

Handout # 10 Future Potential - High Potential Measures Matrix

1	2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q			
		PY2006															Qst. 1 Pros	Qst. 1 Cons			
		End Use/Measure Type	High, Medium, Low Achievability (H, M, L)	Risk Factor 1 (High) to 9 (Low)	Cost Effective Y or N	Potential Niche Markets	Statewide S) / Third Party (TP)	Units		Potential Savings			Levelized Cost		Total Budget						
3	4							5	6	7	8	9	10	11	12	13	14	15	16	17	18
3		Refrigeration And Appliances	M	3 - (market barriers)		Target 10-15 year old secondary units		128,000	17.7	110	2.53	\$ 0.03	\$ 0.19	\$ 23.99	\$ 10.10	\$ 34.09	See detail below	See detail below			
4		Residential																			
5		Refrigerators Recycling						30,000	3.66	20.43	-			\$ 4.20		\$ 4.20	<p>RESIDENTIAL REFRIGERATION: The residential sector represents 37.5% of the total electricity sold in PG&E. Refrigeration savings potential is the 3rd largest area of potential kw savings behind Cooling and Interior lighting and is the 2nd largest area of savings behind Interior lighting. Refrigeration represent 26% and 20% of the overall MW and Gwh savings potential with customers. The goal of this program will be to recycle as many old refrigerators and freezers as can be accomplished. We propose to engage as much of the refrigerator distribution system as is economical including retailers and manufacturers. Market research shows that 18% of California households have 2nd refrigerators and that 1.8 million refrigerators are over 11 years old. Therefore, there is significant opportunity for additional program expansion. The savings are extrapolated from the RASS and the 2004 Appliance Recycling Workbook. California Statewide Residential Appliance Saturation Study, June 2004 Assume PG&E Share =45% - Unit Energy Consumption for 1st refrigerators is 789 kwh, 2nd refrigerators is 1,178 kwh - 1.8 million refrigerators over 11 years old, PG&E share = 810,000 refrigerators - 8.5 million total residential refrigerators, PG&E share = 4.3 million refrigerators - 8% of refrigerators discarded/ year = .06 x 9.5 million = 570,000 discarded est - 18% of households have at least one additional refrigerator = >.18 x 4.3 million - From the workbook for Appliance Recycling the net savings for a refrigerator rec. Therefore the potential is: • Refrigerators : 810,000 x 681 kwh = 55,161,000 kwh and 98,820 peak kw • 2nd Refrigerators: 774,000 x 681 kwh = 52,709,400 kwh and 94,428 peak kw. • Freezers: 774,000 x 894 kwh = 69,195,600 kwh and 120,774 peak kw. • Total: 177,066,000 kwh and 314,022 peak kw The current cost we are expending per unit to cover admin, marketing, implementation/recycling is approximately \$140 per unit recycled. Therefore the estimated cost to recycle 2,258,000 is \$330,120,000. The estimated achievable of the maximum potential is about 10 % of the maximum over a 5 year period. For 2006, we start with a target of 14% of the overall 10% target or 33,012. Home Improvement Products (HIP) - CW, DW, AND ROOM AC: Supports advances made by Energy Star and CEE where adopted; keeps appliance products involved in the energy savings goals, may increase manufacturer/retailer participation in rebate program with Point of Sale (POS) incentives and marketing efforts; keeps water districts co-promotional efforts visible to the utility and water district customers and fosters a visible partnership for the community.</p>	<p>RESIDENTIAL REFRIGERATION: none Home Improvement Products (HIP) - CW, DW, AND ROOM AC: Retailer database advancements or changes will dictate whether POS efforts will be implemented and will impact goal accomplishment. If overall economy is not vibrant, goal accomplishment will be at risk.</p>			
6		Freezers Recycling					3,000	0.47	2.68	-			\$ 0.42		\$ 0.42						
7		Clothes Washers					55,000	0.53	2.40	1.89			\$ 5.38		\$ 5.38						
8		Tier 2a & 2b					30,000	0.26	1.20	0.81			\$ 2.25		\$ 2.25						
9		Tier 3a & 3b					25,000	0.26	1.20	1.08			\$ 3.13		\$ 3.13						
10		Dishwashers					40,000	0.40	2.08	0.64			\$ 3.00		\$ 3.00						
11																					
12		Total Residential				TP	128,000	5.05	27.59	2.53				\$ 13.00	\$ 5.39	\$ 18.38					
13		Commercial Retrofit												\$ 0.85		\$ 0.85			<p>MEDIUM AND LARGE COMMERCIAL REFRIGERATION: According to Kema Xenergy's potential studies, refrigeration as a commercial end use has the potential to save approximately 789 gWh from 2002-2011, second only to lighting in commercial. Medium to Large Commercial Refrigeration: By another cut - just medium and large commercial refrigeration - VaCom Technologies (refrigeration consultants to SBD) came up with some different figures. Based on number of facilities by end-user type, typical load and production affecting refrigeration, and total potential to save energy (35-40%), using current technologies, they put the 10-15 year potential at 477gWh for retrofits and new construction. This does not include small commercial refrigeration. VaCom believed they could be missing up to 30% from the lists they were using. The total sector annual consumption is estimated to be approximately 8,112 gWh per year. The most significant refrigeration loads are associated with the following: • Fruit and vegetable processing/packaging (1,270 gWh) • Dairy processing - milk, cheese, butter, icecream (1,331 gWh) • Beverage processing - wineries, breweries, softdrinks (640 gWh) Other commercial refrigeration end-users include meat and poultry processing, b SMALL COMMERCIAL REFRIGERATION: Current market penetration of premium energy efficient walk-in systems is estimated to be 5,373 mWh (Summary of Energy Efficient Potential for Convenience Store Refrigeration, VaC Small Commercial Pharmacy Refrigeration Efficiency Upgrades: Estimated potential savings for Pharmacy Refrigeration is estimated to be 18,742</p>		
14		Large Chain Supermarkets												\$ 0.85		\$ 0.85					
15		Independent Supermarkets												\$ 0.09		\$ 0.09					
16		Refrigerated Warehouses												\$ 0.27		\$ 0.27					
17		RWH - Public Cold Storage																			
18		RWH - Chain Distribution																			
19		Pharmacies												\$ 2.62		\$ 2.62					
20		Convenience Stores												\$ 0.75		\$ 0.75					
21		Restaurant/Café - Solid Door Refrig.												\$ 1.65		\$ 1.65					
22																					
23		Commercial - New Constructions																			
24		Large Chain Supermarkets												\$ 0.19		\$ 0.19					
25		Independent Supermarkets												\$ 0.03		\$ 0.03					
26		Refrigerated Warehouses												\$ 0.32		\$ 0.32					
27		RWH - Public Cold Storage																			
28		RWH - Chain Distribution																			
29																					
30		Industrial Retrofit																			
31		Refrigerated Warehouses												\$ 1.04		\$ 1.04					
32		Refrigerated Processing												\$ 1.18		\$ 1.18					
33		Dairy Processing																			
34		Beverage																			
35		Ice Rinks																			
36		Meat and Poultry																			
37		Bakery																			
38																					
39		Industrial - New Constructions																			
40		Refrigerated Warehouses												\$ 0.72		\$ 0.72					
41		Refrigerated Processing												\$ 1.26		\$ 1.26					
42		Dairy Processing																			
43		Dairy Farms																			
44		Beverage																			
45		Ice Rinks																			
46		Meat and Poultry																			
47		Bakery																			
48		Total Non-Residential				TP	-	12.61	82.73					\$ 10.99	\$ 4.71	\$ 15.70					

Handout # 10 Future Potential - High Potential Measures Matrix

1 2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
	PY2006																Qst. 1 Pros	Qst. 1 Cons
3	End Use/Measure Type	High, Medium, Low Achievability (H, M, L)	Risk Factor 1 (High) to 9 (Low)	Cost Effective Y or N	Potential Niche Markets	Statewide S) / Third Party (TP)	Units	MW	GWH	MTHM	\$/KWH	\$/THM	Incentive Budget	Admin Budget	Total Budget			
49	HVAC						0	74.7	116	7.09	\$ 0.04	\$ 0.08	\$ 31.64	\$ 13.56	\$ 45.20	Large potential peak reduction. Can target large customers. Synergistic savings with other energy conservation measures.		KWh savings proportionally smaller than other end uses. Cost per kWh higher.
50	Total Residential	H - with targeting L - w/o targeting	7 (Title 24)		Early Replacement	S	0	13.5	22	7.09	\$ 0.04	\$ 0.08	\$ 9.11	\$ 3.90	\$ 13.02			
51	Residential Questions Detail														\$ -	Potential savings second only to large commercial. Large potential peak reduction. Greater public recognition.		KWh savings proportionally smaller than other end uses. Cost per kWh higher.
52	Total Non-Residential					S	0	61.2	94	-	\$ 0.04	-	\$ 22.53	\$ 9.66	\$ 32.18			
53	Office	L - M	7 (Title 24)			S TP in niches	0	17.3	27	-	\$ 0.04	-	-	-	-	Large potential peak reduction. Can target large customers for more cost effective savings		KWh savings proportionally smaller than other end uses. Cost per kWh higher.
54	Retail	H - with targeting L - w/o targeting	5 - (market barriers)			S TP in niches	0	6.7	10	-	\$ 0.04	-	-	-	-	Peak loads		NA
55	School	L - M	6 (Title 24)			S TP in niches	0	2.0	3	-	\$ 0.04	-	-	-	-	Additional Incentives available through Prop 47 and 55 funds. High profile		Complicated bureaucracies, long turnaround time on decisions. No link between operating and capital budgets
56	College					S TP in niches	0	1.7	3	-	\$ 0.04	-	-	-	-			
57	Hospital	M	8 (OSPD)			S TP in niches	0	7.5	12	-	\$ 0.04	-	-	-	-	Very large potential savings. Building boom - SB 1953 requires retrofits by 2008		
58	Hotel						0	2.3	3	-	\$ 0.04	-	-	-	-	NA		Designs emphasizing HVAC diversity, first cost
59	Warehouse						0	4.6	7	-	\$ 0.04	-	-	-	-	NA		Small Potential – hard to reach market segment, low peak savings proportional to kWh savings
60	Misc						0	7.5	12	-	\$ 0.04	-	-	-	-			
61	Restaurant						0	4.1	6	-	\$ 0.04	-	-	-	-	NA		NA
62	Food Store	L - M	4		Technical niche	S TP in niches	0	7.6	12	-	\$ 0.04	-	-	-	-	NA		NA
63	Lighting						11700	49.8	319	-	\$ 0.02	-	\$ 27.78	\$ 11.91	\$ 39.69	See market detail		
64	Total Residential	M-H	8		Target specific use categories, i.e., kitchens	S	2700	14.4	126	-	\$ -	-	\$ 11.78	\$ 5.05	\$ 16.83	This technology makes the most sense for new construction. Especially in kitchens and great rooms where builders install a large number of recessed can fixtures. Standard incandescent or CFL systems has an average of 10 downlights, new system would require 6 downlights. New system will provide twice as much light. Installation costs would be lower than existing technology. The new 2005 lighting code requires that for kitchens at least 50% of the installed wattage must be high efficacy. This technology would also be beneficial in single family residential retrofit and remodeling projects as well as low rise multifamily gut rehab projects.		Since this new technology may be considered in new construction to meet the new 2005 standard for high efficacy lighting, we will not be able to claim the energy savings from these types of fixtures if lighting is used to comply with Title 24 standards. Product availability, training will be needed for lighting designers, installers, electricians, etc. New system material cost is more expensive than existing materials. Customers have been disappointed with the performance of CFL recessed lighting systems.

Handout # 10 Future Potential - High Potential Measures Matrix

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q			
							PY2006													
2							Units			Potential Savings			Levelized Cost			Total Budget				
3	End Use/Measure Type	High, Medium, Low Achievability (H, M, L)	Risk Factor 1 (High) to 9 (Low)	Cost Effective Y or N	Potential Niche Markets	Statewide S) / Third Party (TP)	Units	MW	GWH	MTHM	\$/KWH	\$/THM	Incentive Budget	Admin Budget	Total Budget	Qst. 1 Pros	Qst. 1 Cons			
69	Total Non-Residential	M	4-7 depends on niches/application of technology to use category		Target technology to market	S TP in niches	9000	29.7	165	-	\$ -	-	\$ 9.06	\$ 3.88	\$ 12.94	Reduced Wattage T-8 Fluorescent Lamps (25 watt): This reduced wattage lamp can replace existing 32-watt lamps operating on instant-start ballasts saving 7 watts per lamp. Low wattage Metal Halide as replacement for higher wattage MR16 incandescent and other incandescent PAR lamps: MR16 incandescent lamps are widely used in retail lighting displays. Philips lighting has introduced a 20-watt Metal halide that can replace typically used 50-watt incandescent lamps saving half the energy for similar performance	Reduced Wattage T-8 Fluorescent Lamps (25 watt): • Lumen output reduction is linear so customer must be willing to accept proportionate illumination. • Lamp is more expensive than standard T-8 lamps but price is dependent on volume purchasing. • Lamp operating characteristics not known since it would appear not to be in wide usage. Demonstration projects currently being planned to ascertain performance characteristics. • Only Philips currently manufactures this lamp. • Hard to calculate without data showing number of instant start ballasts currently in use in existing luminaires. Potential study SW039A completed in 2002 does not provide this information. Kema-Xenergy may have this data in unpublished form not included in the final report. Lamp manufacturers may have this data but are unlikely to share.			
70	Deemed Savings, Small Retrofit						0	27.1	152	-	\$ 0.01	-	\$ 7.34	\$ 3.15	\$ 10.49		Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: • Technology is reliable but few luminaires are currently available • Initial installation costs are about twice that of MR16s • There is not much familiarity in the design field for using this product • Hard to calculate without data showing number of display lighting fixtures			
71	Calculated Savings, Large Retrofit						0	1.3	7	-	\$ 0.03	-	\$ 1.28	\$ 0.55	\$ 1.83					
72	Calculated Savings, Nonresidential New Construction						9000	1.3	5	-	\$ 0.01	-	\$ 0.43	\$ 0.19	\$ 0.62					
73	Total Local Government (Res & Nonres)						0	1.9	10	-	\$ 0.08	-	\$ 3.20	\$ 1.37	\$ 4.58	NA	NA			
74	Total San Francisco (Res & Nonres)						0	2.5	11	-	\$ 0.05	-	\$ 2.71	\$ 1.16	\$ 3.87	NA	NA			
75	Total Commercial Lighting Niche Markets						0	1.4	8	-	\$ 0.02	-	\$ 1.03	\$ 0.44	\$ 1.47	NA	NA			
76	Motors	H	3 - w/long term commitment to serve market		Very heterogeneous, must match application	S	0	5.2	47	-	\$ 0.01	-	\$ -	\$ -	\$ 3.28	The industrial sector represents 21% of the total electricity sold in PG&E territory with motors accounting for 67% of this sector's usage. The commercial sector represents 36% of the total electricity sold in PG&E territory with motors representing 50% of this sector's usage. In California, approximately 53% (58,363 GWh) of the non-residential electric energy is used to operate motors 1 hp or greater. In PG&E service territory, over 80,000 motors are replaced every year in the commercial, industrial and agricultural markets, thereby presenting an immediate, substantial, energy savings potential opportunity in an easily identified and targeted market. It is estimated that 45% (26,000 GWh) of this energy is used by the over one million motors (SBW Consulting, 2000). Over time, EPAAct standards have the potential to increase the energy efficiency of these motors approximately 2.3% (600 GWh annually). Market research shows that 80,000 motors are sold annually in PG&E's service territory. NEMA premium shipping data shows that approximately 3,513 premium motors were sold in PG&E's service territory in 2003 (16,730 motors)	Higher rebate levels that more accurately reflect the value of reducing demand on the electrical grid must be established. ASD saturation is presently estimated a 4% by Xenergy, this market is somewhat more difficult to predict potential participation rate due to the application-specific nature of the installations. To succeed, a change in rebate levels, marketing approach, program delivery method and process procedures is mandatory.			
77	Industrial E.T.	H			Source for Therm savings. Must target technology to right application		0	19.5	162	6.24	\$ 0.01	\$ 0.07	\$ -	\$ -	\$ 24.60	With policy changes, high potential for savings possible	Policy changes may be difficult to institute statewide and with regulators			
78	Water Heating	L - M	1- education only 9 - rebates				0	0	0	0.73	-	\$ 0.47	\$ -	\$ -	\$ 2.71	Existing water heating rebate programs apply to single family, multifamily and the commercial sector. They have been effective in delivering natural gas savings in these sectors.	To reach our goal of 4.5 million therms, we would need to increase the number of units in the programs by a factor of 16 over 2004 year-to-date units. This would require us to provide rebates for 57,000 single family water heaters, 30,000 low flow showerheads, 45,000 faucet aerators, and 2,900 storage water heaters, for example, in the residential sector. In the commercial sector, we would need to rebate 164 hot water boilers, about 100 storage water heaters, and about 120 tankless water heaters. Current programs are more focused on electric savings than natural gas savings. To increase the activity level so substantially, we would need to work with Retailers and gear up to offer instant discounts. However, many water heaters are sold through the contractor market which is not a strong point for us right now. Over the last few years we have not emphasized water heaters, due to budget constraints and emphasis on electric savings. Currently we do not have a network of contractors/plumbers that we have worked with, and rebate levels are very low. In addition there is not a lot of product availability for r			

Handout # 10 Future Potential - High Potential Measures Matrix

	A	U	V	W	X	Y	Z	AA
1								
2								
3	End Use/Measure Type	Qst. 3 How to serve market cross-cutting	Existing Efforts Elsewhere and Potential for Program Inclusion	Qst. 5 Package with other energy efficiency & DSM	Qst. 6 Other benefits (societal, environmental, and so forth...)	Qst. 7 Optimize energy savings (type of savings & cost effectiveness)	Qst. 8 Identify policy issues	Qst. 9 Emerging technologies & codes/standards
4	Refrigeration And Appliances	See detail below						
5	Residential	RESIDENTIAL REFRIGERATION: The program can be modified to include refrigerators from commercial accounts. HIP - CW, DW, AND ROOM AC: a. Clothes washers and dishwashers could be included in the Res New Construction program in order to get more high efficiency product installed at construction. Products could be included in water heating efforts to better focus on the energy savings in water and energy.	RESIDENTIAL REFRIGERATION: JACO offers a program where customers pay to have their appliances taken away. The approximate costs are \$15 to \$20. HIP - CW, DW, AND ROOM AC: a. Some retailers offer manufacturer incentives. Explore opportunity for utility to use these incentives along with program offerings to increase customer participation, market penetration, and reduce administrative costs.	RESIDENTIAL REFRIGERATION: Increase participation by incorporating retailers in program promotion the Program for refrigerator sales or Kitchen/Appliance upgrades. HIP - CW, DW, AND ROOM AC: a. As noted above, products could also be incorporated into Res New Construction Rebate Program.	RESIDENTIAL REFRIGERATION: Can connect with the DOE's Appliance Recycling Promotions to maximize Retailer interest. Environmental benefits related to refrigerator recycling and Ozone Depletion are very high due to CFC content in the foam insulation. Contractor has notified us that their process has been nominated by the EPA to be included in an United Nations panel with 20 other countries to address the is. HIP - CW, DW, AND ROOM AC: a. Determine whether water savings can be included in our energy savings estimates; also see about the energy saved in pumping water as an added savings component.	RESIDENTIAL REFRIGERATION: There are no technical obstacles to expanding the Residential Appliance Recycling program. Expansion would call for the vendor to increase manpower for scheduling calls, picking up appliances, and recycling the units. Additional trucks would need to be purchased. This is a labor intensive program and as cost effective as commercial side. However, it is the most cost effective within the residential portfolio related to refrigeration and it addresses equity issues. HIP - CW, DW, AND ROOM AC: To be determined: Contingent on Energy Star or CEE adopting new standards or efficiency levels.	RESIDENTIAL REFRIGERATION: 1) Include refrigerators from commercial accounts 2) How are larger commercial refrigeration systems included? Would this scenario overlap with current SPC? 3) A residential refrigerator rebate program provides minimal savings because of the narrow recycling between standard and high efficiency units. It is important to note that PGC funds are precluded by law from being used for rebates for new refrigerator purchases. 4) What value is placed on the environmental benefits of elimination of the ozone depleting substances? See below. HIP - CW, DW, AND ROOM AC: a. Claiming energy savings that we are not currently ; i.e. water savings.	RESIDENTIAL REFRIGERATION: Issue of OZONE Depleting Substances (CFC in Refrigerator foam insulation) is addressed in a very positive manner in the current Appliance Recycling Program. Has potential to garner emissions credits. HIP - CW, DW, AND ROOM AC: a. Expand CEE involvement on appliance standards and work with PIER/Emerging Technology efforts to identify any new appliance technologies that can be added to future programs.
6	Refrigerators Recycling							
7	Freezers Recycling							
8	Clothes Washers							
9	Tier 2a & 2b							
10	Tier 3a & 3b							
11	Dishwashers							
12	Total Residential							
13	Commercial Retrofit	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: Serving only the refrigeration components of these customers would leave important other savings on the table. However, there are some cross-cutting opportunities through upstream and training programs. • Upstream incentives for manufacturers to stock better equipment	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: EnergySmart Grocer Program - Third Party Program (CPUC funded). Per consultant, the PECCI program described below targets independent grocers but has included some larger chains, overlapping with SBD.Grocers grapple with significant energy concerns — particularly with food refrigeration. The EnergySmart Grocer Program provides grocers with energy audits and information about efficient technology, operations, and management that impacts energy efficiency in their stores. By helping grocers understand the financial benefits of installing energy efficient equipment and providing technical assistance, the program enables them to make sound business decisions about energy efficiency, and then helps them invest in energy efficient equipment by providing rebates to reduce up-front costs. The program highlights the advantages of energy efficient lighting, HVAC, and refrigeration systems. The EnergySmart Grocer program success has resulted from the vendor's willor	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: Refrigeration has a relatively flat load, though there may be good potential for load shifting in refrigerated warehouses. Research is currently underway at UC Davis on the tolerance of certain food for temperature fluctuations. SMALL COMMERCIAL REFRIGERATION: No other existing programs are known that allow for packaging of efforts.	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: CA food processors and food retailers are trying to survive a highly competitive markets due to high cost of business in CA, international competition, and mega-retailers taking market share. They have expressed an urgent need to work more closely with programs. Additionally, there are numerous partners who are very eager to work with PG&E to improve our market outreach and to partner on R&D, Emerging Tech, supporting new incentive measures, etc. They include: • LBNL food processing research and work • CA League of Food Processors • CEC is funding food processing and refig research through PIER • CIFAR – CA Institute of Food and Ag Research has just published a roadmap for energy efficiency in CA food processing • UC Davis new food processing and winery department • CEC is focusing on Food processing SMALL COMMERCIAL REFRIGERATION: By partnering with the Energy Star and CEE's Packaged Solid C Environmental benefits can be calculated by the following formula: Tons of CO2=1.046478 x (MWh x 1000)/2000 Tons of NOx=.000602 x (MWh x 1000)/2000 Tons of SOx=.000368 x (MWh x 1000)/2000	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: None identified at this time. SMALL COMMERCIAL REFRIGERATION: None identified at this time.	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: Limitations on capturing savings from O&M? Investment grade industrial audit program needed to impact market substantially. SMALL COMMERCIAL REFRIGERATION: No current rebate program for new purchases are currently in effect.	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: There are currently few or no codes applying to commercial refrigeration, and there is potential in that area. SMALL COMMERCIAL REFRIGERATION: CEE and Energy Star have developed specifications and qualifying products list for solid door refrigerators and freezers.
14	Large Chain Supermarkets							
15	Independent Supermarkets							
16	Refrigerated Warehouses							
17	RWH - Public Cold Storage							
18	RWH - Chain Distribution							
19	Pharmacies							
20	Convenience Stores							
21	Restaurant/Café - Solid Door Refrig.							
22								
23	Commercial - New Constructions							
24	Large Chain Supermarkets							
25	Independent Supermarkets							
26	Refrigerated Warehouses							
27	RWH - Public Cold Storage							
28	RWH - Chain Distribution							
29								
30	Industrial Retrofit							
31	Refrigerated Warehouses							
32	Refrigerated Processing							
33	Dairy Processing							
34	Beverage							
35	Ice Rinks							
36	Meat and Poultry							
37	Bakery							
38								
39	Industrial - New Constructions							
40	Refrigerated Warehouses							
41	Refrigerated Processing							
42	Dairy Processing							
43	Dairy Farms							
44	Beverage							
45	Ice Rinks							
46	Meat and Poultry							
47	Bakery							
48	Total Non-Residential							

Handout # 10 Future Potential - High Potential Measures Matrix

	A	U	V	W	X	Y	Z	AA
1								
2								
3	End Use/Measure Type	Qst. 3 How to serve market cross-cutting	Existing Efforts Elsewhere and Potential for Program Inclusion	Qst. 5 Package with other energy efficiency & DSM	Qst. 6 Other benefits (societal, environmental, and so forth...)	Qst. 7 Optimize energy savings (type of savings & cost effectiveness)	Qst. 8 Identify policy issues	Qst. 9 Emerging technologies & codes/standards
4	HVAC	Combine with Demand reduction programs. Industry and market segmentation, portfolio marketing to customers. Push/Pull Upstream incentives. Incentives for "Right Sizing" equipment. Focus on increased occupant comfort. Integrated design. Work with developers, architects, engineers.	CHPS, LEED	Opportunity to downsize equipment with whole building analysis (less lighting load - less envelope load) can reduce first cost and increase kW and kWh savings. Demand response capable equipment. TDV effect of 2005 standard	CFC Issues, IEQ, Displacement Ventilation, Productivity	Commissioning and Retro Commissioning Required for optimum energy savings, DDC Controls, System Optimization, Integrated Planning	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. New Title 24 energy code does not consider actual calculated energy use as baseline (uses TDV), so must use "non-compliant" baseline to show actual savings. Determine what constitutes saved energy.	Ground source heat pumps, Passive solar, widespread design and construction of displacement ventilation systems
49	Total Residential							
50	Residential Questions Detail	Early Retirement incentives. Tune-up incentives. Incentives for "Right-Sizing" equipment Various tiered levels for incentives to consumers who take a "system installation approach" which could include each of the following at different levels: charge and airflow, duct testing and sealing, duct upgrades and replacement, attic insulation and window installation (when installed in conjunction with a A/C upgrades) , night ventilation cooling, solar water heating, Hydronic heating systems, variable speed motor upgrades, equipment financing programs , etc. Complete upstream rebate delivery leveraged with manufacturers and distributors single rebate delivery resources. Promotional packages for training incentives for NATE and BPI certification so we get installation and service technicians in the field who understand "how to do it right". Leveraging with external Muni partners to promote cross over programs	CHPS, LEED	Combine with Demand reduction programs. Opportunity to downsize equipment with whole building analysis (less lighting load - less envelope load) can reduce first cost and increase kW and kWh savings. Demand response capable equipment. TDV effect of 2005 standard	CFC Issues, IEQ, Displacement Ventilation, Productivity	Commissioning and Retro Commissioning Required for optimum energy savings	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings. DEER Savings credits may be inaccurate. Market studies are required but not funded	Evaporative condensers, hot dry climate air conditioners, night ventilation systems, zero energy homes, multi-stage and indirect evaporative coolers, passive solar
51	Total Non-Residential							
52	Office	NA	NA	Opportunity to downsize equipment with whole building analysis (less lighting load - less envelope load) can reduce first cost. Demand response capable equipment. TDV effect of 2005 standard	CFC Issues, IEQ, Displacement Ventilation, Productivity. Improved indoor environment	Commissioning and Retro Commissioning Required for optimum energy savings, DDC Controls, System Optimization, Integrated Planning, Right Sizing	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	Ground source heat pumps, Passive solar, Night Ventilation
53	Retail	Target Professional Organizations. Focus on more efficient equipment rather than changes that might affect operation	NA	NA	IEQ, Increased sales (daylighting studies)	Prototype development support for chain store expansion plans, Daylighting potential	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	Advanced controls (radio frequency rather than hard wired allows flexible zoning)
54	School	Target district decision makers, Target government agencies	CHPS	NA	Student Health, Student Performance, Teacher Retention	Package with non-utility incentives/programs	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	New TDV Title 24 changes will create difficulty to exceed code by significant margin
55	College						Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	
56	Hospital	Long term planning -- package ECMs	LEED for Hospitals	NA	Patient health (daylighting and IEQ)	NA	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	OSHPD requirements. Constant volume ventilation requirements vs reliable VSD systems
57	Hotel	Target Professional Organizations	NA	NA	NA	NA	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	NA
58	Warehouse	Customized portfolios for each specific industry	NA	Focus on process loads waste minimization and recovery	NA	NA	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	NA
59	Misc						Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	
60	Restaurant	Target Professional Organizations	NA	Focus on process loads waste minimization and recovery	NA	NA	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	NA
61	Food Store	Focus on more efficient equipment rather than changes that might affect operation	NA	Focus on process loads waste minimization and recovery	System Sizing	NA	Spillover, Free ridership, Upstream claim/potential, Savings for Training/C&S/ET. Title 24 energy code does not consider actual baseline, must use "non-compliant" baseline to show actual savings	NA
62	Lighting							
63	Total Residential	There are opportunities to cross market this new technology to lighting designers, architects, builders, contractors, electricians, lighting suppliers/vendors, etc for use in new construction and retrofit projects.	Only a couple of vendors have product available.	This technology could be package with other programs to provide a whole house approach (res NC or res retrofit). This technology may also be applicable for small commercial/Express Efficiency program. This technology could also be packaged and promoted thru the Energy Star Advanced Lighting package for new homes, and if fixtures are approved by E-Star they could be promoted to the retrofit market as well.	NA	Standard incandescent System: 10 downlights, 65 watts per lamp, material cost \$20 per fixture, installation cost \$30 per fixture, total installed cost \$500, total operating cost per year \$75.92* Standard CFL System: 10 downlights, 13 watts per lamp, material cost \$35 per fixture, installation cost \$30 per fixture, total installed cost \$650, operating cost per year \$58.40* New Kitchen Downlight System 6 downlights, 26 watts per lamp, material cost \$45 per fixture, installation cost per fixture \$25, total installed cost \$420, operating cost per year \$21.02* * operating cost is based on average use of four hours per day and electricity cost of \$0.08 per kWh.	NA	This new technology may need to be used by the builder in new construction or on a retrofit project to meet the new 2005 Title 24 Residential Lighting Standards
64								

Future Potential - High Potential Measures Matrix

	A	U	V	W	X	Y	Z	AA
1								
2								
3	End Use/Measure Type	Qst. 3 How to serve market cross-cutting	Existing Efforts Elsewhere and Potential for Program Inclusion	Qst. 5 Package with other energy efficiency & DSM	Qst. 6 Other benefits (societal, environmental, and so forth...)	Qst. 7 Optimize energy savings (type of savings & cost effectiveness)	Qst. 8 Identify policy issues	Qst. 9 Emerging technologies & codes/standards
69	Total Non-Residential	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Don't know Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Don't know. Metal halides have limited application now in residential design	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Don't know Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Don't know.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Reduced Wattage T-8 Fluorescent Lamps (25 watt): Opportunity exists to bundle marketing effort with scotopic lighting studies since lamp is available in 5000K color. This color temperature might mitigate reduction in illumination occasioned by the lower-wattage lamp Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Could be part of an effort to target retail lighting including lower wattage fluorescents and lower wattage incandescents.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): No obvious other benefits. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Metal halides have longer lamp life and probable lower system operating costs over time.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Don't know. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Replace incandescents which have both energy and higher system operation costs. Technology may be come more attractive as costs go down due to larger market share.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Persistence: higher-wattage lamp could replace lower wattage lamp during relamping cycle. CPUC way not accept savings over time. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Don't know.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Lamp is currently being studied as part of a ET project. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Lamp is currently being studied as part of a ET project.
70	Deemed Savings, Small Retrofit							
71	Calculated Savings, Large Retrofit							
72	Calculated Savings, Nonresidential New Construction							
73	Total Local Government (Res & Nonres)	NA	NA	NA	NA	NA	NA	NA
74	Total San Francisco (Res & Nonres)	NA	NA	NA	NA	NA	NA	NA
75	Total Commercial Lighting Niche Markets	NA	NA	NA	NA	NA	NA	NA
76	Motors	Motor distributors service most, but not all, markets. A continued PG&E Upstream rebate to distributors will cover most markets. Specialty markets and original equipment manufacturers (OEMs) are still excluded as they have distribution channels other than the large mainstream manufacturers.	None identified at this time	We should investigate the possibility of packaging downstream/early replacement programs with Upstream's distributor rebate program. A CEE/DSM/Audits/DR opportunity is clearly an attractive option. Based upon identified geographic system constraints, we could do a targeted marketing blitz that would include special promos such as an enhanced rebate. If we did this in conjunction with targeted audits, we could identify additional, per site, potential for inclusion in the DR programs. A Third party could deliver this program, but we do not recommend this option. The enormous savings potential, customer relationships and PG&E's relationship with national EE leaders of this program would be compromised. However, we could partner, to a degree, with a third party such as our present contract with Energy Solutions. This arrangement allows a 3rd party participant, but keeps PG&E in the principal position.	We can "partner" with: • CEC's strategic industrial motor programs; • DOE's motor challenge program; • EASA's extensive marketing outreach and training programs; and • DOE's marketing of the "100 Free Motors" program and it's future phases. Environmental benefits can be calculated by the following formulas: • Tons of CO ₂ =1.046478 x (MWh x 1000)/2000 • Tons of NO _x =0.00602 x (MWh x 1000)/2000 • Tons of SO _x =0.00368 x (MWh x 1000)/2000	Revisit the claimed savings as it may be understated	Remove the Title 24 savings claim baseline because the system peak is actually reduced by the difference between the currently installed efficiency and the new efficiency, not the title 24 baseline. • Link downstream early replacement motors program with Upstream's distributor rebate program. The strength of the union will significantly leverage the combined program accomplishments and present a very powerful push-pull strategy. • Open Upstream to permit rebates on motors >200hp. • Revise economic summary sheets and work books to accurately reflect energy savings and incremental cost. • Approve a paperless rebate process that does not require a customer's "original" signature. With a paperless process it's possible to pay rebates in 1-2 weeks (or sooner). This will increase the number of participants and the level of participation because participant behavior will be quickly reinforced and the rebate money can be more rapidly re-invested in more motors. • Overcome the conception that push-pull rebates constitute a "double-dipping" situation. The push-pull concept involves "split incentives", not do 2) After the distributor/contractor does a simple manual energy saving calculation, an Instant R This intervention strategy will capture savings with a three prong measure approach: 1) Replac 2) Right-sizing/Downsizing; and 3) Replacement with a NEMA Premium motor upon burnout. • Evaluate an ASD on-line customized, electronically submitted rebate application to reduce pro	None at this time.
77	Industrial E.T.	Deployable teams with select industry knowledge backed up by cross-functional technology experts	None identified at this time	Package with industry-specific offerings, CEC efforts	Emmissions reductions	With high-value niche uptake, large savings for low incentives, moderate outreach costs	Thermal energy storage issues; agreement on fuel switching policies; savings for commissioning, retrocommissioning; incremental cost rules	Low cost savings with potential for ET pilot project opportunities
78	Water Heating	The residential new construction, single family, multifamily and commercial markets all use similar water heating technologies.	Several technologies are available - storage water heaters and tankless (instantaneous) water heaters are the primary technologies in the residential and smaller commercial sector with hot water boilers used in larger commercial buildings.	Could be promoted along with new gas space heaters.	Provides a cost-effective program that addresses the residential market, and can provide substantial energy savings to the multifamily sector.	Current program designs are fairly cost effective.	Any rebates in 2006 to new construction projects will not generate actual savings until about 2008.	Tankless water heaters are unfamiliar to many customers, though not a true "emerging technology" as they are widely available.

Handout # 10 Future Potential - High Potential Measures Matrix

	A	AB	AC	AD
1				
2				
3	End Use/Measure Type	Qst. 10 Known Risk - based on today's knowledge and up-coming studies	Qst. 11 Technology description	Qst. 12 Market Description
4	Refrigeration And Appliances			
5	Residential	RESIDENTIAL REFRIGERATION: Contractor must continue to dispose of the small amounts of Hazardous waste (small PCB switches) in the manner required by State law and maintain appropriate paperwork. This was already addressed by PG&E's Environmental department at the time the 2004/2005 contract was put in place. HIP - CW, DW, AND ROOM AC: None identified at this time.	RESIDENTIAL REFRIGERATION: 1. Process utilized by JACO to capture CFC's in the foam insulation leads the industry. JACO is being nominated to participate on a United Nations panel to address CFC in foam insulation (Ozone depletion). HIP - CW, DW, AND ROOM AC: a. Technologies are already described.	RESIDENTIAL REFRIGERATION: Continuing to reach out to customers with 2nd refrigerators via outreach and education should continue. Expansion to Retailers and manufacturers would be the next step to increase promotion and visibility. Per the RASS, 18% of customers have 2nd refrigerators. HIP - CW, DW, AND ROOM AC: a. See attached Market Potential Summary for PY 2006.
6	Refrigerators Recycling			
7	Freezers Recycling			
8	Clothes Washers			
9	Tier 2a & 2b			
10	Tier 3a & 3b			
11	Dishwashers			
12	Total Residential	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: None at this time.	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: none	MEDIUM AND LARGE COMMERCIAL REFRIGERATION: none
13	Commercial Retrofit			
14	Large Chain Supermarkets			
15	Independent Supermarkets			
16	Refrigerated Warehouses			
17	RWH - Public Cold Storage			
18	RWH - Chain Distribution			
19	Pharmacies			
20	Convenience Stores			
21	Restaurant/Café - Solid Door Refrig.			
22				
23	Commercial - New Constructions			
24	Large Chain Supermarkets			
25	Independent Supermarkets			
26	Refrigerated Warehouses			
27	RWH - Public Cold Storage			
28	RWH - Chain Distribution			
29				
30	Industrial Retrofit			
31	Refrigerated Warehouses			
32	Refrigerated Processing			
33	Dairy Processing			
34	Beverage			
35	Ice Rinks			
36	Meat and Poultry			
37	Bakery			
38				
39	Industrial - New Constructions			
40	Refrigerated Warehouses			
41	Refrigerated Processing			
42	Dairy Processing			
43	Dairy Farms			
44	Beverage			
45	Ice Rinks			
46	Meat and Poultry			
47	Bakery			
48	Total Non-Residential			

Handout # 10 Future Potential - High Potential Measures Matrix

	A	AB	AC	AD
1				
2				
3	End Use/Measure Type	Qst. 10 Known Risk - based on today's knowledge and up-coming studies	Qst. 11 Technology description	Qst. 12 Market Description
49	HVAC	Title 24 Changes, Fed HVAC/Water Heater standards, upcoming Express Efficiency end-use study	Largest potential in chillers. High potential for integrated controls, demand ventilation, HVAC package optimization	High savings from Large Commercial at moderate cost. Substantial savings from residential at high cost. Substantial savings from medium and small commercial market at high cost.
50	Total Residential			
51	Residential Questions Detail	Title 24 Changes, Fed HVAC/Water Heater standards, upcoming Express Efficiency end-use study	Integrated controls, HVAC package optimization	Individual customers and developers. Substantial savings and peak savings at high cost
52	Total Non-Residential			
53	Office	Title 24 Changes, Fed HVAC/Water Heater standards, upcoming Express Efficiency end-use study	Largest potential in chillers. Potential for integrated controls, demand ventilation, HVAC package optimization	Majority of savings from Large Commercial at moderate cost, substantial savings from residential at high cost
54	Retail	NA	NA	Difficult market to serve – more concerned with sales
55	School	NA	Natural Ventilation, Daylighting,	Key market-actor driven
56	College			
57	Hospital	NA	Waste Heat recovery, VSDs	High internal and institutional barriers
58	Hotel	NA	Central systems and controls	NA
59	Warehouse	NA	Opportunities for waste heat recovery	NA
60	Misc			
61	Restaurant	NA	Opportunities for waste heat recovery	Highly diverse market actors
62	Food Store	NA	Opportunities for waste heat recovery	Operates on thin margin less likely utilize ECM that is considered a risk
63	Lighting			
64	Total Residential	Many of the ballast for incandescent and CFL fixtures fail due to the heat build up in the attic. Ballast for downlights are placed in the attic with the fixture and make it very hard to access for replacement. Ballast for this new technology must be make available from within the kitchen.	Fluorescent recessed cans/down lighting system (California Kitchen Lighting System)	Fluorescent recessed cans/down lighting system which can be used in residential new construction (especially in kitchens) for single and multifamily, single family retrofit and multifamily retrofit applications.

Future Potential - High Potential Measures Matrix

	A	AB	AC	AD
1				
2				
3	End Use/Measure Type	Qst. 10 Known Risk - based on today's knowledge and up-coming studies	Qst. 11 Technology description	Qst. 12 Market Description
69	Total Non-Residential	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Not enough operational data available to determine risks for premature failures, ballast complications. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Not enough operational data available to determine risks for premature failures or poor installation performance.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Assume phosphor coating impedes flow of current in lamp reducing wattage. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Ceramic metal halide technology which has been used for several years.	Reduced Wattage T-8 Fluorescent Lamps (25 watt): Commercial building market. May not be as useful in retail lighting applications, but hard to determine. Low wattage Metal Halide as replacement for higher wattage MR16 incandescents and other incandescent PAR lamps: Commercial lighting retail market
70	Deemed Savings, Small Retrofit			
71	Calculated Savings, Large Retrofit			
72	Calculated Savings, Nonresidential New Construction			
73	Total Local Government (Res & Nonres)	NA	NA	NA
74	Total San Francisco (Res & Nonres)	NA	NA	NA
75	Total Commercial Lighting Niche Markets	NA	NA	NA
76	Motors	None at this time.	Motor efficiency upgrades consist of replacing old motors with NEMA Premium efficiency motors and usually occurs at burnout. Motor right sizing/downsizing Real time data logging (using a hand-held data logger to record real time data) will be offered to accurately and persuasively convince customers to make the decision either: downsize, repair or replace the motor. Data logging is necessary to identify operating motors that can be replaced with NEMA Premium efficiency motors. For qualifying motors, we propose to offer an "Instant Rebate" in conjunction with the early replacement program. Vendors/Distributors will complete the early replacement and/or real time manual energy analysis to trigger the PG&E Motor Instant Rebate identification. Replace vs. rewind. Early replacement targets motors that have undergone numerous rewinds. This option targets specific motors for real time data analysis and replacement. Adjustable speed drives (ASDs) control motor loads by varying motor speed with motor load. Real time analyses can be completed with DOE's ASDMaster and linked to rebates. Incentives will be offered to complete real time	We will educate and engage all motor distributors and Electrical Apparatus Service Association (EASA) repair shops in the program.
77	Industrial E.T.	Market approach requires razor sharp promotional tactics and high operational flexibility	Multiple technologies as well as market approaches required	Highly varied markets
78	Water Heating	None known.	Programs include storage water heaters, tankless (instantaneous) water heaters, low flow shower head, faucet aerators, central system natural gas water heaters, central system natural gas boilers, and natural gas boiler controllers.	Single family and multifamily residential market, both existing and new construction, and the commercial and industrial markets, both existing and new construction.