings (th/yr):	8,420
Net Project Cost:	\$76,899	Total Purchased Annual Cost Savings (\$/yr):	\$12,549
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3055

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	2,817
Peak Demand (kW):	0.0
Gas (th/yr):	264
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 2,817

Equivalent Gas Savings (th/yr): 264

Anticipated Gross Incentive: \$940

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,428		\$1,428
		Contingency: 10.00%	\$143		\$143
		Totals:	\$1,571		\$1,571
		Engineering: 15.00%	\$471		
		Construction Phase: 5.00%	\$157		
		Project Management: 6.00%	\$188		
		Total Project Cost:	\$3,958		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,958	Total Purchased Electricity Savings (kWh/yr):	2,817
Rebate/Incentive*:	\$940	Total Purchased Gas Savings (th/yr):	330
Net Project Cost:	\$3,018	Total Purchased Annual Cost Savings (\$/yr):	\$492
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3056

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,380
Peak Demand (kW):	0.0
Gas (th/yr):	317
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,380

Equivalent Gas Savings (th/yr): 317

Anticipated Gross Incentive: \$1,128

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,712		\$1,711
		Contingency: 10.00%	\$171		\$171
		Totals:	\$1,883		\$1,882
		Engineering: 15.00%	\$565		
		Construction Phase: 5.00%	\$188		
		Project Management: 6.00%	\$226		
		Total Project Cost:	\$4,744		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,744	Total Purchased Electricity Savings (kWh/yr):	3,380
Rebate/Incentive*:	\$1,128	Total Purchased Gas Savings (th/yr):	396
Net Project Cost:	\$3,616	Total Purchased Annual Cost Savings (\$/yr):	\$590
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3057

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,380
Peak Demand (kW):	0.0
Gas (th/yr):	317
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,380

Equivalent Gas Savings (th/yr): 317

Anticipated Gross Incentive: \$1,128

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,712		\$1,711
		Contingency: 10.00%	\$171		\$171
		Totals:	\$1,883		\$1,882
		Engineering: 15.00%	\$565		
		Construction Phase: 5.00%	\$188		
		Project Management: 6.00%	\$226		
		Total Project Cost:	\$4,744		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,744	Total Purchased Electricity Savings (kWh/yr):	3,380
Rebate/Incentive*:	\$1,128	Total Purchased Gas Savings (th/yr):	396
Net Project Cost:	\$3,616	Total Purchased Annual Cost Savings (\$/yr):	\$590
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3058

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,380
Peak Demand (kW):	0.0
Gas (th/yr):	317
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,380

Equivalent Gas Savings (th/yr): 317

Anticipated Gross Incentive: \$1,128

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,712		\$1,711
		Contingency: 10.00%	\$171		\$171
		Totals:	\$1,883		\$1,882
		Engineering: 15.00%	\$565		
		Construction Phase: 5.00%	\$188		
		Project Management: 6.00%	\$226		
		Total Project Cost:	\$4,744		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,744	Total Purchased Electricity Savings (kWh/yr):	3,380
Rebate/Incentive*:	\$1,128	Total Purchased Gas Savings (th/yr):	396
Net Project Cost:	\$3,616	Total Purchased Annual Cost Savings (\$/yr):	\$590
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3059

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE - OTHER

Building Key: 05CWIDEO

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,380
Peak Demand (kW):	0.0
Gas (th/yr):	317
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,380

Equivalent Gas Savings (th/yr): 317

Anticipated Gross Incentive: \$1,128

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,712		\$1,711
		Contingency: 10.00%	\$171		\$171
		Totals:	\$1,883		\$1,882
		Engineering: 15.00%	\$565		
		Construction Phase: 5.00%	\$188		
		Project Management: 6.00%	\$226		
		Total Project Cost:	\$4,744		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,744	Total Purchased Electricity Savings (kWh/yr):	3,380
Rebate/Incentive*:	\$1,128	Total Purchased Gas Savings (th/yr):	396
Net Project Cost:	\$3,616	Total Purchased Annual Cost Savings (\$/yr):	\$590
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3060

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE - OTHER

Building Key: 05CWIDEO

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,943
Peak Demand (kW):	0.0
Gas (th/yr):	369
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,943

Equivalent Gas Savings (th/yr): 369

Anticipated Gross Incentive: \$1,315

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,995		\$1,995
		Contingency: 10.00%	\$200		\$200
		Totals:	\$2,195		\$2,195
		Engineering: 15.00%	\$658		
		Construction Phase: 5.00%	\$219		
		Project Management: 6.00%	\$263		
		Total Project Cost:	\$5,530		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,530	Total Purchased Electricity Savings (kWh/yr):	3,943
Rebate/Incentive*:	\$1,315	Total Purchased Gas Savings (th/yr):	461
Net Project Cost:	\$4,215	Total Purchased Annual Cost Savings (\$/yr):	\$688
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3061

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE - OTHER

Building Key: 05CWIDEO

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,943
Peak Demand (kW):	0.0
Gas (th/yr):	369
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,943

Equivalent Gas Savings (th/yr): 369

Anticipated Gross Incentive: \$1,315

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,995		\$1,995
		Contingency: 10.00%	\$200		\$200
		Totals:	\$2,195		\$2,195
		Engineering: 15.00%	\$658		
		Construction Phase: 5.00%	\$219		
		Project Management: 6.00%	\$263		
		Total Project Cost:	\$5,530		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,530	Total Purchased Electricity Savings (kWh/yr):	3,943
Rebate/Incentive*:	\$1,315	Total Purchased Gas Savings (th/yr):	461
Net Project Cost:	\$4,215	Total Purchased Annual Cost Savings (\$/yr):	\$688
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3062

Project: SBD, New/Renov - Campus Approved Projects Under \$5 Million

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE - OTHER

Building Key: 05CWIDEO

Basic Gross Area (sf):

Calculation File: UC SEP Capital Project Savings Potential (27 Mar) - Checked MZ 032708.xls

Project Description Reference(s): New Construction and Renovation from Capital Program.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,943
Peak Demand (kW):	0.0
Gas (th/yr):	369
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,943

Equivalent Gas Savings (th/yr): 369

Anticipated Gross Incentive: \$1,315

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Construction Cost	1				
		Raw Costs:			
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,995		\$1,995
		Contingency: 10.00%	\$200		\$200
		Totals:	\$2,195		\$2,195
		Engineering: 15.00%	\$658		
		Construction Phase: 5.00%	\$219		
		Project Management: 6.00%	\$263		
		Total Project Cost:	\$5,530		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,530	Total Purchased Electricity Savings (kWh/yr):	3,943
Rebate/Incentive*:	\$1,315	Total Purchased Gas Savings (th/yr):	461
Net Project Cost:	\$4,215	Total Purchased Annual Cost Savings (\$/yr):	\$688
Net Simple Payback Period (yrs):	6.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3063

Project: Lab Freezers Phase 1 of 2: 20 Lab Freezer Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Lab Freezer Projects SEP MZ 032708-Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 2. Lab Freezers .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	77,280
Peak Demand (kW):	9.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 77,280

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$18,547

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Lab Freezer	20				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$280,000		\$0
		Contingency: 10.00%	\$28,000		\$0
		Totals:	\$308,000		\$0
		Engineering: 15.00%	\$46,200		
		Construction Phase: 5.00%	\$15,400		
		Project Management: 6.00%	\$18,480		
		Total Project Cost:	\$388,080		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$388,080	Total Purchased Electricity Savings (kWh/yr):	77,280
Rebate/Incentive*:	\$18,547	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$369,533	Total Purchased Annual Cost Savings (\$/yr):	\$5,796
Net Simple Payback Period (yrs):	63.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3064

Project: Lab Freezers Phase 2 of 2: 9 Lab Freezer Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Lab Freezer Projects SEP MZ 032708-Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 2. Lab Freezers .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	34,776
Peak Demand (kW):	4.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 34,776

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$8,346

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Lab Freezer	9				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$126,000		\$0
		Contingency: 10.00%	\$12,600		\$0
		Totals:	\$138,600		\$0
		Engineering: 15.00%	\$20,790		
		Construction Phase: 5.00%	\$6,930		
		Project Management: 6.00%	\$8,316		
		Total Project Cost:	\$174,636		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$174,636	Total Purchased Electricity Savings (kWh/yr):	34,776
Rebate/Incentive*:	\$8,346	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$166,290	Total Purchased Annual Cost Savings (\$/yr):	\$2,608
Net Simple Payback Period (yrs):	63.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3065

Project: Refrigerators Phase 1 of 3: 100 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Refrigerator (Campus-wide) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	224,300
Peak Demand (kW):	26.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 224,300

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$53,832

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	100				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$69,800		\$0
		Contingency: 10.00%	\$6,980		\$0
		Totals:	\$76,780		\$0
		Engineering: 15.00%	\$11,517		
		Construction Phase: 5.00%	\$3,839		
		Project Management: 6.00%	\$4,607		
		Total Project Cost:	\$96,743		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$96,743	Total Purchased Electricity Savings (kWh/yr):	224,300
Rebate/Incentive*:	\$53,832	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$42,911	Total Purchased Annual Cost Savings (\$/yr):	\$16,823
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3066

Project: Refrigerators Phase 2 of 3: 100 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Refrigerator (Campus-wide) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	224,300
Peak Demand (kW):	26.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 224,300

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$53,832

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	100				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$69,800		\$0
		Contingency: 10.00%	\$6,980		\$0
		Totals:	\$76,780		\$0
		Engineering: 15.00%	\$11,517		
		Construction Phase: 5.00%	\$3,839		
		Project Management: 6.00%	\$4,607		
		Total Project Cost:	\$96,743		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$96,743	Total Purchased Electricity Savings (kWh/yr):	224,300
Rebate/Incentive*:	\$53,832	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$42,911	Total Purchased Annual Cost Savings (\$/yr):	\$16,823
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3067

Project: Refrigerators Phase 3 of 3: 9 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Refrigerator (Campus-wide) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	20,187
Peak Demand (kW):	2.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 20,187

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,845

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	9				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$6,282		\$0
		Contingency: 10.00%	\$628		\$0
		Totals:	\$6,910		\$0
		Engineering: 15.00%	\$1,037		
		Construction Phase: 5.00%	\$346		
		Project Management: 6.00%	\$415		
		Total Project Cost:	\$8,707		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$8,707	Total Purchased Electricity Savings (kWh/yr):	20,187
Rebate/Incentive*:	\$4,845	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$3,862	Total Purchased Annual Cost Savings (\$/yr):	\$1,514
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3068

Project: Refrigerators Phase 1 of 3: 100 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Refrigerator (Housing) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	224,300
Peak Demand (kW):	26.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 224,300

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$53,832

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	100				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$69,800		\$0
		Contingency: 10.00%	\$6,980		\$0
		Totals:	\$76,780		\$0
		Engineering: 15.00%	\$11,517		
		Construction Phase: 5.00%	\$3,839		
		Project Management: 6.00%	\$4,607		
		Total Project Cost:	\$96,743		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$96,743	Total Purchased Electricity Savings (kWh/yr):	224,300
Rebate/Incentive*:	\$53,832	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$42,911	Total Purchased Annual Cost Savings (\$/yr):	\$16,823
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3069

Project: Refrigerators Phase 2 of 3: 100 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Refrigerator (Housing) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	224,300
Peak Demand (kW):	26.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 224,300

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$53,832

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	100				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$69,800		\$0
		Contingency: 10.00%	\$6,980		\$0
		Totals:	\$76,780		\$0
		Engineering: 15.00%	\$11,517		
		Construction Phase: 5.00%	\$3,839		
		Project Management: 6.00%	\$4,607		
		Total Project Cost:	\$96,743		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$96,743	Total Purchased Electricity Savings (kWh/yr):	224,300
Rebate/Incentive*:	\$53,832	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$42,911	Total Purchased Annual Cost Savings (\$/yr):	\$16,823
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3070

Project: Refrigerators Phase 3 of 3: 95 Energy Star Refrigerator Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: Refrigerator (Housing) Projects SEP MZ 032608.Checked by LCK.xls

Project Description Reference(s): Campus Wide Project 1. Refrigerators.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	213,085
Peak Demand (kW):	24.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 213,085

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$51,140

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Energy Star Refrigerator	95				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$66,310		\$0
		Contingency: 10.00%	\$6,631		\$0
		Totals:	\$72,941		\$0
		Engineering: 15.00%	\$10,941		
		Construction Phase: 5.00%	\$3,647		
		Project Management: 6.00%	\$4,376		
		Total Project Cost:	\$91,906		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$91,906	Total Purchased Electricity Savings (kWh/yr):	213,085
Rebate/Incentive*:	\$51,140	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$40,766	Total Purchased Annual Cost Savings (\$/yr):	\$15,981
Net Simple Payback Period (yrs):	2.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3071

Project: LCD Phase 1 of 4: 1000 Verdiem (PC Power Management) Installations and 40 CRT Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Verdiem & CRT Projects SEP MZ 032608 - TLH.xls

Project Description Reference(s): Campus Wide Project 4. Network Computer Power Management Software/CRT .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	213,796
Peak Demand (kW):	27.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 213,796

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$51,311

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Verdiem (or similar) Software, Licence & Installation	1,000				
LCD Monitor & Installation	40				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$48,200		\$1,000
		Contingency: 10.00%	\$4,820		\$100
		Totals:	\$53,020		\$1,100
		Engineering: 15.00%	\$8,118		
		Construction Phase: 5.00%	\$2,706		
		Project Management: 6.00%	\$3,247		
		Total Project Cost:	\$68,191		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$68,191	Total Purchased Electricity Savings (kWh/yr):	213,796
Rebate/Incentive*:	\$51,311	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$16,880	Total Purchased Annual Cost Savings (\$/yr):	\$16,035
Net Simple Payback Period (yrs):	1.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3072

Project: LCD Phase 2 of 4: 1000 Verdiem (PC Power Management) Installations and 40 CRT Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Verdiem & CRT Projects SEP MZ 032608 - TLH.xls

Project Description Reference(s): Campus Wide Project 4. Network Computer Power Management Software/CRT .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	213,796
Peak Demand (kW):	27.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 213,796

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$51,311

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Verdiem (or similar) Software, Licence & Installation	1,000				
LCD Monitor & Installation	40				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$48,200		\$1,000
		Contingency: 10.00%	\$4,820		\$100
		Totals:	\$53,020		\$1,100
		Engineering: 15.00%	\$8,118		
		Construction Phase: 5.00%	\$2,706		
		Project Management: 6.00%	\$3,247		
		Total Project Cost:	\$68,191		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$68,191	Total Purchased Electricity Savings (kWh/yr):	213,796
Rebate/Incentive*:	\$51,311	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$16,880	Total Purchased Annual Cost Savings (\$/yr):	\$16,035
Net Simple Payback Period (yrs):	1.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3073

Project: LCD Phase 3 of 4: 1000 Verdiem (PC Power Management) Installations and 40 CRT Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Verdiem & CRT Projects SEP MZ 032608 - TLH.xls

Project Description Reference(s): Campus Wide Project 4. Network Computer Power Management Software/CRT .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	213,796
Peak Demand (kW):	27.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 213,796

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$51,311

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
LCD Monitor & Installation	40				
Verdiem (or similar) Software, Licence & Installation	1,000				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$48,200		\$1,000
		Contingency: 10.00%	\$4,820		\$100
		Totals:	\$53,020		\$1,100
		Engineering: 15.00%	\$8,118		
		Construction Phase: 5.00%	\$2,706		
		Project Management: 6.00%	\$3,247		
		Total Project Cost:	\$68,191		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$68,191	Total Purchased Electricity Savings (kWh/yr):	213,796
Rebate/Incentive*:	\$51,311	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$16,880	Total Purchased Annual Cost Savings (\$/yr):	\$16,035
Net Simple Payback Period (yrs):	1.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3074

Project: LCD Phase 4 of 4: 630 Verdiem (PC Power Management) Installations and 25 CRT Replacements

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Verdiem & CRT Projects SEP MZ 032608 - TLH.xls

Project Description Reference(s): Campus Wide Project 4. Network Computer Power Management Software/CRT .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	134,691
Peak Demand (kW):	17.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 134,691

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$32,326

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
LCD Monitor & Installation	25				
Verdiem (or similar) Software, Licence & Installation	630				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$30,300		\$625
		Contingency: 10.00%	\$3,030		\$63
		Totals:	\$33,330		\$688
		Engineering: 15.00%	\$5,103		
		Construction Phase: 5.00%	\$1,701		
		Project Management: 6.00%	\$2,041		
		Total Project Cost:	\$42,862		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$42,862	Total Purchased Electricity Savings (kWh/yr):	134,691
Rebate/Incentive*:	\$32,326	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$10,536	Total Purchased Annual Cost Savings (\$/yr):	\$10,102
Net Simple Payback Period (yrs):	1.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3075

Project: Server Virtualization Phase 1 of 2: 10 VM Installations

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Virtualization Projects SEP MZ 032608 - Checked ADM 032808.xls

Project Description Reference(s): Campus Wide Project 3. Server Virtualization .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	280,000
Peak Demand (kW):	35.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 280,000

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$67,200

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Hardware, Software, License & Installation; VM or similar, per Vir	10				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$210,000		\$0
		Contingency: 10.00%	\$21,000		\$0
		Totals:	\$231,000		\$0
		Engineering: 15.00%	\$34,650		
		Construction Phase: 5.00%	\$11,550		
		Project Management: 6.00%	\$13,860		
		Total Project Cost:	\$291,060		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$291,060	Total Purchased Electricity Savings (kWh/yr):	280,000
Rebate/Incentive*:	\$67,200	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$223,860	Total Purchased Annual Cost Savings (\$/yr):	\$21,000
Net Simple Payback Period (yrs):	10.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3076

Project: Server Virtualization Phase 2 of 2: 10 VM Installations

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: Virtualization Projects SEP MZ 032608 - Checked ADM 032808.xls

Project Description Reference(s): Campus Wide Project 3. Server Virtualization .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	280,000
Peak Demand (kW):	35.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 280,000

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$67,200

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Hardware, Software, License & Installation; VM or similar, per Vir	10				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$210,000		\$0
		Contingency: 10.00%	\$21,000		\$0
		Totals:	\$231,000		\$0
		Engineering: 15.00%	\$34,650		
		Construction Phase: 5.00%	\$11,550		
		Project Management: 6.00%	\$13,860		
		Total Project Cost:	\$291,060		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$291,060	Total Purchased Electricity Savings (kWh/yr):	280,000
Rebate/Incentive*:	\$67,200	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$223,860	Total Purchased Annual Cost Savings (\$/yr):	\$21,000
Net Simple Payback Period (yrs):	10.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3104

Project: Replace LAB HID's with new, linear fluorescent industrials; replace existing corridor HID recessed cans with new CFL cans

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BOURNS

Building Key: 05CP5261

Basic Gross Area (sf): 157,189

Calculation File: UCR Bourns A SEP Custom Calc.NAM.xls

Project Description Reference(s): Lighting Project 4. Interior High Bay Lighting .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	268,266
Peak Demand (kW):	31.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 268,266

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$64,384

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
2-26-watt CF can	75	\$110.00	\$8,077	\$160.00	\$12,972
4L F32T8 NLO industrial (or equal)	333	\$150.00	\$48,901	\$200.00	\$71,995
26-watt CF can	75	\$100.00	\$7,343	\$160.00	\$12,972
Raw Costs:			\$64,320		\$97,939
City: San Bernardino			Sales Tax: 8.25%	\$5,306	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$8,355	\$11,753
City Index Labor Multiplier: 108.1%			Subtotals:	\$77,982	\$109,691
Contingency: 10.00%				\$7,798	\$10,969
Totals:				\$85,780	\$120,660
Engineering: 15.00%				\$30,966	
Construction Phase: 5.00%				\$10,322	
Project Management: 6.00%				\$12,386	
Total Project Cost:				\$260,115	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$260,115	Total Purchased Electricity Savings (kWh/yr):	268,266
Rebate/Incentive*:	\$64,384	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$195,731	Total Purchased Annual Cost Savings (\$/yr):	\$20,120
Net Simple Payback Period (yrs):	9.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3105

Project: Replace fire stair fixtures with bi-level fixtures; retrofit classroom fixtures with 28W T8 lamps and RLO ballasts; retrofit café fixtures with CFL; install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UCR EXTEN CT

Building Key: 05CP5722

Basic Gross Area (sf): 196,641

Calculation File: UCR Extension SEP Custom Calc.NAM.xls

Project Description Reference(s): Lighting Project 3. Stairwell Lighting.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	173,573
Peak Demand (kW):	45.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 173,573

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$41,658

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Dual technology wall occ. sensors	20	\$42.28	\$828	\$35.00	\$757
2L F32T8 RLO, low wattage retrofit	412	\$17.80	\$7,180	\$25.00	\$11,134
18W CFL Screw-in	484	\$2.50	\$1,185	\$2.00	\$1,046
1L F32T8 RLO, low wattage retrofit	360	\$14.00	\$4,934	\$25.00	\$9,729
Dual technology ceiling occ. sensors	87	\$98.00	\$8,347	\$48.00	\$4,514
New, bi-level fire stair fixtures	15	\$160.20	\$2,353	\$106.80	\$1,732
Raw Costs:			\$24,826		\$28,912
City: San Bernardino Sales Tax: 8.25%			\$2,048		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$3,469
City Index Labor Multiplier: 108.1%			Subtotals:	\$30,099	\$32,382
Contingency: 10.00%			\$3,010		\$3,238
Totals:			\$33,109		\$35,620
Engineering: 15.00%			\$10,309		
Construction Phase: 5.00%			\$3,436		
Project Management: 6.00%			\$4,124		
Total Project Cost:			\$86,598		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$86,598	Total Purchased Electricity Savings (kWh/yr):	173,573
Rebate/Incentive*:	\$41,658	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$44,940	Total Purchased Annual Cost Savings (\$/yr):	\$13,018
Net Simple Payback Period (yrs):	3.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3106

Project: Retrofit existing HPS walkway pole lights with Pulse Start Metal Halide (PSMH) lamps and MH electronic ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UCR Exterior walkway and area pole lights.NAM.xls

Project Description Reference(s): Lighting Project 5. Parking Garage and Outdoor Pole Lighting.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	157,154
Peak Demand (kW):	36.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 157,154

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$37,717

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
150-watt PSMH/EB	240	\$125.00	\$29,370	\$150.00	\$38,916
70-watt PSMH/EB	60	\$125.00	\$7,343	\$150.00	\$9,729
Raw Costs:			\$36,713		\$48,645
City: San Bernardino					
Sales Tax: 8.25%			\$3,029		N/A
City Index Material Multiplier: 97.9%					
Contractor O&P: 12.00%			\$4,769		\$5,837
Subtotals:			\$44,510		\$54,482
City Index Labor Multiplier: 108.1%					
Contingency: 10.00%			\$4,451		\$5,448
Totals:			\$48,961		\$59,931
Engineering: 15.00%			\$16,334		
Construction Phase: 5.00%			\$5,445		
Project Management: 6.00%			\$6,534		
Total Project Cost:			\$137,204		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$137,204	Total Purchased Electricity Savings (kWh/yr):	157,154
Rebate/Incentive*:	\$37,717	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$99,487	Total Purchased Annual Cost Savings (\$/yr):	\$11,787
Net Simple Payback Period (yrs):	8.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3107

Project: Replace Gym MH high bays with fluorescent high bays plus occupancy sensors

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PE

Building Key: 05CP5334

Basic Gross Area (sf): 66,335

Calculation File: UCR PE Gym SEP Custom Calc.NAM.xls

Project Description Reference(s): Lighting Project 4. Interior High Bay Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	132,149
Peak Demand (kW):	16.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 132,149

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$31,716

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4L F54T5HO High Bay (or 632T8 HLO)	72	\$250.00	\$17,622	\$150.00	\$11,675
Raw Costs:			\$17,622		\$11,675
City: San Bernardino		Sales Tax: 8.25%	\$1,454		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,289		\$1,401
City Index Labor Multiplier: 108.1%		Subtotals:	\$21,365		\$13,076
		Contingency: 10.00%	\$2,136		\$1,308
		Totals:	\$23,501		\$14,383
		Engineering: 15.00%	\$5,683		
		Construction Phase: 5.00%	\$1,894		
		Project Management: 6.00%	\$2,273		
		Total Project Cost:	\$47,735		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$47,735	Total Purchased Electricity Savings (kWh/yr):	132,149
Rebate/Incentive*:	\$31,716	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$16,019	Total Purchased Annual Cost Savings (\$/yr):	\$9,911
Net Simple Payback Period (yrs):	1.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3108

Project: Retrofit or replace 2F96T12 SL industrials and strips with 4F32T8 3rd gen lamps and RLO premium ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CNTRL UTL PL

Building Key: 05CP5295

Basic Gross Area (sf): 22,018

Calculation File: UCR Steam Plant.NAM.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	10,249
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 10,249

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,460

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4L F32T8 RLO retrofit kits	30	\$30.00	\$881	\$75.00	\$2,432
Raw Costs:			\$881		\$2,432
City: San Bernardino		Sales Tax: 8.25%	\$73		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$114		\$292
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,068		\$2,724
		Contingency: 10.00%	\$107		\$272
		Totals:	\$1,175		\$2,997
		Engineering: 15.00%	\$626		
		Construction Phase: 5.00%	\$209		
		Project Management: 6.00%	\$250		
		Total Project Cost:	\$5,256		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,256	Total Purchased Electricity Savings (kWh/yr):	10,249
Rebate/Incentive*:	\$2,460	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,796	Total Purchased Annual Cost Savings (\$/yr):	\$769
Net Simple Payback Period (yrs):	3.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3109

Project: Replace MH high bays with fluorescents and occupancy sensors in gym and racquetball courts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STU REC CTR

Building Key: 05CP5511

Basic Gross Area (sf): 86,048

Calculation File: UCR Stu Rec Ctr Gym.NAM.xls

Project Description Reference(s): Lighting Project 4. Interior High Bay Lighting .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	308,347
Peak Demand (kW):	38.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 308,347

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$74,003

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Dual technology ceiling occ. sensors	4	\$98.00	\$384	\$48.00	\$208
4L F54T5HO High Bay (or 632T8 HLO)	140	\$250.00	\$34,265	\$150.00	\$22,701
4L F55 BiAx retrofit kit	28	\$250.00	\$6,853	\$150.00	\$4,540
Raw Costs:			\$41,502		\$27,449
City: San Bernardino			Sales Tax: 8.25%	\$3,424	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$5,391	\$3,294
City Index Labor Multiplier: 108.1%			Subtotals:	\$50,317	\$30,743
Contingency: 10.00%			\$5,032		\$3,074
Totals:			\$55,348		\$33,817
Engineering: 15.00%			\$13,375		
Construction Phase: 5.00%			\$4,458		
Project Management: 6.00%			\$5,350		
Total Project Cost:			\$112,348		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$112,348	Total Purchased Electricity Savings (kWh/yr):	308,347
Rebate/Incentive*:	\$74,003	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$38,345	Total Purchased Annual Cost Savings (\$/yr):	\$23,126
Net Simple Payback Period (yrs):	1.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3110

Project: Solar Pool Water Heater

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC Riverside Pools 051208.xls

Project Description Reference(s): Pool Project 3. Solar Water Heating .

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	13,894
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 13,894

Anticipated Gross Incentive: \$13,894

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Solar Water Heating System	1	\$44,038.70	\$43,114	\$57,316.88	\$61,960
Raw Costs:			\$43,114		\$61,960
City: San Bernardino		Sales Tax: 8.25%	\$3,557		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$5,600		\$7,435
City Index Labor Multiplier: 108.1%		Subtotals:	\$52,271		\$69,395
		Contingency: 10.00%	\$5,227		\$6,939
		Totals:	\$57,498		\$76,334
		Engineering: 15.00%	\$20,075		
		Construction Phase: 5.00%	\$6,692		
		Project Management: 6.00%	\$8,030		
		Total Project Cost:	\$168,629		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$168,629	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$13,894	Total Purchased Gas Savings (th/yr):	17,368
Net Project Cost:	\$154,735	Total Purchased Annual Cost Savings (\$/yr):	\$14,762
Net Simple Payback Period (yrs):	10.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3111

Project: Pool Cover with Powered Winder

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC Riverside Pools 051208.xls

Project Description Reference(s): Pool Project 2. Pool Covers.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	0
Peak Demand (kW):	0.0
Gas (th/yr):	23,040
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 0

Equivalent Gas Savings (th/yr): 23,040

Anticipated Gross Incentive: \$23,040

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Power Winder	1	\$6,000.00	\$5,874	\$3,000.00	\$3,243
Cover and Storage Reel Cost	1	\$24,717.00	\$24,198	\$0.00	\$0
Raw Costs:			\$30,072		\$3,243
City: San Bernardino Sales Tax: 8.25%			\$2,481		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,906	\$389
City Index Labor Multiplier: 108.1%			Subtotals:	\$36,459	\$3,632
Contingency: 10.00%			\$3,646		\$363
Totals:			\$40,105		\$3,995
Engineering: 15.00%			\$6,615		
Construction Phase: 5.00%			\$2,205		
Project Management: 6.00%			\$2,646		
Total Project Cost:			\$55,567		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$55,567	Total Purchased Electricity Savings (kWh/yr):	0
Rebate/Incentive*:	\$23,040	Total Purchased Gas Savings (th/yr):	28,800
Net Project Cost:	\$32,527	Total Purchased Annual Cost Savings (\$/yr):	\$24,480
Net Simple Payback Period (yrs):	1.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3112

Project: Variable Speed Circulation Pump

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC Riverside Pools 051208.xls

Project Description Reference(s): Pool Project 1. Variable Speed Drives and High Efficiency Motors for Filter Pumps.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	23,078
Peak Demand (kW):	0.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 23,078

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$5,539

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Premium Efficiency Motor (5)	1	\$820.00	\$803	\$80.00	\$86
VSD and Controls	1	\$5,760.00	\$5,639	\$835.00	\$903
Raw Costs:			\$6,442		\$989
City: San Bernardino Sales Tax: 8.25%			\$531		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$837	\$119
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,810	\$1,108
			Contingency: 10.00%	\$781	\$111
			Totals:	\$8,591	\$1,219
			Engineering: 15.00%	\$1,471	
			Construction Phase: 5.00%	\$490	
			Project Management: 6.00%	\$589	
Total Project Cost:			\$12,360		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$12,360	Total Purchased Electricity Savings (kWh/yr):	23,078
Rebate/Incentive*:	\$5,539	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$6,821	Total Purchased Annual Cost Savings (\$/yr):	\$1,731
Net Simple Payback Period (yrs):	3.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3113

Project: Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BELLTOWER

Building Key: 05CP5530

Basic Gross Area (sf): 4,774

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	8,844
Peak Demand (kW):	4.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 8,844

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,123

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,328.00	\$1,300	\$1,865.00	\$2,016
Raw Costs:			\$1,300		\$2,016
City: San Bernardino		Sales Tax: 8.25%	\$107		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$169		\$242
City Index Labor Multiplier: 108.1%		Subtotals:	\$1,576		\$2,258
		Contingency: 10.00%	\$158		\$226
		Totals:	\$1,734		\$2,484
		Engineering: 15.00%	\$633		
		Construction Phase: 5.00%	\$211		
		Project Management: 6.00%	\$253		
		Total Project Cost:	\$5,314		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$5,314	Total Purchased Electricity Savings (kWh/yr):	8,844
Rebate/Incentive*:	\$2,123	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$3,191	Total Purchased Annual Cost Savings (\$/yr):	\$663
Net Simple Payback Period (yrs):	4.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3114

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ANDERSON 1

Building Key: 05CP5325

Basic Gross Area (sf): 27,028

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	23,013
Peak Demand (kW):	8.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 23,013

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$5,523

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$6,390.00	\$6,256	\$8,974.00	\$9,701
Raw Costs:			\$6,256		\$9,701
City: San Bernardino Sales Tax: 8.25%			\$516		N/A
City Index Material Multiplier: 97.9%			\$813		\$1,164
City Index Labor Multiplier: 108.1%			\$7,585		\$10,865
Subtotals:			\$7,585		\$10,865
Contingency: 10.00%			\$758		\$1,087
Totals:			\$8,343		\$11,952
Engineering: 15.00%			\$3,044		
Construction Phase: 5.00%			\$1,015		
Project Management: 6.00%			\$1,218		
Total Project Cost:			\$25,571		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$25,571	Total Purchased Electricity Savings (kWh/yr):	23,013
Rebate/Incentive*:	\$5,523	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$20,048	Total Purchased Annual Cost Savings (\$/yr):	\$1,726
Net Simple Payback Period (yrs):	11.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3115

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ANDERSON 2

Building Key: 05CP5357

Basic Gross Area (sf): 11,165

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	11,979
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 11,979

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,875

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$2,639.00	\$2,584	\$3,707.00	\$4,007
Raw Costs:			\$2,584		\$4,007
City: San Bernardino		Sales Tax: 8.25%	\$213		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$336		\$481
Subtotals:			\$3,132		\$4,488
City Index Labor Multiplier: 108.1%		Contingency: 10.00%	\$313		\$449
Totals:			\$3,446		\$4,937
		Engineering: 15.00%	\$1,257		
		Construction Phase: 5.00%	\$419		
		Project Management: 6.00%	\$503		
Total Project Cost:			\$10,562		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$10,562	Total Purchased Electricity Savings (kWh/yr):	11,979
Rebate/Incentive*:	\$2,875	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$7,687	Total Purchased Annual Cost Savings (\$/yr):	\$898
Net Simple Payback Period (yrs):	8.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3116

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BATCHELOR

Building Key: 05CP5501

Basic Gross Area (sf): 105,334

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	111,102
Peak Demand (kW):	33.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 111,102

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$26,664

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$24,902.00	\$24,379	\$34,974.00	\$37,807
Daylighting	1	\$522.00	\$511	\$1,362.00	\$1,472
Raw Costs:			\$24,890		\$39,279
City: San Bernardino Sales Tax: 8.25%			\$2,053		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,233	\$4,714
City Index Labor Multiplier: 108.1%			Subtotals:	\$30,177	\$43,993
			Contingency: 10.00%	\$3,018	\$4,399
			Totals:	\$33,194	\$48,392
			Engineering: 15.00%	\$12,238	
			Construction Phase: 5.00%	\$4,079	
			Project Management: 6.00%	\$4,895	
Total Project Cost:			\$102,799		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$102,799	Total Purchased Electricity Savings (kWh/yr):	111,102
Rebate/Incentive*:	\$26,664	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$76,135	Total Purchased Annual Cost Savings (\$/yr):	\$8,333
Net Simple Payback Period (yrs):	9.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3117

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUS SURGE

Building Key: 05CP5380

Basic Gross Area (sf): 72,340

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	76,273
Peak Demand (kW):	23.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 76,273

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$18,306

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$3,025.00	\$2,961	\$2,427.00	\$2,624
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$17,102.00	\$16,743	\$24,019.00	\$25,965
Daylighting	1	\$1,330.00	\$1,302	\$3,470.00	\$3,751
Raw Costs:			\$21,006		\$32,339
City: San Bernardino Sales Tax: 8.25%			\$1,733		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$3,881
City Index Labor Multiplier: 108.1%			Subtotals:	\$25,468	\$36,220
Contingency: 10.00%			\$2,547		\$3,622
Totals:			\$28,015		\$39,842
Engineering: 15.00%			\$10,179		
Construction Phase: 5.00%			\$3,393		
Project Management: 6.00%			\$4,071		
Total Project Cost:			\$85,500		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$85,500	Total Purchased Electricity Savings (kWh/yr):	76,273
Rebate/Incentive*:	\$18,306	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$67,194	Total Purchased Annual Cost Savings (\$/yr):	\$5,720
Net Simple Payback Period (yrs):	11.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3118

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENTOMOLOGY

Building Key: 05CP5417

Basic Gross Area (sf): 69,417

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	82,299
Peak Demand (kW):	23.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 82,299

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$19,752

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$16,411.00	\$16,066	\$23,049.00	\$24,916
Occupancy Sensors	1	\$4,548.00	\$4,452	\$3,650.00	\$3,946
Raw Costs:			\$20,519		\$28,862
City: San Bernardino Sales Tax: 8.25%			\$1,693		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$2,665	\$3,463
City Index Labor Multiplier: 108.1%			Subtotals:	\$24,877	\$32,325
Contingency: 10.00%			\$2,488		\$3,233
Totals:			\$27,365		\$35,558
Engineering: 15.00%			\$9,438		
Construction Phase: 5.00%			\$3,146		
Project Management: 6.00%			\$3,775		
Total Project Cost:			\$79,282		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$79,282	Total Purchased Electricity Savings (kWh/yr):	82,299
Rebate/Incentive*:	\$19,752	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$59,530	Total Purchased Annual Cost Savings (\$/yr):	\$6,172
Net Simple Payback Period (yrs):	9.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3119

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: HINDERAKER

Building Key: 05CP5480

Basic Gross Area (sf): 44,873

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	82,630
Peak Demand (kW):	19.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 82,630

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$19,831

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$10,608.00	\$10,385	\$14,899.00	\$16,106
Occupancy Sensors	1	\$18,267.00	\$17,883	\$14,661.00	\$15,849
Daylighting	1	\$759.00	\$743	\$1,980.00	\$2,140
Raw Costs:			\$29,012		\$34,095
City: San Bernardino Sales Tax: 8.25%			\$2,393		N/A
City Index Material Multiplier: 97.9%			\$3,769		\$4,091
City Index Labor Multiplier: 108.1%			\$35,174		\$38,186
Subtotals:			\$35,174		\$38,186
Contingency: 10.00%			\$3,517		\$3,819
Totals:			\$38,691		\$42,005
Engineering: 15.00%			\$12,104		
Construction Phase: 5.00%			\$4,035		
Project Management: 6.00%			\$4,842		
Total Project Cost:			\$101,677		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$101,677	Total Purchased Electricity Savings (kWh/yr):	82,630
Rebate/Incentive*:	\$19,831	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$81,846	Total Purchased Annual Cost Savings (\$/yr):	\$6,197
Net Simple Payback Period (yrs):	13.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3120

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: HUMANITIES

Building Key: 05CP5498

Basic Gross Area (sf): 29,369

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	50,724
Peak Demand (kW):	12.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 50,724

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$12,174

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$6,943.00	\$6,797	\$9,751.00	\$10,541
Occupancy Sensors	1	\$10,597.00	\$10,374	\$8,505.00	\$9,194
Raw Costs:			\$17,172		\$19,735
City: San Bernardino			Sales Tax: 8.25%	\$1,417	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$2,231	\$2,368
City Index Labor Multiplier: 108.1%			Subtotals:	\$20,819	\$22,103
			Contingency: 10.00%	\$2,082	\$2,210
			Totals:	\$22,901	\$24,313
			Engineering: 15.00%	\$7,082	
			Construction Phase: 5.00%	\$2,361	
			Project Management: 6.00%	\$2,833	
Total Project Cost:				\$59,490	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$59,490	Total Purchased Electricity Savings (kWh/yr):	50,724
Rebate/Incentive*:	\$12,174	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$47,316	Total Purchased Annual Cost Savings (\$/yr):	\$3,804
Net Simple Payback Period (yrs):	12.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3121

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: INTER VILLAG

Building Key: 05CP5998

Basic Gross Area (sf): 103,000

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	91,412
Peak Demand (kW):	35.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 91,412

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$21,939

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$24,350.00	\$23,839	\$34,199.00	\$36,969
Occupancy Sensors	1	\$9,656.00	\$9,453	\$7,750.00	\$8,378
Raw Costs:			\$33,292		\$45,347
City: San Bernardino			Sales Tax: 8.25%	\$2,747	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$4,325	\$5,442
City Index Labor Multiplier: 108.1%			Subtotals:	\$40,363	\$50,788
			Contingency: 10.00%	\$4,036	\$5,079
			Totals:	\$44,399	\$55,867
			Engineering: 15.00%	\$15,040	
			Construction Phase: 5.00%	\$5,013	
			Project Management: 6.00%	\$6,016	
Total Project Cost:				\$126,336	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$126,336	Total Purchased Electricity Savings (kWh/yr):	91,412
Rebate/Incentive*:	\$21,939	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$104,397	Total Purchased Annual Cost Savings (\$/yr):	\$6,856
Net Simple Payback Period (yrs):	15.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3122

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: LIFE SCIENCE

Building Key: 05CP5316

Basic Gross Area (sf): 47,099

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	56,776
Peak Demand (kW):	16.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 56,776

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$13,626

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$11,134.00	\$10,900	\$15,638.00	\$16,905
Occupancy Sensors	1	\$3,523.00	\$3,449	\$2,827.00	\$3,056
Raw Costs:			\$14,349		\$19,961
City: San Bernardino Sales Tax: 8.25%			\$1,184		N/A
City Index Material Multiplier: 97.9%			\$1,864		\$2,395
City Index Labor Multiplier: 108.1%			\$17,397		\$22,356
Contractor O&P: 12.00%			\$1,740		\$2,236
Subtotals:			\$19,137		\$24,592
Contingency: 10.00%			\$6,559		
Totals:			\$2,186		
Engineering: 15.00%			\$2,624		
Construction Phase: 5.00%					
Project Management: 6.00%					
Total Project Cost:			\$55,098		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$55,098	Total Purchased Electricity Savings (kWh/yr):	56,776
Rebate/Incentive*:	\$13,626	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$41,472	Total Purchased Annual Cost Savings (\$/yr):	\$4,258
Net Simple Payback Period (yrs):	9.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3123

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: OLMSTED

Building Key: 05CP5497

Basic Gross Area (sf): 92,594

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	130,510
Peak Demand (kW):	33.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 130,510

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$31,322

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$21,890.00	\$21,430	\$30,744.00	\$33,234
Occupancy Sensors	1	\$15,263.00	\$14,942	\$12,250.00	\$13,242
Daylighting	1	\$942.00	\$922	\$2,456.00	\$2,655
Raw Costs:			\$37,295		\$49,131
City: San Bernardino Sales Tax: 8.25%			\$3,077		N/A
City Index Material Multiplier: 97.9%			\$4,845		\$5,896
City Index Labor Multiplier: 108.1%			\$45,216		\$55,027
Subtotals:			\$45,216		\$55,027
Contingency: 10.00%			\$4,522		\$5,503
Totals:			\$49,738		\$60,530
Engineering: 15.00%			\$16,540		
Construction Phase: 5.00%			\$5,513		
Project Management: 6.00%			\$6,616		
Total Project Cost:			\$138,938		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$138,938	Total Purchased Electricity Savings (kWh/yr):	130,510
Rebate/Incentive*:	\$31,322	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$107,616	Total Purchased Annual Cost Savings (\$/yr):	\$9,788
Net Simple Payback Period (yrs):	11.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3124

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND A

Building Key: 05CP5365

Basic Gross Area (sf): 17,538

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	15,010
Peak Demand (kW):	6.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 15,010

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,602

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$4,146.00	\$4,059	\$5,823.00	\$6,295
Occupancy Sensors	1	\$1,171.00	\$1,146	\$940.00	\$1,016
Raw Costs:			\$5,205		\$7,311
City: San Bernardino Sales Tax: 8.25%			\$429		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$676	\$877
City Index Labor Multiplier: 108.1%			Subtotals:	\$6,311	\$8,188
			Contingency: 10.00%	\$631	\$819
			Totals:	\$6,942	\$9,007
			Engineering: 15.00%	\$2,392	
			Construction Phase: 5.00%	\$797	
			Project Management: 6.00%	\$957	
Total Project Cost:			\$20,096		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$20,096	Total Purchased Electricity Savings (kWh/yr):	15,010
Rebate/Incentive*:	\$3,602	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$16,494	Total Purchased Annual Cost Savings (\$/yr):	\$1,126
Net Simple Payback Period (yrs):	14.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3125

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND BC

Building Key: 05CP5636

Basic Gross Area (sf): 35,220

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	30,412
Peak Demand (kW):	12.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 30,412

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$7,299

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$8,326.00	\$8,151	\$11,694.00	\$12,641
Occupancy Sensors	1	\$2,580.00	\$2,526	\$2,071.00	\$2,239
Raw Costs:			\$10,677		\$14,880
City: San Bernardino Sales Tax: 8.25%			\$881		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$1,387	\$1,786
City Index Labor Multiplier: 108.1%			Subtotals:	\$12,945	\$16,666
			Contingency: 10.00%	\$1,294	\$1,667
			Totals:	\$14,239	\$18,332
			Engineering: 15.00%	\$4,886	
			Construction Phase: 5.00%	\$1,629	
			Project Management: 6.00%	\$1,954	
Total Project Cost:			\$41,040		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$41,040	Total Purchased Electricity Savings (kWh/yr):	30,412
Rebate/Incentive*:	\$7,299	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$33,741	Total Purchased Annual Cost Savings (\$/yr):	\$2,281
Net Simple Payback Period (yrs):	14.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3126

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND D

Building Key: 05CP5637

Basic Gross Area (sf): 18,243

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	15,684
Peak Demand (kW):	6.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 15,684

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,764

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$4,313.00	\$4,222	\$6,057.00	\$6,548
Occupancy Sensors	1	\$1,278.00	\$1,251	\$1,026.00	\$1,109
Raw Costs:			\$5,474		\$7,657
City: San Bernardino Sales Tax: 8.25%			\$452		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$711	\$919
City Index Labor Multiplier: 108.1%			Subtotals:	\$6,636	\$8,576
Contingency: 10.00%			\$664		\$858
Totals:			\$7,300		\$9,433
Engineering: 15.00%			\$2,510		
Construction Phase: 5.00%			\$837		
Project Management: 6.00%			\$1,004		
Total Project Cost:			\$21,083		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$21,083	Total Purchased Electricity Savings (kWh/yr):	15,684
Rebate/Incentive*:	\$3,764	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$17,319	Total Purchased Annual Cost Savings (\$/yr):	\$1,176
Net Simple Payback Period (yrs):	14.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3127

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND E

Building Key: 05CP5638

Basic Gross Area (sf): 17,490

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	15,802
Peak Demand (kW):	6.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 15,802

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,792

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$4,135.00	\$4,048	\$5,807.00	\$6,277
Occupancy Sensors	1	\$1,878.00	\$1,839	\$1,508.00	\$1,630
Raw Costs:			\$5,887		\$7,908
City: San Bernardino Sales Tax: 8.25%			\$486		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$765	\$949
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,137	\$8,856
			Contingency: 10.00%	\$714	\$886
			Totals:	\$7,851	\$9,742
			Engineering: 15.00%	\$2,639	
			Construction Phase: 5.00%	\$880	
			Project Management: 6.00%	\$1,056	
Total Project Cost:				\$22,167	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$22,167	Total Purchased Electricity Savings (kWh/yr):	15,802
Rebate/Incentive*:	\$3,792	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$18,375	Total Purchased Annual Cost Savings (\$/yr):	\$1,185
Net Simple Payback Period (yrs):	15.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3128

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND FG

Building Key: 05CP5639

Basic Gross Area (sf): 34,513

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	29,927
Peak Demand (kW):	11.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 29,927

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$7,182

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$8,159.00	\$7,988	\$11,459.00	\$12,387
Occupancy Sensors	1	\$2,636.00	\$2,581	\$2,116.00	\$2,287
Raw Costs:			\$10,568		\$14,675
City: San Bernardino Sales Tax: 8.25%			\$872		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$1,373	\$1,761
City Index Labor Multiplier: 108.1%			Subtotals:	\$12,813	\$16,436
			Contingency: 10.00%	\$1,281	\$1,644
			Totals:	\$14,094	\$18,079
			Engineering: 15.00%	\$4,826	
			Construction Phase: 5.00%	\$1,609	
			Project Management: 6.00%	\$1,930	
Total Project Cost:			\$40,538		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$40,538	Total Purchased Electricity Savings (kWh/yr):	29,927
Rebate/Incentive*:	\$7,182	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$33,356	Total Purchased Annual Cost Savings (\$/yr):	\$2,245
Net Simple Payback Period (yrs):	14.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3129

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND H

Building Key: 05CP5640

Basic Gross Area (sf): 18,605

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	17,062
Peak Demand (kW):	6.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 17,062

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,095

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$4,398.00	\$4,306	\$6,177.00	\$6,677
Occupancy Sensors	1	\$2,213.00	\$2,167	\$1,776.00	\$1,920
Raw Costs:			\$6,472		\$8,597
City: San Bernardino Sales Tax: 8.25%			\$534		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$841	\$1,032
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,847	\$9,629
Contingency: 10.00%			\$785		\$963
Totals:			\$8,632		\$10,592
Engineering: 15.00%			\$2,883		
Construction Phase: 5.00%			\$961		
Project Management: 6.00%			\$1,153		
Total Project Cost:			\$24,221		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$24,221	Total Purchased Electricity Savings (kWh/yr):	17,062
Rebate/Incentive*:	\$4,095	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$20,126	Total Purchased Annual Cost Savings (\$/yr):	\$1,280
Net Simple Payback Period (yrs):	15.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3130

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND I

Building Key: 05CP5369

Basic Gross Area (sf): 23,464

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	19,917
Peak Demand (kW):	8.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 19,917

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,780

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,547.00	\$5,431	\$7,791.00	\$8,422
Occupancy Sensors	1	\$1,426.00	\$1,396	\$1,144.00	\$1,237
Raw Costs:			\$6,827		\$9,659
City: San Bernardino			Sales Tax: 8.25%	\$563	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$887	\$1,159
City Index Labor Multiplier: 108.1%			Subtotals:	\$8,277	\$10,818
			Contingency: 10.00%	\$828	\$1,082
			Totals:	\$9,104	\$11,900
			Engineering: 15.00%	\$3,151	
			Construction Phase: 5.00%	\$1,050	
			Project Management: 6.00%	\$1,260	
Total Project Cost:				\$26,465	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$26,465	Total Purchased Electricity Savings (kWh/yr):	19,917
Rebate/Incentive*:	\$4,780	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$21,685	Total Purchased Annual Cost Savings (\$/yr):	\$1,494
Net Simple Payback Period (yrs):	14.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3131

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND J

Building Key: 05CP5641

Basic Gross Area (sf): 23,365

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	20,258
Peak Demand (kW):	8.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 20,258

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,862

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,524.00	\$5,408	\$7,758.00	\$8,386
Occupancy Sensors	1	\$1,783.00	\$1,746	\$1,431.00	\$1,547
Raw Costs:			\$7,154		\$9,933
City: San Bernardino Sales Tax: 8.25%			\$590		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$1,192
			Subtotals:		\$11,125
City Index Labor Multiplier: 108.1%			Contingency: 10.00%	\$867	\$1,113
			Totals:	\$9,540	\$12,238
			Engineering: 15.00%	\$3,267	
			Construction Phase: 5.00%	\$1,089	
			Project Management: 6.00%	\$1,307	
Total Project Cost:				\$27,440	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$27,440	Total Purchased Electricity Savings (kWh/yr):	20,258
Rebate/Incentive*:	\$4,862	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$22,578	Total Purchased Annual Cost Savings (\$/yr):	\$1,519
Net Simple Payback Period (yrs):	14.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3132

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND K

Building Key: 05CP5642

Basic Gross Area (sf): 22,765

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	19,401
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 19,401

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,656

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,382.00	\$5,269	\$7,559.00	\$8,171
Occupancy Sensors	1	\$1,450.00	\$1,420	\$1,163.00	\$1,257
Raw Costs:			\$6,689		\$9,428
City: San Bernardino Sales Tax: 8.25%			\$552		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$869	\$1,131
City Index Labor Multiplier: 108.1%			Subtotals:	\$8,109	\$10,560
			Contingency: 10.00%	\$811	\$1,056
			Totals:	\$8,920	\$11,616
			Engineering: 15.00%	\$3,080	
			Construction Phase: 5.00%	\$1,027	
			Project Management: 6.00%	\$1,232	
Total Project Cost:				\$25,875	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$25,875	Total Purchased Electricity Savings (kWh/yr):	19,401
Rebate/Incentive*:	\$4,656	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$21,219	Total Purchased Annual Cost Savings (\$/yr):	\$1,455
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3133

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND L

Building Key: 05CP5643

Basic Gross Area (sf): 21,795

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	18,594
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 18,594

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,463

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,152.00	\$5,044	\$7,237.00	\$7,823
Occupancy Sensors	1	\$1,404.00	\$1,375	\$1,127.00	\$1,218
Raw Costs:			\$6,418		\$9,041
City: San Bernardino Sales Tax: 8.25%			\$530		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$834	\$1,085
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,782	\$10,126
			Contingency: 10.00%	\$778	\$1,013
			Totals:	\$8,560	\$11,139
			Engineering: 15.00%	\$2,955	
			Construction Phase: 5.00%	\$985	
			Project Management: 6.00%	\$1,182	
Total Project Cost:				\$24,821	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$24,821	Total Purchased Electricity Savings (kWh/yr):	18,594
Rebate/Incentive*:	\$4,463	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$20,358	Total Purchased Annual Cost Savings (\$/yr):	\$1,395
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3134

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND M

Building Key: 05CP5644

Basic Gross Area (sf): 22,765

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	19,392
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 19,392

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,654

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$1,442.00	\$1,412	\$1,157.00	\$1,251
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,382.00	\$5,269	\$7,559.00	\$8,171
Raw Costs:			\$6,681		\$9,422
City: San Bernardino Sales Tax: 8.25%			\$551		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$868	\$1,131
City Index Labor Multiplier: 108.1%			Subtotals:	\$8,100	\$10,553
			Contingency: 10.00%	\$810	\$1,055
			Totals:	\$8,910	\$11,608
			Engineering: 15.00%	\$3,078	
			Construction Phase: 5.00%	\$1,026	
			Project Management: 6.00%	\$1,231	
Total Project Cost:			\$25,852		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$25,852	Total Purchased Electricity Savings (kWh/yr):	19,392
Rebate/Incentive*:	\$4,654	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$21,198	Total Purchased Annual Cost Savings (\$/yr):	\$1,454
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3135

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND N

Building Key: 05CP5645

Basic Gross Area (sf): 21,795

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	18,594
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 18,594

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,463

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,152.00	\$5,044	\$7,237.00	\$7,823
Occupancy Sensors	1	\$1,404.00	\$1,375	\$1,127.00	\$1,218
Raw Costs:			\$6,418		\$9,041
City: San Bernardino Sales Tax: 8.25%			\$530		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$834	\$1,085
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,782	\$10,126
			Contingency: 10.00%	\$778	\$1,013
			Totals:	\$8,560	\$11,139
			Engineering: 15.00%	\$2,955	
			Construction Phase: 5.00%	\$985	
			Project Management: 6.00%	\$1,182	
Total Project Cost:				\$24,821	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$24,821	Total Purchased Electricity Savings (kWh/yr):	18,594
Rebate/Incentive*:	\$4,463	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$20,358	Total Purchased Annual Cost Savings (\$/yr):	\$1,395
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3136

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND O

Building Key: 05CP5646

Basic Gross Area (sf): 21,795

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	18,594
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 18,594

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,463

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,152.00	\$5,044	\$7,237.00	\$7,823
Occupancy Sensors	1	\$1,404.00	\$1,375	\$1,127.00	\$1,218
Raw Costs:			\$6,418		\$9,041
City: San Bernardino Sales Tax: 8.25%			\$530		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$834	\$1,085
City Index Labor Multiplier: 108.1%			Subtotals:	\$7,782	\$10,126
			Contingency: 10.00%	\$778	\$1,013
			Totals:	\$8,560	\$11,139
			Engineering: 15.00%	\$2,955	
			Construction Phase: 5.00%	\$985	
			Project Management: 6.00%	\$1,182	
Total Project Cost:				\$24,821	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$24,821	Total Purchased Electricity Savings (kWh/yr):	18,594
Rebate/Incentive*:	\$4,463	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$20,358	Total Purchased Annual Cost Savings (\$/yr):	\$1,395
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3137

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND P

Building Key: 05CP5647

Basic Gross Area (sf): 22,765

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	19,373
Peak Demand (kW):	7.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 19,373

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,650

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$5,382.00	\$5,269	\$7,559.00	\$8,171
Occupancy Sensors	1	\$1,426.00	\$1,396	\$1,144.00	\$1,237
Raw Costs:			\$6,665		\$9,408
City: San Bernardino Sales Tax: 8.25%			\$550		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$866	\$1,129
City Index Labor Multiplier: 108.1%			Subtotals:	\$8,081	\$10,537
			Contingency: 10.00%	\$808	\$1,054
			Totals:	\$8,889	\$11,591
			Engineering: 15.00%	\$3,072	
			Construction Phase: 5.00%	\$1,024	
			Project Management: 6.00%	\$1,229	
Total Project Cost:			\$25,804		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$25,804	Total Purchased Electricity Savings (kWh/yr):	19,373
Rebate/Incentive*:	\$4,650	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$21,154	Total Purchased Annual Cost Savings (\$/yr):	\$1,453
Net Simple Payback Period (yrs):	14.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3138

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PENTLAND Q

Building Key: 05CP5648

Basic Gross Area (sf): 4,493

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	4,964
Peak Demand (kW):	2.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 4,964

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,191

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$1,062.00	\$1,040	\$1,492.00	\$1,613
Occupancy Sensors	1	\$1,254.00	\$1,228	\$1,006.00	\$1,087
Raw Costs:			\$2,267		\$2,700
City: San Bernardino Sales Tax: 8.25%			\$187		N/A
City Index Material Multiplier: 97.9%			\$295		\$324
City Index Labor Multiplier: 108.1%			\$2,749		\$3,024
Contractor O&P: 12.00%			\$275		\$302
Subtotals:			\$3,024		\$3,327
Contingency: 10.00%			\$953		
Totals:			\$318		
Engineering: 15.00%			\$381		
Construction Phase: 5.00%					
Project Management: 6.00%					
Total Project Cost:			\$8,002		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$8,002	Total Purchased Electricity Savings (kWh/yr):	4,964
Rebate/Incentive*:	\$1,191	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$6,811	Total Purchased Annual Cost Savings (\$/yr):	\$372
Net Simple Payback Period (yrs):	18.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3139

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICS

Building Key: 05CP5504

Basic Gross Area (sf): 89,541

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	120,553
Peak Demand (kW):	31.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 120,553

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$28,933

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$21,168.00	\$20,723	\$29,730.00	\$32,138
Occupancy Sensors	1	\$11,516.00	\$11,274	\$9,243.00	\$9,992
Daylighting	1	\$613.00	\$600	\$1,600.00	\$1,730
Raw Costs:			\$32,598		\$43,859
City: San Bernardino Sales Tax: 8.25%			\$2,689		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$4,234	\$5,263
City Index Labor Multiplier: 108.1%			Subtotals:	\$39,522	\$49,123
Contingency: 10.00%			\$3,952		\$4,912
Totals:			\$43,474		\$54,035
Engineering: 15.00%			\$14,626		
Construction Phase: 5.00%			\$4,875		
Project Management: 6.00%			\$5,851		
Total Project Cost:			\$122,861		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$122,861	Total Purchased Electricity Savings (kWh/yr):	120,553
Rebate/Incentive*:	\$28,933	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$93,928	Total Purchased Annual Cost Savings (\$/yr):	\$9,041
Net Simple Payback Period (yrs):	10.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3140

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PIERCE

Building Key: 05CP5508

Basic Gross Area (sf): 141,355

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	155,571
Peak Demand (kW):	44.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 155,571

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$37,337

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$33,417.00	\$32,715	\$46,934.00	\$50,736
Occupancy Sensors	1	\$1,251.00	\$1,225	\$1,004.00	\$1,085
Raw Costs:			\$33,940		\$51,821
City: San Bernardino Sales Tax: 8.25%			\$2,800		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$4,409	\$6,219
City Index Labor Multiplier: 108.1%			Subtotals:	\$41,149	\$58,039
			Contingency: 10.00%	\$4,115	\$5,804
			Totals:	\$45,264	\$63,843
			Engineering: 15.00%	\$16,366	
			Construction Phase: 5.00%	\$5,455	
			Project Management: 6.00%	\$6,546	
Total Project Cost:					\$137,475

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$137,475	Total Purchased Electricity Savings (kWh/yr):	155,571
Rebate/Incentive*:	\$37,337	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$100,138	Total Purchased Annual Cost Savings (\$/yr):	\$11,668
Net Simple Payback Period (yrs):	8.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3141

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: RIVERA LIB

Building Key: 05CP5322

Basic Gross Area (sf): 225,413

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	311,360
Peak Demand (kW):	77.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 311,360

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$74,726

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$53,289.00	\$52,170	\$74,844.00	\$80,906
Occupancy Sensors	1	\$25,493.00	\$24,958	\$20,461.00	\$22,118
Daylighting	1	\$7,450.00	\$7,294	\$19,436.00	\$21,010
Raw Costs:			\$84,421		\$124,035
City: San Bernardino Sales Tax: 8.25%			\$6,965		N/A
City Index Material Multiplier: 97.9%			\$10,966		\$14,884
City Index Labor Multiplier: 108.1%			\$102,352		\$138,919
Subtotals:			\$102,352		\$138,919
Contingency: 10.00%			\$10,235		\$13,892
Totals:			\$112,587		\$152,811
Engineering: 15.00%			\$39,810		
Construction Phase: 5.00%			\$13,270		
Project Management: 6.00%			\$15,924		
Total Project Cost:			\$334,402		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$334,402	Total Purchased Electricity Savings (kWh/yr):	311,360
Rebate/Incentive*:	\$74,726	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$259,676	Total Purchased Annual Cost Savings (\$/yr):	\$23,352
Net Simple Payback Period (yrs):	11.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3142

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SCIENCE LAB1

Building Key: 05CP5416

Basic Gross Area (sf): 45,472

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	53,154
Peak Demand (kW):	15.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 53,154

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$12,757

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$10,750.00	\$10,524	\$15,098.00	\$16,321
Occupancy Sensors	1	\$2,209.00	\$2,163	\$1,773.00	\$1,917
Raw Costs:			\$12,687		\$18,238
City: San Bernardino Sales Tax: 8.25%			\$1,047		N/A
City Index Material Multiplier: 97.9%			\$1,648		\$2,189
City Index Labor Multiplier: 108.1%			\$15,382		\$20,426
Subtotals:			\$15,382		\$20,426
Contingency: 10.00%			\$1,538		\$2,043
Totals:			\$16,920		\$22,469
Engineering: 15.00%			\$5,908		
Construction Phase: 5.00%			\$1,969		
Project Management: 6.00%			\$2,363		
Total Project Cost:			\$49,629		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$49,629	Total Purchased Electricity Savings (kWh/yr):	53,154
Rebate/Incentive*:	\$12,757	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$36,872	Total Purchased Annual Cost Savings (\$/yr):	\$3,987
Net Simple Payback Period (yrs):	9.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3143

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SCIENCE LIB

Building Key: 05CP5418

Basic Gross Area (sf): 175,719

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	254,148
Peak Demand (kW):	63.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 254,148

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$60,996

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$41,541.00	\$40,669	\$58,344.00	\$63,070
Occupancy Sensors	1	\$30,255.00	\$29,620	\$24,282.00	\$26,249
Daylighting	1	\$5,559.00	\$5,442	\$14,503.00	\$15,678
Raw Costs:			\$75,731		\$104,996
City: San Bernardino Sales Tax: 8.25%			\$6,248		N/A
City Index Material Multiplier: 97.9%			\$9,837		\$12,600
City Index Labor Multiplier: 108.1%			\$91,816		\$117,596
Contingency: 10.00%			\$9,182		\$11,760
Totals:			\$100,997		\$129,356
Engineering: 15.00%			\$34,553		
Construction Phase: 5.00%			\$11,518		
Project Management: 6.00%			\$13,821		
Total Project Cost:			\$290,245		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$290,245	Total Purchased Electricity Savings (kWh/yr):	254,148
Rebate/Incentive*:	\$60,996	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$229,249	Total Purchased Annual Cost Savings (\$/yr):	\$19,061
Net Simple Payback Period (yrs):	12.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3144

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SPIETH

Building Key: 05CP5323

Basic Gross Area (sf): 100,927

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	121,350
Peak Demand (kW):	33.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 121,350

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$29,124

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$23,860.00	\$23,359	\$33,511.00	\$36,225
Occupancy Sensors	1	\$6,946.00	\$6,800	\$5,575.00	\$6,027
Raw Costs:			\$30,159		\$42,252
City: San Bernardino Sales Tax: 8.25%			\$2,488		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,918	\$5,070
City Index Labor Multiplier: 108.1%			Subtotals:	\$36,565	\$47,322
			Contingency: 10.00%	\$3,656	\$4,732
			Totals:	\$40,221	\$52,054
			Engineering: 15.00%	\$13,841	
			Construction Phase: 5.00%	\$4,614	
			Project Management: 6.00%	\$5,537	
Total Project Cost:			\$116,267		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$116,267	Total Purchased Electricity Savings (kWh/yr):	121,350
Rebate/Incentive*:	\$29,124	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$87,143	Total Purchased Annual Cost Savings (\$/yr):	\$9,101
Net Simple Payback Period (yrs):	9.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3145

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install additional occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SPROUL

Building Key: 05CP5523

Basic Gross Area (sf): 78,834

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	122,818
Peak Demand (kW):	30.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 122,818

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$29,476

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$18,637.00	\$18,246	\$26,175.00	\$28,295
Occupancy Sensors	1	\$19,862.00	\$19,445	\$15,941.00	\$17,232
Daylighting	1	\$1,169.00	\$1,144	\$3,050.00	\$3,297
Raw Costs:			\$38,835		\$48,824
City: San Bernardino Sales Tax: 8.25%			\$3,204		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$5,045	\$5,859
City Index Labor Multiplier: 108.1%			Subtotals:	\$47,084	\$54,683
Contingency: 10.00%			\$4,708		\$5,468
Totals:			\$51,792		\$60,152
Engineering: 15.00%			\$16,792		
Construction Phase: 5.00%			\$5,597		
Project Management: 6.00%			\$6,717		
Total Project Cost:			\$141,049		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$141,049	Total Purchased Electricity Savings (kWh/yr):	122,818
Rebate/Incentive*:	\$29,476	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$111,573	Total Purchased Annual Cost Savings (\$/yr):	\$9,211
Net Simple Payback Period (yrs):	12.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3146

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STAT COMP

Building Key: 05CP5588

Basic Gross Area (sf): 41,939

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	42,032
Peak Demand (kW):	13.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 42,032

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$10,088

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$9,915.00	\$9,707	\$13,925.00	\$15,053
Daylighting	1	\$494.00	\$484	\$1,289.00	\$1,393
Raw Costs:			\$10,190		\$16,446
City: San Bernardino Sales Tax: 8.25%			\$841		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$1,324	\$1,974
City Index Labor Multiplier: 108.1%			Subtotals:	\$12,355	\$18,420
Contingency: 10.00%			\$1,235		\$1,842
Totals:			\$13,590		\$20,262
Engineering: 15.00%			\$5,078		
Construction Phase: 5.00%			\$1,693		
Project Management: 6.00%			\$2,031		
Total Project Cost:			\$42,654		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$42,654	Total Purchased Electricity Savings (kWh/yr):	42,032
Rebate/Incentive*:	\$10,088	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$32,566	Total Purchased Annual Cost Savings (\$/yr):	\$3,152
Net Simple Payback Period (yrs):	10.3		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3147

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STONEHAVEN

Building Key: 05CP5991

Basic Gross Area (sf): 158,511

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	138,485
Peak Demand (kW):	53.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 138,485

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$33,236

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$37,473.00	\$36,686	\$52,631.00	\$56,894
Occupancy Sensors	1	\$12,990.00	\$12,717	\$10,425.00	\$11,269
Raw Costs:			\$49,403		\$68,164
City: San Bernardino			Sales Tax: 8.25%	\$4,076	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$6,417	\$8,180
City Index Labor Multiplier: 108.1%			Subtotals:	\$59,897	\$76,343
			Contingency: 10.00%	\$5,990	\$7,634
			Totals:	\$65,886	\$83,977
			Engineering: 15.00%	\$22,480	
			Construction Phase: 5.00%	\$7,493	
			Project Management: 6.00%	\$8,992	
Total Project Cost:				\$188,828	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$188,828	Total Purchased Electricity Savings (kWh/yr):	138,485
Rebate/Incentive*:	\$33,236	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$155,592	Total Purchased Annual Cost Savings (\$/yr):	\$10,386
Net Simple Payback Period (yrs):	15.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3148

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BOYCE

Building Key: 05CP5341

Basic Gross Area (sf): 124,321

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	157,182
Peak Demand (kW):	42.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 157,182

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$37,724

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$28,699.00	\$28,096	\$40,307.00	\$43,572
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$692.00	\$677	\$971.00	\$1,050
Occupancy Sensors	1	\$8,725.00	\$8,542	\$7,003.00	\$7,570
Raw Costs:			\$37,316		\$52,192
City: San Bernardino Sales Tax: 8.25%			\$3,079		N/A
City Index Material Multiplier: 97.9%			\$4,847		\$6,263
City Index Labor Multiplier: 108.1%			\$45,241		\$58,455
Subtotals:			\$45,241		\$58,455
Contingency: 10.00%			\$4,524		\$5,845
Totals:			\$49,766		\$64,300
Engineering: 15.00%			\$17,110		
Construction Phase: 5.00%			\$5,703		
Project Management: 6.00%			\$6,844		
Total Project Cost:			\$143,723		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$143,723	Total Purchased Electricity Savings (kWh/yr):	157,182
Rebate/Incentive*:	\$37,724	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$105,999	Total Purchased Annual Cost Savings (\$/yr):	\$11,789
Net Simple Payback Period (yrs):	9.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3149

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: WATKINS

Building Key: 05CP5354

Basic Gross Area (sf): 62,237

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	107,093
Peak Demand (kW):	25.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 107,093

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$25,702

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Daylighting	1	\$989.00	\$968	\$2,579.00	\$2,788
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$14,367.00	\$14,065	\$20,178.00	\$21,812
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$346.00	\$339	\$486.00	\$525
Occupancy Sensors	1	\$19,547.00	\$19,137	\$15,688.00	\$16,959
Raw Costs:			\$34,509		\$42,084
City: San Bernardino			Sales Tax: 8.25%	\$2,847	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$4,483	\$5,050
City Index Labor Multiplier: 108.1%			Subtotals:	\$41,838	\$47,135
Contingency: 10.00%			\$4,184		\$4,713
Totals:			\$46,022		\$51,848
Engineering: 15.00%			\$14,681		
Construction Phase: 5.00%			\$4,894		
Project Management: 6.00%			\$5,872		
Total Project Cost:			\$123,317		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$123,317	Total Purchased Electricity Savings (kWh/yr):	107,093
Rebate/Incentive*:	\$25,702	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$97,615	Total Purchased Annual Cost Savings (\$/yr):	\$8,032
Net Simple Payback Period (yrs):	12.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3150

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: WEBBER

Building Key: 05CP5342

Basic Gross Area (sf): 48,565

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	61,716
Peak Demand (kW):	17.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 61,716

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$14,812

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$11,211.00	\$10,976	\$15,746.00	\$17,021
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$270.00	\$264	\$379.00	\$410
Occupancy Sensors	1	\$3,351.00	\$3,281	\$2,690.00	\$2,908
Raw Costs:			\$14,521		\$20,339
City: San Bernardino Sales Tax: 8.25%			\$1,198		N/A
City Index Material Multiplier: 97.9%			\$1,886		\$2,441
City Index Labor Multiplier: 108.1%			\$17,605		\$22,780
Subtotals:			\$17,605		\$22,780
Contingency: 10.00%			\$1,760		\$2,278
Totals:			\$19,365		\$25,058
Engineering: 15.00%			\$6,663		
Construction Phase: 5.00%			\$2,221		
Project Management: 6.00%			\$2,665		
Total Project Cost:			\$55,973		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$55,973	Total Purchased Electricity Savings (kWh/yr):	61,716
Rebate/Incentive*:	\$14,812	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$41,161	Total Purchased Annual Cost Savings (\$/yr):	\$4,629
Net Simple Payback Period (yrs):	8.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3151

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and Install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ABER INVER

Building Key: 05CP5343

Basic Gross Area (sf): 203,939

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	199,858
Peak Demand (kW):	77.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 199,858

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$47,966

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$43,391.00	\$42,480	\$60,943.00	\$65,879
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$4,821.00	\$4,720	\$6,771.00	\$7,319
Occupancy Sensors	1	\$17,465.00	\$17,098	\$14,017.00	\$15,152
Raw Costs:			\$64,298		\$88,351
City: San Bernardino			Sales Tax: 8.25%	\$5,305	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$8,352	\$10,602
City Index Labor Multiplier: 108.1%			Subtotals:	\$77,955	\$98,953
Contingency: 10.00%			\$7,795		\$9,895
Totals:			\$85,750		\$108,849
Engineering: 15.00%			\$29,190		
Construction Phase: 5.00%			\$9,730		
Project Management: 6.00%			\$11,676		
Total Project Cost:			\$245,194		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$245,194	Total Purchased Electricity Savings (kWh/yr):	199,858
Rebate/Incentive*:	\$47,966	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$197,228	Total Purchased Annual Cost Savings (\$/yr):	\$14,989
Net Simple Payback Period (yrs):	13.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3152

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: HUM & SOC SC

Building Key: 05CP5307

Basic Gross Area (sf): 105,966

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	248,756
Peak Demand (kW):	61.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 248,756

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$59,701

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$37,867.00	\$37,072	\$30,392.00	\$32,854
Daylighting	1	\$1,810.00	\$1,772	\$4,721.00	\$5,103
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$10,020.00	\$9,810	\$14,074.00	\$15,214
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$15,031.00	\$14,715	\$21,110.00	\$22,820
Raw Costs:			\$63,369		\$75,991
City: San Bernardino Sales Tax: 8.25%			\$5,228		N/A
City Index Material Multiplier: 97.9%			\$8,232		\$9,119
City Index Labor Multiplier: 108.1%			\$76,828		\$85,110
Contingency: 10.00%			\$7,683		\$8,511
Totals:			\$84,511		\$93,621
Engineering: 15.00%			\$26,720		
Construction Phase: 5.00%			\$8,907		
Project Management: 6.00%			\$10,688		
Total Project Cost:			\$224,446		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$224,446	Total Purchased Electricity Savings (kWh/yr):	248,756
Rebate/Incentive*:	\$59,701	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$164,745	Total Purchased Annual Cost Savings (\$/yr):	\$18,657
Net Simple Payback Period (yrs):	8.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3153

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UNV PLZA APT

Building Key: 05CP5715

Basic Gross Area (sf): 72,544

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	105,681
Peak Demand (kW):	40.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 105,681

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$25,363

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$8,071.00	\$7,902	\$11,335.00	\$12,253
Incandescents --> Compact Fluorescents	1	\$849.00	\$831	\$1,192.00	\$1,289
Occupancy Sensors	1	\$8,866.00	\$8,680	\$7,116.00	\$7,692
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$9,079.00	\$8,888	\$12,752.00	\$13,785
Raw Costs:			\$26,301		\$35,019
City: San Bernardino			Sales Tax: 8.25%	\$2,170	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$3,416	\$4,202
City Index Labor Multiplier: 108.1%			Subtotals:	\$31,887	\$39,221
Contingency: 10.00%			\$3,189		\$3,922
Totals:			\$35,076		\$43,143
Engineering: 15.00%			\$11,733		
Construction Phase: 5.00%			\$3,911		
Project Management: 6.00%			\$4,693		
Total Project Cost:			\$98,556		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$98,556	Total Purchased Electricity Savings (kWh/yr):	105,681
Rebate/Incentive*:	\$25,363	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$73,193	Total Purchased Annual Cost Savings (\$/yr):	\$7,926
Net Simple Payback Period (yrs):	9.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3154

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: EAST I&Q FAC

Building Key: 05CP5289

Basic Gross Area (sf): 28,438

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	56,301
Peak Demand (kW):	15.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 56,301

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$13,512

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$2,117.00	\$2,073	\$1,699.00	\$1,837
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$3,361.00	\$3,290	\$4,721.00	\$5,103
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$3,361.00	\$3,290	\$4,721.00	\$5,103
Raw Costs:			\$8,653		\$12,043
City: San Bernardino Sales Tax: 8.25%			\$714		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$1,124	\$1,445
City Index Labor Multiplier: 108.1%			Subtotals:	\$10,491	\$13,489
Contingency: 10.00%			\$1,049		\$1,349
Totals:			\$11,540		\$14,837
Engineering: 15.00%			\$3,957		
Construction Phase: 5.00%			\$1,319		
Project Management: 6.00%			\$1,583		
Total Project Cost:			\$33,236		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$33,236	Total Purchased Electricity Savings (kWh/yr):	56,301
Rebate/Incentive*:	\$13,512	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$19,724	Total Purchased Annual Cost Savings (\$/yr):	\$4,223
Net Simple Payback Period (yrs):	4.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3155

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: FALKIRK STUDENT APTS

Building Key: 05CTBD5

Basic Gross Area (sf): 162,270

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	174,717
Peak Demand (kW):	66.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 174,717

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$41,932

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$13,298.00	\$13,019	\$10,673.00	\$11,538
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$13,539.00	\$13,255	\$19,016.00	\$20,556
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$13,539.00	\$13,255	\$19,016.00	\$20,556
Incandescents --> Compact Fluorescents	1	\$5,061.00	\$4,955	\$7,109.00	\$7,685
Raw Costs:			\$44,483		\$60,335
City: San Bernardino Sales Tax: 8.25%			\$3,670		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$5,778	\$7,240
City Index Labor Multiplier: 108.1%			Subtotals:	\$53,931	\$67,575
Contingency: 10.00%			\$5,393		\$6,758
Totals:			\$59,324		\$74,333
Engineering: 15.00%			\$20,049		
Construction Phase: 5.00%			\$6,683		
Project Management: 6.00%			\$8,019		
Total Project Cost:			\$168,407		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$168,407	Total Purchased Electricity Savings (kWh/yr):	174,717
Rebate/Incentive*:	\$41,932	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$126,475	Total Purchased Annual Cost Savings (\$/yr):	\$13,104
Net Simple Payback Period (yrs):	9.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3156

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: LOTHIAN HALL

Building Key: 05CP5502

Basic Gross Area (sf): 246,791

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	406,265
Peak Demand (kW):	158.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 406,265

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$97,504

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$14,586.00	\$14,280	\$20,486.00	\$22,145
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$43,757.00	\$42,838	\$61,457.00	\$66,435
Occupancy Sensors	1	\$20,380.00	\$19,952	\$16,357.00	\$17,682
Daylighting	1	\$820.00	\$803	\$2,139.00	\$2,312
Raw Costs:			\$77,873		\$108,575
City: San Bernardino			Sales Tax: 8.25%	\$6,424	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$10,116	\$13,029
City Index Labor Multiplier: 108.1%			Subtotals:	\$94,413	\$121,604
Contingency: 10.00%			\$9,441		\$12,160
Totals:			\$103,854		\$133,764
Engineering: 15.00%			\$35,643		
Construction Phase: 5.00%			\$11,881		
Project Management: 6.00%			\$14,257		
Total Project Cost:			\$299,399		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$299,399	Total Purchased Electricity Savings (kWh/yr):	406,265
Rebate/Incentive*:	\$97,504	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$201,895	Total Purchased Annual Cost Savings (\$/yr):	\$30,470
Net Simple Payback Period (yrs):	6.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3157

Project: Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BIOLOGIC SCI

Building Key: 05CP5186

Basic Gross Area (sf): 54,300

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	13,461
Peak Demand (kW):	4.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 13,461

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,231

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$3,020.00	\$2,957	\$4,242.00	\$4,586
Raw Costs:			\$2,957		\$4,586
City: San Bernardino		Sales Tax: 8.25%	\$244		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$384		\$550
Subtotals:			\$3,585		\$5,136
City Index Labor Multiplier: 108.1%		Contingency: 10.00%	\$358		\$514
Totals:			\$3,943		\$5,649
		Engineering: 15.00%	\$1,439		
		Construction Phase: 5.00%	\$480		
		Project Management: 6.00%	\$576		
Total Project Cost:			\$12,087		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$12,087	Total Purchased Electricity Savings (kWh/yr):	13,461
Rebate/Incentive*:	\$3,231	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$8,856	Total Purchased Annual Cost Savings (\$/yr):	\$1,010
Net Simple Payback Period (yrs):	8.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3158

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK A

Building Key: 05CP5590

Basic Gross Area (sf): 16,185

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	14,152
Peak Demand (kW):	5.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 14,152

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,396

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$675.00	\$661	\$948.00	\$1,025
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,350.00	\$1,322	\$1,897.00	\$2,051
Incandescents --> Compact Fluorescents	1	\$505.00	\$494	\$709.00	\$766
Occupancy Sensors	1	\$903.00	\$884	\$725.00	\$784
Raw Costs:			\$3,361		\$4,626
City: San Bernardino			Sales Tax: 8.25%	\$277	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$437	\$555
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,075	\$5,181
Contingency: 10.00%			\$407		\$518
Totals:			\$4,482		\$5,699
Engineering: 15.00%			\$1,527		
Construction Phase: 5.00%			\$509		
Project Management: 6.00%			\$611		
Total Project Cost:			\$12,828		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$12,828	Total Purchased Electricity Savings (kWh/yr):	14,152
Rebate/Incentive*:	\$3,396	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$9,432	Total Purchased Annual Cost Savings (\$/yr):	\$1,061
Net Simple Payback Period (yrs):	8.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3159

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK B

Building Key: 05CP5591

Basic Gross Area (sf): 3,274

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,464
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,464

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$831

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$137.00	\$134	\$192.00	\$208
Occupancy Sensors	1	\$509.00	\$498	\$409.00	\$442
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$273.00	\$267	\$384.00	\$415
Incandescents --> Compact Fluorescents	1	\$102.00	\$100	\$143.00	\$155
Raw Costs:			\$1,000		\$1,219
City: San Bernardino			Sales Tax: 8.25%	\$82	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$130	\$146
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,212	\$1,366
Contingency: 10.00%			\$121		\$137
Totals:			\$1,333		\$1,502
Engineering: 15.00%			\$425		
Construction Phase: 5.00%			\$142		
Project Management: 6.00%			\$170		
Total Project Cost:			\$3,572		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,572	Total Purchased Electricity Savings (kWh/yr):	3,464
Rebate/Incentive*:	\$831	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,741	Total Purchased Annual Cost Savings (\$/yr):	\$260
Net Simple Payback Period (yrs):	10.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3160

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK C

Building Key: 05CP5592

Basic Gross Area (sf): 4,320

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,743
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,743

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$898

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$180.00	\$176	\$253.00	\$273
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$360.00	\$352	\$506.00	\$547
Incandescents --> Compact Fluorescents	1	\$135.00	\$132	\$189.00	\$204
Occupancy Sensors	1	\$222.00	\$217	\$178.00	\$192
Raw Costs:			\$878		\$1,217
City: San Bernardino			Sales Tax: 8.25%	\$72	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$114	\$146
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,065	\$1,363
Contingency: 10.00%			\$106		\$136
Totals:			\$1,171		\$1,500
Engineering: 15.00%			\$401		
Construction Phase: 5.00%			\$134		
Project Management: 6.00%			\$160		
Total Project Cost:			\$3,365		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,365	Total Purchased Electricity Savings (kWh/yr):	3,743
Rebate/Incentive*:	\$898	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,467	Total Purchased Annual Cost Savings (\$/yr):	\$281
Net Simple Payback Period (yrs):	8.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3161

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK D

Building Key: 05CP5593

Basic Gross Area (sf): 6,608

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	10,818
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 10,818

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,596

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$276.00	\$270	\$387.00	\$418
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$551.00	\$539	\$774.00	\$837
Occupancy Sensors	1	\$1,311.00	\$1,283	\$1,052.00	\$1,137
Incandescents --> Compact Fluorescents	1	\$206.00	\$202	\$289.00	\$312
Raw Costs:			\$2,295		\$2,705
City: San Bernardino			Sales Tax: 8.25%		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$325
City Index Labor Multiplier: 108.1%			Subtotals:	\$2,782	\$3,029
Contingency: 10.00%			\$278		\$303
Totals:			\$3,060		\$3,332
Engineering: 15.00%			\$959		
Construction Phase: 5.00%			\$320		
Project Management: 6.00%			\$384		
Total Project Cost:			\$8,055		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$8,055	Total Purchased Electricity Savings (kWh/yr):	10,818
Rebate/Incentive*:	\$2,596	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,459	Total Purchased Annual Cost Savings (\$/yr):	\$811
Net Simple Payback Period (yrs):	6.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3162

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK E

Building Key: 05CP5594

Basic Gross Area (sf): 8,195

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	7,142
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 7,142

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,714

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Occupancy Sensors	1	\$445.00	\$436	\$357.00	\$386
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
Raw Costs:			\$1,691		\$2,331
City: San Bernardino			Sales Tax: 8.25%		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$280
City Index Labor Multiplier: 108.1%			Subtotals:	\$2,050	\$2,610
Contingency: 10.00%			\$205		\$261
Totals:			\$2,255		\$2,871
Engineering: 15.00%			\$769		
Construction Phase: 5.00%			\$256		
Project Management: 6.00%			\$308		
Total Project Cost:			\$6,459		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$6,459	Total Purchased Electricity Savings (kWh/yr):	7,142
Rebate/Incentive*:	\$1,714	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$4,745	Total Purchased Annual Cost Savings (\$/yr):	\$536
Net Simple Payback Period (yrs):	8.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3163

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK F

Building Key: 05CP5595

Basic Gross Area (sf): 8,195

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	9,107
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 9,107

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,186

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Occupancy Sensors	1	\$1,512.00	\$1,480	\$1,214.00	\$1,312
Raw Costs:			\$2,735		\$3,257
City: San Bernardino Sales Tax: 8.25%			\$226		N/A
City Index Material Multiplier: 97.9%			\$355		\$391
City Index Labor Multiplier: 108.1%			\$3,316		\$3,648
Contractor O&P: 12.00%					
Subtotals:			\$3,316		\$3,648
Contingency: 10.00%			\$332		\$365
Totals:			\$3,648		\$4,013
Engineering: 15.00%			\$1,149		
Construction Phase: 5.00%			\$383		
Project Management: 6.00%			\$460		
Total Project Cost:			\$9,652		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$9,652	Total Purchased Electricity Savings (kWh/yr):	9,107
Rebate/Incentive*:	\$2,186	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$7,466	Total Purchased Annual Cost Savings (\$/yr):	\$683
Net Simple Payback Period (yrs):	10.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3164

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK G

Building Key: 05CP5596

Basic Gross Area (sf): 8,223

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	8,952
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 8,952

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,148

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$360.00	\$389
Occupancy Sensors	1	\$1,416.00	\$1,386	\$1,136.00	\$1,228
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$686.00	\$672	\$964.00	\$1,042
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$343.00	\$336	\$482.00	\$521
Raw Costs:			\$2,644		\$3,180
City: San Bernardino Sales Tax: 8.25%			\$218		N/A
City Index Material Multiplier: 97.9%			\$343		\$382
City Index Labor Multiplier: 108.1%			\$3,206		\$3,562
Contingency: 10.00%			\$321		\$356
Totals:			\$3,527		\$3,918
Engineering: 15.00%			\$1,117		
Construction Phase: 5.00%			\$372		
Project Management: 6.00%			\$447		
Total Project Cost:			\$9,380		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$9,380	Total Purchased Electricity Savings (kWh/yr):	8,952
Rebate/Incentive*:	\$2,148	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$7,232	Total Purchased Annual Cost Savings (\$/yr):	\$671
Net Simple Payback Period (yrs):	10.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3165

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BANNOCK H
Building Key: 05CP5597
Basic Gross Area (sf): 8,195
Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	9,198
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 9,198

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,208

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Occupancy Sensors	1	\$1,562.00	\$1,529	\$1,253.00	\$1,354
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
Raw Costs:			\$2,784		\$3,299
City: San Bernardino Sales Tax: 8.25%			\$230		N/A
City Index Material Multiplier: 97.9%			\$362		\$396
City Index Labor Multiplier: 108.1%			\$3,376		\$3,695
Contingency: 10.00%			\$338		\$370
Totals:			\$3,713		\$4,065
Engineering: 15.00%			\$1,167		
Construction Phase: 5.00%			\$389		
Project Management: 6.00%			\$467		
Total Project Cost:			\$9,800		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$9,800	Total Purchased Electricity Savings (kWh/yr):	9,198
Rebate/Incentive*:	\$2,208	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$7,592	Total Purchased Annual Cost Savings (\$/yr):	\$690
Net Simple Payback Period (yrs):	11.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3166

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK I

Building Key: 05CP5598

Basic Gross Area (sf): 8,196

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	7,740
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 7,740

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,858

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Occupancy Sensors	1	\$769.00	\$753	\$617.00	\$667
Raw Costs:			\$2,008		\$2,612
City: San Bernardino Sales Tax: 8.25%			\$166		N/A
City Index Material Multiplier: 97.9%			\$261		\$313
City Index Labor Multiplier: 108.1%			\$2,434		\$2,925
Contingency: 10.00%			\$243		\$293
Totals:			\$2,678		\$3,218
Engineering: 15.00%			\$884		
Construction Phase: 5.00%			\$295		
Project Management: 6.00%			\$354		
Total Project Cost:			\$7,428		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$7,428	Total Purchased Electricity Savings (kWh/yr):	7,740
Rebate/Incentive*:	\$1,858	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,570	Total Purchased Annual Cost Savings (\$/yr):	\$581
Net Simple Payback Period (yrs):	9.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3167

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK K

Building Key: 05CP5600

Basic Gross Area (sf): 3,938

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	4,329
Peak Demand (kW):	2.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 4,329

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,039

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$329.00	\$322	\$461.00	\$498
Incandescents --> Compact Fluorescents	1	\$123.00	\$120	\$173.00	\$187
Occupancy Sensors	1	\$701.00	\$686	\$562.00	\$608
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$164.00	\$161	\$231.00	\$250
Raw Costs:			\$1,289		\$1,543
City: San Bernardino			Sales Tax: 8.25%	\$106	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$167	\$185
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,563	\$1,728
Contingency: 10.00%			\$156		\$173
Totals:			\$1,720		\$1,900
Engineering: 15.00%			\$543		
Construction Phase: 5.00%			\$181		
Project Management: 6.00%			\$217		
Total Project Cost:			\$4,561		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$4,561	Total Purchased Electricity Savings (kWh/yr):	4,329
Rebate/Incentive*:	\$1,039	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$3,522	Total Purchased Annual Cost Savings (\$/yr):	\$325
Net Simple Payback Period (yrs):	10.8		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3168

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK L

Building Key: 05CP5601

Basic Gross Area (sf): 11,561

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	12,352
Peak Demand (kW):	4.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 12,352

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,964

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$1,863.00	\$1,824	\$1,496.00	\$1,617
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$965.00	\$945	\$1,355.00	\$1,465
Incandescents --> Compact Fluorescents	1	\$361.00	\$353	\$506.00	\$547
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$482.00	\$472	\$677.00	\$732
Raw Costs:			\$3,594		\$4,361
City: San Bernardino			Sales Tax: 8.25%	\$296	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$467	\$523
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,357	\$4,884
Contingency: 10.00%			\$436		\$488
Totals:			\$4,793		\$5,372
Engineering: 15.00%			\$1,525		
Construction Phase: 5.00%			\$508		
Project Management: 6.00%			\$610		
Total Project Cost:			\$12,808		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$12,808	Total Purchased Electricity Savings (kWh/yr):	12,352
Rebate/Incentive*:	\$2,964	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$9,844	Total Purchased Annual Cost Savings (\$/yr):	\$926
Net Simple Payback Period (yrs):	10.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3169

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK N

Building Key: 05CP5603

Basic Gross Area (sf): 4,098

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,781
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,781

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$907

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$342.00	\$335	\$480.00	\$519
Incandescents --> Compact Fluorescents	1	\$128.00	\$125	\$180.00	\$195
Occupancy Sensors	1	\$336.00	\$329	\$270.00	\$292
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$171.00	\$167	\$240.00	\$259
Raw Costs:			\$956		\$1,265
City: San Bernardino Sales Tax: 8.25%			\$79		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$152
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,160	\$1,417
Contingency: 10.00%			\$116		\$142
Totals:			\$1,276		\$1,558
Engineering: 15.00%			\$425		
Construction Phase: 5.00%			\$142		
Project Management: 6.00%			\$170		
Total Project Cost:			\$3,571		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,571	Total Purchased Electricity Savings (kWh/yr):	3,781
Rebate/Incentive*:	\$907	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,664	Total Purchased Annual Cost Savings (\$/yr):	\$284
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3170

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK O

Building Key: 05CP5604

Basic Gross Area (sf): 4,098

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,781
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,781

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$907

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$336.00	\$329	\$270.00	\$292
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$171.00	\$167	\$240.00	\$259
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$342.00	\$335	\$480.00	\$519
Incandescents --> Compact Fluorescents	1	\$128.00	\$125	\$180.00	\$195
Raw Costs:			\$956		\$1,265
City: San Bernardino Sales Tax: 8.25%			\$79		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$152
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,160	\$1,417
Contingency: 10.00%			\$116		\$142
Totals:			\$1,276		\$1,558
Engineering: 15.00%			\$425		
Construction Phase: 5.00%			\$142		
Project Management: 6.00%			\$170		
Total Project Cost:			\$3,571		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,571	Total Purchased Electricity Savings (kWh/yr):	3,781
Rebate/Incentive*:	\$907	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,664	Total Purchased Annual Cost Savings (\$/yr):	\$284
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3171

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK P

Building Key: 05CP5605

Basic Gross Area (sf): 4,098

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	3,781
Peak Demand (kW):	1.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 3,781

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$907

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$336.00	\$329	\$270.00	\$292
Incandescents --> Compact Fluorescents	1	\$128.00	\$125	\$180.00	\$195
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$171.00	\$167	\$240.00	\$259
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$342.00	\$335	\$480.00	\$519
Raw Costs:			\$956		\$1,265
City: San Bernardino			Sales Tax: 8.25%	\$79	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$124	\$152
City Index Labor Multiplier: 108.1%			Subtotals:	\$1,160	\$1,417
Contingency: 10.00%			\$116		\$142
Totals:			\$1,276		\$1,558
Engineering: 15.00%			\$425		
Construction Phase: 5.00%			\$142		
Project Management: 6.00%			\$170		
Total Project Cost:			\$3,571		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$3,571	Total Purchased Electricity Savings (kWh/yr):	3,781
Rebate/Incentive*:	\$907	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$2,664	Total Purchased Annual Cost Savings (\$/yr):	\$284
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3172

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK Q

Building Key: 05CP5606

Basic Gross Area (sf): 7,372

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	7,065
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 7,065

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,696

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$308.00	\$302	\$432.00	\$467
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$615.00	\$602	\$864.00	\$934
Incandescents --> Compact Fluorescents	1	\$230.00	\$225	\$323.00	\$349
Occupancy Sensors	1	\$747.00	\$731	\$600.00	\$649
Raw Costs:			\$1,860		\$2,399
City: San Bernardino			Sales Tax: 8.25%	\$153	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$242	\$288
City Index Labor Multiplier: 108.1%			Subtotals:	\$2,255	\$2,687
Contingency: 10.00%			\$226		\$269
Totals:			\$2,481		\$2,955
Engineering: 15.00%			\$815		
Construction Phase: 5.00%			\$272		
Project Management: 6.00%			\$326		
Total Project Cost:			\$6,849		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$6,849	Total Purchased Electricity Savings (kWh/yr):	7,065
Rebate/Incentive*:	\$1,696	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,153	Total Purchased Annual Cost Savings (\$/yr):	\$530
Net Simple Payback Period (yrs):	9.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3173

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK R

Building Key: 05CP5607

Basic Gross Area (sf): 8,196

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	7,561
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 7,561

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,815

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Occupancy Sensors	1	\$672.00	\$658	\$539.00	\$583
Raw Costs:			\$1,913		\$2,527
City: San Bernardino Sales Tax: 8.25%			\$158		N/A
City Index Material Multiplier: 97.9%			\$248		\$303
City Index Labor Multiplier: 108.1%			\$2,319		\$2,831
Contingency: 10.00%			\$232		\$283
Totals:			\$2,551		\$3,114
Engineering: 15.00%			\$850		
Construction Phase: 5.00%			\$283		
Project Management: 6.00%			\$340		
Total Project Cost:			\$7,138		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$7,138	Total Purchased Electricity Savings (kWh/yr):	7,561
Rebate/Incentive*:	\$1,815	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,323	Total Purchased Annual Cost Savings (\$/yr):	\$567
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3174

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK S

Building Key: 05CP5608

Basic Gross Area (sf): 16,389

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	15,119
Peak Demand (kW):	6.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 15,119

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,629

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$684.00	\$670	\$960.00	\$1,038
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,367.00	\$1,338	\$1,921.00	\$2,077
Incandescents --> Compact Fluorescents	1	\$511.00	\$500	\$718.00	\$776
Occupancy Sensors	1	\$1,343.00	\$1,315	\$1,078.00	\$1,165
Raw Costs:			\$3,823		\$5,056
City: San Bernardino			Sales Tax: 8.25%	\$315	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$497	\$607
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,635	\$5,663
Contingency: 10.00%			\$463		\$566
Totals:			\$5,098		\$6,229
Engineering: 15.00%			\$1,699		
Construction Phase: 5.00%			\$566		
Project Management: 6.00%			\$680		
Total Project Cost:			\$14,272		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$14,272	Total Purchased Electricity Savings (kWh/yr):	15,119
Rebate/Incentive*:	\$3,629	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$10,643	Total Purchased Annual Cost Savings (\$/yr):	\$1,134
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3175

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK T

Building Key: 05CP5609

Basic Gross Area (sf): 8,196

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	7,561
Peak Demand (kW):	3.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 7,561

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$1,815

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$672.00	\$658	\$539.00	\$583
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$342.00	\$335	\$480.00	\$519
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$684.00	\$670	\$960.00	\$1,038
Incandescents --> Compact Fluorescents	1	\$256.00	\$251	\$359.00	\$388
Raw Costs:			\$1,913		\$2,527
City: San Bernardino Sales Tax: 8.25%			\$158		N/A
City Index Material Multiplier: 97.9%			\$248		\$303
City Index Labor Multiplier: 108.1%			\$2,319		\$2,831
Contingency: 10.00%			\$232		\$283
Totals:			\$2,551		\$3,114
Engineering: 15.00%			\$850		
Construction Phase: 5.00%			\$283		
Project Management: 6.00%			\$340		
Total Project Cost:			\$7,138		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$7,138	Total Purchased Electricity Savings (kWh/yr):	7,561
Rebate/Incentive*:	\$1,815	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,323	Total Purchased Annual Cost Savings (\$/yr):	\$567
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3176

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BANNOCK U

Building Key: 05CP5610

Basic Gross Area (sf): 12,292

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	11,340
Peak Demand (kW):	4.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:		Central Plant Efficiencies:
Electricity	\$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas	\$1 per annual therm	kWh/ton-hr: 0.8
		th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 11,340

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$2,722

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$1,007.00	\$986	\$808.00	\$873
Incandescents --> Compact Fluorescents	1	\$383.00	\$375	\$538.00	\$582
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$513.00	\$502	\$720.00	\$778
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,026.00	\$1,004	\$1,440.00	\$1,557
Raw Costs:			\$2,867		\$3,790
City: San Bernardino			Sales Tax: 8.25%	\$237	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$372	\$455
City Index Labor Multiplier: 108.1%			Subtotals:	\$3,477	\$4,245
Contingency: 10.00%			\$348		\$424
Totals:			\$3,824		\$4,669
Engineering: 15.00%			\$1,274		
Construction Phase: 5.00%			\$425		
Project Management: 6.00%			\$510		
Total Project Cost:			\$10,702		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$10,702	Total Purchased Electricity Savings (kWh/yr):	11,340
Rebate/Incentive*:	\$2,722	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$7,980	Total Purchased Annual Cost Savings (\$/yr):	\$851
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3177

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BANNOCK V
Building Key: 05CP5611
Basic Gross Area (sf): 16,389
Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 15,119
Peak Demand (kW): 6.0
Gas (th/yr): 0
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 15,119

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$3,629

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
4-foot F32T8 Lamps, Standard NLO Ballasts --> 28W F32T8 Lam	1	\$684.00	\$670	\$960.00	\$1,038
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,367.00	\$1,338	\$1,921.00	\$2,077
Incandescents --> Compact Fluorescents	1	\$511.00	\$500	\$718.00	\$776
Occupancy Sensors	1	\$1,343.00	\$1,315	\$1,078.00	\$1,165
Raw Costs:			\$3,823		\$5,056
City: San Bernardino Sales Tax: 8.25%			\$315		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%		\$607
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,635	\$5,663
Contingency: 10.00%			\$463		\$566
Totals:			\$5,098		\$6,229
Engineering: 15.00%			\$1,699		
Construction Phase: 5.00%			\$566		
Project Management: 6.00%			\$680		
Total Project Cost:			\$14,272		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$14,272	Total Purchased Electricity Savings (kWh/yr):	15,119
Rebate/Incentive*:	\$3,629	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$10,643	Total Purchased Annual Cost Savings (\$/yr):	\$1,134
Net Simple Payback Period (yrs):	9.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3178

Project: Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CA MUS PHOTO

Building Key: 05CP5720

Basic Gross Area (sf): 26,326

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	17,787
Peak Demand (kW):	5.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 17,787

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$4,269

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$1,464.00	\$1,433	\$2,057.00	\$2,224
Occupancy Sensors	1	\$4,413.00	\$4,320	\$3,542.00	\$3,829
Raw Costs:			\$5,754		\$6,053
City: San Bernardino Sales Tax: 8.25%			\$475		N/A
City Index Material Multiplier: 97.9%			\$747		\$726
City Index Labor Multiplier: 108.1%			\$6,976		\$6,779
Subtotals:			\$6,976		\$6,779
Contingency: 10.00%			\$698		\$678
Totals:			\$7,673		\$7,457
Engineering: 15.00%			\$2,269		
Construction Phase: 5.00%			\$756		
Project Management: 6.00%			\$908		
Total Project Cost:			\$19,064		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$19,064	Total Purchased Electricity Savings (kWh/yr):	17,787
Rebate/Incentive*:	\$4,269	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$14,795	Total Purchased Annual Cost Savings (\$/yr):	\$1,334
Net Simple Payback Period (yrs):	11.1		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3179

Project: Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts

Campus: RIVERSIDE

Location: RIVERSIDE

Building: GERMPASM

Building Key: 05CP5994

Basic Gross Area (sf): 35,381

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	71,940
Peak Demand (kW):	20.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 71,940

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$17,266

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$6,570.00	\$6,432	\$9,228.00	\$9,975
Raw Costs:			\$6,432		\$9,975
City: San Bernardino		Sales Tax: 8.25%	\$531		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$836		\$1,197
City Index Labor Multiplier: 108.1%		Subtotals:	\$7,798		\$11,173
		Contingency: 10.00%	\$780		\$1,117
		Totals:	\$8,578		\$12,290
		Engineering: 15.00%	\$3,130		
		Construction Phase: 5.00%	\$1,043		
		Project Management: 6.00%	\$1,252		
		Total Project Cost:	\$26,293		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$26,293	Total Purchased Electricity Savings (kWh/yr):	71,940
Rebate/Incentive*:	\$17,266	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$9,027	Total Purchased Annual Cost Savings (\$/yr):	\$5,396
Net Simple Payback Period (yrs):	1.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3180

Project: Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UNIV LAB BLD

Building Key: 05CP5263

Basic Gross Area (sf): 13,356

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	35,221
Peak Demand (kW):	10.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 35,221

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$8,453

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Occupancy Sensors	1	\$384.00	\$376	\$308.00	\$333
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$3,157.00	\$3,091	\$4,435.00	\$4,794
Raw Costs:			\$3,467		\$5,127
City: San Bernardino			Sales Tax: 8.25%	\$286	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$450	\$615
City Index Labor Multiplier: 108.1%			Subtotals:	\$4,203	\$5,742
			Contingency: 10.00%	\$420	\$574
			Totals:	\$4,623	\$6,317
			Engineering: 15.00%	\$1,641	
			Construction Phase: 5.00%	\$547	
			Project Management: 6.00%	\$656	
Total Project Cost:				\$13,784	

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$13,784	Total Purchased Electricity Savings (kWh/yr):	35,221
Rebate/Incentive*:	\$8,453	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$5,331	Total Purchased Annual Cost Savings (\$/yr):	\$2,642
Net Simple Payback Period (yrs):	2.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3181

Project: Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate

Campus: RIVERSIDE

Location: RIVERSIDE

Building: UNIV OFC BLD

Building Key: 05CP5205

Basic Gross Area (sf): 20,288

Calculation File: UCR All Building List - Lighting Analysis 051808.xls

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	66,218
Peak Demand (kW):	17.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 66,218

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$15,892

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
T12 Lamps, Magnetic Ballasts --> 28W F32T8 Lamps, Prem Eff F	1	\$4,796.00	\$4,695	\$6,736.00	\$7,282
Occupancy Sensors	1	\$8,118.00	\$7,948	\$6,515.00	\$7,043
Raw Costs:			\$12,643		\$14,324
City: San Bernardino Sales Tax: 8.25%			\$1,043		N/A
City Index Material Multiplier: 97.9%			\$1,642		\$1,719
City Index Labor Multiplier: 108.1%			\$15,328		\$16,043
Contractor O&P: 12.00%			\$1,533		\$1,604
Subtotals:			\$16,861		\$17,648
Contingency: 10.00%			\$5,176		
Totals:			\$1,725		
Engineering: 15.00%			\$2,071		
Construction Phase: 5.00%					
Project Management: 6.00%					
Total Project Cost:			\$43,481		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$43,481	Total Purchased Electricity Savings (kWh/yr):	66,218
Rebate/Incentive*:	\$15,892	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$27,589	Total Purchased Annual Cost Savings (\$/yr):	\$4,966
Net Simple Payback Period (yrs):	5.6		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3182

Project: UC Riverside Lothian Hall Kitchen Hood Controls

Campus: RIVERSIDE

Location: RIVERSIDE

Building: LOTHIAN HALL

Building Key: 05CP5502

Basic Gross Area (sf): 246,791

Calculation File: UC Riverside Lothian Kitchen Hood Controls.xls

Project Description Reference(s): Air Handler Project 8. Kitchen Hood VFD.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	57,530
Peak Demand (kW):	30.0
Gas (th/yr):	1,239
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 57,530

Equivalent Gas Savings (th/yr): 1,239

Anticipated Gross Incentive: \$15,046

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Kitchen Hood Controls	1				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$26,100		\$17,400
		Contingency: 10.00%	\$2,610		\$1,740
		Totals:	\$28,710		\$19,140
		Engineering: 15.00%	\$7,178		
		Construction Phase: 5.00%	\$2,393		
		Project Management: 6.00%	\$2,871		
		Total Project Cost:	\$60,291		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$60,291	Total Purchased Electricity Savings (kWh/yr):	57,530
Rebate/Incentive*:	\$15,046	Total Purchased Gas Savings (th/yr):	1,549
Net Project Cost:	\$45,245	Total Purchased Annual Cost Savings (\$/yr):	\$5,631
Net Simple Payback Period (yrs):	8.0		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3183

Project: UC Riverside Aberdeen Inverness Kitchen Hood Controls

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ABER INVER

Building Key: 05CP5343

Basic Gross Area (sf): 203,939

Calculation File: UC Riverside Aberdeen Kitchen Hood Controls.xls

Project Description Reference(s): Air Handler Project 8. Kitchen Hood VFD.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	16,895
Peak Demand (kW):	10.0
Gas (th/yr):	636
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 16,895

Equivalent Gas Savings (th/yr): 636

Anticipated Gross Incentive: \$4,691

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Kitchen Hood Controls	1				
City: San Bernardino		Raw Costs:			
City Index Material Multiplier: 97.9%		Sales Tax: 8.25%			N/A
City Index Labor Multiplier: 108.1%		Contractor O&P: 12.00%			
		Subtotals:	\$8,100		\$5,400
		Contingency: 10.00%	\$810		\$540
		Totals:	\$8,910		\$5,940
		Engineering: 15.00%	\$2,228		
		Construction Phase: 5.00%	\$743		
		Project Management: 6.00%	\$891		
		Total Project Cost:	\$18,711		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$18,711	Total Purchased Electricity Savings (kWh/yr):	16,895
Rebate/Incentive*:	\$4,691	Total Purchased Gas Savings (th/yr):	795
Net Project Cost:	\$14,020	Total Purchased Annual Cost Savings (\$/yr):	\$1,943
Net Simple Payback Period (yrs):	7.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3184

Project: Bookstore-Retrofit all 4-foot T12 fixtures with T8 lamps and reduced light output (RLO) electronic ballasts (28W T8 lamps in the 4-foot fixtures); Install occupancy sensors in offices.

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BOOKSTORE

Building Key: 05CP5224

Basic Gross Area (sf): 32,139

Calculation File: UCR Bookstore SEP Custom Calc NAM - Checked

Project Description Reference(s): Lighting Project 1. Interior Linear Fluorescent Lighting & Lighting Project 2. Interior Lighting Controls.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	37,998
Peak Demand (kW):	12.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 37,998

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$9,120

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
1-lamp, F25T8 + RLO ballast	16	\$12.00	\$188	\$25.00	\$432
3-lamp, F17T8 + RLO ballast	13	\$20.00	\$255	\$30.00	\$422
1-lamp, 28W F32T8 + RLO ballast	40	\$12.00	\$470	\$25.00	\$1,081
2-lamp, 28W F32T8 + RLO ballast	32	\$14.00	\$439	\$25.00	\$865
3-lamp, 28W F32T8 + RLO ballast	180	\$16.00	\$2,820	\$25.00	\$4,865
Wall occupancy sensors	11	\$42.28	\$455	\$35.00	\$416
Raw Costs:			\$4,626		\$8,080
City: San Bernardino			Sales Tax: 8.25%	\$382	N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$601	\$970
City Index Labor Multiplier: 108.1%			Subtotals:	\$5,608	\$9,050
Contingency: 10.00%			\$561		\$905
Totals:			\$6,169		\$9,955
Engineering: 15.00%			\$2,419		
Construction Phase: 5.00%			\$806		
Project Management: 6.00%			\$967		
Total Project Cost:			\$20,317		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$20,317	Total Purchased Electricity Savings (kWh/yr):	37,998
Rebate/Incentive*:	\$9,120	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$11,197	Total Purchased Annual Cost Savings (\$/yr):	\$2,850
Net Simple Payback Period (yrs):	3.9		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3185

Project: Install 10,000 sf Window Film (1st Increment of 5)

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - Window Film.xls

Project Description Reference(s): UC Riverside Custom Project 1: Install Solar Window Film.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	152,700
Peak Demand (kW):	30.0
Gas (th/yr):	-490
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 152,700

Equivalent Gas Savings (th/yr): -490

Anticipated Gross Incentive: \$36,158

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Window Film, sf	10,000	\$2.00	\$19,580	\$1.12	\$12,107
Raw Costs:			\$19,580		\$12,107
City: San Bernardino		Sales Tax: 8.25%	\$1,615		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,543		\$1,453
City Index Labor Multiplier: 108.1%		Subtotals:	\$23,739		\$13,560
		Contingency: 10.00%	\$2,374		\$1,356
		Totals:	\$26,113		\$14,916
		Engineering: 15.00%	\$6,154		
		Construction Phase: 5.00%	\$2,051		
		Project Management: 6.00%	\$2,462		
		Total Project Cost:	\$51,696		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$51,696	Total Purchased Electricity Savings (kWh/yr):	152,700
Rebate/Incentive*:	\$36,158	Total Purchased Gas Savings (th/yr):	-613
Net Project Cost:	\$15,538	Total Purchased Annual Cost Savings (\$/yr):	\$10,932
Net Simple Payback Period (yrs):	1.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3186

Project: Install 10,000 sf Window Film (2nd Increment of 5)

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - Window Film.xls

Project Description Reference(s): UC Riverside Custom Project 1: Install Solar Window Film.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	152,700
Peak Demand (kW):	30.0
Gas (th/yr):	-490
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 152,700

Equivalent Gas Savings (th/yr): -490

Anticipated Gross Incentive: \$36,158

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Window Film, sf	10,000	\$2.00	\$19,580	\$1.12	\$12,107
Raw Costs:			\$19,580		\$12,107
City: San Bernardino		Sales Tax: 8.25%	\$1,615		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,543		\$1,453
City Index Labor Multiplier: 108.1%		Subtotals:	\$23,739		\$13,560
		Contingency: 10.00%	\$2,374		\$1,356
		Totals:	\$26,113		\$14,916
		Engineering: 15.00%	\$6,154		
		Construction Phase: 5.00%	\$2,051		
		Project Management: 6.00%	\$2,462		
		Total Project Cost:	\$51,696		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$51,696	Total Purchased Electricity Savings (kWh/yr):	152,700
Rebate/Incentive*:	\$36,158	Total Purchased Gas Savings (th/yr):	-613
Net Project Cost:	\$15,538	Total Purchased Annual Cost Savings (\$/yr):	\$10,932
Net Simple Payback Period (yrs):	1.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3187

Project: Install 10,000 sf Window Film (3rd Increment of 5)

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - Window Film.xls

Project Description Reference(s): UC Riverside Custom Project 1: Install Solar Window Film.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	152,700
Peak Demand (kW):	30.0
Gas (th/yr):	-490
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 152,700

Equivalent Gas Savings (th/yr): -490

Anticipated Gross Incentive: \$36,158

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Window Film, sf	10,000	\$2.00	\$19,580	\$1.12	\$12,107
Raw Costs:			\$19,580		\$12,107
City: San Bernardino		Sales Tax: 8.25%	\$1,615		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,543		\$1,453
City Index Labor Multiplier: 108.1%		Subtotals:	\$23,739		\$13,560
		Contingency: 10.00%	\$2,374		\$1,356
		Totals:	\$26,113		\$14,916
		Engineering: 15.00%	\$6,154		
		Construction Phase: 5.00%	\$2,051		
		Project Management: 6.00%	\$2,462		
		Total Project Cost:	\$51,696		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$51,696	Total Purchased Electricity Savings (kWh/yr):	152,700
Rebate/Incentive*:	\$36,158	Total Purchased Gas Savings (th/yr):	-613
Net Project Cost:	\$15,538	Total Purchased Annual Cost Savings (\$/yr):	\$10,932
Net Simple Payback Period (yrs):	1.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3188

Project: Install 10,000 sf Window Film (4th Increment of 5)

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWISE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - Window Film.xls

Project Description Reference(s): UC Riverside Custom Project 1: Install Solar Window Film.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	152,700
Peak Demand (kW):	30.0
Gas (th/yr):	-490
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 152,700

Equivalent Gas Savings (th/yr): -490

Anticipated Gross Incentive: \$36,158

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Window Film, sf	10,000	\$2.00	\$19,580	\$1.12	\$12,107
Raw Costs:			\$19,580		\$12,107
City: San Bernardino		Sales Tax: 8.25%	\$1,615		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,543		\$1,453
City Index Labor Multiplier: 108.1%		Subtotals:	\$23,739		\$13,560
		Contingency: 10.00%	\$2,374		\$1,356
		Totals:	\$26,113		\$14,916
		Engineering: 15.00%	\$6,154		
		Construction Phase: 5.00%	\$2,051		
		Project Management: 6.00%	\$2,462		
		Total Project Cost:	\$51,696		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$51,696	Total Purchased Electricity Savings (kWh/yr):	152,700
Rebate/Incentive*:	\$36,158	Total Purchased Gas Savings (th/yr):	-613
Net Project Cost:	\$15,538	Total Purchased Annual Cost Savings (\$/yr):	\$10,932
Net Simple Payback Period (yrs):	1.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3189

Project: Install 10,000 sf Window Film (5th Increment of 5)

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - Window Film.xls

Project Description Reference(s): UC Riverside Custom Project 1: Install Solar Window Film.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	152,700
Peak Demand (kW):	30.0
Gas (th/yr):	-490
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 152,700

Equivalent Gas Savings (th/yr): -490

Anticipated Gross Incentive: \$36,158

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Window Film, sf	10,000	\$2.00	\$19,580	\$1.12	\$12,107
Raw Costs:			\$19,580		\$12,107
City: San Bernardino		Sales Tax: 8.25%	\$1,615		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$2,543		\$1,453
City Index Labor Multiplier: 108.1%		Subtotals:	\$23,739		\$13,560
		Contingency: 10.00%	\$2,374		\$1,356
		Totals:	\$26,113		\$14,916
		Engineering: 15.00%	\$6,154		
		Construction Phase: 5.00%	\$2,051		
		Project Management: 6.00%	\$2,462		
		Total Project Cost:	\$51,696		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$51,696	Total Purchased Electricity Savings (kWh/yr):	152,700
Rebate/Incentive*:	\$36,158	Total Purchased Gas Savings (th/yr):	-613
Net Project Cost:	\$15,538	Total Purchased Annual Cost Savings (\$/yr):	\$10,932
Net Simple Payback Period (yrs):	1.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3190

Project: HEAT RECOVERY

Campus: RIVERSIDE

Location: RIVERSIDE

Building: STAT COMP

Building Key: 05CP5588

Basic Gross Area (sf): 41,939

Calculation File: 05CP5588 - Statics & Computers - HeatRecoveryCalcs.xls

Project Description Reference(s): UC Riverside Custom Project 3: Heat Recovery on 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	350,829
Peak Demand (kW):	1.0
Gas (th/yr):	18,000
Chilled Water (ton-hr/yr):	233,886
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 537,938

Equivalent Gas Savings (th/yr): 18,000

Anticipated Gross Incentive: \$147,105

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Ductwork Demolition	1	\$0.00	\$0	\$2,500.00	\$2,703
20,000 CFM Air to Air Heat Recovery	3	\$19,900.00	\$58,446	\$1,275.00	\$4,135
10,000 CFM Air to Air Heat Recovery	1	\$11,000.00	\$10,769	\$1,125.00	\$1,216
Sheet Metal Ductwork	1	\$3,900.00	\$3,818	\$19,050.00	\$20,593
Ductwork Insulation	1	\$2,935.00	\$2,873	\$8,292.00	\$8,964
Raw Costs:			\$75,907		\$37,610
City: San Bernardino Sales Tax: 8.25%			\$6,262		N/A
City Index Material Multiplier: 97.9% Contractor O&P: 12.00%			\$9,860		\$4,513
City Index Labor Multiplier: 108.1% Subtotals:			\$92,029		\$42,123
Contingency: 10.00%			\$9,203		\$4,212
Totals:			\$101,232		\$46,336
Engineering: 15.00%			\$22,135		
Construction Phase: 5.00%			\$7,378		
Project Management: 6.00%			\$8,854		
Total Project Cost:			\$185,936		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$185,936	Total Purchased Electricity Savings (kWh/yr):	537,938
Rebate/Incentive*:	\$147,105	Total Purchased Gas Savings (th/yr):	22,500
Net Project Cost:	\$38,831	Total Purchased Annual Cost Savings (\$/yr):	\$59,470
Net Simple Payback Period (yrs):	0.7		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3191

Project: HEAT RECOVERY

Campus: RIVERSIDE

Location: RIVERSIDE

Building: SPIETH

Building Key: 05CP5323

Basic Gross Area (sf): 100,927

Calculation File: 05CP5323 - Spieth - HeatRecoveryCalcs.xls

Project Description Reference(s): UC Riverside Custom Project 3: Heat Recovery on 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	610,659
Peak Demand (kW):	3.0
Gas (th/yr):	31,331
Chilled Water (ton-hr/yr):	407,106
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 936,344

Equivalent Gas Savings (th/yr): 31,331

Anticipated Gross Incentive: \$256,054

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
50,000 CFM Air to Air Heat Recovery	2	\$43,600.00	\$85,369	\$2,525.00	\$5,459
Sheet Metal Ductwork	1	\$5,850.00	\$5,727	\$28,575.00	\$30,890
Ductwork Demolition	1	\$0.00	\$0	\$3,750.00	\$4,054
Ductwork Insulation	1	\$4,402.50	\$4,310	\$12,438.00	\$13,445
Raw Costs:			\$95,406		\$53,848
City: San Bernardino Sales Tax: 8.25%			\$7,871		N/A
City Index Material Multiplier: 97.9%			Contractor O&P: 12.00%	\$12,393	\$6,462
City Index Labor Multiplier: 108.1%			Subtotals:	\$115,670	\$60,310
Contingency: 10.00%			\$11,567		\$6,031
Totals:			\$127,237		\$66,341
Engineering: 15.00%			\$29,037		
Construction Phase: 5.00%			\$9,679		
Project Management: 6.00%			\$11,615		
Total Project Cost:			\$243,908		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$243,908	Total Purchased Electricity Savings (kWh/yr):	936,344
Rebate/Incentive*:	\$195,126	Total Purchased Gas Savings (th/yr):	39,164
Net Project Cost:	\$48,782	Total Purchased Annual Cost Savings (\$/yr):	\$103,515
Net Simple Payback Period (yrs):	0.5		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3192

Project: Replace CHW Coils

Campus: RIVERSIDE

Location: RIVERSIDE

Building: CAMPUSWIDE

Building Key: 05CWIDE

Basic Gross Area (sf):

Calculation File: UC SEP Custom Calculation - CHW Coils.xls

Project Description Reference(s): UC Riverside Custom Project 2: Replace Chilled Water Coils.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	1,222,960
Peak Demand (kW):	252.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 1,222,960

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$293,510

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Estimated Incremental Cost	1	\$250,000.00	\$244,750	\$225,000.00	\$243,225
		Raw Costs:	\$244,750		\$243,225
City: San Bernardino		Sales Tax: 8.25%	\$20,192		N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%	\$31,793		\$29,187
		Subtotals:	\$296,735		\$272,412
City Index Labor Multiplier: 108.1%		Contingency: 10.00%	\$29,673		\$27,241
		Totals:	\$326,408		\$299,653
		Engineering: 15.00%	\$93,909		
		Construction Phase: 5.00%	\$31,303		
		Project Management: 6.00%	\$37,564		
		Total Project Cost:	\$788,838		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$788,838	Total Purchased Electricity Savings (kWh/yr):	1,222,960
Rebate/Incentive*:	\$293,510	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$495,328	Total Purchased Annual Cost Savings (\$/yr):	\$91,722
Net Simple Payback Period (yrs):	5.4		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3193

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ARTS

Building Key: 05CP5411

Basic Gross Area (sf): 106,659

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	31,477
Peak Demand (kW):	8.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 31,477

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$7,554

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	42				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$22,411		\$2,064
		Contingency: 10.00%	\$2,241		\$206
		Totals:	\$24,652		\$2,271
		Engineering: 15.00%	\$4,038		
		Construction Phase: 5.00%	\$1,346		
		Project Management: 6.00%	\$1,615		
		Total Project Cost:	\$33,922		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$33,922	Total Purchased Electricity Savings (kWh/yr):	31,477
Rebate/Incentive*:	\$7,554	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$26,368	Total Purchased Annual Cost Savings (\$/yr):	\$2,361
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3194

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: BATCHELOR

Building Key: 05CP5501

Basic Gross Area (sf): 105,334

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	293,786
Peak Demand (kW):	75.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 293,786

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$70,509

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	392				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$209,166		\$19,266
		Contingency: 10.00%	\$20,917		\$1,927
		Totals:	\$230,083		\$21,192
		Engineering: 15.00%	\$37,691		
		Construction Phase: 5.00%	\$12,564		
		Project Management: 6.00%	\$15,077		
		Total Project Cost:	\$316,607		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$316,607	Total Purchased Electricity Savings (kWh/yr):	293,786
Rebate/Incentive*:	\$70,509	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$246,098	Total Purchased Annual Cost Savings (\$/yr):	\$22,034
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3195

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BOURNS
Building Key: 05CP5261
Basic Gross Area (sf): 157,189
Calculation File: UC SEP Custom Calculation - Evap Precooling.xls
Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 308,026
Peak Demand (kW): 79.0
Gas (th/yr): 0
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 308,026

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$73,926

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	411				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$219,305		\$20,199
		Contingency: 10.00%	\$21,930		\$2,020
		Totals:	\$241,235		\$22,219
		Engineering: 15.00%	\$39,518		
		Construction Phase: 5.00%	\$13,173		
		Project Management: 6.00%	\$15,807		
		Total Project Cost:	\$331,953		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$331,953 **Total Purchased Electricity Savings (kWh/yr):** 308,026
Rebate/Incentive*: \$73,926 **Total Purchased Gas Savings (th/yr):** 0
Net Project Cost: \$258,027 **Total Purchased Annual Cost Savings (\$/yr):** \$23,102
Net Simple Payback Period (yrs): 11.2

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3196

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE
Location: RIVERSIDE
Building: BOYCE
Building Key: 05CP5341
Basic Gross Area (sf): 124,321
Calculation File: UC SEP Custom Calculation - Evap Precooling.xls
Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 364,235
Peak Demand (kW): 93.0
Gas (th/yr): 0
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Electricity \$0.24 per annual kWh
Natural Gas \$1 per annual therm
Central Plant Efficiencies: th/MMBTU: 12.5
kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 364,235

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$87,416

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	486				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$259,324		\$23,886
		Contingency: 10.00%	\$25,932		\$2,389
		Totals:	\$285,256		\$26,274
		Engineering: 15.00%	\$46,730		
		Construction Phase: 5.00%	\$15,577		
		Project Management: 6.00%	\$18,692		
		Total Project Cost:	\$392,528		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$392,528
Rebate/Incentive*: \$87,416
Net Project Cost: \$305,112
Net Simple Payback Period (yrs): 11.2

Total Purchased Electricity Savings (kWh/yr): 364,235
Total Purchased Gas Savings (th/yr): 0
Total Purchased Annual Cost Savings (\$/yr): \$27,318

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3197

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: ENTOMOLOGY

Building Key: 05CP5417

Basic Gross Area (sf): 69,417

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	159,634
Peak Demand (kW):	41.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 159,634

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$38,312

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	213				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$113,654		\$10,468
		Contingency: 10.00%	\$11,365		\$1,047
		Totals:	\$125,020		\$11,515
		Engineering: 15.00%	\$20,480		
		Construction Phase: 5.00%	\$6,827		
		Project Management: 6.00%	\$8,192		
		Total Project Cost:	\$172,034		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$172,034	Total Purchased Electricity Savings (kWh/yr):	159,634
Rebate/Incentive*:	\$38,312	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$133,722	Total Purchased Annual Cost Savings (\$/yr):	\$11,973
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3198

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE
Location: RIVERSIDE
Building: GEOLOGY
Building Key: 05CP5335
Basic Gross Area (sf): 96,019
Calculation File: UC SEP Custom Calculation - Evap Precooling.xls
Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	199,355
Peak Demand (kW):	51.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 199,355

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$47,845

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	266				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$141,934		\$13,073
		Contingency: 10.00%	\$14,193		\$1,307
		Totals:	\$156,128		\$14,380
		Engineering: 15.00%	\$25,576		
		Construction Phase: 5.00%	\$8,525		
		Project Management: 6.00%	\$10,230		
		Total Project Cost:	\$214,840		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$214,840	Total Purchased Electricity Savings (kWh/yr):	199,355
Rebate/Incentive*:	\$47,845	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$166,995	Total Purchased Annual Cost Savings (\$/yr):	\$14,952
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3199

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: INSECTARY

Building Key: 05CP5301

Basic Gross Area (sf): 8,783

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	280,296
Peak Demand (kW):	72.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 280,296

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$67,271

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	374				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$199,562		\$18,381
		Contingency: 10.00%	\$19,956		\$1,838
		Totals:	\$219,518		\$20,219
		Engineering: 15.00%	\$35,961		
		Construction Phase: 5.00%	\$11,987		
		Project Management: 6.00%	\$14,384		
		Total Project Cost:	\$302,069		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$302,069	Total Purchased Electricity Savings (kWh/yr):	280,296
Rebate/Incentive*:	\$67,271	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$234,798	Total Purchased Annual Cost Savings (\$/yr):	\$21,022
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3200

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PHYSICAL SCI

Building Key: 05CP5414

Basic Gross Area (sf): 134,709

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	606,308
Peak Demand (kW):	155.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 606,308

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$145,514

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	809				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$431,673		\$39,760
		Contingency: 10.00%	\$43,167		\$3,976
		Totals:	\$474,840		\$43,736
		Engineering: 15.00%	\$77,786		
		Construction Phase: 5.00%	\$25,929		
		Project Management: 6.00%	\$31,115		
		Total Project Cost:	\$653,406		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$653,406	Total Purchased Electricity Savings (kWh/yr):	606,308
Rebate/Incentive*:	\$145,514	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$507,892	Total Purchased Annual Cost Savings (\$/yr):	\$45,473
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3201

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE
Location: RIVERSIDE
Building: PHYSICS
Building Key: 05CP5504
Basic Gross Area (sf): 89,541
Calculation File: UC SEP Custom Calculation - Evap Precooling.xls
Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	174,623
Peak Demand (kW):	45.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 174,623

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$41,910

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	233				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$124,326		\$11,451
		Contingency: 10.00%	\$12,433		\$1,145
		Totals:	\$136,759		\$12,596
		Engineering: 15.00%	\$22,403		
		Construction Phase: 5.00%	\$7,468		
		Project Management: 6.00%	\$8,961		
		Total Project Cost:	\$188,187		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$188,187	Total Purchased Electricity Savings (kWh/yr):	174,623
Rebate/Incentive*:	\$41,910	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$146,277	Total Purchased Annual Cost Savings (\$/yr):	\$13,097
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3202

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE

Location: RIVERSIDE

Building: PIERCE

Building Key: 05CP5508

Basic Gross Area (sf): 141,355

Calculation File: UC SEP Custom Calculation - Evap Precooling.xls

Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup

Start Preliminary Engineering:

Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr):	543,354
Peak Demand (kW):	139.0
Gas (th/yr):	0
Chilled Water (ton-hr/yr):	0
HW/Steam (MMBTu/yr):	0

Incentive Calculation Basis

Assumed Incentive Rates:	Central Plant Efficiencies:
Electricity \$0.24 per annual kWh	th/MMBTU: 12.5
Natural Gas \$1 per annual therm	kWh/ton-hr: 0.8
	th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 543,354

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$130,405

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	725				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$386,851		\$35,632
		Contingency: 10.00%	\$38,685		\$3,563
		Totals:	\$425,536		\$39,195
		Engineering: 15.00%	\$69,710		
		Construction Phase: 5.00%	\$23,237		
		Project Management: 6.00%	\$27,884		
		Total Project Cost:	\$585,561		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost:	\$585,561	Total Purchased Electricity Savings (kWh/yr):	543,354
Rebate/Incentive*:	\$130,405	Total Purchased Gas Savings (th/yr):	0
Net Project Cost:	\$455,156	Total Purchased Annual Cost Savings (\$/yr):	\$40,752
Net Simple Payback Period (yrs):	11.2		

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

PROJECT DETAIL REPORT

SEP Project ID Number: E3203

Project: Evaporative Precooling for 100% OSA Systems

Campus: RIVERSIDE
Location: RIVERSIDE
Building: WEBBER
Building Key: 05CP5342
Basic Gross Area (sf): 48,565
Calculation File: UC SEP Custom Calculation - Evap Precooling.xls
Project Description Reference(s): UC Riverside Custom Project 5: Evaporative Pre-cooling for 100% OSA Air Handler.

Campus Prioritization and Schedule

Project Tier: Backup
Start Preliminary Engineering:
Scheduled Completion:

Project Energy Savings Summary

Building Energy Savings

Electric (kWh/yr): 130,405
Peak Demand (kW): 33.0
Gas (th/yr): 0
Chilled Water (ton-hr/yr): 0
HW/Steam (MMBTu/yr): 0

Incentive Calculation Basis

Assumed Incentive Rates: Central Plant Efficiencies:
Electricity \$0.24 per annual kWh th/MMBTU: 12.5
Natural Gas \$1 per annual therm kWh/ton-hr: 0.8
th/ton-hr: 0.0

Equivalent Electric Savings (kWh/yr): 130,405

Equivalent Gas Savings (th/yr): 0

Anticipated Gross Incentive: \$31,297

Note: Where the anticipated gross incentive exceeds 80% of the total project cost, the incentive is capped. The net incentive amount is shown below in the Project Cost Summary.

Project Cost Summary

Equipment Description	Qty	Bare Material Cost per Unit (\$)	Extended Bare Material Cost (\$)	Bare Labor Cost per Unit (\$)	Extended Bare Labor Cost (\$)
Evaporative Cooling, per ton	174				
Raw Costs:					
City: San Bernardino		Sales Tax: 8.25%			N/A
City Index Material Multiplier: 97.9%		Contractor O&P: 12.00%			
City Index Labor Multiplier: 108.1%		Subtotals:	\$92,844		\$8,552
		Contingency: 10.00%	\$9,284		\$855
		Totals:	\$102,129		\$9,407
		Engineering: 15.00%	\$16,730		
		Construction Phase: 5.00%	\$5,577		
		Project Management: 6.00%	\$6,692		
		Total Project Cost:	\$140,535		

Project Economic Summary, Including Cogeneration and Purchased Utility Impacts

Total Project Cost: \$140,535 **Total Purchased Electricity Savings (kWh/yr):** 130,405
Rebate/Incentive*: \$31,297 **Total Purchased Gas Savings (th/yr):** 0
Net Project Cost: \$109,238 **Total Purchased Annual Cost Savings (\$/yr):** \$9,780
Net Simple Payback Period (yrs): 11.2

*Highlighted incentives have been capped at 80% of the total project cost. It is recommended that these projects be bundled together with other projects to maximize incentive funding.

11. PROJECT LISTS & SUMMARY OF PROJECTS

Table 11.1 is a complete list of all projects identified through the SEP effort, organized by funding source and project types. Subtotals are provided for savings and costs by project type and fund source. It is anticipated that the campus may wish to sort and view the list in a number of different manners. A complete project list is also provided electronically with this report for this purpose. See Appendix C.

Table 11.2 is a project list based on the commitments and prioritization made by the campus upon review of the preliminary project list, and is organized by IOU program cycle and the campus designated Tier. The energy savings for the projects accepted by the campus as Tier 1 projects became the basis for the level of energy savings commitments to the Investor Owned Utilities, although the campuses are free to substitute projects as desired to achieve the level of committed energy savings. Tier 2 projects are the planned projects projected by the campus to achieve savings approximately 50% above the committed levels.

The savings shown in Table 11.2 include both savings based on the preliminary project list (shown as “committed” savings), and the savings which have been refined in the course of the Strategic Energy Plan development (shown as “updated”). The most notable refinement is identification of projects to replace the placeholder projects in the preliminary list. Since the campus selected and preliminarily scheduled placeholder projects by building, one potential HVAC project in each of the buildings was selected as a representative project for the updated columns. Where no HVAC projects were identified, no projects were selected. The campus may choose in the end, as with any project, to implement a different set of projects, but the representative projects selected show one possible method of achieving the committed savings.

Table 11.1.1: SEP Projects by Funding Source and Project Type

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
State Funded Buildings											
MBCx Projects											
E3003	05CP5186	BIOLOGIC SCI	Monitoring Based Commissioning	102,627	12.0	13,779	\$ 19,409	\$ 91,818	\$ 35,653	\$ 56,165	2.9
E3004	05CP5194	ENGINEERING2	Monitoring Based Commissioning	298,595	34.0	40,089	\$ 56,470	\$ 267,143	\$ 103,734	\$ 163,409	2.9
E3005	05CP5261	BOURNS	Monitoring Based Commissioning	297,087	34.0	39,886	\$ 56,185	\$ 265,795	\$ 103,210	\$ 162,585	2.9
E3006	05CP5307	HUM & SOC SC	Monitoring Based Commissioning	181,594	9.0	13,908	\$ 17,941	\$ 89,590	\$ 30,709	\$ 58,881	3.3
E3007	05CP5323	SPIETH	Monitoring Based Commissioning	190,752	22.0	25,610	\$ 36,075	\$ 170,660	\$ 66,268	\$ 104,392	2.9
E3008	05CP5334	PE	Monitoring Based Commissioning	51,078	6.0	8,706	\$ 11,231	\$ 56,083	\$ 19,224	\$ 36,859	3.3
E3009	05CP5335	GEOLOGY	Monitoring Based Commissioning	181,476	21.0	24,365	\$ 34,321	\$ 162,360	\$ 63,046	\$ 99,314	2.9
E3013	05CP5354	WATKINS	Monitoring Based Commissioning	117,628	13.0	15,793	\$ 22,246	\$ 105,238	\$ 40,865	\$ 64,373	2.9
E3014	05CP5380	CAMPUS SURGE	Monitoring Based Commissioning	55,702	6.0	9,495	\$ 12,248	\$ 61,161	\$ 20,964	\$ 40,197	3.3
E3015	05CP5411	ARTS	Monitoring Based Commissioning	82,127	9.0	13,999	\$ 18,058	\$ 90,176	\$ 30,909	\$ 59,267	3.3
E3016	05CP5414	PHYSICAL SCI	Monitoring Based Commissioning	254,600	29.0	34,183	\$ 48,150	\$ 227,782	\$ 88,450	\$ 139,332	2.9
E3017	05CP5417	ENTOMOLOGY	Monitoring Based Commissioning	131,198	15.0	17,615	\$ 24,813	\$ 117,379	\$ 45,580	\$ 71,799	2.9
E3018	05CP5497	OLMSTED	Monitoring Based Commissioning	71,297	8.0	12,153	\$ 15,677	\$ 78,285	\$ 26,833	\$ 51,452	3.3
E3019	05CP5501	BACHELOR	Monitoring Based Commissioning	199,081	23.0	26,729	\$ 37,651	\$ 178,112	\$ 69,162	\$ 108,950	2.9
E3022	05CP5508	PIERCE	Monitoring Based Commissioning	267,161	30.0	35,869	\$ 50,526	\$ 239,020	\$ 92,814	\$ 146,206	2.9
E3023	05CP5510	UNIV COMMONS	Monitoring Based Commissioning	41,110	5.0	7,008	\$ 9,040	\$ 45,139	\$ 15,472	\$ 29,667	3.3
E3025	05CP5523	SPOUL	Monitoring Based Commissioning	60,702	7.0	10,348	\$ 13,348	\$ 66,651	\$ 22,846	\$ 43,805	3.3
E3027	05CP5722	UCR EXTEN CT	Monitoring Based Commissioning	98,408	11.0	16,774	\$ 21,638	\$ 108,051	\$ 37,037	\$ 71,014	3.3
Subtotal, State Funded, MBCx Projects				2,582,223	294.0	366,305	\$ 505,026	\$ 2,420,444	\$ 912,776	\$ 1,507,668	3.0
New Construction Projects											
E3020	05CP5501	BACHELOR	SBD, New/Renov - Bachelor Hall Building Systems Renewal	280,040	32.0	16,399	\$ 34,942	\$ 392,980	\$ 80,329	\$ 312,651	8.9
E3033	05CTBD3	ENGINEERING BUILDING UNIT 3	SBD, New/Renov - Engineering Building Unit 3	1,032,570	118.0	61,504	\$ 129,721	\$ 1,056,936	\$ 297,020	\$ 759,916	5.9
E3034	05CTBD4	PROFESSIONAL CTR	SBD, New/Renov - West Campus Graduate and Professional Center Phase 1	299,700	34.0	35,100	\$ 52,313	\$ 420,572	\$ 100,008	\$ 320,564	6.1
E3058	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,380	-	396	\$ 590	\$ 4,744	\$ 1,128	\$ 3,616	6.1
E3057	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,380	-	396	\$ 590	\$ 4,744	\$ 1,128	\$ 3,616	6.1
E3056	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,380	-	396	\$ 590	\$ 4,744	\$ 1,128	\$ 3,616	6.1
E3055	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Campus Approved Projects Under \$5 Million	2,817	-	330	\$ 492	\$ 3,958	\$ 940	\$ 3,018	6.1
E3054	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Academic Facilities Renewal Step 1	71,898	8.0	8,420	\$ 12,549	\$ 100,891	\$ 23,992	\$ 76,899	6.1
E3010	05CWIDE	CAMPUSWIDE	SBD, New/Renov - Boyce Hall and Webber Hall Renovations	1,248,096	142.0	74,341	\$ 156,797	\$ 1,277,540	\$ 359,016	\$ 918,524	5.9
Subtotal, State Funded, New Construction Projects				2,945,261	334.0	197,283	\$ 388,585	\$ 3,267,110	\$ 854,689	\$ 2,402,421	6.2
HVAC Projects											
E2001	05CP5186	BIOLOGIC SCI	LAB HOODS & AHU'S - CV TO VAV CONVERSION	672,807	34.0	40,850	\$ 85,183	\$ 2,233,267	\$ 202,324	\$ 2,030,943	23.8
E3195	05CP5261	BOURNS	Evaporative Precooling for 100% OSA Systems	308,026	79.0	-	\$ 23,102	\$ 331,953	\$ 73,926	\$ 258,027	11.2
E2002	05CP5261	BOURNS	LAB HOODS & AHU'S - CV TO VAV CONVERSION	1,420,664	86.0	58,388	\$ 156,179	\$ 4,021,836	\$ 399,347	\$ 3,622,489	23.2
E3199	05CP5307	INSECTARY	Evaporative Precooling for 100% OSA Systems	280,296	72.0	-	\$ 21,022	\$ 302,069	\$ 67,271	\$ 234,798	11.2
E2003	05CP5322	RIVERA LIB	AHU'S - CV TO VAV RETROFIT	407,851	27.0	54,425	\$ 76,850	\$ 555,059	\$ 152,309	\$ 402,750	5.2
E3191	05CP5323	SPIETH	HEAT RECOVERY	936,344	3.0	39,164	\$ 103,515	\$ 243,908	\$ 256,054	\$ 48,782	0.5
E2005	05CP5323	SPIETH	LAB HOODS & AHU'S - CV TO VAV CONVERSION	1,150,551	52.0	46,438	\$ 125,763	\$ 3,515,922	\$ 322,570	\$ 3,193,352	25.4
E2004	05CP5323	SPIETH	MZDDAHU'S - CV TO VAV RETROFIT	181,943	19.0	17,063	\$ 28,149	\$ 275,479	\$ 60,729	\$ 214,750	7.6
E2006	05CP5334	PE	AHU'S - CV TO VAV RETROFIT	228,983	22.0	29,050	\$ 41,866	\$ 295,993	\$ 84,006	\$ 211,987	5.1
E3198	05CP5335	GEOLOGY	Evaporative Precooling for 100% OSA Systems	199,355	51.0	-	\$ 14,952	\$ 214,840	\$ 47,845	\$ 166,995	11.2
E2007	05CP5335	GEOLOGY	LABHOODS & AHU'S - CV TO VAV CONVERSION	1,232,445	59.0	69,950	\$ 151,891	\$ 1,763,198	\$ 365,737	\$ 1,397,461	9.2
E3196	05CP5341	BOYCE	Evaporative Precooling for 100% OSA Systems	364,235	83.0	-	\$ 27,318	\$ 392,528	\$ 87,416	\$ 305,112	11.2
E2008	05CP5341	BOYCE	LAB FUMEHOOD & DDAHU'S - CV TO VAV CONVERSION	1,554,589	68.0	126,988	\$ 224,534	\$ 3,514,806	\$ 500,089	\$ 3,014,717	13.4
E3203	05CP5342	WEBBER	Evaporative Precooling for 100% OSA Systems	130,405	33.0	-	\$ 9,780	\$ 140,535	\$ 31,297	\$ 109,238	11.2
E2009	05CP5342	WEBBER	FUMEHOOD & MZAHU - CV TO VAV CONVERSION	575,565	27.0	45,675	\$ 81,991	\$ 1,400,548	\$ 183,811	\$ 1,216,737	14.8
E2011	05CP5380	CAMPUS SURGE	Replace (E) Pkg AC Units w/ VAVAHU'S & Connect to CHW & Steam	867,568	415.0	(19,036)	\$ 48,887	\$ 1,983,753	\$ 188,877	\$ 1,794,876	36.7

Table 11.1.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3193	05CP5411	ARTS	Evaporative Precooling for 100% OSA Systems	31,477	8.0	-	\$ 2,361	\$ 33,922	\$ 7,554	\$ 26,368	11.2
E3200	05CP5414	PHYSICAL SCI	Evaporative Precooling for 100% OSA Systems	606,308	155.0	-	\$ 45,473	\$ 653,406	\$ 145,514	\$ 507,892	11.2
E2012	05CP5414	PHYSICAL SCI	LAB HOODS & AHU'S - CV TO VAV CONVERSION	3,139,991	155.0	107,088	\$ 326,524	\$ 10,319,585	\$ 860,685	\$ 9,458,900	29.0
E3197	05CP5417	ENTOMOLOGY	Evaporative Precooling for 100% OSA Systems	159,634	41.0	-	\$ 11,973	\$ 172,034	\$ 38,312	\$ 133,722	11.2
E2013	05CP5417	ENTOMOLOGY	LAB FUMEHOODS & AHU'S - CV TO VAV CONVERSION	1,116,114	55.0	55,963	\$ 131,277	\$ 1,646,118	\$ 323,830	\$ 1,322,288	10.1
E2014	05CP5480	HINDERAKER	DOMZAHU - CV TO VAV RETROFIT	308,272	33.0	21,450	\$ 41,353	\$ 339,758	\$ 95,435	\$ 244,323	5.9
E2015	05CP5497	OLMSTED	DOMZAHU'S - CV TO VAV RETROFIT	305,743	25.0	35,800	\$ 53,361	\$ 189,922	\$ 109,178	\$ 80,744	11.5
E3194	05CP5501	BATCHELOR	Evaporative Precooling for 100% OSA Systems	293,786	75.0	-	\$ 22,034	\$ 316,607	\$ 70,509	\$ 246,098	11.2
E2016	05CP5501	BATCHELOR	FUMEHOOD & AHU'S - CV TO VAV CONVERSION	1,273,825	58.0	77,125	\$ 161,093	\$ 5,011,504	\$ 382,843	\$ 4,628,661	28.7
E3201	05CP5504	PHYSICS	Evaporative Precooling for 100% OSA Systems	174,623	45.0	-	\$ 13,097	\$ 188,187	\$ 41,910	\$ 146,277	11.2
E2019	05CP5504	PHYSICS	AHU (S-8) - CV TO VAV RETROFIT	155,734	18.0	8,800	\$ 19,160	\$ 66,760	\$ 46,176	\$ 20,584	11.1
E2018	05CP5504	PHYSICS	LAB FUMEHOODS & DOMZAHU'S - CV TO VAV CONVERSION	936,030	43.0	61,213	\$ 122,233	\$ 1,950,970	\$ 285,860	\$ 1,665,110	13.6
E3202	05CP5508	PIERCE	Evaporative Precooling for 100% OSA Systems	543,354	139.0	-	\$ 40,752	\$ 585,561	\$ 130,405	\$ 455,156	11.2
E2020	05CP5508	PIERCE	LAB FUMEHOODS & DOMZAHU'S - CV TO VAV CONVERSION	2,666,824	124.0	75,813	\$ 264,452	\$ 6,739,032	\$ 715,850	\$ 6,023,182	22.8
E2022	05CP5523	SPROUL	DDAHU'S - CV TO VAV RETROFIT	793,391	60.0	22,675	\$ 78,778	\$ 1,031,303	\$ 213,089	\$ 818,214	10.4
E3190	05CP5588	STAT COMP	HEAT RECOVERY	537,938	1.0	22,500	\$ 59,470	\$ 185,936	\$ 147,105	\$ 38,831	0.7
E2023	05CP5588	STAT COMP	DDAHU'S - CV TO VAV RETROFIT	332,266	32.0	36,825	\$ 56,221	\$ 625,422	\$ 116,569	\$ 508,853	9.1
E3192	05CWIDE	CAMPUSWIDE	Replace CHW Coils	1,222,960	252.0	-	\$ 91,722	\$ 788,838	\$ 293,510	\$ 495,328	5.4
E3053	05CWIDE	CAMPUSWIDE	UC Riverside Energy Recovery System	28,416	-	33,919	\$ 30,962	\$ 298,572	\$ 33,955	\$ 224,617	7.3
Subtotal, State Funded, HVAC Projects				25,138,312	2,459.0	1,068,121	\$ 2,793,276	\$ 52,289,133	\$ 7,081,897	\$ 45,207,236	16.2
Lighting Projects											
E3157	05CP5186	BIOLOGIC SCI	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts	13,461	4.0	-	\$ 1,010	\$ 12,087	\$ 3,231	\$ 8,856	8.8
E3181	05CP5205	UNIV OFC BLD	Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	66,218	17.0	-	\$ 4,966	\$ 43,481	\$ 15,892	\$ 27,589	5.6
E3184	05CP5224	BOOKSTORE	Bookstore-Retrofit all 4-foot T12 fixtures with T8 lamps and reduced light output (RLO) electronic ballasts (28W T8 lamps in the 4-foot fixtures); install occupancy sensors in offices.	37,998	12.0	-	\$ 2,850	\$ 20,317	\$ 9,120	\$ 11,197	3.9
E3104	05CP5261	BOURNS	Replace LAB HIDs with new, linear fluorescent industrials; replace existing corridor HID recessed cans with new CFL cans	268,266	31.0	-	\$ 20,120	\$ 260,115	\$ 64,384	\$ 195,731	9.7
E3180	05CP5263	UNIV LAB BLD	Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	35,221	10.0	-	\$ 2,642	\$ 13,784	\$ 8,453	\$ 5,331	2.0
E3154	05CP5289	EAST I&Q FAC	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	56,301	15.0	-	\$ 4,223	\$ 33,236	\$ 13,512	\$ 19,724	4.7
E3108	05CP5295	CNTRL UTL PL	Retrofit or replace 2F96T12 SL industrials and strips with 4F32T8 3rd gen lamps and RLO premium ballasts	10,249	1.0	-	\$ 769	\$ 5,256	\$ 2,460	\$ 2,796	3.6
E3152	05CP5307	HUM & SOC SC	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate	248,756	61.0	-	\$ 18,657	\$ 224,446	\$ 59,701	\$ 164,745	8.8
E3122	05CP5316	LIFE SCIENCE	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	56,776	16.0	-	\$ 4,258	\$ 55,098	\$ 13,626	\$ 41,472	9.7
E3141	05CP5322	RIVERA LIB	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate	311,360	77.0	-	\$ 23,352	\$ 334,402	\$ 74,726	\$ 259,676	11.1
E3144	05CP5323	SPIETH	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate	121,350	33.0	-	\$ 9,101	\$ 116,267	\$ 29,124	\$ 87,143	9.6
E3114	05CP5325	ANDERSON 1	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts	23,013	8.0	-	\$ 1,726	\$ 25,571	\$ 5,523	\$ 20,048	11.6

Table 11.1.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3107	05CP5334	PE	Replace Gym MH high bays with fluorescent high bays plus occupancy sensors	132,149	16.0	-	\$ 9,911	\$ 47,735	\$ 31,716	\$ 16,019	1.6
E3148	05CP5341	BOYCE	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	157,182	42.0	-	\$ 11,789	\$ 143,723	\$ 37,724	\$ 105,999	9.0
E3150	05CP5342	WEBBER	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	61,716	17.0	-	\$ 4,629	\$ 55,973	\$ 14,812	\$ 41,161	8.9
E3149	05CP5354	WATKINS	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate	107,093	25.0	-	\$ 8,032	\$ 123,317	\$ 25,702	\$ 97,615	12.2
E3115	05CP5357	ANDERSON 2	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts	11,979	3.0	-	\$ 898	\$ 10,562	\$ 2,875	\$ 7,687	8.6
E3117	05CP5380	CAMPUS SURGE	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate	76,273	23.0	-	\$ 5,720	\$ 85,500	\$ 18,306	\$ 67,194	11.7
E3142	05CP5416	SCIENCE LAB1	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate	53,154	15.0	-	\$ 3,987	\$ 49,629	\$ 12,757	\$ 36,872	9.2
E3118	05CP5417	ENTOMOLOGY	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate	82,299	23.0	-	\$ 6,172	\$ 79,282	\$ 19,752	\$ 59,530	9.6
E3143	05CP5418	SCIENCE LIB	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate	254,148	63.0	-	\$ 19,061	\$ 290,245	\$ 60,996	\$ 229,249	12.0
E3119	05CP5480	HINDERAKER	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate	82,630	19.0	-	\$ 6,197	\$ 101,677	\$ 19,831	\$ 81,846	13.2
E3123	05CP5497	OLMSTED	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate	130,510	33.0	-	\$ 9,788	\$ 138,938	\$ 31,322	\$ 107,616	11.0
E3120	05CP5498	HUMANITIES	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate	50,724	12.0	-	\$ 3,804	\$ 59,490	\$ 12,174	\$ 47,316	12.4
E3116	05CP5501	BACHELOR	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install daylighting controls where appropriate	111,102	33.0	-	\$ 8,333	\$ 102,799	\$ 26,664	\$ 76,135	9.1
E3139	05CP5504	PHYSICS	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate	120,553	31.0	-	\$ 9,041	\$ 122,861	\$ 28,933	\$ 93,928	10.4
E3140	05CP5508	PIERCE	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors where appropriate	155,571	44.0	-	\$ 11,668	\$ 137,475	\$ 37,337	\$ 100,138	8.6
E3145	05CP5523	SPROUL	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install additional occupancy sensors and daylighting controls where appropriate	122,818	30.0	-	\$ 9,211	\$ 141,049	\$ 29,476	\$ 111,573	12.1
E3113	05CP5530	BELLTOWER	Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts	8,844	4.0	-	\$ 663	\$ 5,314	\$ 2,123	\$ 3,191	4.8
E3146	05CP5588	STAT COMP	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install daylighting controls where appropriate	42,032	13.0	-	\$ 3,152	\$ 42,654	\$ 10,088	\$ 32,566	10.3
E3161	05CP5593	BANNOCK D	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	10,818	3.0	-	\$ 811	\$ 8,055	\$ 2,596	\$ 5,459	6.7
E3163	05CP5595	BANNOCK F	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	9,107	3.0	-	\$ 683	\$ 9,652	\$ 2,186	\$ 7,466	10.9

Table 11.1.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3164	05CP5596	BANNOCK G	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	8,952	3.0	-	\$ 671	\$ 9,380	\$ 2,148	\$ 7,232	10.8
E3165	05CP5597	BANNOCK H	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	9,198	3.0	-	\$ 690	\$ 9,800	\$ 2,208	\$ 7,592	11.0
E3166	05CP5598	BANNOCK I	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	7,740	3.0	-	\$ 581	\$ 7,428	\$ 1,958	\$ 5,570	9.6
E3178	05CP5720	CA MUS PHOTO	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors and daylighting controls where appropriate	17,787	5.0	-	\$ 1,334	\$ 19,064	\$ 4,269	\$ 14,795	11.1
E3105	05CP5722	UCR EXTEN CT	Replace fire stair fixtures with bi-level fixtures; retrofit classroom fixtures with 28W T8 lamps and RLO ballasts; retrofit café fixtures with CFL; install occupancy sensors where appropriate	173,573	45.0	-	\$ 13,018	\$ 86,598	\$ 41,658	\$ 44,940	3.5
E3165	05CTBD5	FALKIRK STUDENT APTS	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	174,717	66.0	-	\$ 13,104	\$ 168,407	\$ 41,932	\$ 126,475	9.7
E3106	05COWIDE	CAMPUSWIDE	Retrofit existing HPS walkway pole lights with Pulse Start Metal Halide (PSMH) lamps and MH electronic ballasts	157,154	36.0	-	\$ 11,787	\$ 137,204	\$ 37,717	\$ 99,487	8.4
Subtotal, State Funded, Lighting Projects				3,578,792	898.0	-	\$ 268,409	\$ 3,337,870	\$ 858,912	\$ 2,478,958	9.2
Other Projects											
E3189	05COWIDE	CAMPUSWIDE	Install 10,000 sf Window Film (5th Increment of 5)	152,700	30.0	(613)	\$ 10,932	\$ 51,696	\$ 36,158	\$ 15,538	1.4
E3188	05COWIDE	CAMPUSWIDE	Install 10,000 sf Window Film (4th Increment of 5)	152,700	30.0	(613)	\$ 10,932	\$ 51,696	\$ 36,158	\$ 15,538	1.4
E3187	05COWIDE	CAMPUSWIDE	Install 10,000 sf Window Film (3rd Increment of 5)	152,700	30.0	(613)	\$ 10,932	\$ 51,696	\$ 36,158	\$ 15,538	1.4
E3186	05COWIDE	CAMPUSWIDE	Install 10,000 sf Window Film (2nd Increment of 5)	152,700	30.0	(613)	\$ 10,932	\$ 51,696	\$ 36,158	\$ 15,538	1.4
E3185	05COWIDE	CAMPUSWIDE	Install 10,000 sf Window Film (1st Increment of 5)	152,700	30.0	(613)	\$ 10,932	\$ 51,696	\$ 36,158	\$ 15,538	1.4
E3112	05COWIDE	CAMPUSWIDE	Variable Speed Circulation Pump	23,078	-	-	\$ 1,731	\$ 12,360	\$ 5,539	\$ 6,821	3.9
E3110	05COWIDE	CAMPUSWIDE	Pool Cover with Powered Winder	-	-	28,800	\$ 24,480	\$ 55,567	\$ 23,040	\$ 32,527	1.3
E3076	05COWIDE	CAMPUSWIDE	Solar Pool Water Heater	-	-	17,368	\$ 14,762	\$ 168,629	\$ 13,894	\$ 154,735	10.5
E3075	05COWIDE	CAMPUSWIDE	Server Virtualization Phase 1 of 2: 10 VM Installations	280,000	35.0	-	\$ 21,000	\$ 291,060	\$ 67,200	\$ 223,860	10.7
E3074	05COWIDE	CAMPUSWIDE	LCD Phase 4 of 4: 630 Veridigm (PC Power Management) Installations and 25 CRT Replacements	134,691	17.0	-	\$ 10,102	\$ 42,862	\$ 32,326	\$ 10,536	1.0
E3073	05COWIDE	CAMPUSWIDE	LCD Phase 3 of 4: 1000 Veridigm (PC Power Management) Installations and 40 CRT Replacements	213,796	27.0	-	\$ 16,035	\$ 68,191	\$ 51,311	\$ 16,880	1.1
E3072	05COWIDE	CAMPUSWIDE	LCD Phase 2 of 4: 1000 Veridigm (PC Power Management) Installations and 40 CRT Replacements	213,796	27.0	-	\$ 16,035	\$ 68,191	\$ 51,311	\$ 16,880	1.1
E3071	05COWIDE	CAMPUSWIDE	LCD Phase 1 of 4: 1000 Veridigm (PC Power Management) Installations and 40 CRT Replacements	213,796	27.0	-	\$ 16,035	\$ 68,191	\$ 51,311	\$ 16,880	1.1
E3070	05COWIDE	CAMPUSWIDE	Refrigerators Phase 3 of 3: 95 Energy Star Refrigerator Replacements	213,085	24.0	-	\$ 15,981	\$ 91,906	\$ 51,140	\$ 40,766	2.6
E3069	05COWIDE	CAMPUSWIDE	Refrigerators Phase 2 of 3: 100 Energy Star Refrigerator Replacements	224,300	26.0	-	\$ 16,823	\$ 96,743	\$ 53,832	\$ 42,911	2.6
E3068	05COWIDE	CAMPUSWIDE	Refrigerators Phase 1 of 3: 100 Energy Star Refrigerator Replacements	224,300	26.0	-	\$ 16,823	\$ 96,743	\$ 53,832	\$ 42,911	2.6
E3067	05COWIDE	CAMPUSWIDE	Refrigerators Phase 3 of 3: 9 Energy Star Refrigerator Replacements	20,187	2.0	-	\$ 1,514	\$ 8,707	\$ 4,845	\$ 3,862	2.6
E3066	05COWIDE	CAMPUSWIDE	Refrigerators Phase 2 of 3: 100 Energy Star Refrigerator Replacements	224,300	26.0	-	\$ 16,823	\$ 96,743	\$ 53,832	\$ 42,911	2.6
E3065	05COWIDE	CAMPUSWIDE	Refrigerators Phase 1 of 3: 100 Energy Star Refrigerator Replacements	224,300	26.0	-	\$ 16,823	\$ 96,743	\$ 53,832	\$ 42,911	2.6
E3064	05COWIDE	CAMPUSWIDE	Lab Freezers Phase 2 of 2: 9 Lab Freezer Replacements	34,776	4.0	-	\$ 2,608	\$ 174,636	\$ 8,346	\$ 166,290	63.8

Table 11.1.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3063	05CWIDE	CAMPUSWIDE	Lab Freezers Phase 1 of 2: 20 Lab Freezer Replacements	77,280	9.0	-	\$ 5,796	\$ 388,080	\$ 18,547	\$ 369,533	63.8
E3002	05CWIDE	CAMPUSWIDE	Pool Covers - UCR Pool	-	-	31,580	\$ 26,843	\$ 56,766	\$ 25,264	\$ 31,502	1.2
E3001	05CWIDE	CAMPUSWIDE	Solar Pool Water Heater - UCR Pool	-	-	12,998	\$ 11,048	\$ 11,1250	\$ 10,398	\$ 100,852	9.1
Subtotal, State Funded, Other Projects				3,365,185	461.0	87,683	\$ 326,919	\$ 2,542,908	\$ 877,790	\$ 1,665,118	5.1
Savings by Design (SBD) - Deferred Maintenance & Capital Renewal Projects											
E3062	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2014	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3051	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2014	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3050	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2014	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3049	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2013	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3048	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2013	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3047	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2013	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3046	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2012	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3045	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2012	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3044	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2012	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3043	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2011	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3042	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2011	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3041	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2011	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3040	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2010	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3039	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2010	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3038	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2010	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3037	05CWIDE	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2009	-	-	35,511	\$ 30,185	\$ 346,500	\$ 28,409	\$ 318,091	10.5
E3036	05CWIDE	CAMPUSWIDE	Second Electric Savings Component of DM and CR Projects 2009	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
E3035	05CWIDE	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2009	454,550	52.0	-	\$ 34,091	\$ 693,000	\$ 109,092	\$ 583,908	17.1
Subtotal, State Funded, Deferred Maintenance & Capital Renewal Projects				5,454,600	624.0	213,068	\$ 590,202	\$ 10,395,000	\$ 1,479,558	\$ 8,915,442	15.1
Subtotal, State Funded Projects				43,064,373	5,070.0	1,932,459	\$ 4,872,418	\$ 74,252,464	\$ 12,075,622	\$ 62,176,842	12.8
Housing Funded											
MBCX											
E3011	05CP5343	ABER INVER	Monitoring Based Commissioning	157,033	18.0	26,768	\$ 34,530	\$ 172,423	\$ 59,102	\$ 113,321	3.3
E3021	05CP5502	LOTHIAN HALL	Monitoring Based Commissioning	190,029	22.0	32,391	\$ 41,785	\$ 208,653	\$ 71,520	\$ 137,133	3.3
E3026	05CP5715	UNV PLZA APT	Monitoring Based Commissioning	55,859	6.0	9,521	\$ 12,282	\$ 61,333	\$ 21,023	\$ 40,310	3.3
E3028	05CP5991	STONEHAVEN	Monitoring Based Commissioning	122,053	14.0	20,805	\$ 26,838	\$ 134,015	\$ 45,937	\$ 88,078	3.3
E3029	05CP5998	INTER VILLAG	Monitoring Based Commissioning	79,310	9.0	13,519	\$ 17,439	\$ 87,084	\$ 29,849	\$ 57,235	3.3
Subtotal, Housing, MBCX				604,284	69.0	103,004	\$ 132,874	\$ 663,507	\$ 227,431	\$ 436,076	3.3
New Construction											
E3012	05CP5343	ABER INVER	SBD, New/Renov - Aberdeen-Inverness Refurbishment	69,930	8.0	8,190	\$ 12,206	\$ 98,136	\$ 23,335	\$ 74,801	6.1
E3030	05CTB01	CANYON CREST DINING COMMONS	SBD, New/Renov - Canyon Crest Dining Commons, Phase 1	167,063	19.0	19,566	\$ 29,161	\$ 234,439	\$ 55,748	\$ 178,691	6.1
E3032	05CTB02	CANYON CREST RESIDENT HALLS	SBD, New/Renov - Canyon Crest Residence Halls, Phase 2	237,213	27.0	27,781	\$ 41,405	\$ 332,876	\$ 79,156	\$ 253,720	6.1
E3031	05CTB02	CANYON CREST RESIDENT HALLS	SBD, New/Renov - Canyon Crest Residence Halls, Phase 1	362,131	41.0	42,411	\$ 63,209	\$ 508,171	\$ 120,840	\$ 387,331	6.1
Subtotal, Housing, New Construction				836,337	95.0	97,949	\$ 145,982	\$ 1,173,622	\$ 279,079	\$ 894,543	6.1

Table 11.1.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
HVAC Projects											
E2010	05CP5343	ABER INVER	DOMZAHU'S - CV TO VAV RETROFIT	1,297,689	106.0	42.313	\$ 133,292	\$ 3,378,244	\$ 353,758	\$ 3,024,486	22.7
E2017	05CP5502	LOTHIAN HALL	REPLACE OLD UNITS WITH VAV AHU'S	446,271	69.0	771	\$ 34,126	\$ 955,486	\$ 107,722	\$ 847,764	24.8
Subtotal, Housing, HVAC Projects				1,743,960	175.0	43,084	\$ 167,418	\$ 4,333,730	\$ 461,480	\$ 3,872,250	23.1
Other Projects											
E3183	05CP5343	ABER INVER	UC Riverside Aberdeen Inverness Kitchen Hood Controls	16,895	10.0	795	\$ 1,943	\$ 18,711	\$ 4,691	\$ 14,020	7.2
E3182	05CP5502	LOTHIAN HALL	UC Riverside Lothian Hall Kitchen Hood Controls	57,530	30.0	1,549	\$ 5,631	\$ 60,291	\$ 15,046	\$ 45,245	8.0
Subtotal, Housing, Other Projects				74,425	40.0	2,344	\$ 7,574	\$ 79,002	\$ 19,737	\$ 59,265	7.8
Lighting Projects											
E3151	05CP5343	ABER INVER	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	199,858	77.0	-	\$ 14,989	\$ 245,194	\$ 47,966	\$ 197,228	13.2
E3124	05CP5365	PENTLAND A	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	15,010	6.0	-	\$ 1,126	\$ 20,096	\$ 3,602	\$ 16,494	14.7
E3130	05CP5369	PENTLAND I	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	19,917	8.0	-	\$ 1,494	\$ 26,465	\$ 4,780	\$ 21,685	14.5
E3156	05CP5502	LOTHIAN HALL	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; and install occupancy sensors where appropriate	406,265	158.0	-	\$ 30,470	\$ 299,399	\$ 97,504	\$ 201,895	6.6
E3158	05CP5590	BANNOCK A	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	14,152	5.0	-	\$ 1,061	\$ 12,828	\$ 3,396	\$ 9,432	8.9
E3159	05CP5591	BANNOCK B	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	3,464	1.0	-	\$ 260	\$ 3,572	\$ 831	\$ 2,741	10.6
E3160	05CP5592	BANNOCK C	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	3,743	1.0	-	\$ 281	\$ 3,365	\$ 898	\$ 2,467	8.8
E3162	05CP5594	BANNOCK E	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	7,142	3.0	-	\$ 536	\$ 6,459	\$ 1,714	\$ 4,745	8.9
E3167	05CP5600	BANNOCK K	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	4,329	2.0	-	\$ 325	\$ 4,561	\$ 1,039	\$ 3,522	10.8
E3168	05CP5601	BANNOCK L	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	12,352	4.0	-	\$ 926	\$ 12,808	\$ 2,964	\$ 9,844	10.6
E3169	05CP5603	BANNOCK N	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	3,781	1.0	-	\$ 284	\$ 3,571	\$ 907	\$ 2,664	9.4
E3170	05CP5604	BANNOCK O	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	3,781	1.0	-	\$ 284	\$ 3,571	\$ 907	\$ 2,664	9.4
E3171	05CP5605	BANNOCK P	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	3,781	1.0	-	\$ 284	\$ 3,571	\$ 907	\$ 2,664	9.4

Table 11.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3172	05CP5606	BANNOCK Q	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	7,065	3.0	-	\$ 530	\$ 6,849	\$ 1,696	\$ 5,153	9.7
E3173	05CP5607	BANNOCK R	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	7,561	3.0	-	\$ 567	\$ 7,138	\$ 1,815	\$ 5,323	9.4
E3174	05CP5608	BANNOCK S	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	15,119	6.0	-	\$ 1,134	\$ 14,272	\$ 3,629	\$ 10,643	9.4
E3175	05CP5609	BANNOCK T	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	7,561	3.0	-	\$ 567	\$ 7,138	\$ 1,815	\$ 5,323	9.4
E3176	05CP5610	BANNOCK U	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	11,340	4.0	-	\$ 851	\$ 10,702	\$ 2,722	\$ 7,980	9.4
E3177	05CP5611	BANNOCK V	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescent; and install occupancy sensors where appropriate	15,119	6.0	-	\$ 1,134	\$ 14,272	\$ 3,629	\$ 10,643	9.4
E3125	05CP5636	PENTLAND BC	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	30,412	12.0	-	\$ 2,281	\$ 41,040	\$ 7,299	\$ 33,741	14.8
E3126	05CP5637	PENTLAND D	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	15,684	6.0	-	\$ 1,176	\$ 21,083	\$ 3,764	\$ 17,319	14.7
E3127	05CP5638	PENTLAND E	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	15,802	6.0	-	\$ 1,185	\$ 22,167	\$ 3,792	\$ 18,375	15.5
E3128	05CP5639	PENTLAND FG	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	29,927	11.0	-	\$ 2,245	\$ 40,538	\$ 7,182	\$ 33,356	14.9
E3129	05CP5640	PENTLAND H	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	17,062	6.0	-	\$ 1,280	\$ 24,221	\$ 4,095	\$ 20,126	15.7
E3131	05CP5641	PENTLAND J	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	20,258	8.0	-	\$ 1,519	\$ 27,440	\$ 4,862	\$ 22,578	14.9
E3132	05CP5642	PENTLAND K	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	19,401	7.0	-	\$ 1,455	\$ 25,875	\$ 4,656	\$ 21,219	14.6
E3133	05CP5643	PENTLAND L	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	18,594	7.0	-	\$ 1,395	\$ 24,821	\$ 4,463	\$ 20,358	14.6
E3134	05CP5644	PENTLAND M	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	19,392	7.0	-	\$ 1,454	\$ 25,852	\$ 4,654	\$ 21,198	14.6
E3135	05CP5645	PENTLAND N	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	18,594	7.0	-	\$ 1,395	\$ 24,821	\$ 4,463	\$ 20,358	14.6
E3136	05CP5646	PENTLAND O	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	18,594	7.0	-	\$ 1,395	\$ 24,821	\$ 4,463	\$ 20,358	14.6

Table 11.1: SEP Projects by Funding Source and Project Type (Continued)

SEP Project ID	Building Key	Building Name	Project Name	Total Purchased Electricity Savings (kWh/yr)	Demand Savings (kW)	Total Purchased Gas Savings (th/yr)	Total Cost Savings (\$/yr)	Estimated Project Cost (\$)	Gross Estimated Utility Incentive (\$)	Net Project Cost (\$)	Net Simple Payback (yrs)
E3137	05CP5647	PENTLAND P	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	19,373	7.0	-	\$ 1,453	\$ 25,804	\$ 4,650	\$ 21,154	14.6
E3138	05CP5648	PENTLAND Q	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	4,964	2.0	-	\$ 372	\$ 8,002	\$ 1,191	\$ 6,811	18.3
E3163	05CP5715	UNV PLZA APT	Retrofit T12 and T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts; incandescents with compact fluorescents; and install occupancy sensors where appropriate	105,681	40.0	-	\$ 7,926	\$ 98,556	\$ 25,363	\$ 73,193	9.2
E3147	05CP5991	STONEHAVEN	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	138,485	53.0	-	\$ 10,386	\$ 188,828	\$ 33,236	\$ 155,592	15.0
E3121	05CP5998	INTER VILLAG	Retrofit T8 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts, and install occupancy sensors where appropriate	91,412	35.0	-	\$ 6,856	\$ 126,336	\$ 21,939	\$ 104,397	15.2
Subtotal, Housing, Lighting Projects				1,344,975	514.0	-	\$ 100,873	\$ 1,456,037	\$ 322,793	\$ 1,133,244	11.2
Subtotal, Housing Funded Projects				4,603,981	893.0	246,380	\$ 554,722	\$ 7,705,898	\$ 1,310,520	\$ 6,395,378	11.5
Other Fund Source											
MBCx											
E3024	05CP5511	STU REC CTR	Monitoring Based Commissioning	66,257	8.0	11,294	\$ 14,569	\$ 72,750	\$ 24,937	\$ 47,813	3.3
Subtotal, Other Fund Source MBCx Projects				66,257	8.0	11,294	\$ 14,569	\$ 72,750	\$ 24,937	\$ 47,813	3.3
New Construction											
E3062	05CW/IDEO	CAMPUSWIDE - OTHER	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,943	-	461	\$ 688	\$ 5,530	\$ 1,315	\$ 4,215	6.1
E3061	05CW/IDEO	CAMPUSWIDE - OTHER	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,943	-	461	\$ 688	\$ 5,530	\$ 1,315	\$ 4,215	6.1
E3060	05CW/IDEO	CAMPUSWIDE - OTHER	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,943	-	461	\$ 688	\$ 5,530	\$ 1,315	\$ 4,215	6.1
E3059	05CW/IDEO	CAMPUSWIDE - OTHER	SBD, New/Renov - Campus Approved Projects Under \$5 Million	3,380	-	396	\$ 590	\$ 4,744	\$ 1,128	\$ 3,616	6.1
Subtotal, Other Fund Source New Construction				15,209	-	1,780	\$ 2,654	\$ 21,335	\$ 5,073	\$ 16,262	6.1
HVAC Projects											
E2021	05CP5511	STU REC CTR	AHUS - CV TO VAV RETROFIT	1,121,747	232.0	1,220	\$ 85,168	\$ 524,937	\$ 270,195	\$ 254,742	3.0
Subtotal, Other Fund Source HVAC				1,121,747	232.0	1,220	\$ 85,168	\$ 524,937	\$ 270,195	\$ 254,742	3.0
Lighting Projects											
E3109	05CP5511	STU REC CTR	Replace MH high bays with fluorescent and occupancy sensors in gym and racquetball courts	308,347	38.0	-	\$ 23,126	\$ 112,348	\$ 74,003	\$ 38,345	1.7
E3179	05CP5994	GERMPLASM	Retrofit T12 fixtures with 28W T8 lamps and reduced light output (RLO) ballasts	71,940	20.0	-	\$ 5,396	\$ 26,293	\$ 17,266	\$ 9,027	1.7
Subtotal, Other Fund Source Lighting				380,287	58.0	-	\$ 28,522	\$ 138,642	\$ 91,269	\$ 47,373	1.7
Subtotal, Other Fund Source Projects				1,583,500	298.0	14,294	\$ 130,912	\$ 757,663	\$ 391,474	\$ 366,189	2.8
UC Riverside Total				49,251,854	6,261.0	2,193,133	\$ 5,558,052	\$ 82,716,025	\$ 13,777,616	\$ 68,938,409	12.4

Table 11.2: Project Commitments by Campus

										Updated Projects**			
SEP ID#	Building Key	Building Name	Project Name	Project Tier	Project Delivery Method	Start Preliminary Engineering	Project Complete	Committed Electric Savings (kWh/yr)*	Committed Gas Savings (Therms/yr)*	SEP ID#	Project Name	Updated Electric Savings (kWh/yr)**	Updated Savings (Therms/yr)**
2009-11 Program Cycle													
2009-11 Tier 1 Projects													
E3016	05CP5414	PHYSICAL SCI	Monitoring Based Commissioning	Tier 1	Design - Bid	1/1/2011	6/1/2011	254,600	27,346	E3016	No change in project	254,600	34,183
E3020	05CP5501	BATCHELOR	SBD, New/Renov - Batchelor Hall Building Systems Renewal	Tier 1	Design - Bid	1/1/2011	6/1/2011	280,040	26,238	E3020	No change in project	280,040	16,399
E3038	05CWide	CAMPUSWIDE	First Electric Savings Component of DM and CR Projects 2010	Tier 1	Design - Bid	3/28/2008	12/31/2009	454,550	-	E3038	No change in project	454,550	-
E3040	05CWide	CAMPUSWIDE	Natural Gas Component of DM and CR Projects 2009	Tier 1	Design - Bid	3/28/2008	12/31/2009	-	28,409	E3040	No change in project	-	35,511
E3077	05CP5186	BIOLOGIC SCI	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	225,480	18,960	E2001	LAB HOODS & AHU'S - CV TO VAV CONVERSION	672,807	40,850
E3078	05CP5194	ENGINEERING2	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	9/1/2009	8/1/2010	656,050	55,160	None Identified			
E3080	05CP5261	BOURNS	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	652,740	54,880	E3195	Evaporative Precooling for 100% OSA Systems	308,026	-
E3082	05CP5307	HUM & SOC SC	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	9/1/2009	8/1/2010	183,190	21,090	None Identified			
E3085	05CP5334	PE	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	undecided	9/1/2009	8/1/2010	114,680	13,200	E2006	AHU'S - CV TO VAV RETROFIT	228,983	29,050
E3086	05CP5335	GEOLOGY	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	398,730	33,530	E2007	LABHOODS & AHU'S - CV TO VAV CONVERSION	1,232,445	69,950
E3090	05CP5380	CAMPUS SURGE	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	125,060	14,400	E2011	Replace (E) Pkg AC Units w/ VAVAHU's & Connect to CHW & Steam	867,568	(19,036)
E3091	05CP5411	ARTS	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	184,390	21,230	E3193	Evaporative Precooling for 100% OSA Systems	31,477	-
E3093	05CP5417	ENTOMOLOGY	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2010	6/1/2011	288,260	24,240	E2013	LAB FUMEHOODS & AHU'S - CV TO VAV CONVERSION	1,116,114	55,963
E3096	05CP5497	OLMSTED	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	9/1/2009	8/1/2010	160,080	18,430	E2015	DDMZAHU'S - CV TO VAV RETROFIT	305,743	35,800
E3099	05CP5508	PIERCE	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	9/1/2009	8/1/2010	586,990	49,350	E3202	Evaporative Precooling for 100% OSA Systems	543,354	-
Subtotal, 2009-11 Tier 1 Projects									4,564,840	406,463	6,295,706298,669		
2009-11 Tier 2 Projects													
E3003	05CP5186	BIOLOGIC SCI	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	102,627	11,023	E3003	No change in project	102,627	13,779
E3004	05CP5194	ENGINEERING2	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2009	6/1/2009	298,595	32,071	E3004	No change in project	298,595	40,089
E3005	05CP5261	BOURNS	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	297,087	31,909	E3005	No change in project	297,087	39,886
E3006	05CP5307	HUM & SOC SC	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2009	6/1/2009	81,594	11,126	E3006	No change in project	81,594	13,908
E3007	05CP5323	SPIETH	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2011	6/1/2011	190,752	20,488	E3007	No change in project	190,752	25,610
E3008	05CP5334	PE	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2009	6/1/2009	51,078	6,965	E3008	No change in project	51,078	8,706
E3009	05CP5335	GEOLOGY	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	181,476	19,492	E3009	No change in project	181,476	24,365
E3010	05CP5341	BOYCE	SBD, New/Renov - Boyce Hall and Webber Hall Renovations	Tier 2	Design - Bid	1/1/2009	6/1/2009	1,248,096	59,473	E3010	No change in project	1,248,096	74,341
E3013	05CP5354	WATKINS	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2011	6/1/2011	117,628	12,634	E3013	No change in project	117,628	15,793
E3014	05CP5380	CAMPUS SURGE	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	55,702	7,596	E3014	No change in project	55,702	9,495

Table 11.2: Project Commitments by Campus (Continued)

										Updated Projects*			
SEP ID#	Building Key	Building Name	Project Name	Project Tier	Project Method	Start Preliminary Engineering	Project Complete	Committed Electric Savings (kWh/yr)*	Committed Gas Savings (Therms/yr)*	SEP ID#	Project Name	Updated Electric Savings (kWh/yr)**	Updated Savings (Therms/yr)**
E3015	05CP5411	ARTS	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	82,127	11,199	E3015	No change in project	82,127	13,999
E3017	05CP5417	ENTOMOLOGY	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2010	6/1/2010	131,198	14,092	E3017	No change in project	131,198	17,615
E3018	05CP5497	OLMSTED	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2009	6/1/2009	71,297	9,722	E3018	No change in project	71,297	12,153
E3019	05CP5501	BATCHELOR	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2011	6/1/2011	199,081	21,383	E3019	No change in project	199,081	26,729
E3022	05CP5508	PIERCE	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2009	6/1/2009	267,161	28,695	E3022	No change in project	267,161	35,869
E3025	05CP5523	SPROUL	Monitoring Based Commissioning	Tier 2	Design - Bid	1/1/2011	6/1/2011	60,702	8,278	E3025	No change in project	60,702	10,348
Subtotal, 2009-11 Tier 2 Projects								3,436,201	306,146				
2012-14 Program Cycle													
2012-14 Tier 1 Projects													
E3084	05CP5323	SPIETH	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	419,110	35,240	E3191	HEAT RECOVERY	936,344	39,164
E3089	05CP5354	WATKINS	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	258,440	21,730	None Identified			
E3092	05CP5414	PHYSICAL SCI	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	559,390	47,030	E2012	LAB HOODS & AHU'S - CV TO VAV CONVERSION	3,139,991	107,088
E3097	05CP5501	BATCHELOR	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	437,410	36,780	E3194	Evaporative Precooling for 100% OSA Systems	293,786	-
E3098	05CP5504	PHYSICS	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	371,830	31,260	E2018	DDMZAHU'S - CV TO VAV CONVERSION	936,030	61,213
E3101	05CP5523	SPROUL	Placeholder HVAC Project - Projected from Systemwide Average of SEP Audits to Date	Tier 1	Undecided	6/1/2011	6/1/2012	136,290	15,690	E2022	DDAHU'S - CV TO VAV RETROFIT	793,391	22,675
Subtotal, 2012-14 Tier 1 Projects								2,182,470	187,730	6,099,542			
Total Campus Tier 1 & 2 Projects								10,183,511	900,339	15,831,449			

* Committed energy savings based on preliminary project list published March 28, 2008 and may vary slightly from final energy savings in this report

** Updated projects include a select HVAC project identified in buildings originally chosen with placeholder projects

12. ENERGY & GHG FORECAST

The University of California 2007 Policy of Sustainable Practices sets the goal of reducing greenhouse gas emissions to 2000 levels by 2014 and to 1990 levels by 2020. Each campus will need to develop complete greenhouse gas emissions calculations for the baseline years of 1990 and 2000. In order to determine the potential impact of energy efficiency and renewable energy projects identified in the Strategic Energy Plan, current, past, and future greenhouse gas emissions from purchased electricity and natural gas have been estimated based on information provided on energy purchases for fiscal years 1999-2000 and 2006-2007. Greenhouse gas emissions savings for the projects identified have also been calculated in order to compare their impact with the greenhouse gas emissions reduction goals. While these emissions calculations do not include all sources of campus greenhouse gas emissions, they do provide a way of measuring the impact of the projects identified in the SEP in relation to electricity and natural gas usage.

12.1 Electricity Emissions Factors

Although some California utilities publish greenhouse gas emissions factors for their delivered power, a complete record of historical and current factors is not available. Therefore, in accordance with the California Climate Action Registry (CCAR) General Reporting Protocol, EPA's eGRID emissions factor for the CALI – WECC California subregion for 2000 of 0.000366 metric tons of CO₂e/kWh was used to calculate greenhouse gas emissions from purchased electricity. This number includes greenhouse gas emissions of carbon dioxide, methane, and nitrous oxide and uses global warming potential factors published in the IPCC's Third Assessment Report to convert methane and nitrous oxide emissions to carbon dioxide equivalents. The emissions factor is reported in metric tons of carbon dioxide equivalent per kWh (CO₂e/kWh) of electricity purchased. While the emissions factor does normally vary by year based on the actual fuel mix used, a constant value was used to isolate the impacts of energy efficiency and renewable energy projects. Each campus may choose to develop utility and year specific emissions factors when filing their greenhouse gas emissions with the California Climate Action Registry.

12.2 Gas Emissions Factors

The emission factors provided in the California Climate Action Registry General Reporting Protocol, Tables C.5 and C.6 were used to calculate the greenhouse gas emissions associated with natural gas purchases. This number is 0.005295 metric tons of CO₂e per therm.

12.3 Current Energy Usage and Emissions

Current emissions from purchased utilities are shown in Table 1.1

12.4 2014 Goals

The University of California has set the goal of meeting 2000 greenhouse gas emission by 2014. In 2000 many campuses were purchasing their energy from Enron which relied on a different power mix than the state-wide average. This information is not accurately reflected in the average state-wide emissions factor and therefore actual greenhouse gas emissions for campuses purchasing Enron power will be much higher than calculated. In addition to

the campus wide greenhouse gas emissions goal, the campus also needs to meet the goal of reducing growth adjusted electricity consumption to 10% below 2000 levels by 2014. The energy consumption and greenhouse gas emissions associated with the 2014 goals are shown in Table 1.1. The emissions are based on the statewide average emissions factor.

12.5 2020 Goals

While the goal of achieving a reduction of greenhouse gas emissions to 1990 levels by 2020 has been set, the lack of data on energy consumption and emission factors in 1990 has made it infeasible to determine an accurate baseline.

12.6 SEP Energy Efficiency and Renewable Energy Projects

The Strategic Energy Plan has identified energy efficiency and renewable energy projects to help meet the greenhouse gas emissions targets of each campus. The impact of these proposed projects on greenhouse gas emissions is shown in Table 1.1. If the campus chooses to install the photovoltaic systems proposed in the SEP, they will need to retain ownership of the renewable energy credits (RECs) associated with the production of electricity from the PV panels in order to claim credit for the greenhouse gas emissions reductions from the system.

13. CONCLUSIONS

13.1 Next Steps and Recommendations

13.1.1 Action Plan

The UC Strategic Energy Plan was driven by the UC's Policy on Sustainable Practices, Section II d., which stipulates that the system (1) reduce systemwide growth-adjusted energy consumption by 10 percent or more by 2014 from the year 2000 base consumption level, and (2) reduce GHG emissions to 2000 levels by 2014.

To accomplish these goals, the campus must create a strategic action plan for implementing energy-saving projects through the year 2014. The plan should address both State and Non-state funded facilities. The SEP project list should be used as a starting point to guide these action plans, but the University should continuously evaluate the feasibility of additional energy-saving measures. Every campus has begun to develop an action plan through 2011. For each year in the six year program, the University should re-evaluate and modify the action plan to reflect actual progress towards goals and necessary future steps.

13.1.2 College Performance: Measurement and Reporting

To ensure meeting the goals and requirements of the UC Policy on Sustainable Practices, the campus must measure, evaluate, and report energy use and greenhouse gas emissions regularly.

A Climate Change Working Group at each campus is currently developing a protocol to allow for growth adjustment and normalization of data and accurate reporting procedures. These Working Groups will monitor progress toward reaching the stated goals for GHG reduction, and will evaluate suggestions for programs to reach these goals.

13.2 Funding Sources

Significant financial investment will be required to accomplish the UC Policy on Sustainable Practices goals. A variety of financing programs and funding sources are available to the Universities. Two major funding sources designed specifically to support energy efficiency projects are the Utility Incentive Programs and the UCOP's Energy Efficiency Financing program.

13.2.1 Utility Incentive Programs

Most Utilities in California offer incentives to customers to support the implementation of energy-saving projects.

The University of California/California State University/Investor-Owned Utility (UC/CSU/IOU) Energy Efficiency Partnership Program provides funding to all campuses served by San Diego Gas and Electric (SDG&E), Southern California Gas (SCG), Southern California Edison (SCE), Pacific Gas and Electric (PG&E). Through the Partnership, these IOUs distribute incentives from Public Purpose Programs (formerly Publics Good Charges) that customers pay on their utility bills. Since 2004, the IOUs have paid UC almost \$20 million in incentives through this Partnership, and the IOUs have offered to increase UC funding in

future years. As a preliminary step within the Strategic Energy Plan, commitments were made to the IOUs to coincide with CPUC filing deadlines and it is anticipated that funding levels will be granted for the commitment. Current UC/CSU/IOU Partnership incentive rates are \$0.24 per kilowatt-hour saved in the first year and \$1.00 per therm saved in the first year, and the Partnership will pay up to 80% of the project cost. This incentive structure is anticipated to remain unchanged in the future program years.

Publicly-Owned Utilities, such as Los Angeles Department of Public Works (LADWP), Sacramento Municipal Utility District (SMUD), Riverside Public Utilities (RPU) also manage energy efficiency incentive programs that have historically paid substantial incentives to Universities in their territories. There have been discussions with each of these utilities to negotiate similar incentive rates, which may be firmed up in the coming months. In either case, Universities served by these Utilities are strongly encouraged to participate in the Utility incentive programs available.

13.2.2 UCOP Energy Efficiency Financing

UCOP has designed a program to work in concert with the Utility incentive programs to provide low-interest loan to cover the cost to the campuses after the incentives. Campuses will pay back the loans to UCOP using the energy cost savings. To do so will require Department of Finance approval to allow for capital debt service to be paid with energy cost savings. In order to be eligible for the UCOP borrowed funds, a portfolio of projects must meet minimum, although liberal, project cost return requirement. The anticipated criteria include a 85% ratio of loan payment to energy savings, which equates to approximately 15 year simple payback on the portfolio of projects.

UCOP is prepared to lend up to \$500 million to campuses through 2014 to support energy-saving projects.

To learn more about UCOP Energy Efficiency Project Financing, contact

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APPENDICES



Appendix A

Field Data Forms

(Electronic copies only – see folder “Appendix A - Field Data Forms” on disk)



Appendix B

Savings Calculations

(Electronic copies only – see folder “Appendix B- Savings Calculations” on disk)



Appendix C

Other Calculations and Data

