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Measurement & Evaluation of the San Francisco Peak Energy Pilot Program (SFPEP)

MAESTRO/CALMAC Evaluation Showcase

July 26, 2006

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Discussion Outline

- Evaluation Objectives
- Impact Approach and Findings
- Process Approach and Findings
- Discussion

Review of Evaluation Goals

- Develop adjusted, reliable estimates of summer and winter peak energy savings
- Assess the overall effectiveness of the SFE/PG&E partnership, focusing on lessons learned and recommendations for improving partnership effectiveness.
- Determine the effectiveness of the implementation of the five major Program elements, and make recommendations on adaptations required to achieve stated program goals.

Evaluation Focus

Impact evaluation was focused on four key program elements:

- Cash Rebates for Business Customers
- Standard Performance Contract
- Single Family Direct Install
- Multi-Family Rebate.

Process evaluation included these – and:

- Commercial Turnkey Services

Remaining program elements considered only in the context of the overall effectiveness of the Partnership

- Residential Case Studies,
- Energy Audits,
- Codes and Standards, and
- Emerging Technologies

On-site verifications

Program Element	Number of Verification Inspections Planned	Number of Verification Inspections Achieved
Rebates for Business Customers	232	182 + 50
Standard Performance Contracts	4	5
Single-Family Direct Install	40	40
Single Family Torchiere Exchange	20	20
Multi-Family Rebates	100 units	100

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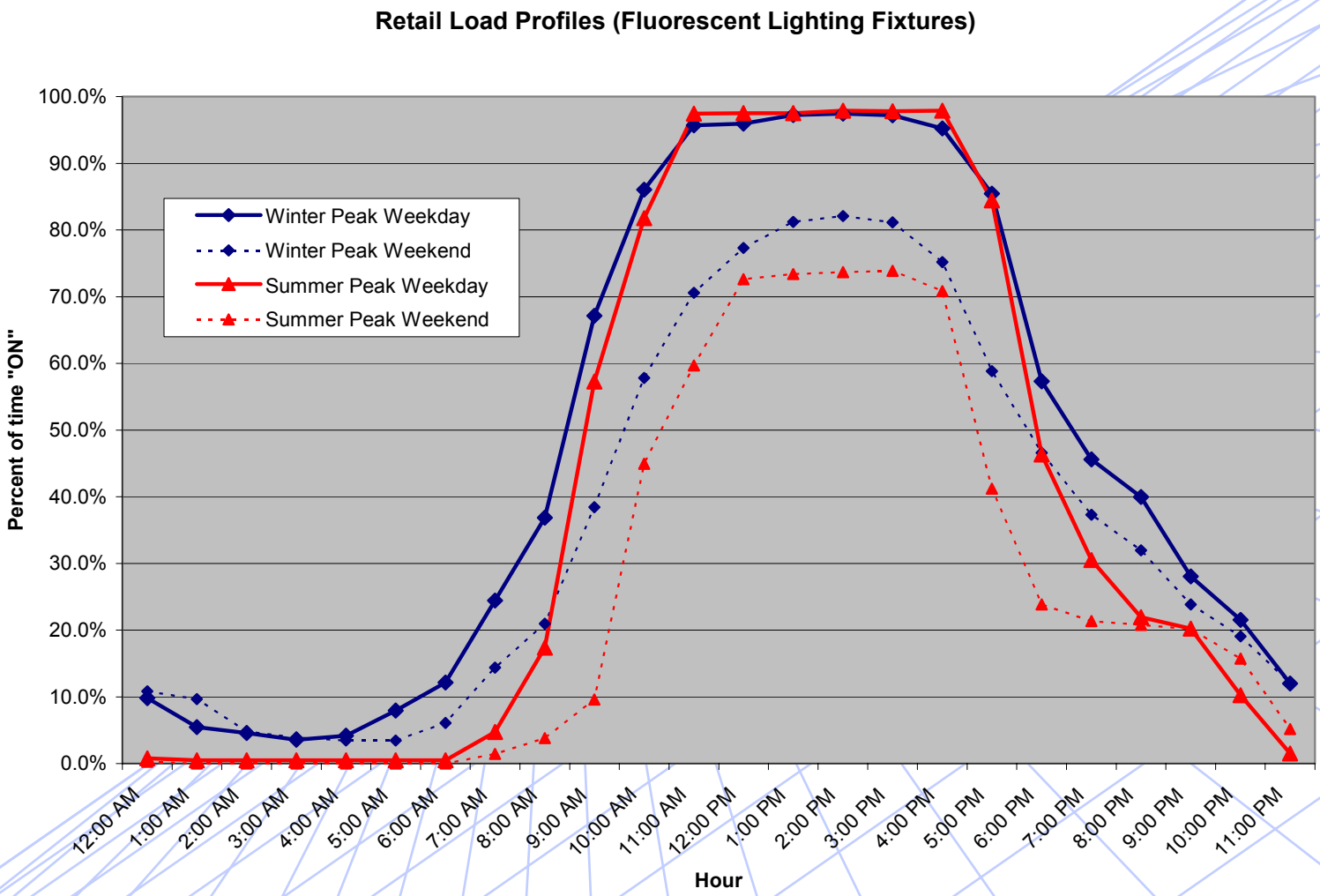
Example Findings:
Cash Rebates for Business

CRB Recorded Savings: by measure

Measure Code	Measure Description	Number of units installed	Gross kW saved	% of kW program savings	Gross kWh saved	% of kWh program savings	% of rebates
L290	4-foot premium T-8/T-5 Lamp & Electronic Ballast replacing of T-12 lamp & efficient magnetic ballast	199,266	2,203	32%	11,158,510	29%	62%
L83	Wall or ceiling mounted occupancy sensors for area lighting	3,456	1,265	18%	2,616,518	7%	6%
L137	High efficiency LED exit signs	6,818	278	4%	2,299,750	6%	8%
R50	Door gasket replacements on cooler and freezer doors	27,948	170	2%	1,490,484	4%	4%
R2	Strip curtains for walk-in coolers	49,103	1,256	18%	11,003,050	29%	5%
Total			**5,173**	**75%**	**28,568,312**	**75%**	**84%**

Lighting Loads in Retail space



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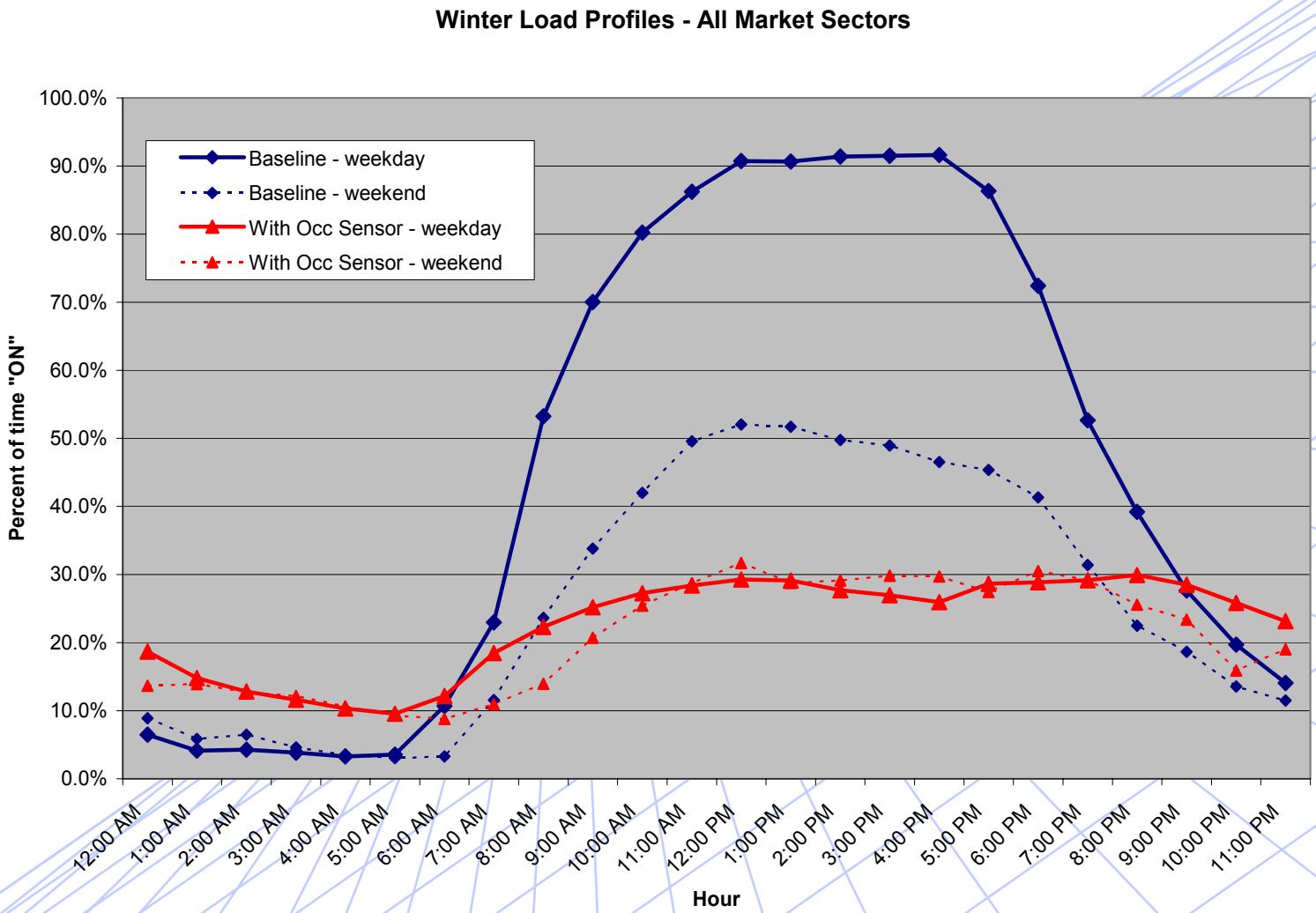
T8 (L290) Hours of Use Summary

Market Sector	Self-reported hours of use for participants with data loggers	Logger data for participants also self reporting	Self-reported average from verified population	Ratio estimated population hours of use	Logger data for all sector participants	2005 DEER Update Operating Hour Assumptions	PY 2004 / 2005 PG&E Lighting Work paper
Grocery	4,368	4,519	4,886	5,055	4,448	5,824	5,800
Hotel/Restaurant	N/A	N/A	5,200	N/A*	5,662	6,776	5,050
Office	2,437	2,429	2,539	2,531	2,510	2,616	4,000
Other	3,285	3,091	3,342	3,145	2,524	3,673	2,537
Retail	3,383	3,443	3,678	3,744	3,820	4,117	4,450

Occupancy Sensor load shapes



Ex-post Gross Impacts

Program Element	GROSS MW (goals)	GROSS MW (ex-ante)	Summer GROSS MW (ex-post)	Winter GROSS MW (ex-post)	GROSS MWh (ex-ante)	GROSS MWh (ex-post)
Cash Rebates for Business	18.65	7.17	6.60	6.60	39,814	38,025
SPC	2.10	4.26	4.26	4.73	31,336	31,336
Single Family	0.15	0.26	0.29	0.54	2,012	2,277
Multi-Family	0.40	0.24	0.24	0.24	1,832	1,832
TOTAL	**21.32**	**11.93**	**11.40**	**12.11**	**74,994**	**73,470**

Process Evaluation

- Identify Partnership and Program Issues
- Identify Prospective Candidates for Partnership Interviews and Surveys
- Partnership Path:
  - Developed four interview guides: Staff (2 rounds), Community, Implementation Contractor
  - Conduct Interviews (Ridge & Associates, Equipoise)
  - Analyze and Summarize Findings per Partnership and Program Issues
- Participant Path:
  - Developed four surveys: Single Family, Multifamily, Business, Torchiere
  - Conduct Surveys (Northwest Research Group: SF, MF, Bus; CCSC staff: Torchiere)
  - Analyze and Summarize Findings per Program Issues

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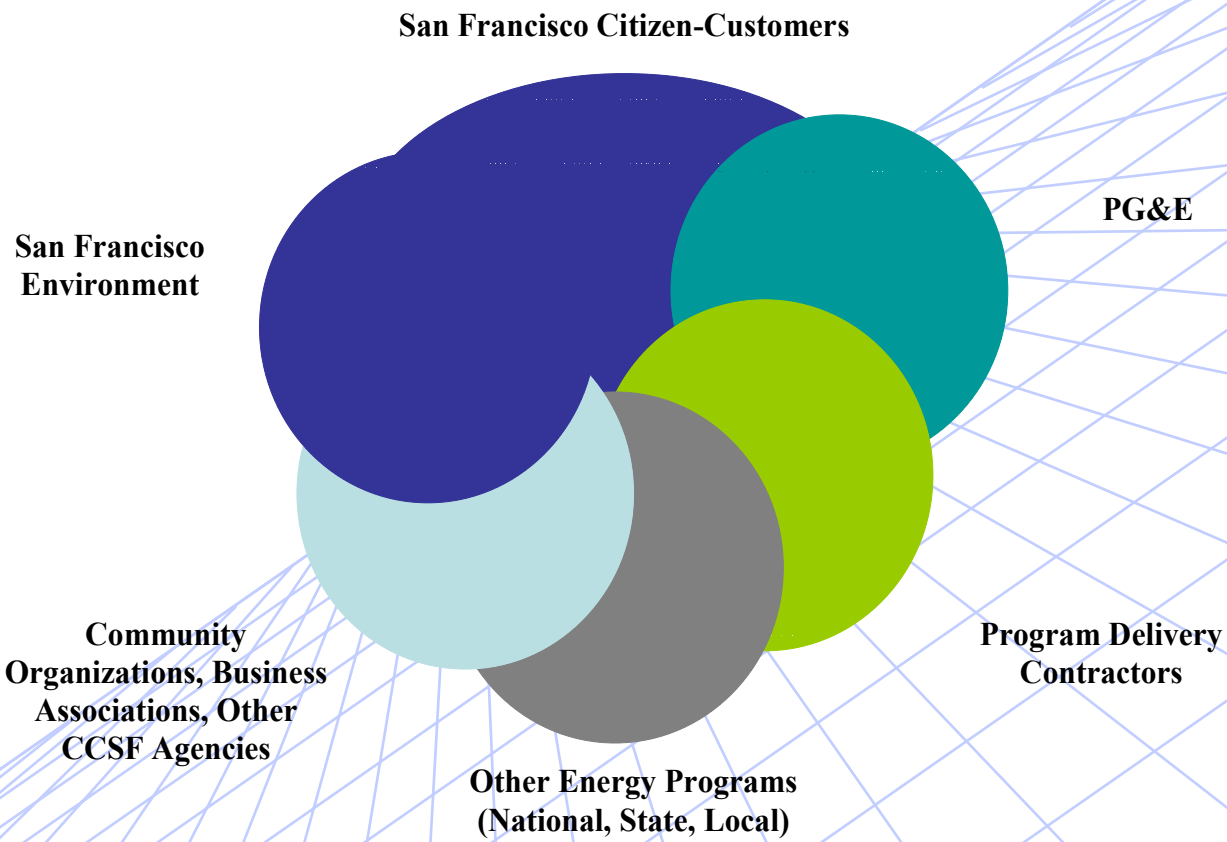
San Francisco Peak Energy Program
Partner Relationships



Partnership Interviews

- Four Groups: Core Program Managers & Staff (two rounds), Community Organizations, Contractors
- 20 interviews completed with…
  - PG&E staff (6 program managers)
  - CCSF Dept of Environment Staff (4 program staff including CTS staff)
  - PG&E Delivery Contractors (2 people - American Synergy, EMCOR)
  - Community Outreach Partners (8 people):
    - Charity Cultural Services Center
    - CCSF Dept of Building Inspection
    - SF PUC - Water
    - Business Associations (Pier 39, BOMA)
    - Community Organizations (One Stop, Bayview Network for Elders)
    - Community Meeting Facilitator

Participant Surveys

	Research Plan		Actual Completed Surveys	
Program Element	**Participant Population**	**Participant Surveys**	**Participant Surveys**	**Statistical Precision (@ 90% Conf.)**
Single-Family	995	214	168	± 5%
Multi-Family				
Tenants	4491	255	118	± 8%
Property Mgrs	37	20	10	± 20%
Torchieres	3,400	Not in Plan	71	± 10%
Business Segment				
Total	961	211	211	± 5%
Offices (30%)	293	64	33	± 15%
Retail (25%)	242	53	46	± 11%
Hotel/Restaurants (16%)	151	33	42	± 11%
Grocery (11%)	110	24	13	± 22%
All Others (17%)	165	36	77	± 7%
Cash Rebates	732	153	163	± 6%
CTS	198	42	40	± 12%
SPC	31	16	8	± 25%

Chinatown Torchiere Exchange

Partnership & Process Findings

- The relatively short duration of the partnership was not long enough to develop and effectively utilize relationships and marketing channels to achieve ambitious energy savings goals.
- Regulatory process imposed incentive caps, measure requirements, and community development objectives that may have hindered the partnership from achieving energy and demand targets.
- There was a sense on the part of SFE that PG&E wanted to avoid significant alterations to the statewide programs PG&E already had in operation, and whether true or not, impression limited the development of SFPEP program features.

Partnership & Process Findings ++

- Marketing effectiveness was improved by the partnership, and had the program continued over a longer period that effectiveness probably would have further grown.
- Hard-to-reach markets were served through the program: ethnic, low-income, important geographic, and small business markets all were served. Multi-lingual versions of selected marketing flyers was very helpful in recruiting participants of differing ethnic backgrounds.
- Community outreach was improved by the partnership, particularly in residential and small business segments that utilized SFE's relationship strengths for such efforts as the torchiere exchanges and CTS. This success did not extend to all constituents in the City.
- Better coordination between SFPEP and Statewide programs is needed to avoid customer confusion and tracking concerns.

Program Element Findings

- Energy efficiency measures not available in statewide programs saw market penetration in the Business sector, especially refrigeration measures –subsequent statewide program developments created some confusion when they offered the same measure incentives.
- In the Multi-family program, difficulty in replacing hard-wired CFL lamps on burnout is concern of program participants.
- Commercial Turnkey Services energy audit and follow-up services provided by SFE staff to small businesses filled a gap in PG&E's business program portfolio and provided a neutral perspective on measures recommended by contractors.

Some Recommendations

- More detailed study of occupancy sensors by space type is recommended because current workpaper assumptions do not reflect many installations.
- A potential study for measures with high winter peak reduction should be completed – including electric heating loads
- Review baseline assumptions on operating hours for SPC lighting installations to determine whether adjustments are necessary based on the lighting analysis of the Cash Rebates for Business customers.
- Consider a review of therm savings for program elements that produce gas savings.
- More complete program records should be kept by direct install field contractors for Single Family and Multi-Family Program elements.