

California Higher Education  
Sustainability Conference  
June 25, 2013



# The CCC/IOU Energy Efficiency Partnership

## How to Utilize Proposition 39 Funding for Energy and Cost Saving Projects



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# California Community Colleges

## A System Perspective



Frederick E. Harris, Assistant Vice Chancellor  
College Finance and Facilities Planning  
California Community Colleges Chancellor's Office

# California Community Colleges

The Largest System of Public Higher Ed in the WORLD

- **2.6 million students annually**
  - Over 70% of the state's public college students
- **1/4 of all community college students in U.S.**
  - Are enrolled in California's community colleges
- **System of FIRST Choice**
  - We serve the “bottom” 100% of students!!

# California Community Colleges Systemwide Detail

- **72 districts encompassing 112 campuses, 72 approved off-campus centers and 23 separately reported district offices**
- **Includes 24,398 acres of land, 5,192 buildings, and 72.4 million gross square feet of space**
- **Innumerable off-campus outreach centers at various facilities**

# California Community Colleges Systemwide Facilities Needs

- \$35.8 Billion over next 10 years
- 5 year needs in new & existing facilities
  - Enrollment Growth = 18.5m new ASF
  - Modernization = 27.3m ASF of existing bldgs
    - 67% over 25 years old
    - 46% over 40 years old

# There will NEVER be enough money!

## Need to work SMARTER:

- Better Planning & Facility utilization
- Streamlined project delivery systems
- Benchmark to industry best practices

## AND

1. Collaborative Partnerships
2. Focus on Life Cycle / Sustainable benefits
3. Capital investments relieve district budgets

## Proposition 39

- **Adopted by the voters in November 2012 to close corporate tax loopholes and will provide roughly \$550 million annually to K-12 and CCC's for Energy Projects**
- **CCC's will receive \$40 million for FY 2013-2014 distributed on an FTES basis to all CCC Districts for energy efficiency and renewable generation projects**
- **Chancellors Office will work with Districts and CCC/IOU Partnership to identify and fund projects – currently \$150 million identified so far!**
- **Implementation will parallel CCC/IOU Partnership process to combine Prop 39 funds and leverage utility incentives**

# Proposition 39

- **Program Guidance issued by Chancellors Office defines program requirements**
  - Project qualification criteria
  - Project proposal and process for receiving funding
  - M&V and Reporting Requirements
- **Money will be distributed later this summer after CEC approval of program Guidance**



Proposition 39: Clean Energy Jobs Act of 2012

## California Community Colleges Energy Project Guidance

Prepared for the Administration by the  
California Community Colleges Chancellor's Office

MAY 29, 2013





**LONG BEACH**  
CITY COLLEGE

**Long Beach Community College District**

**Energy Efficiency Projects**  
**California Higher Education Sustainability**  
**Conference**

**Timothy Wootten – Long Beach City College**  
**Medhanie Ephrem – Long Beach City College**

# Long Beach Community College

California Higher Education Sustainability Conference

- LBCCD Intro
- Phase 1 (*Central Plants*)
- Phase 2A (*Energy Efficiency Projects*)
- Phase 2B (*Energy Efficiency Projects*)
- Savings-By-Design
- Parking Structure/Solar
- Central Plant Expansion and Optimization Project
- Prop 39 Projects



# Long Beach Community College

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- **LBCCD**
  - **Consists of two campuses (Approximately 150 acres)**
    - **Liberal Arts Campus (LAC - 1927)**
      - 32 buildings
    - **Pacific Coast Campus (PCC - 1935)**
      - 27 buildings
    - **Measure E Bond Fund (2002 & 2008)**
      - \$181 million
      - \$440 million

# Long Beach Community College

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- **Energy Projects**

- **Phase 1 Central Plants**

- **Two Central Plants constructed.**
  - LAC – (2) 600 ton chillers, (1) 300 ton chiller, looking to expand
    - Designed for 2,400 ton capacity
  - PCC – (2) 300 ton chillers, (1) 300 ton multi-stack chiller
    - Designed for 900 ton capacity
- **Centralized automated EMS system**
- **Saves Campus approximately 1.5 million in kWh in energy consumptions**
- **Reduces approximately 500 metric tons on CO2 emissions**
- **Operational savings of approximately \$150,000/year**
- **Received \$1million from CCC/IOU for construction of the Central Plants**



# Long Beach Community College

## California Higher Education Sustainability Conference

- **Energy Projects**

- **Phase 2A**

- **Consisted of Facilities Improvement Measures which do not require intensive design and/or which are not required to go through a DSA approval process such as, unitary equipment upgrades, where existing old equipment will be replaced by like-in-kind new, energy efficient equipment, which are of equal or lesser weight.**
- **We also went through and virtualized all physical servers.**
  - **100 servers to 15 high end servers in virtual environment.**
- **Incentive paid out from 06-08 program**

# Long Beach Community College

## California Higher Education Sustainability Conference

- Energy Projects

- Phase 2B

- Consisted of FIMs requiring intensive design, and which require *DSA* approval such as major mechanical improvements or replacement of large air handlers, interconnecting this equipment to the new central plant, converting constant volume systems to VAV (Variable Air Volume) systems etc. The scope of this phase included work in buildings and other measures as follows;
      - Lighting
        - Campus interior/exterior/walkway lighting
        - Stadium ball-field lighting
      - Controls upgrade (Centrally Automated System)
        - HVAC
        - Lighting
      - Sub-metering at each building
      - Window film addition
    - Infrastructure Project
      - In conjunction with the Phase 2B work, there was a campus wide infrastructure project, which included extending the Chilled Water Return/Supply lines to connect the majority of our campus to the Central Plants. Approximately 3 miles of underground piping.
      - Irrigation water supply changed from Domestic Water to Reclaimed Water
    - Incentive to be paid out from 10-12 program

# Long Beach Community College

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- **Savings-By-Design**

- All construction projects go through the Savings-By-Design process during the Design Development phase of our projects. In turn, Energy Efficient buildings are constructed and the District receives a one time rebate check. All Construction projects are designed to at least be more than 15% above Title 24. If a project is designed more than 15% above Title 24 (equivalent to LEED Silver), the design team also receives an incentive. Once all of our current projects have been completed, LBCCD will have received close to \$2 million in incentives.

# Long Beach Community College

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- **LAC Parking Structure**
  - Approximately 900 parking spaces
  - Lighting system uses high-efficiency GE ballasts
    - Achieve 77% better than 2008 Title 24
    - Received \$25,050 in incentives
  - **Solar site**
    - 450kW
    - Largest CSI system in Long Beach
    - Largest campus system in Long Beach
    - Second largest solar power system in Long Beach
    - To receive approximately \$621,603 from CSI





# Long Beach Community College

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- **Central Plant Expansion and Optimization Project**
  - Adding (1) 900 ton chiller to the Liberal Arts Campus Central Plant.
  - **Optimization system** –
    - The optimization system is a very smart piece of software and hardware that interfaces with the cooling, air-handling and controls systems in large buildings. Once it's installed, the system will learn how a building operates, and then optimize that operation to improve comfort, increase energy-efficiency and provide fully-automated demand-response.
    - To be implemented at both the Liberal Arts Campus and the Pacific Coast Campus.
    - Savings -
      - Approximately 1,126,00 KWh savings/year
      - Average electrical cost savings are \$135,000/year
      - Estimated utility rebate \$200,000

# Long Beach Community College

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- **Prop 39 Projects**
  - **LAC Bldg. T RCx**
    - **Estimated incentive \$62,376**
  - **LAC Bldg. D RCX**
    - **Estimated incentive \$43,566**
  - **LAC/PCC Central Plant Optimization**
    - **Estimated incentive \$286,928**
  - **LAC/PCC Lighting**
    - **Estimated incentive \$124,315**
  - **LAC/PCC Solar**
    - **Estimated incentive TBD**

# CCC/IOU Energy Efficiency Partnership

# Long Beach Community College

## California Higher Education Sustainability Conference

Project	Rebate Received date to	Future Rebate	Comments	Funding Source
LAC/PCC Central Plants	\$1,021,358			SCE
PCC Bldg. LRC	\$3,597			SCE
Vending Machine Energy Controllers	\$3,597		Rebates funded entire project	SCE
Energy Savings Project ( <i>phase 2A</i> )	\$148,190			SCE/ LBWD
Server Virtualization	\$53,630			SCE
Energy Savings Project ( <i>phase 2B</i> )	\$28,858			SCE
PCC Bldg.'s DD/EE ( <i>Phase 1</i> )	\$42,463			SCE
LAC Bldg. I			Awarded upon project completion	SCE
PCC Bldg.'s AA/BB ( <i>Phase 2</i> )		\$25,419	Awarded upon project completion	SCE
PCC Bldg. CC		\$4,446	Awarded upon project completion	SCE
LAC Bldg. A		\$28,716	Awarded upon project completion	SCE
LAC Parking Structure	\$246,766	\$399,274	SCE rebate awarded/CSI incentives dispersed monthly	SCE/CSI
LAC Math Technology Building		TBD	Plans currently in review by SCE	SCE
LAC Bldg. C		TBD	Plans to be reviewed by SCE	SCE
PCC Bldg. GG		TBD	Plans to be reviewed by SC	SCE
LAC/PCC Central Plant Optimization		\$200,000	Plans to be reviewed by SCE	SCE
<b>Total</b>	<b>\$1,551,886</b>	<b>\$657,855</b>		



SAN MATEO COUNTY  
**COMMUNITY**  
COLLEGE DISTRICT

# **CCC/IOU Partnership Freeing up Dollars for Facilities**

**"Facilities Excellence"**

**California Higher Education Sustainability Conference**

**June 25, 2013 Santa Barbara, CA**

**José D. Nuñez – San Mateo CCD**

# San Mateo County Community College District

- **Three Campuses (1.4M GSF / 346 Acres)**
  - **Cañada College – Redwood City - 1968**
  - **Skyline College – San Bruno - 1969**
  - **College of San Mateo – San Mateo – 1963**
  - **District Office, San Mateo - 1978**
- **25,000 Students / 1,000 Faculty & Staff**
- **\$900M Capital Improvement Program**
  - **Multiple Funding Sources**
  - **Multiple Delivery Methods**

# Freeing Up Dollars for Facilities

- **Issue: Increased GSF and Operational Cost with No Additional Funding**
- **Challenge: The Budget Allocation Model**
- **Discourse: Total Cost of Ownership**
- **Players:**
  - **Three Colleges**
  - **Chancellor's Office**
  - **Facilities Planning**

# Total Cost of Ownership (An Additional ~ 448,756 gsf)

- Existing Facilities (as of 2000) 1,171,823 gsf
- New CIP Facilities
  - Cañada Bldg. 7 FMC ~ 17,292 gsf
  - Cañada Bldg. 9 Library/LRC ~ 75,917 gsf
  - Cañada Bldg. 22 ~ 11,870 gsf
  - CSM Bldg. 5 Health & Wellness ~ 89,086 gsf
  - CSM Bldg. 6 Pool House ~ 1,586 gsf
  - CSM Bldg. 10 College Center Bldg. 10 ~ 142,901 gsf
  - CSM Bldg. 35 RPSC ~ 9,244 gsf
  - CSM Bldg. 36 Science Building & Planetarium ~ 60,904 gsf
  - Skyline Bldg. 4 Multicultural/Cosmetology/Admin Center ~ 72,810 gsf
  - Skyline Bldg. 6/7 Student Union/Science & Allied Health ~ 106,816 gsf
  - Skyline Bldg. 11N Transmission Facility ~ 6,746 gsf
  - Skyline Bldg. 14 Child Development Center ~ 11,00 gsf (Loma Chica Modernization)
  - Skyline Bldg. 19 Pac Heights ~ 38,842 gsf
  - Skyline Bldg. 22-24 FMC ~ 15,698 gsf
  - DW Athletic Facilities (Restrooms / Press Boxes) ~ 5,120 gsf
- CIP Demolished Facilities
  - Cañada Redwood City Downtown Center ~ 3,775 gsf
  - CSM 5/6 ~ 73,588 gsf
  - CSM 10, 11 & 13 ~ 42,603 gsf
  - CSM Bldg. 20 & Greenhouse ~ 13,126 gsf
  - CSM Bldgs. 21 – 29 ~ 58,958 gsf
  - Skyline Bldg. 4 ~ 2,900 gsf
  - Skyline Bldg. 20 Locker Room ~ 4,320 gsf
  - Skyline Bldg. 22-24 Old FMC ~ 13,048 gsf
  - Skyline Chestnut Center ~ 3,644 gsf
  - District Office Portable Office ~ 1,114 gsf



# New Facilities



Skyline College Building 4 Multi-Cultural/Cosmetology (21.3%)



College of San Mateo Building 5 Health & Wellness (36%)



College of San Mateo Building 10 College Center (21.5%)



Cañada College Facilities Maintenance Center (FMC) (16%)<sup>24</sup>



# New Facilities



Cañada College Building 9 Library/Learning Resource Center (30%)



Skyline College Building 6 Student & Community Center (28%)



Skyline College Facilities Maintenance Center (FMC) (18.2%)

# Freeing up Dollars for Facilities: The Analytics

- **Utility Savings Matrix**
  - Savings due to Energy Efficiency & Sustainability Projects (kWh, Therms, CCF, etc.)
- **Space Analysis – Buildings and Grounds**
  - Increased Square Footage (Buildings, Parking, Landscape)
- **Increased Operational Cost**
- **Labor (APPA Levels)**
- **Facilities Budget Analysis**

# The Rationale: Use Funding From Ongoing EE Savings

## ● Operational (On-going)

- Energy & Sustainability Savings - \$1,712,553
  - Therms: \$146,960
  - KWH: \$802,593
  - Cogen: \$500,00
  - O&M: \$28,000
  - Athletic Field Conversion: \$235,000

## ● Capital (One-time) (as of June 2013)

- PG&E Energy Efficiency: \$1,024,778
- Savings by Design: \$524,016
- CCC/IOU Partnership
  - Received \$470,329
  - Pending \$28,800



# The Discourse: Increase in GSF

**SMCCCD Facilities Square Footage Increase**

	<b>2000 GSF</b>	<b>2012 GSF</b>	<b>Change</b>	<b>% Change</b>
<b>Cañada College</b>	246,431	352,215	105,784	43%
<b>CSM/District Office</b>	592,230	727,039	134,809	23%
<b>Skyline College</b>	333,162	541,325	208,163	62%
<b>Total</b>	1,171,823	1,620,579	448,756	15%

# The Discourse: Association of Higher Education Facilities Officers (APPA) Guidelines

- **Custodial – If cleaning activities are accomplished with decreasing frequency, appearance will suffer**
  - Level 1: Orderly Spotlessness
  - Level 2: Ordinary Tidiness
  - Level 3: Casual Inattention
  - Level 4: Moderate Dinginess
  - Level 5: Unkempt Neglect
  - APPA Recommends Level 2 as the reasonable standard
- **Standard Spaces – Not all spaces are created equal. Different space types require different cleaning approaches and effort**
- **All data presented in Cleanable Square Feet – an industry standard of measure**

# The Discourse: Association of Higher Education Facilities Officers (APPA) Guidelines

- **Engineering – If maintenance activities are accomplished with decreasing frequency, breakdowns will increase and service will suffer**
  - Level 1: Showpiece Facility
  - Level 2: Comprehensive Stewardship
  - Level 3: Managed Care
  - Level 4: Reactive Management
  - Level 5: Crisis Response
  - APPA Recommends Level 2 as the reasonable standard
- **Grounds – If grounds maintenance activities are accomplished with decreasing frequency, appearance will suffer**
  - Level 1: State of the Art
  - Level 2: High Level
  - Level 3: Moderate Level
  - Level 4: Moderately Low-Level
  - Level 5: Minimum Level
  - APPA recommends Level 2 as the reasonable standard

# The Discourse: Staffing Needs

	FY10-11 Current Staffing				FY10-11 Proposed Staffing Needs			
	CAN	CSM	SKY	Total	CAN	CSM	SKY	Total
<b>Custodial</b>	8	17	13	38	1	3	3	7
<b>Engineering</b>	4	7	6	17	0	1	0	1
<b>Grounds</b>	3	6	3	12	0	2	2	4
<b>Total</b>				67				12

# The Discourse: Staffing Needs

Additional Annual Budget Needs					
	\$ per FTE	Cañada College	College of San Mateo	Skyline College	Total
<b>Custodial</b>	\$ 43,445	\$ 43,445	\$ 130,335	\$ 130,335	\$ 304,115
<b>Engineering</b>	\$ 59,712	\$ -	\$ 131,712	\$ 61,000	\$ 192,712
<b>Grounds</b>	\$ 44,076	\$ -	\$ 88,152	\$ 88,152	\$ 176,304
<b>Total</b>		\$ 43,445	\$ 350,199	\$ 279,487	\$ 673,131
<b>Total Needs (w/ benefits @ 35%)</b>		\$ 58,651	\$ 472,769	\$ 377,307	\$ 908,727



# The Discourse: Increased Operational Cost

- **GENERAL OPERATIONAL NEEDS (\$480,000)**

- Fuel expense increases for vehicles and fuel-powered equipment
- Certification of backflow prevention devices
- Hazardous Waste Generator Fee
- Custodial supplies increases
- "new" Computerized Maintenance Management System
- FUSION
- Chiller/Cooling Tower maintenance
- Chiller/Hot water loop water treatment
- Boiler maintenance
- Elevator Inspection and Permit Fees
- Annual Fire Pump testing and overhaul
- Annual Fire Extinguisher inspections
- Air filters and V-belts for air handling unit
- Batteries for fire life safety devices and ACAMS
- Exterior/Interior Lighting replacements
- Replacement parts/services for BMS, Data RM AC, Sewage Pumps, VFDs, irrigation, to name a few
- Lawn chemicals

- **BUILDING SYSTEMS MAINTENANCE NEEDS (\$535,000)**

- Access Controls and Monitoring (ACAMs) (\$250,000)
  - Upkeep of equipment (cameras, servers)
  - Repair and replace parts (nodes, input/output, readers)
- Fire and Life Safety Systems Maintenance (\$170,000)
- Building Management Systems Maintenance (\$115,000)



# The Discourse: Summary

## Additional Annual Budget Needs for Facilities

<b>Needs</b>	<b>Cañada College</b>	<b>College of San Mateo</b>	<b>Skyline College</b>	<b>Total</b>
<b>Staffing</b>	\$58,651	\$472,769	\$377,307	\$908,727
<b>General Operational Needs</b>	\$120,000	\$240,000	\$120,000	\$480,000
<b>Building Systems Maintenance Needs</b>	\$126,046	\$160,821	\$248,133	\$535,000
<b>Total</b>	\$304,697	\$873,590	\$745,440	\$1,923,727

# The Buy In Road Show: Nine Months

- **One-on-One**
  - CBO
  - CFO
  - Chancellor
  - College Presidents
- **Chancellor's Cabinet**
  - Chancellor, Presidents, Executive Staff
- **Constituents – Road Show**
  - SMCCCD Financial Officers
  - College Cabinet
    - President, VPs, CBO, Marketing
  - College Council (Shared Governance)
    - Admin, Faculty, Staff, Students



# The Discourse: Summary

## Additional Annual Budget Needs for Facilities

Needs	Total
Staffing	\$908,727
General Operational Needs	\$480,000
Building Systems Maintenance Needs	\$535,000
Total	\$1,923,727

# Question & Answer

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# CCC/IOU Energy Efficiency Partnership

## Economic & Environmental Sustainability



**Lisa Hannaman – Southern California Edison**

# Incentives and Savings to Date

<b>Program Cycle Year(s)</b>	<b>kW</b>	<b>kWh/yr</b>	<b>thm/yr</b>	<b>Incentive Paid</b>
<b>2006-2008</b>	<b>9,339</b>	<b>39,732,201</b>	<b>1,078,475</b>	<b>\$ 9,066,384</b>
<b>2009</b>	<b>1,827</b>	<b>9,004,448</b>	<b>281,193</b>	<b>\$ 2,196,724</b>
<b>2010-2012</b>	<b>11,088</b>	<b>39,348,199</b>	<b>1,546,336</b>	<b>\$ 10,723,543</b>
<b>Total</b>	<b>22,254</b>	<b>88,084,848</b>	<b>2,906,004</b>	<b>21,986,651</b>

# CCC/IOU EE Partnership

## 2010-12 Cycle Re-cap



- Retrofit projects
- Monitoring-Based Commissioning (MBCx)  
/Retro Commissioning (RCx)
- New Construction Design Assistance and Incentives
- IT Projects
- Demand Response



## 2013-2014 Partnership Vision

- **Strive for 100% Participation from all Districts and Campuses**
- **Focus on activities that produce energy savings**
- **Provide innovative and flexible offerings that best meet needs of campuses**
- **NEW programs for the next cycle include:**
  - **Project Development Services**
  - **Retro commissioning (RCx) Pilot Program**
  - **DEEP Intern Program**
  - **Board of Governors' Initiatives**
  - **More Effective Outreach & Education to Campuses**

# Program Incentives for 2013-14

MEASURE	INCENTIVE RATE
<b>Electricity</b>	
Packaged HVAC, HVAC Controls, Motors, Drives	
Lighting, Lighting Controls, Daylighting	
Central Plants, Chiller Retrofits, and other major Energy Efficiency Infrastructure Projects	
Monitor Based Commissioning (MBCx)	
IT Projects	
<b>Natural Gas</b>	
<b><u>ALL</u></b> Gas Measures	

# Program Benefits

## 10-Year Cumulative Impacts

Electricity Savings:

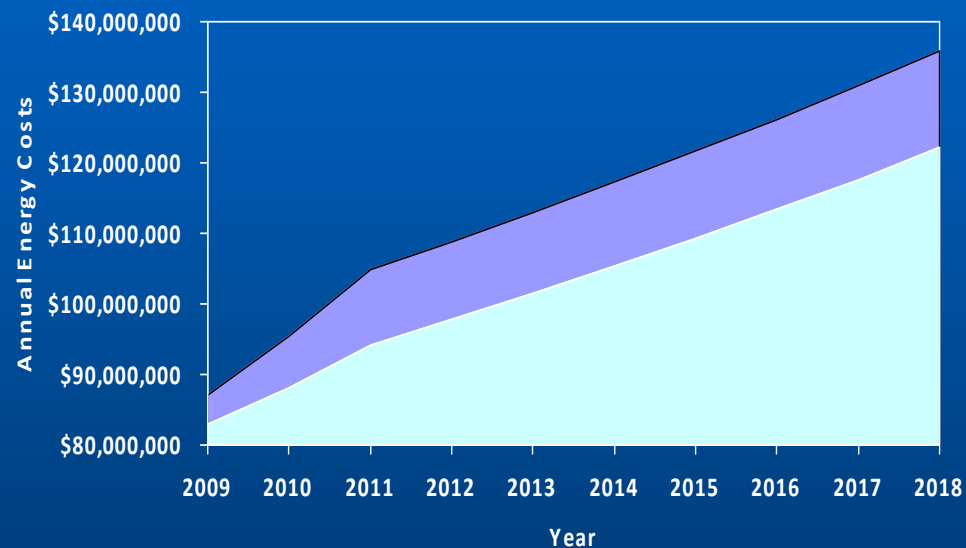
725,562,048 kWh

Natural Gas Savings:

23,080,884 therms

**\$1 for sustainable facilities  
yields \$2 energy savings**

10 Year Effects of 3-Year Program Implementation  
Statewide CCC Campus Energy Costs (IOU Served Campuses Only)



■ Business as Usual ■ Targeted Portfolio Implementation, 2009-2011

**Every \$1 invested by a district  
for sustainable facilities improvements  
through the 2009-11 Partnership will yield  
\$2 in energy savings over the next 10 years**

# Contact Information

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