Status Report on EM&V for UC/CSU/IOU Energy Efficiency Partnership

Presented to

MAESTRO/CALMAC Evaluation Showcase

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Program Overview

- Partnership of University of California/California State University and the Investor-Owned Utilities
- Goals are savings and establishing a permanent framework for campus energy management
- Energy Efficiency Retrofits. Up to 100 percent funding for campus energy efficiency retrofit projects
- Monitoring-based commissioning (MBCx). Up to 100 percent funding for MBCx projects. Monitoring capability will be permanently installed and campus staff will receive training on retro/continuous commissioning.
- Training and Education. Workshops on new construction, retrofits and retro-commissioning

Sampling

- Separate random samples for Retrofit/MBCx, each stratified by type of project
  - Retrofit (HVAC, Lighting, Miscellaneous)
  - MBCx (Central Plant, Lab Building and Non-Lab Building)
- Impact and process evaluation data collection and analysis for all sampled cases

Impact Evaluation

- Project-Specific Evaluation Plans
- Baseline and Post Data Collection
  - Performance metering via data loggers/EMCS trend logs
  - Inspections and on-site interviews with facility staff
  - Self-report free-ridership data from telephone surveys
- Project-specific models of 1st year savings for kWh, kW and therms
- Savings realization rates will be applied to program savings claim by project type within Retrofit/MBCx domains

Process Evaluation

- Review of program materials
- In-Person and Telephone Interviews
  - Program management teams
  - Campus facilities staff, interviews tailored to important topics for
    - Retrofit
    - MBCx
  - Participants in high-priority Training and Education events

Program Savings Estimates for Retrofit Projects (Feb 2005)

	Number of	First-year gross savings kWh	kW	therms
Retrofit projects				
HVAC	38	6,420,037	792	388,899
Lighting	45	6,866,526	1,384	-
Miscellaneous	9	272,480	5	149,944
Total	**92**	**13,559,043**	**2,181**	**538,843**

Retrofit Sample

	Number of	First-year gross savings kWh	kW	therms
Sampled projects				
HVAC	8	2,957,980	625	272,943
Lighting	6	2,736,401	442	-
Miscellaneous	3	-	-	131,450
Total	**17**	**5,694,381**	**1,067**	**404,393**
% of Program	**18%**	**42%**	**49%**	**75%**

Sampled projects located on 9 campuses

Program Savings Estimates for MBCx Projects (Feb 2005)

	Number of projects	First-year gross savings		
		kWh	kW	therms
MBCx projects				
Central plant	7	2,623,509	343	241,405
Lab building	13	3,416,602	336	91,266
Non-lab building	15	1,991,370	214	191,530
Total	**35**	**8,031,481**	**893**	**524,201**

MBCx Sample

	Number of projects	First-year gross savings kWh	kW	therms
Sampled projects				
Central plant	2	228,304	40	181,363
Lab building	2	696,000	23	69,973
Non-lab building	3	569,407	54	73,941
Total	**7**	**1,493,711**	**117**	**325,277**
% of Program	**20%**	**19%**	**13%**	**62%**

Sampled projects located on 7 campuses

Findings from 1st Year Report

- Program Theory #1: Partnership will lead to a higher rate of adoption for efficiency projects
  - Findings: Higher levels of funding is causing retrofit projects to be undertaken that would not have happen under other programs. MBCx is clearly a new initiative for the campuses.
- Program Theory #2: New performance monitoring data will lead to more energy efficient operations.
  - MBCx project applicants are enthusiastic about having increased monitoring capability and the program is providing the needed resources. A combination of enthusiastic users and new resources may lead to this theory's validation, but more time is needed, along with completed MBCx projects, before we can reach a conclusion.

EM&V Status

	EVALUATION STATUS			
	Baseline data collection complete	Project complete	Post data collection complete	M&V analysis complete
Sampled projects				
Retrofit				
HVAC	8	8	3	-
Lighting	6	6	4	3
Miscellaneous	3	3	-	-
MBCx				
Central plant	-	-	-	-
Lab building	-	-	-	-
Non-lab building	1	1	-	-
TOTAL	**18**	**18**	**7**	**3**
% of all sampled	75%	75%	29%	12%