WORKING GROUP 2 DEMAND RESPONSE PROGRAM EVALUATION

SUMMARY OF PHASE 1 RESEARCH

FINAL

Prepared for

Working Group 2 Measurement and Evaluation Committee

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1. EXECUTIVE SUMMARY/OVERALL FINDINGS

This report presents a summary of findings and results from the Phase 1 evaluation of Working Group 2 (WG2) demand response programs. The evaluation commenced at the start of 2004, as a result, there was limited time to gather and evaluate data prior to the March 31 utility filings. Research activities for this report included interviews with utility program managers and account executives, in-depth interviews with small samples of participants and non-participants, review and analysis of customer feedback collected by account representatives, analysis of utility data, and initial results from a large quantitative survey of non-participants.

Overall, it appears that the market is reasonably aware of both the CPP and DBP programs, given their recent approval, but the level of familiarity is somewhat shallow, with few customers knowledgeable about the details of the programs or associated support incentives. Roughly a third of the market reports they are not at all familiar with the new programs.

Actual sign-ups are low across the board for CPP (around 60 accounts, representing 34 unique customers). DBP sign-ups are much higher (roughly 420 accounts, representing 186 unique customers), of which almost 90 percent are from SCE. It appears that different marketing strategies may explain the differences in enrollment (e.g., SCE had specific numeric signup goals for its account reps for the latter half of 2003, while the other utilities did not). No signups have occurred yet for SDG&E's HPO. The expected peak reduction impact associated with current signups is uncertain, as is usually the case with new voluntary DR programs.

Although it is true that adoption takes time and these programs have been actively marketed only since late 2003, the results of this research provide evidence that the WG2 DR programs -- in their current form and with current market conditions -- may not make as large a contribution to achieving overall DR goals as desired. The market appears to need stronger motivation, knowledge, and capability if the DR goals are to be attained.

Given the difficulties of making major modifications before summer 2004, and the fact that the adoption process has not played itself out, we recommend that marketing and support for the current DR programs be continued through summer 2004. At the same time, investigation of potential modifications for 2005 should be intensified, using the results of this ongoing evaluation and utility-specific rate design research. In addition, we believe the current Transitional Incentives Programs may not be as effective as intended. Response to these incentives should be watched closely to assess whether modifications would increase their effect on participation levels. Such modifications might, for example, address customer concerns regarding the timing of incentive payments or compensation for bill protection customers.

Finally, we suggest that new options be considered to further encourage and motivate customers to leave their current "comfort zone" regarding DR capability and willingness. This may require an assessment of which market actors and resources are available and best suited for such an effort. Additional services to help customers identify and carryout DR actions, provided before and throughout this summer, should be considered to help increase the amount of program load reductions that can be achieved from current participants.

2. INTRODUCTION

On June 6, 2002, the Commission adopted R.02-06-001, its Order Instituting Rulemaking on "policies and practices for advanced metering, demand response, and dynamic pricing." In the Administrative Law Judge's Ruling Following Prehearing Conference, dated August 1, 2002, a procedural framework was established. This framework includes three working groups: WG1 - Overall Policy, WG2 - Large Customer Issues, and WG3 - Small Customer Issues. "Large Customers" is defined as customers with average monthly demands of 200 kW or greater.

In Decision 03-06-032, the Commission authorized the three investor-owned utilities' Critical Peak Pricing (CPP) tariff and Demand Bidding Program (DBP), as well as SDG&E's Hourly Pricing Option (HPO) and the California Power Authority's Demand Reserves Program (DRP). This decision also required monitoring and evaluation of the programs and adopted the monitoring and evaluation plan proposed by Working Group 2.

2.1 OBJECTIVES FOR THIS WG2 EVALUATION PHASE I REPORT

The goal of this report is to present a summary of findings and results from the Phase 1 evaluation of Working Group 2 (WG2) demand response programs, specifically, for the Critical Peak Pricing (CPP) tariff, the Demand Bidding Program (DBP), SDG&E's Hourly Pricing Option (HPO), the Bill Protection Plan for CPP, and the Technical Assistance Incentives (for both CPP and DBP).[1] Specific objectives are to:

- Summarize and assess the DR marketing efforts to date for each of the three utilities, including development of timelines for marketing activities, comparisons of marketing approaches, and assessment of results achieved to date

- Develop a preliminary assessment of end user awareness, participation, decision making processes, perceptions, obstacles, and issues with regard to both the DR concept and the specific WG2 programs

- Based on that assessment, provide findings and recommendations to supplement the utilities' March 31 filings, first through a presentation to WG2 on March 15, 2004 and subsequently through this report

- Identify key issues and questions for the next phase of the evaluation research.

It should be noted that this report was not intended to support a specific redesign of DR rates or programs; rather it was meant to assess the design and marketing of current programs and suggest potential areas for modification. Other utility-specific research is focusing on more detailed issues regarding customer trade-offs between program features and possible modifications to the DR programs as a result.

[1] Note that the California Power Authority's Demand Reserves Partnership (DRP) program is not in the scope of the current evaluation.

2.2 ACTIVITIES FOR PHASE I REPORT

This evaluation commenced at the start of 2004, so there was limited time to gather and evaluate data prior to the March 31 utility filings. While an effort was made to conduct the data collection activities sequentially, so that each data collection effort could inform those that follow, the short time frame available for these activities meant that many were done concurrently rather than sequentially. The following data collection and analysis activities were completed.

- Utility staff interviews – After a review of program marketing databases and collateral, interviews were conducted first with the managers in charge of DR programs and/or DR program marketing at each of the utilities, then with other utility staff, including managers of individual programs and customer account representatives. In total, 12 interviews were completed.

- In-depth interviews with customers – Telephone interviews were conducted with 60 customers identified by utility databases as eligible for the DR programs: 28 participants and 34 non-participants. The goal of the customer interviews was to obtain a detailed understanding of customer motivations, awareness, knowledge, infrastructure, reasons for participation and non-participation, desired attributes of DR programs for participation, and perceptions of marketing efforts.

- Collection and analysis of population and participant data – A database of the eligible population of customers or potential customers for the WG2 DR offerings (e.g., including Direct Access customers) was developed, including all available marketing and participation indicators. The purpose of this database was to characterize and track all program and evaluation related activities, retrospectively and on an ongoing basis, and to produce reliable assessments of the effects of program efforts on the target population.

- Incorporation of feedback collected by customer representatives -- In addition to the analysis of in-depth interviews conducted with DR participants, the evaluation team had access to data collected by utility account representatives in the course of their marketing efforts. These data were collected to gain additional insights into customer responses to the DR marketing effort.

Phase 1 evaluation findings were first presented at the March 15, 2004 WG2 meeting (see Appendix A). The March 15th presentation is included as an appendix to this report.

2.3 QUANTITATIVE SURVEY AND SUBSEQUENT DETAILED REPORT

In addition, a quantitative survey representative of the entire eligible market of non-participants for the WG2 DR programs commenced in March. This survey includes 500 decision-maker responses divided among a representative sample of customers based on customer size, business type, and utility service territory. Some of the results of this survey are incorporated in this report, however, because of the time constraint on the filing of this summary report, a subsequent report will be published that includes comprehensive analysis of the quantitative survey as well as additional detailed results from the other Phase 1 research activities.

3. OVERALL DR GOALS, WG2 POPULATION AND PROGRAMS, AND PARTICIPATION TO DATE

3.1 DR GOALS AND WG2 POPULATION

The goal of all the DR programs evaluated for this report is to provide California with greater flexibility in responding to periods of high peak electricity demand. The objective in rolling out these specific programs relatively quickly with limited formal rate design research was to achieve a "quick win" that would take advantage of the new interval meters installed on customers with peak demand over 200 kW, give both customers and utilities experience in implementing statewide DR programs, and deliver significant load reductions for Summer 2004.

Specific numeric goals for the price-responsive DR programs included in Decision 03-06-032 for all DR programs, not just WG2, are presented in Exhibit 1.

Exhibit 1
Price-Responsive Demand Reduction Goals (2003 and 2004 figures are in MW)

	Utility		
Year	**PG&E**	**SCE**	**SDG&E**
2003	150	150	30
2004	400	400	80
2005	3% of annual system peak demand		
2006	4% of annual system peak demand		
2007	5% of annual system peak demand		

As noted previously, the three DR WG2 programs addressed in this report are Critical Peak Pricing (CPP), Demand Bidding Program (DBP), and SDG&E's Hourly Pricing Option (HPO). The total eligible population for these programs for all three utilities is presented in Exhibit 2.

Exhibit 2
Initial Estimates of WG2 Eligible Populations
(Source: Quantum Consulting analysis of data received from PG&E, SCE, and SDG&E)

3 IOUs	Eligible Accounts*	Eligible Accounts MW Sum**	Eligible Account GWh Sum	Eligible for CPP	Eligible for DBP	Eligible for HPO (SDG&E Only)
Size						
Very Small (100-200 kW) - SDG&E Only	2,076	297	897	1,989	2,076	1,988
Small (200-500 kW)	11,426	3,666	12,337	11,388	11,416	1,316
Medium (500-1000 kW)	3,958	2,734	9,761	3,778	3,956	344
Large (1000-2000 kW)	1,462	1,994	7,333	1,284	1,462	94
Extra Large (2000+ kW)	961	5,341	13,422	816	961	51
Business Type						
Commercial and TCU						
Office	3,308	2,120	6,192	3,271	3,298	744
Retail/Grocery	2,220	964	3,966	2,215	2,219	491
Institutional	3,703	2,040	6,254	3,663	3,703	917
Other Commercial	2,810	1,707	6,367	2,765	2,810	691
Transportation/Communication/Utility	1,602	1,209	2,762	1,530	1,601	235
Industrial and Agricultural						
Petroleum, Plastic, Rubber and Chemicals	805	1,108	3,411	711	805	79
Mining, Metals, Stone, Glass, Concrete	646	716	2,891	547	646	27
Electronic, Machinery, Fabricated Metals	1,642	1,171	4,328	1,564	1,642	247
Other Industrial and Agriculture	2,552	2,109	6,923	2,399	2,551	208
Unclassified						
Unknown	596	887	655	590	596	154
Totals	19,883	14,031	43,749	19,255	19,871	3,793

* Excluding Direct Access Accounts
**Non-coincident customer peak demand

3.2 THE CRITICAL PEAK PRICING (CPP) TARIFF

CPP is a rate that includes increased prices during 6 or 7 hours of up to 12 "Critical Peak Pricing" days each year and reduced prices during non-critical-peak periods. Specific prices in the tariff are applied based on participating customers Otherwise Applicable Tariff (OAT). For PG&E CPP customers, savings can occur in summer only; for SCE and SDG&E customers, savings can occur year-round. SCE customers must have an annual maximum demand greater than 200 kW, PG&E customers must have average annual maximum demand greater than 200 kW, and for SDG&E customers the threshold is 100 kW of annual maximum demand. The rate is not available to direct access customers.

There are two levels of Critical Peak Pricing periods. In SCE's and PG&E's programs they are High-Price Periods (3 to 6 PM) and Moderate-Price Periods (Noon to 3PM). In SDG&E's program, they are Period 1 (3 to 6 PM) and Period 2 (11AM to 3 PM). The amounts and percentages of rate credits and charges vary among the utilities:

- PG&E's Energy rates during the High Price Periods are 5 times the Otherwise Applicable Tariff (OAT) for energy and 3 times the OAT during Moderate Price Periods. At other times in the summer, PG&E's On-peak and Part-peak energy rates for CPP participants are reduced by over 22 percent and over 3 percent respectively.

- SCE's rates are about 6.7 times the OAT during CPP High-price periods and 2.0 times the OAT during CPP Moderate-price periods. At other times in the summer, the CPP rates are about 9.3 percent less than OAT energy rates.

- SDG&E's energy rates are 10.0 times the OAT during CPP Period 1 (i.e., the high price period) and 3.79 times OAT for CPP Period 2. At other times in the summer, the CPP rates are about 9.5 percent less than OAT energy rates.

Operationally, each utility determines the day before whether there will be a Critical Peak Pricing Day the next day and notifies participants. SDG&E will e-mail its participants by 4PM, SCE will telephone and e-mail or page starting at 3PM and PG&E will e-mail and page its participants by 5PM. The determination will be based on the forecasted temperatures at specific locations and on other system conditions.

All of the utilities conducted a rate analysis to determine whether eligible customers would pay more or less on the CPP tariff than on their OAT, assuming their previous year's pattern of energy usage with load shifting ranging from 0 to 20 percent. Sample results of these rate analyses are presented in Exhibits 3 and 4 and summarized below:

- For both PG&E and SCE,[2] of the roughly half of eligible customers who would benefit from CPP rates without making any changes to their consumption pattern, 75 percent of them would save less than 1 percent per year, or roughly $2,000 per year.
- For SDG&E, of roughly two-thirds that would benefit on CPP without any change, 75 percent would have savings less than 1.7 percent per year.
- For both PG&E and SCE, of the 99 percent of eligible customers who would benefit from CPP rates with a roughly 20 percent reduction during each CPP event, 75 percent would save less than 1.6 percent per year, or roughly $4,000 per year.
- For SDG&E, of roughly 75 percent that would benefit on CPP with a 10 percent reduction,[3] 75 percent of them would have savings less than 2 percent per year

[2] SCE results are based on GS-2 as the OAT.

[3] The rate analysis provided by SDG&E included only 0, 3, and 10 percent reduction scenarios.

Exhibit 3
PG&E Rate Analysis for CPP Eligible Accounts Assuming 0 Percent Load Reduction in Critical Peak Period (Savings are Negative Part of the Scale)

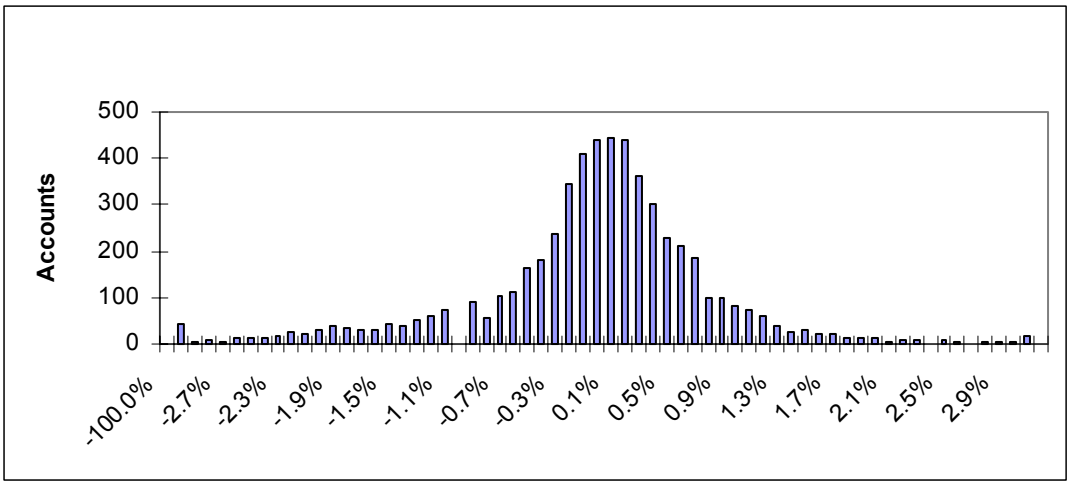
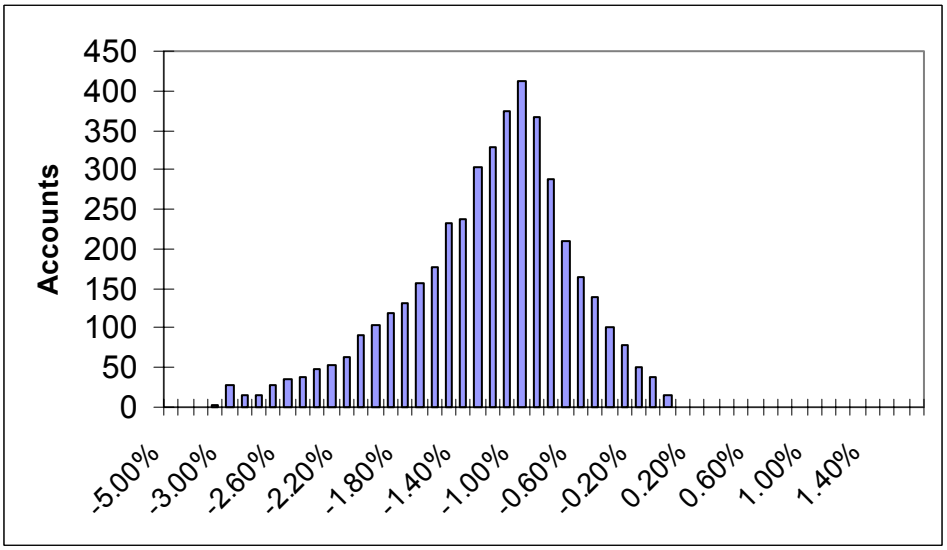


Exhibit 4
SCE Rate Analysis for CPP Eligible GS-2 Accounts Assuming 20 Percent Load Reduction in Critical Peak Period (Savings are Negative Part of the Scale)



3.3 THE DEMAND BIDDING PROGRAM (DBP)

DBP is a program that provides opportunities for customers to promise load shifting during critical periods for a "bid" incentive. SDG&E, SCE and PG&E DBP programs all allow customers with over 200 kW demand who are not on a real-time-pricing schedule to "Bid" (i.e., offer to curtail) usage by 100 kW or more for two or more hours during certain "events" and

receive payment equal to the amount of their actual reduction times the predetermined DBP Price incentive.

Two kinds of "events" may occur:

- Day-Ahead events may be called by the utility when its projected hourly energy costs exceed $0.15/kWh. The DBP Price incentive during these events will equal the utility's projected hourly energy costs. These events will be for 4 or more hours between noon and 8 pm.

- Day-Of events may be called by the utility when its system reliability is threatened or when the ISO declares an emergency. Customers will receive a fixed price of $0.50/kWh for actual reductions.

While there is no limit to the number of these Day-Ahead or Day-Of events, each utility also may declare up to two "test events." Compliant customers will receive a fixed price of $0.50/kWh for actual reductions during test events. Customer's usage reduction bids must be submitted via the Internet by 4:00 PM the day before a Day-Ahead event and by 1:00 PM on a Day-Of event.

A customer's actual hourly reductions are determined by subtracting actual hourly usage from their "Expected Demand" (SDG&E's term) or "Customer Specific Energy Baseline" (SCE and PG&E's term). The baseline for each hour is determined by averaging the same hours during the three highest usage days of the last ten non-event weekdays. While there is no penalty for non-compliance, to get any payment, the customer must curtail at least 50 percent of its Bid usage and will be paid for usage reductions up to 150 percent of its Bid usage.

One of the few differences among the programs is in the form of notification customers receive: SDG&E will e-mail, SCE will telephone, PG&E will e-mail and page using its proprietary Inter-Act System.

Potential savings for DBP customers were estimated below based on amount of demand reduction and the type of bid, assuming participation in four demand reduction incidents per year and four hours per demand reduction incident. Day Before savings were calculated at 15 cents/kWh, Day Of calculated at 50 cents/kWh. As shown in Exhibit 5, the resulting savings ranged from $240 for 100 kW for a Day-Before Bid to $4,000 for 500 kW for a Day-Of Bid.

Exhibit 5
Example Customer Savings for DBP Participation

Savings in kW	*Day Before Bid (@15 cents per kWh reduced)*	*Day Of Bid (@50 cents per kWh reduced)*
100	$240	$800
200	$480	$1,600
500	$1,200	$4,000

3.4 THE SDG&E HOURLY PRICING OPTION (HPO)

HPO is a daily-adjusted hourly electric rate offered only by SDG&E that provides potential cost savings for customers with at least a 100 kW monthly maximum demand who can shift energy usage to lower-priced hours. Participants receive day-ahead notification of hourly electric commodity prices; if they are able to shift their usage, they may be able to reduce their overall cost; if not, they pay higher rates during peak hours.

Through February 2004, no customers were signed up for this tariff. Because this is a market based rate and market prices have not been that high, there has been little incentive for customers to participate in this program. In addition, there is an uncertainty element associated with hourly prices that may keep many customers away. Finally, there has not been much of a real "hourly" market - SDG&E uses an index that has little volatility. As shown in Section 4, customer familiarity of the HPO is still quite low.

3.5 TRANSITIONAL INCENTIVES

The following two incentives are offered to encourage customers to participate in the DR initiatives:

- The Bill Protection Incentive assures participants they will not pay more under the CPP tariff than they would have under their otherwise applicable tariff (OAT) for the first 14 months they participate in the CPP program. To receive the incentive, the customer must reduce on-peak usage by an average of 3 percent for each CPP event during those 14 months.

- The Technical Assistance incentive provides CPP or DBP participants with a cash incentive of up to $50 per kW of curtailable on-peak load reduction to cover the cost of load reduction feasibility studies conducted by CEC-approved professional engineers. Customers receive half the incentive upon certification by the engineer; to receive the other half, customers must provide actual load reductions averaging at least 50 percent of the certified amount during CPP or DBP events.

3.6 OTHER RELATED PROGRAMS

CA Power Authority Demand Reserves Partnership. The California Power Authority's Demand Reserves Partnership (DRP) Program is available to direct access customers as well as large bundled service customers. Like the Demand Bidding Program, customers provide demand reductions when contacted and receive payments for reductions; in addition, however, customers also receive a reservation payment. This program is offered by the California Power Authority, but is marketed by the utilities and energy service providers.

California Energy Commission's Enhanced Automation Program. The California Energy Commission's "Enhanced Automation" education campaign is designed to inform customers of building automation and controls upgrades available to save money on their electric bills and support participation in DR initiatives. The education packet provided to customers includes case studies of success stories, a Business Case Guidebook and a Technical Options Guidebook.

3.7 PROGRAM PARTICIPATION TO DATE

Participation to date varies widely across utilities and across programs. As summarized in Exhibit 6, participation for CPP totaled 57 accounts, for DBP 420 accounts, and no customers were signed up for HPO.

SCE accounted for approximately 90 percent of DBP participants and has no CPP signups. Initially, SCE had virtually no customers that would benefit from CPP because of an inconsistency between CPP and the otherwise applicable tariff that was not corrected until late December 2003. PG&E had 8 DBP and 20 CPP participants. SDG&E had 5 DBP and 10 CPP participants.

Exhibit 6
WG2 DR Program Participation to Date[4]

3 IOUs	Participants	Participant Account MW Sum*	Participant Account GWh Sum	CPP Participants	DBP Participants
Size					
Very Small (100-200 kW) - SDG&E Only	2	0.4	1	1	1
Small (200-500 kW)	205	63	323	16	189
Medium (500-1000 kW)	130	93	373	23	107
Large (1000-2000 kW)	82	113	442	17	66
Extra Large (2000+ kW)	56	296	1,428	0	57
Business Type					
Commercial and TCU					
Office	34	26	97	1	32
Retail/Grocery	131	46	267	0	132
Institutional	32	79	350	10	22
Other Commercial	61	67	275	11	50
Transportation/Communication/Utility	37	29	81	14	23
Industrial and Agricultural					
Petroleum, Plastic, Rubber and Chemicals	48	80	353	3	45
Mining, Metals, Stone, Glass, Concrete	30	90	497	3	28
Electronic, Machinery, Fabricated Metals	50	90	403	2	49
Other Industrial and Agriculture	50	57	234	13	39
Unclassified					
Unknown	2	2	10	0	0
Total Accounts	475	566	2,567	57	420
Total Customers	220			34	186

*Diversified customer peak demand

[4] Data through the end of March for PG&E and SDG&E, for SCE the data is through the end of February.

4. ANALYSIS OF PHASE 1 RESEARCH RESULTS

4.1 MARKETING ACTIVITIES TO DATE

One of the key factors influencing the implementation of the DR programs has been the short time frame in which they were developed and introduced. The chronology of events surrounding the programs' approval and implementation therefore takes on additional importance to an evaluation of the progress of the programs to date. A summary of the marketing activities of the IOUs drawn from documents and interviews with program managers at each of the utilities is presented in Exhibit 7.

While the approach to marketing of the DR programs by the three utilities was similar in many respects, it differed in others, according to the program managers and account reps. Areas of similarity included:

- **Common state-wide collateral**. A decision was made in mid-2003 to develop a single marketing package that would be used by all the utilities, with all the utilities working to develop an agreed-upon format and content and SDG&E spearheading the actual production of materials. The availability of consistent collateral across utilities had the clear benefit of supporting the state-wide approach desired by the CEC/CPUC, but it also made the collateral development process time consuming and more complex. As a result, the statewide collateral package was not available until October 2003. This led both PG&E and SCE to develop their own collateral to support earlier marketing efforts, as discussed below. However, the utility-specific materials were also very similar in their approach and content.

- **A focus on using account managers/executives/representatives as the primary delivery mechanism for the marketing effort**. Most of the market eligible for the DR programs is comprised of customers large enough to have an assigned account representative, and all the utilities used the account representatives as the point of contact for informing these customers about the DR programs. One-on-one meetings were the primary means of communicating, with multiple visits or contacts typically required to complete the marketing and enrollment process.

- **Use of rate analysis to demonstrate the effect of the CPP tariff on the bills of targeted customers**. All of the utilities conducted rate analyses on billing data of all eligible accounts. The rate analyses consisted of hypothetical electricity bills calculated by applying the CPP tariff to the previous year's usage pattern assuming load shifting during CPP events ranging across several scenarios, including a no reduction case. These rate analyses were made available to account executives to use at their discretion during their DR marketing meetings with customers. Account executives were not required to present the rate analyses to all customers and did not believe it was necessary or productive in all cases, particularly for customers for whom rate analyses showed significant increases in bills.

Exhibit 7
WG2 DR Program Marketing Activity Timeline[5]

			Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	January
	Rate History							SDG&E CPP, DBP Rates filed 7/11, in effect 8/8	PG&E CPP and DBP Rates Approved 8/1/03	SCE CPP and DBP Rates Approved 9/5/03	Statewide collateral available		Revised SCE CPP Rate Approved 12/24/03	
PG&E	**Marketing Activities**		Initial training with 260 AEs			Text-based fact sheet developed		Internal "glossy" collateral developed	Full-scale assigned customer marketing					
						Initial assigned customer contacts			Emeter marketing to unassigned accounts					
	No. of Accts.	DBP								1	5	7	8	8
		CPP									8	14	19	20
SCE	**Marketing Activities**				Product rollout for reps at CTAC				Product rollout for customers at CTAC		Statewide and SCE packets sent out	DBP website training sessions		
				Newsletter				Newsletter	Newsletter		Newsletter		Newsletter	
			DR dicussed in California Electricity Marketplace Updates								Full-scale marketing			
								Internal training for reps						
								Internal collateral developed, used in customer presentations						
	No. of Accts.	DBP								9	39	131	384	393
		CPP												
SDG&E	**Marketing Activities**							Initial one-on-one meetings with customers						
				Internal workshops preparing customers for DR programs										
						Internal collateral done								Full scale marketing kickoff
	No. of Accts.	DBP												5
		CPP												10
		HPO												0

[5] This summary is intended to be representative of activities as summarized by utility representatives and may not include all activities related to marketing DR programs.

- **Focus on AB970 participants**. All the utilities were required to focus on AB970 DR participants; however, many of these were direct access customers and therefore not eligible for the DR programs.

Differences in the approach to marketing DR could be seen both in the timing and overall emphasis of the marketing efforts.

- **SCE** had an explicit goal of signing up customers to meet the kW targets set forth in its WG2-related DR goals. The total WG2-related DR goal for the SCE service territory was allocated among account representatives according to their customer base, and the goal was incorporated into each account rep's performance plans. SCE began actively marketing these rates in October 2003, and even before then had sent out newsletters and provided customers with training on the use of its online DBP tool. SCE also internally produced specialized, more in-depth marketing pieces for use in discussions with its customers. SCE used incentives to orient its account representatives to achieve specific signup goals for the DR programs. (Note that SCE had virtually no CPP benefitters in 2003 because of a lag in regulatory approval between a rate reduction for the otherwise applicable tariffs, which occurred in September, and carrying through of that reduction in the CPP December.)

- **PG&E** set as its goal to reach 100 percent of eligible customers and make them aware of CPP, DBP, and CPA-DRP programs by the end of 2003. PG&E held an initial meeting with all account managers in February 2003 to provide an overview of the coming rates, but had to wait until late July for final rate approval. Rather than wait for the statewide materials, PG&E developed its own marketing pieces before the statewide materials became available. This collateral was also provided to and used by a contractor hired by PG&E to conduct an email and telemarketing campaign to unassigned accounts. PG&E had reached its goals for 2003 based largely on participation in the CPA-DRP programs. PG&E had goals for its account executives to achieve awareness goals and obtain customer feedback in 2003.

- **SDG&E** chose a later rollout for in-person contacts. SDG&E waited for statewide collateral, but then found that customers were not interested in talking about what they perceived to be summer rates in the fall. Instead, SDG&E held its full-scale kickoff in early 2004 so that it could incorporate end-of-2003 changes to its TOU rate, which is linked to the CPP rate. SDG&E also conducted workshops earlier in 2003 preparing its customers for the CPP, DBP, and HPO programs prior to program availability.

It is clear that the 2003 marketing efforts for all the utilities were affected by the relatively short time frame between the approval of the DR programs and the end of the year. Overall, however, despite the difference in approach, timing, and the extent of utility-specific marketing materials used, the basic message being conveyed to customers was consistent. The statewide collateral helped ensure that representatives from different utilities were "on the same page" when describing the programs to their large time-of-use customers. In addition, as discussed further below, the utilities generally succeeded in achieving significant levels of awareness among eligible customers of the new DR programs.

4.2 CUSTOMER PERCEPTIONS OF MARKETING ACTIVITIES

Based on the results of in-depth interviews with customers,[6] the overwhelming majority of participants and non-participants learned about the DR programs from their utility representative;[7] only two participants and three non-participants reported learning about the programs from other sources. Many participants said they made their decision to participate based solely on the utility representative's presentation and recommendation.

As the above suggests, the overwhelming majority of participants and most non-participants interviewed hold their utility representative in high regard. Almost all participants and over half of non-participants interviewed said the utility representative's presentation on the DR programs was very effective; only two non-participants (and no participants) rated the presentation as not at all effective.[8]

Responses regarding the quality of collateral and other program materials suggest they are effective. Over 90 percent of in-depth interview respondents said they thought the information was "very effective" or "somewhat effective," although many of these same customers subsequently provided comments that they had not read or did not remember the materials.[9] The few respondents who said the material was "not effective" likewise offered comments that they had not seen or did not remember the materials.

4.3 ACCOUNT REP PERCEPTIONS OF MARKETING ACTIVITIES

Because of the relative complexity of the DR programs and the difficulty of explaining all aspects of the programs thoroughly in what is essentially a piece of marketing literature, the role of the utility representatives takes on particular importance for these programs. Considerations raised by several program and account managers in connection with their role in marketing the DR programs included the following:

- Several program managers emphasized that their account representatives are not a sales organization; they are more oriented to helping customers make decisions that are in the customer's own best interest.

- In part for the above reason, account representatives say it is very important for them to maintain credibility with the customer. If they are perceived to be promoting programs or actions that have little benefit for the customer, credibility suffers. Some account reps

[6] In-depth interviews were completed with 28 participants and 34 non-participants.

[7] Initial results from the quantitative survey indicate that two-thirds of the market learned about the new DR programs from direct contact with their utility.

[8] Initial results from the quantitative survey indicates that three-fourths of customers recalled receiving some type of information from their utility on the new DR programs; of these, nearly 80 percent said the information received was "very" or "somewhat" helpful.

[9] Sixty-three percent of customers in the quantitative survey reported that they remembered receiving brochures and print materials about the new DR programs.

said that they could not aggressively promote the DR programs to customers who would see only minimal benefits (if any) in return for significant effort and risk.

- A few of the customers targeted by the DR programs had bad experiences with interruptible rates during the energy crisis, and remain skeptical of any program or rate that could cause them to face similar disruptions.

- Account representatives already had a full workload before the DR programs; marketing these programs has been an additional demand on their already busy schedule.

- There is little current sense of urgency among most customers regarding electricity supply and pricing, which makes it more difficult for account representatives to promote the DR programs.

4.4 AWARENESS, FAMILIARITY, AND DECISION-MAKING STATUS

Awareness and Familiarity

The exact extent of customer awareness of the DR programs is difficult to gauge from the limited number of in-depth interviews conducted, however, familiarity levels are being determined more precisely with the results from the quantitative survey, which has just been completed and will be presented in greater detail in a future report.

In-Depth Interview Results. The in-depth interviews indicated that most nonparticipants are aware of the programs, and, at this time, believe they have made a decision not to participate. Almost 90 percent of the customers interviewed in-depth are familiar with the demand response program concept, while the percentage aware of the CPP and DBP programs ranged from 33 to 100 percent across utilities, as shown in the exhibit below.

Exhibit 8
DR Program Awareness – In-depth Interviews

		Participants		Nonparticipants	
PG&E	Critical Peak Pricing (CPP)	11	92%	10	71%
	Demand Bidding Program (DBP)	6	50%	8	57%
	Both CPP & DBP	5	42%	7	50%
	Observations	12		14	
SCE	Critical Peak Pricing (CPP)	6	46%	12	75%
	Demand Bidding Program (DBP)	13	100%	10	63%
	Both CPP & DBP	6	46%	10	63%
	Observations	13		16	
SDG&E	Critical Peak Pricing (CPP)	1	33%	3	75%
	Demand Bidding Program (DBP)	3	100%	3	75%
	Both CPP & DBP	1	33%	3	75%
	Observations	3		4	
ALL	Critical Peak Pricing (CPP)	18	64%	25	74%
	Demand Bidding Program (DBP)	22	79%	21	62%
	Both CPP & DBP	12	43%	20	59%
	Observations	28		34	

This awareness does not indicate detailed understanding of these relatively complex programs, however. Only 1 of 9 CPP participants said they were very familiar with that program, while only 9 of 19 DBP participants were very familiar with the program in which they had enrolled.

Lack of detailed understanding of the programs is corroborated by respondent familiarity with the transitional incentives. These incentives are described on the first page of both the CPP and DBP sheets in the statewide collateral, and are also featured on a separate sheet in the statewide packet. Nevertheless, customer familiarity with these incentives is limited.

- More than 60 percent of both DR participants and non-participants said they were not familiar with the Bill Protection incentives.

- Over half of participants and two-thirds of non-participants said they were not familiar with the Technical Assistance incentive.

Finally, few in-depth interview respondents are familiar with other DR programs.

- Only three participants and four non-participants claimed to be aware of the CEC's Enhanced Automation program.

- Only one SDG&E customer claimed to be very familiar with that utility's HPO program. No customers claimed to be somewhat familiar.

- Only two participants and two non-participants claimed to be somewhat familiar with the CPA Demand Reserve Partners program. No one claimed to be very familiar with the program.

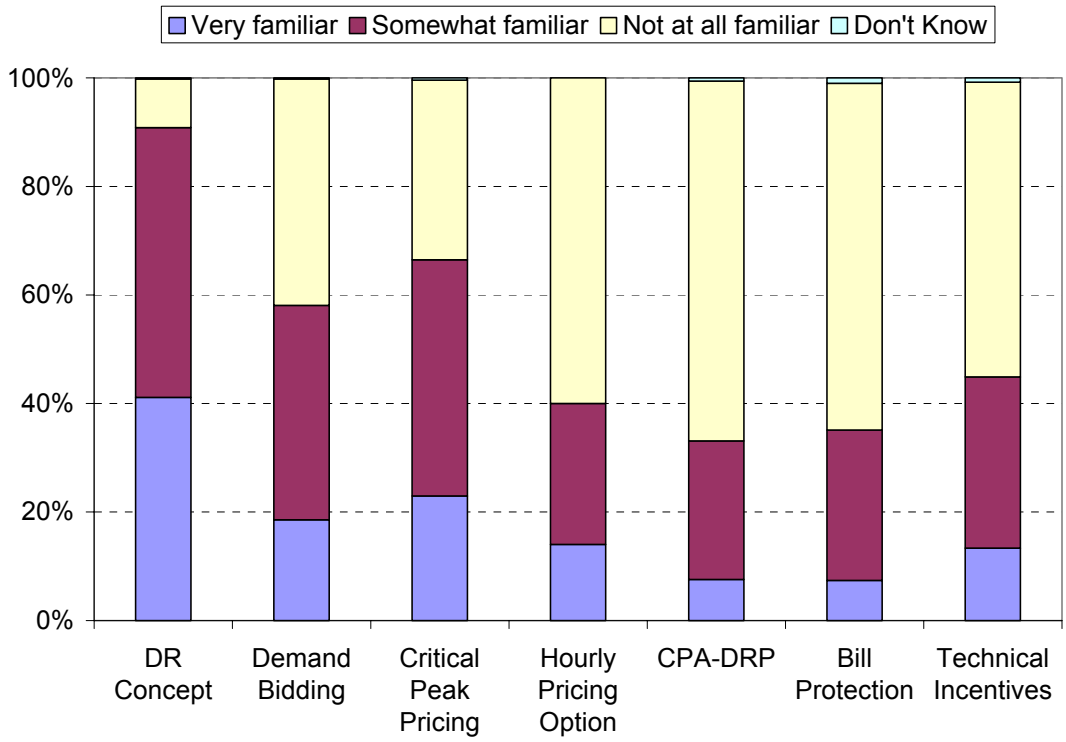
Quantitative Non-Participant Survey Results. Initial DR concept and program familiarity results from the quantitative survey are shown in Exhibit 9. These results are generally consistent with the findings from the in-depth interviews.

Status of Decision-making on Program Participation

In this subsection, we present interview results related to the issue of the current status of customer decision-making about the new DR programs. Our research sought to illuminate the extent to which customers believed they had or had not made definitive decisions about participating.

In-Depth Interview Results. The in-depth interview results indicate that lack of detailed knowledge of DR programs has not kept customers from believing they had already made decisions about participating in them. The vast majority of non-participants interviewed said they are unlikely to enroll in either program – primarily because they view load shifting or load reduction as incompatible with existing business operation. Secondary factors include lack of financial motivation and uncertainty/changes in programs over time.

Exhibit 9
DR Concept and Program Familiarity – Quantitative Survey of 500 Non-participants



Moreover, non-participants give little indication that they would be induced to sign up if changes were made to the CPP and DBP programs. The common customer perception is that business and operational concerns override any savings that might be possible through these programs.

For customers who have enrolled in these programs, many do not anticipate having to make major changes to their usage pattern as a result of their participation. All of the CPP participants interviewed said that they had to do nothing, or very little, to benefit, since their peak loads were during system off peak times. Some account representatives said they sought out such customers as participants in order to build experience with the program.

DBP participants said they signed up for the program because there is no risk (i.e., no penalty for non-response) and, to a lesser extent, for potential savings/reduced costs. It is not clear how many DBP participants are committed to making bids, only about half said they are likely to make a bid in the coming summer. DBP participants say that they will reduce demand when they can, but that demand reduction is not a high priority, and they are unlikely to be driven by the program incentives. One customer who signed up for DBP expressed concern about being able to comply with curtailment requests in light of his facility's production schedule.

Over 80 percent of non-participants said they chose not to participate in the DBP program because they are unable to shift or reduce load. In addition, two former DBP participants

decided to forgo this year's program because no bids were accepted last year, citing the time and cost of participation as reasons.

Quantitative Non-Participant Survey Results. Initial program decision-making results from the quantitative survey are shown in Exhibits 10 and 11. Approximately 4 percent of the respondents indicated that they plan to participate in the CPP and DBP. About one-quarter indicated they had made a firm decision not to participate, while another quarter were either still deciding or had not considered the participation issue one way or the other. The remaining customers were those that stated they were unfamiliar with the programs. Of twenty respondents that were familiar with the SDG&E HPO, one indicated they planned to participate, 9 had decided not to participate, and 9 were still deciding or had yet to consider it.

Exhibit 10
CPP Decision-Making – Quantitative Survey of 500 Non-participants

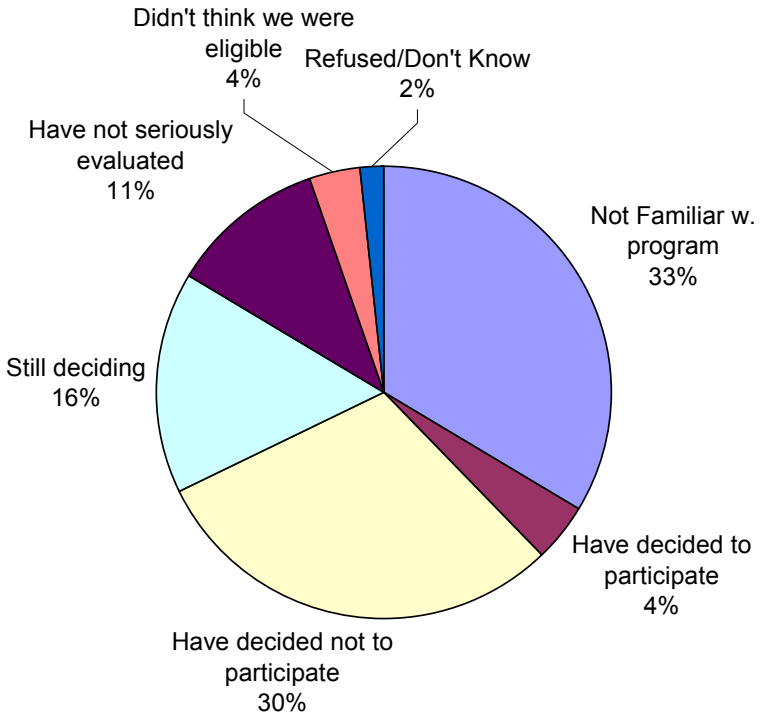
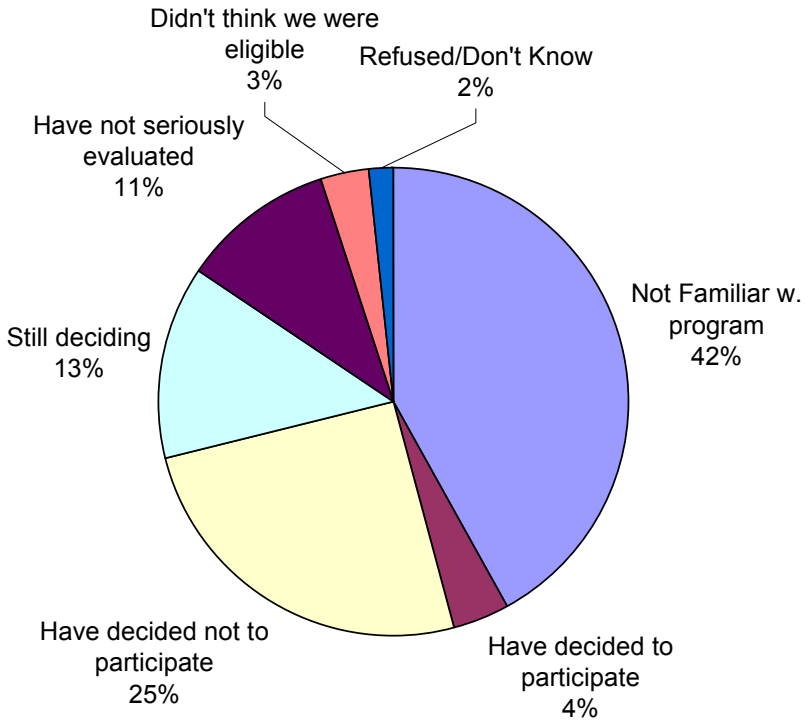


Exhibit 11
DBP Decision-Making – Quantitative Survey of 500 Non-participants



4.5 CUSTOMER FEEDBACK TO UTILITY ACCOUNT REPRESENTATIVES

In addition to the analysis of in-depth interviews conducted with DR participants, the evaluation team had access to data collected by utility account representatives in the course of their marketing efforts. All three utilities sought and obtained customers feedback through their account managers. Because a disinterested third party did not interview these customers, this feedback is not considered independent market research. Nevertheless, the results provide useful insights into customer perceptions of the DR marketing effort, their own ability to shift load, and their interest in participating in one of the DR program offerings.

4.5.1 Southern California Edison

SCE representatives conducted in-person meetings with customers to discuss both CPP and DBP, and completed a short survey during some of the meetings to assess customer response. Respondents were not selected at random; the survey yielded 809 records (roughly 10 percent of eligible accounts); since some customers had multiple accounts, 621 Surveys could be associated with unique customers. Respondents ranged in size from small (200-500 kW) to extra large (>2000 kW), and included institutional, commercial, and industrial/agricultural business types.

Results of this informal survey indicated that only 58 percent of customers were eligible for both programs, but 82 percent were eligible for at least one, including 65 percent who were eligible for CPP.

CPP Tariff

Regarding the CPP, 35 percent of customers said they had been presented with a rate analysis; of those, 18 percent benefited under the new rate with no load reduction, while 55 percent benefited with a reduction of 1 to 15 percent.

- Only one-fifth of respondents said they "agreed" with the rate analysis results in that they thought such level of load shifting was feasible for them.[10] Small and Industrial customers were somewhat more likely than others to agree with their rate analysis.

- Those whose results showed a savings with no load shift were more likely than others to agree with the analysis results, at 36 percent. These customers also had the highest likelihood of participation in the rate.

- A notable fraction of customers (22 percent) agreed with the rate analysis (which showed they could save with some load shifting), but indicated they were not interested in participation.

A large majority of respondents – 80 percent – said they did not intend to participate in CPP, 19 percent were undecided, and 1 percent intended to participate.

- The generally negative response is reflected in the percentages who said they were unable to shift load (43 percent),[11] that production requirements prohibited load shifting (31 percent), that the program is too complicated or risky (22 percent), or that the program was not cost-effective for them (18 percent).

- Among those who believe their organization could shift load, the most common comment is that the program is too complicated or risky.

- However, nearly half of those who were undecided about CPP expressed positive interest in the program when asked.

Demand Bidding Program

Consistent with SCE's participation to date, customers responded more favorably to the DBP than to the CPP. Nearly 60 percent of respondents expressed some interest in DBP participation,

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[10] Note that the answer to this question bundled agreement with both the rate analysis itself and the assumption of load shifting associated with the peak reduction scenarios, only one of which was a zero reduction case. As a result, one can not discern whether customers doubted the rate analysis itself, the reduction scenarios, or the certainty of their current year load shape as a predictor of next year's load shape.

[11] This may be due to a lack of experience with enabling technologies and DR operation strategies; increased experience and knowledge might change beliefs regarding a site's ability to shift load.

with the highest levels of interest among extra large and industrial customers. Overall, 28 percent of customers said they are actively considering participation.

The more positive response to DBP than CPP appears to be attributable to a simpler, less risky program design, and the perception of more cost effective participation. Only two percent stated the DBP program was too complicated or risky (versus 22 percent of for CPP), and 13 percent feel the program is not cost effective for their organization (versus 18 percent for CPP).

- The primary reason for not considering DBP participation is the inability to shift load; similar to the CPP responses, 43 percent state that they are unable to shift load, including 30 percent who say they are unable to shift load for production reason.

- Among those able to shift load, concerns about cost effectiveness top the reasons provided for not participating. Organizational impediments to participation approval was also frequent

Other Programs, Transitional Incentives, and Participation History

Interest in the CPA Demand Reserves Program is uniformly low with 84 percent claiming no interest, and only 2 percent expressing strong interest. Similarly, interest in transitional incentives and enhanced automation services is low.

Those with demand response program experience were more likely than others to consider participation in both programs (defined as 'yes' or 'undecided'). The effect is larger for DBP, where 73 percent of those with DR experience are considering participation versus 45 percent of those with no experience. For the CPP program 23 percent of DR experienced customers are interested versus 17 percent of customers with no DR experience.

Participation in energy efficiency incentive programs does not impact customers attitudes towards the CPP and DBP programs; there are similar percentages of those with and without past experience that have interest in the programs

4.5.2 PG&E

PG&E engaged Nexant to conduct an analysis of responses from more than 2,000 customers obtained from account manager meetings with customers. Note that PG&E's results are based on what was very close to a census of assigned customers at the time of analysis. Of the customers met with, 68 percent said they had no interest in any DR programs. Among the 32 percent who expressed some interest, 13 percent were interested in CPP, 8.8 percent in DBP, and 16 percent in CPA/DRP (totals exceed 32 percent because some customer expressed interest in more than one program.)

CPP Tariff

CPP interest level across customer types ranged from 10 to 29 percent.

- Customer types with the highest percentage of CPP interest (the number of interested customers as a percentage of those eligible for the rate) include heavy industry (29

percent), lodging (27 percent), and the grocery/restaurant and extraction industries (21 percent each).

- Customer types with the lowest CPP interest were warehouses (10 percent), agriculture (11 percent), and health services and pumping industries (12 percent each).

- Customers who say they can shift load are more than twice as likely to be interested in the CPP Program compared to all eligible CPP customers. Even so, two-thirds of the eligible sub-population who say they can shift load are not interested in CPP.

- Customers who participated in past LM/DR programs are slightly more likely to be interested in the CPP Program compared to all eligible CPP customers.

All of PG&E's CPP program sign-ups at the time of these interviews would be categorized as structural benefitters,[12] that is, customers who benefit from this tariff without changing any business operations if they maintained their 2002 pattern of energy consumption. Among 455 structural benefitters, only 22 percent are interested in the CPP Program; that so few customers who benefit with no change in usage accept the CPP tariff is seen as a strong indicator for tariff redesign or repackaging. Customer comments indicate that the primary reason for lack of interest in CPP is small savings for a high level of customer effort (in terms of approval and paperwork to change tariffs) and risk (e.g., projected saving may not eventuate due to changes in load shape that are outside the customer's direct control).

Demand Bidding Program

DBP interest level across customer types ranged from 0 to 27 percent.

- Customer types with the highest percentage of DBP interest include refrigerated warehouse (27 percent), pumping Industries (26 percent), and food manufacturing (21 percent).

- Customer types with the lowest percentages of DBP interest include lodging (0 percent), retail (3 percent), grocery/restaurant (4 percent), and extraction industries (5 percent).

- Customers who say they can shift load are twice as likely to be interested in the DBP compared to all eligible DBP customers. Even so, 80 percent of those who say they can shift load say they are not interested in DBP. The highest ranked factor for lack of interest in the DBP is "small savings – internal cost and effort too high."

Other Programs, Transitional Incentives, and Participation History

PG&E customers see bill protection as an essential feature of the CPP Program: 78 percent of customers interested in the program and 94 percent of signed CPP customers are interested in bill protection. However, PG&E account managers note a concern among customers that bill

[12] This assumes their previous year load shape accurately predicts their next year's load shape. Even structural benefitters face some risk that they may not save if their next year load shape is a higher critical peak period load than their base year shape due to factors, like weather and economic conditions, outside of their control.

protection true-up over 14 months may conflict with customer's perspective on time value of money.

Among CPP interested customers, there was similar interest in technical assistance (TA) incentives (28 percent) and the Enhanced Automation (EA) program (25 percent). However, for customers interested in DBP, there was a difference in interest in the support programs: 27 percent for TA versus 14 percent for EA, despite the fact that EA is free and does not require participation in a DR program. Objections to the use of TA and EA incentives may be the result of customers who wanted to use in-house engineering expertise or objected to third party (non-PG&E) entities looking into customer operations.

Customers who participated in past LM/DR Programs were slightly more likely to be interested in both the CPP and DBP programs compared to all eligible customers.

Conclusions of Nexant Analysis of PG&E Account Manager Data on Customer Interest

Nexant concluded that PG&E current DR Program initiatives are successful in:

- Exposing all eligible customers to the current demand responsive (DR) program options.
- Collecting significant customer input (quantitative and verbatims) regarding interest levels in the new programs.
- Effectively positioning PG&E account services to market the new DR programs to customers.

They also identified several barriers to the current DR programs, including:

- Structural barriers – current tariff is designed to be revenue neutral with no losers, is inherently complex, and has limited applicability in some sectors; DR marketing was challenged by end of summer timing of tariff decision approval and the time it took to receive statewide marketing materials.
- Customer interest barriers – limited benefits for high implementation efforts ("What's in it for me?"); no perception of a current crisis; priority of business/operational concerns.
- Internal PG&E barriers – Account Managers (AMs) customer visits, during the past energy crisis, focused on the energy crisis not product offerings; new tariff structure and financials impacts AMs credibility; new program marketing adds time-sensitive duties on top of existing full work load.

4.5.3 SDG&E

SDG&E obtained feedback from customers contacted to date through its account executives (AEs) and program managers who made contact with them. Cross-cutting comments regarding DR programs in general included the following (all comments in quotation marks are quotes by SDG&E AEs):

- Many customers are either too large or too small to participate in the SDG&E DR programs. "A lot of customers are direct access (DA) and can't participate in SDG&E programs." On the other hand, "many customers are too small; they can't participate because they can't aggregate load, and their individual loads are too low."

- "Not all customers have the IDR & metering equipment."

- One AE reported that "many customers say they have already taken conservation and load reduction measures to the fullest extent; they can't reduce another 100 kW." Similarly, another AE reported that "thermostats are already turned up; they are doing everything they can already to reduce load."

- Some customers who are in reliability-oriented programs such as RBRP think they are already participating in DR programs. "They don't know the difference between 'price' and 'reliability', they just know they are participating. "

- "Customers don't want to have to sign a contract to participate in a 'voluntary' program."

CPP Tariff

According to the SDG&E AEs, customer concerns regarding the CPP included both their lack of infrastructure and the incompatibility with normal business operations.

- One AE noted that bundled service customers between 100 kW and 300 kW do not have a 15 minute interval meter. For these accounts "the CPP rate can be a hard sell due to the lack of a rate analysis."

- Several AEs said customers considered CPP participation inconsistent with their business needs.
  - Property management companies reported that they could only participate in a "voluntary" program.
  - A convention center said that "they are at the mercy of the events that are booked at the time and not willing to turn out the lights or compromise the shows going on."

- There were some customers who responded positively to the CPP rate, although one AE pointed out that "customers signing up for CPP can save by making little or no change to their current operation."

Demand Bidding Program

While the lack of required load shifting makes the DBP attractive to more customers, SDG&E's AEs report that there are still significant barriers to customers signing up.

- One AE said that "school districts have not been willing to sign onto Demand Bidding. They tell me they do not want to take the teachers calls and complaints or the phone calls from parents that are complaining."

- The complexity of the DBP program is an issue for some customers. "The contract is so cumbersome, they have to have the legal department review it, and then their cost center is charged," which offsets the savings that might be achieved.

- Other customers reportedly feel that "this program is too much work for the money, with getting e-mail, dropping load, etc."

AEs stated that a number of customers were interested in DBP, but needed to do additional research or acquire more information. Several customers were interested, but not sure if they could drop 100 kW (this was cited for at least three customers).

Other Programs

Since so many of the customers contacted were Direct Access, a number of AEs said they discussed the possibility of participation in the CPA-DRP program with these customers. Most customers were, however, reluctant to participate in this non-utility program.

- Several customers were afraid to participate in CPA-DRP because of the uncertainty regarding the future of the program and the agency that administers it.

- One property management firm cited changes to the program mid-stream, as well as the detail and complexity of the contract. This customer had 27 comments regarding the CPA-DRP contract.

- Several large retailers also mentioned the complexity of the CPA contracts. One firm's legal department decided not to proceed; another said they would be interested in participating in utility programs only; not in working with a third party.

- A shopping center management company also was not happy with the CPA program, noting that it took a full year to obtain their program participation check for $65,000 (and "it wasn't worth the hassle"). Also, "they prefer to work with the utilities and did not like dealing with the DR Providers."

The HPO tariff was discussed by one AE as "possible" for a municipality because of large transmission rate increases, but no action was taken and further analysis was needed.

Conclusions and Recommendations

Based on feedback from their customers, SDG&E AEs offered several suggestions for potential changes that might encourage more firms to participate in the DR programs.

- Consider programs for smaller customers to participate in and/or be able to aggregate load, including smaller firms with backup generation capacity.

- Since DA customers already have phone lines, modems, IDR meters, it may be appropriate to provide them with kWickview as an incentive to participate in the CPA-DRP program.

5. CROSS-CUTTING ANALYSIS OF ISSUES

Key issues raised by the results obtained from program manager, account executive, and customer interviews are discussed below.

5.1 MARKETING ISSUES

It appears that PG&E and SCE reps succeeded in contacting all or most of their eligible customers before the end of 2003, while SDG&E chose to begin its full-scale, direct marketing campaign in 2004. While the utilities have attained significant achievements in raising awareness and tracking response, the level of customer familiarity with DR programs is somewhat shallow as evidenced by both our in-depth interview and quantitative survey results. In addition, awareness and familiarity with transitional incentive programs is relatively low, as is awareness of the CPA DRP.

Account representatives (reps) have played a strong, effective role in the outreach function to date, but their pivotal function in the marketing effort raises several issues.

- The everyday goal of the reps is to maintain long-term credibility with customers; hence, they are uncomfortable pushing programs if the programs do not demonstrate clear benefits for their customers or if the customer shows resistance.

- The question that arises is whether there is a need to market programs and support DR more aggressively; to "push back" when the customer offers initial resistance. This is particularly an issue with CPP, where the potential downside risk causes many customers to reject participation out of hand. The marketing challenge is how to overcome this initial resistance.

Account reps have understandable concerns about encouraging customers to try to implement more demand response actions than they are currently comfortable with. They are likely to continue their existing efforts to keep customers aware of programs, provide them with information and training opportunities, and help those with interest in a program to participate. But they may be less willing to push (or pull) customers out of their DR comfort zone. The low level of customer familiarity with transitional incentives suggests that account reps may not have used these as a tool to counter the two most frequently cited objections to participation (i.e., the financial risk of going on CPP and inability to reduce or shift load). On the other hand, it may also be the case that the lower familiarity levels with the transitional incentives are simply a function of modest initial interest levels in the programs themselves.

While further research is being conducted on familiarity with the DR programs, as well as the transitional incentives, it may be appropriate to begin considering whether additional efforts are needed to encourage customers to participate in these programs, whether the programs themselves should be modified, or both.

5.2 CUSTOMER ADOPTION/DECISION-MAKING ISSUES

In viewing the results achieved by these programs to date, it is worth bearing in mind that any new product/service adoption takes time. For now, customers see the DR programs as complex, but this perception may decrease over time. One program manager drew a parallel between the current reluctance to embrace DR and the early days of DSM, when it took time for customers to adapt to this new way of looking at their energy usage.

Thus far, the decision making process with regard to DR appears somewhat binary: customers with previous DR experience are generally more interested and able to make relatively quick decisions on whether to participate in new programs; those with no previous experience typically either immediately reject the programs out of hand or move into a passive "uncertain/undecided" mode.

More market feedback is needed to help answer questions raised by the above findings.

- What would be the impact on participation of greater financial motivation?
- What would be the impact on participation of increased DR knowledge and capability?
- Will participation increase simply with more time?

Utilities are currently conducting some market research related to these questions, and the next phase of the WG2 evaluation will do so as well.

5.3 PARTICIPATION AND PROSPECTIVE IMPACTS

It should be noted that it would be possible for utilities to attain the overall goal of load signed up under these programs while actually having only a modest impact on peak demand. This could occur because: a) customers with usage profiles that naturally lead them to benefit from the CPP rate could sign up with no appreciable impact on peak demand, or b) customers could sign up for the DBP program but never actually submit bids when the opportunity arises.

Due to the voluntary nature of these programs, actual load reduction potential from signups to date is uncertain. Many of the CPP participants are customers who benefit on that rate without on-peak reduction, as indicated by the rate analysis provided to customers as part of the marketing effort. If customers benefit on the CPP rate with no change to their usage patterns, peak demand will be unaffected.

Similarly, while the total load signed up for DBP is impressive; the level of DBP participant commitment to bidding and reductions appears mixed. Comments from both account representatives and customers suggest that some firms may respond to bid opportunities only if those coincide with previously planned maintenance or other production stoppages.

5.4 PROGRAM/TARIFF DESIGN

While, as noted earlier, specific recommendations for changes to the tariff were not the focus of this evaluation, interviews with program managers and account reps raised a number of issues regarding current tariff design.

- The biggest issue for CPP is the perception that this tariff carries significant risk relative to the potential reward. As noted previously, most customers show only modest overall savings under CPP even when they reduce load substantially, yet the very high CPP price of on-peak power places customers at a substantial risk. Even when rate analyses show modest gains under CPP, many customers point out that their usage could change (especially if the economy improves or the summer is unusually hot) in a way that increases on-peak usage.

- Account reps also report that customers say the complexity associated with current tariffs does not justify the modest potential gain. Both CPP and DBP require fairly intensive tracking of usage before and during program events; in addition, the paperwork required just to sign up for DBP, especially for multi-site customers, is seen as daunting. (This leads to the additional observation that account reps will need to provide continued support to customers who sign up for the DR programs.)

To a large extent the unfavorable risk/reward ratio is a result of the requirement that the current DR programs be revenue neutral: that is, the same amount of revenue is recovered from all eligible customers under the new tariff as under the old tariff. (In the present context, this means that any savings for customers on the DR tariffs must be matched by a decrease in costs of serving customers on that tariff.) Under revenue neutrality it is not possible to incent customers to participate in DR if that means other customers in the same class must pay more as a result; upside potential for participants is therefore limited. In addition, incentives for peak load reductions must also be justified from a benefit-cost perspective that considers marginal costs and other factors, as discussed in the *Second Report of Working Group 2 on Dynamic Tariff and Program Proposals: Implementation Issues*, December, 2002.

5.5 TRANSITIONAL INCENTIVES PROGRAMS

Awareness of and interest in transitional incentives are somewhat low, although it is unclear whether low interest so far is due to low interest in the DR programs themselves, low familiarity with the incentives, or intrinsic unattractiveness of the incentives.

- Account reps as well as customers commented on timing issues related to these incentives. For bill protection, customers must wait for 14 months to be made whole if they do worse under CPP; for technical assistance, half the incentive is not paid until the customer has actually signed up for the program and demonstrated the required load reduction – which could be nearly a year after the initial study.

- Large sophisticated customers believe they know their load better than anyone, and may be reluctant to have a third party become too familiar with their operations. It may therefore be worth considering some kind of incentives for in-house staff to conduct the technical analysis of load shifting potential.

- These incentive programs may be perceived as carrying too much of their own hassle and risk; Bill Protection, for example, requires that customers reduce their peak load by an average of 3 percent across all CPP events in order to be eligible, which requires customers to actively track their usage over that period.

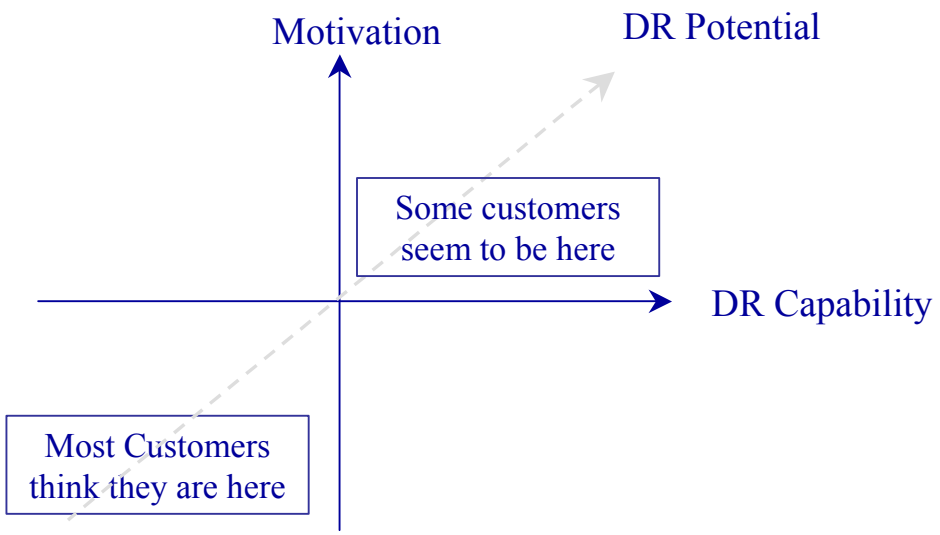
Even the Enhanced Automation program, which offers free site-specific services, has had little uptake – perhaps in part because it still has a cost associated with the time required from the facility manager. New building infrastructure capabilities may help, especially as customers gain experience and confidence in managing them. New research by the PIER DR Center[13] on automated DR, for example, could help contribute to overcoming customer reluctance.

5.6 PROGRAM ATTRACTIVENESS VS. DR CAPABILITY

One way to view the current status of DR programs in California is to see the acceptance of DR programs along two dimensions: motivation and capability. This can be illustrated graphically as in Exhibit 12.

The attractiveness of DR programs is a function of numerous aspects of rate design, including potential savings and risk, the difficulty or hassle associated both with signing up for the programs and with ongoing participation, and other factors such as the urgency of energy-related issues. Capability includes not only the ability to incorporate load shifting into overall business operations, but also the hardware and software systems required to successfully participate in DR programs and customer familiarity regarding the operation of those systems.

Exhibit 12
Conceptual Relationship Between DR Potential and Motivation and Capability



At present, most customers see themselves in the lower left quadrant of the exhibit. The programs themselves are not seen as very attractive in that potential savings are small, risks (from CPP) are significant, and participation is perceived as time consuming and complex, while the need to shift load does not seem particularly urgent. Similarly, many customers insist that they lack even the basic ability to shift load, let alone having the tools and knowledge to handle such load shifting.

[13] For information on this new demand response center, see http://drrc.lbl.gov/DRRC.html.

For California's DR goals to be achieved, it appears so far that both motivation and capability will have to be enhanced. That would mean greater potential savings or a greater sense of urgency on the motivation side, and greater access to (and knowledge of) load management tools along the capability dimension. The growing use of online load data that is readily accessible to customers, in combination with appropriate training, suggests that capability will gradually improve. Whether the attractiveness of the DR programs themselves needs to be addressed is discussed below.

5.7 THE QUESTION OF IF AND WHEN TO MODIFY PROGRAMS

When viewing results of the DR programs to date, it is important to see learning as part of the process of rolling out new offers – at regulatory agencies, utilities, and customers. It is difficult to "get it right the first time", and there is evidence from other parts of the country of programs that have been tried for three years and are still not achieving their hoped-for impacts (e.g., NY ISO Day-Ahead Pricing Program), while other programs are doing better than expected.

There are two ways to view the desirability and timing of program changes. One view holds that it is important to let the sales cycle play out for a while, since full-scale marketing has only been conducted for a relatively short time. The other view holds that the current programs have intrinsic limitations, and modifications should therefore be made sooner rather than later.

In our view, it is not yet obvious whether the programs should be modified. There is fairly strong evidence that the financial incentives for participation are weak (even for structural benefitters). On the other hand, the programs are still relatively new, interest appears to be on the rise, and many customers express a willingness to take voluntary actions to reduce peak load temporarily to enhance overall system reliability. Moreover, the market is concerned about the credibility of regulators and utilities vis-à-vis the number of changes in programs over the past few years. (It should be noted, however, that the incentives/prices for the programs could be changed without substantially changing the operation or other requirements of the program, so that the issue of financial incentives for participation could, in theory, be relatively easily addressed.)

Since the timing for any CPUC-approved changes to the program in time for summer 2004 is likely prohibitive, we believe the current focus should be on continuing/expanding research on whether and what to change or modify to get ahead of 2005. A key part of this research will be a review of the actual summer 2004 experience, which should provide examples of active participation and contribute to on-going learning.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 OVERALL CONCLUSIONS

Overall, the targeted market is aware of both the CPP and DBP programs, but the level of familiarity is somewhat shallow, with few customers knowledgeable about the details of the programs or the incentives designed to support them. Customers seem to feel they know enough about the programs to decide about them, however, with much of the market having made a firm decision not to participate – particularly with regard to CPP.

Actual sign-ups are low across the board for CPP (around 60 accounts, representing 34 unique customers). DBP sign-ups are much higher (roughly 420 accounts, representing 186 unique customers), of which almost 90 percent are from SCE. It appears that different marketing strategies may explain the differences in enrollment (e.g., SCE had specific numeric signup goals for its account reps, and the other utilities did not). Currently, it is unclear how much load reduction the participants signed up to date will deliver this summer.

Although it is true that adoption takes time and these programs have been actively marketed only since late 2003, the results of this research provide fairly strong evidence that the WG2 DR programs -- in their current form and with current market conditions -- may not make as large a contribution to achieving overall DR goals as desired. Based on results from the various data sources used, the market appears to need stronger motivation, knowledge, and capability if the DR goals are to be attained.

6.2 OVERALL RECOMMENDATIONS

Our basic recommendation is that marketing and support for the current DR programs be continued through summer 2004, but that research on potential modifications for 2005 be intensified, using the results of ongoing quantitative evaluation research, end use metering, process evaluation of program implementation in the coming summer, and utility-specific rate design research. And, because of the asymmetry of potential costs versus potential benefits built into these offerings, it may also be appropriate to revisit the fundamental requirement that these programs be revenue neutral.

In addition, we believe the current Transitional Incentives Programs may not be as effective as intended. Response to these incentives should be watched closely to assess whether modifications would increase their effect on participation levels. Such modifications might, for example, address customer concerns regarding the timing of incentive payments or compensation for bill protection customers.

Finally, we suggest that new options be considered to further encourage and motivate customers to leave their current "comfort zone" regarding DR capability and willingness. This may require an assessment of which market actors and resources are available and best suited for such an effort. Additional services to help customers identify and carryout DR actions, provided before and throughout this summer, should be considered to help increase the amount of program load reductions that can be achieved from current participants.

7. NEXT STEPS FOR EVALUATION RESEARCH

In light of the research issues described above, and consistent with the ongoing Phase 2 evaluation, the following activities are being pursued:

- A quantitative baseline survey of 500 customers has just been completed and is currently being analyzed to further assess DR program familiarity, decision-making, barriers, motivation, capability, potential, and needs.

- An impact evaluation will be conducted for summer 2004, including on-site data and measurement to better understand DR impacts, potential, and constraints.

- A sub-metering task will be conducted on a small sample of participants to measure load reductions on end uses and assess perceived and actual tradeoffs between load reduction capability and energy services (e.g., occupant comfort and productivity).

- Also in the summer 2004 time frame, additional data will be collected to support a process evaluation that will assess implementation and participation experiences.

- Finally, additional customer in-depth research will be conducted to further assess program preferences, both by individual utilities and as part of the overall evaluation effort.

Appendix A – Presentation to Working Group 2, March 15, 2004

WG2 Demand Response Evaluation: Summary from DRAFT Phase 1 Report

Prepared by: Quantum Consulting, Inc. with assistance from Summit Blue, LLC

Prepared for: Working Group 2 Evaluation Committee

March 15, 2004

QUANTUM CONSULTING

SUMMIT BLUE CONSULTING, LLC

Phase I Report Contents

I. Summary and Issues
II. Introduction
III. Analysis of Results
IV. Conclusions and Recommendations
V. Next Steps for Evaluation Research

I. Overview of Themes

- Market is aware of CPP and DBP, but level of familiarity is shallow
- Assistance programs have little traction so far
- DBP signups higher for SCE; CPP very low across all utilities; no HPO signups (SDG&E only)
- Much of initial market reaction is not to participate
- Programs are still fairly new - adoption takes time
- But…moderate-to-strong evidence that programs in current form, with current market conditions, may not make major contribution to achieving overall DR goals
- Market appears to need stronger motivation, knowledge, and capability
- On-going learning will occur with these tariffs

Initial Views or Interpretations

1. Regarding adjusting rate offers in 2004:
   - Two views expressed --1) Need to let sales/adoption cycle play out versus 2) a desire to make needed changes now
   - Some PMs expressed the dilemma as: Giving current rates time to work or accepting the inevitable and make changes sooner rather than later
2. Many customer responses consistent with new product or service offering -- can't do it and/or don't need it:
   - Perceived inability to shift load is cited by customers most often as the reason for non-participation (this may change over time)
   - Secondary factors cited include lack of financial motivation and uncertainty/changes in programs over time
3. Benefits count -- particularly for account execs/reps when marketing rates to customers:
   - Need to understand value to the commodity provider of customers' ability to shift load and develop win/win rates

II. Introduction

Objectives for Phase I Report

- Summarize and assess marketing efforts to date
- Develop preliminary assessment of end user awareness, participation, decision making, perceptions, obstacles, and issues
- Provide findings and recommendations to Working Group 2 to support March 31 filings
- Identify key issues and questions for next phase of research

Activities for Phase I Report

- Limited time prior to 3/31/04 Utility filings
- Evaluation commenced 1/1/04
- WG2 Eval Committee focused Phase I evaluation effort on:
  - Utility staff interviews (12)
  - In-depth interviews with end users (~60)
  - Collection and analysis of population and participant data
  - Incorporating feedback collected by customer representatives
  - Planning for quantitative end user survey directly following Phase I report (500 interviews)
  - Summary of draft report to be presented March 15, 2004

Introduction to DR Programs

- Programs being evaluated – Critical Peak Pricing (CPP), Demand Bidding Program (DBP), and SDG&E Hourly Pricing Option (HPO):
  - CPP is a rate which provides increased prices during critical peak periods and reduced prices during non-critical peak periods
    - PG&E CPP savings occur in summer only; SCE/SDG&E year-round
  - DBP is a program that provides opportunities for customers to promise load shifting during critical periods for a "bid" incentive
  - HPO is a daily adjusted hourly electric rate that provides potential cost savings for customers who can shift energy usage to lower-priced hours
- *Transitional Incentives* – Bill Protection Plan and Technical Assistance
- Other related programs:
  - CA Power Authority's Demand Reserves Partnership
  - CA Energy Commission's Enhanced Automation (information)

Demand Response Goals

- **R. 02-06-001 Table 1:**

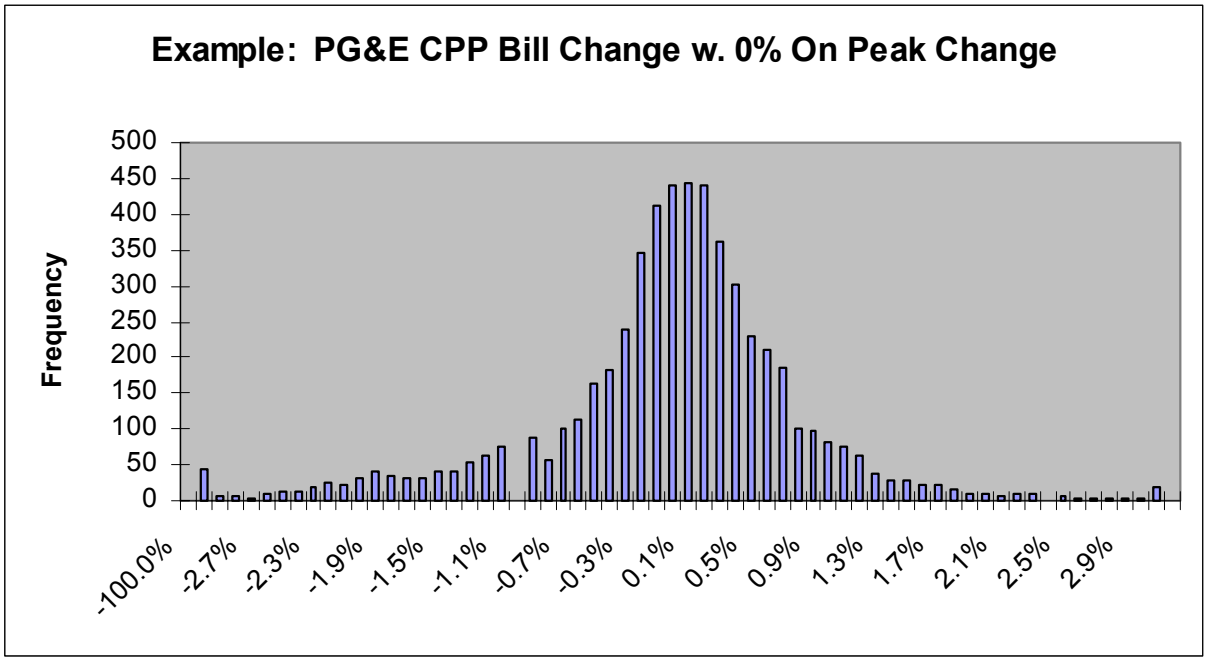
	Utility		
Year	**PG&E**	**SCE**	**SDG&E**
2003	150	150	30
2004	400	400	80
2005	3% of annual system peak demand		
2006	4% of annual system peak demand		
2007	5% of annual system peak demand		

DR 2003/2004 Marketing Timeline

			Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	January
	Rate History							SDG&E CPP, DBP Rates filed 7/11, in effect 8/8	PG&E CPP and DBP Rates Approved 8/1/03	SCE CPP and DBP Rates Approved 9/5/03	Statewide collateral available		Revised SCE CPP Rate Approved 12/24/03	
PG&E	**Marketing Activities**		Initial training with 260 AEs			Text-based fact sheet developed		Internal "glossy" collateral developed	Full-scale assigned customer marketing					
						Initial assigned customer contacts			Emeter marketing to unassigned accounts					
	No. of Accts.	DBP								1	5	7	8	8
		CPP									8	14	19	20
SCE	**Marketing Activities**				Product rollout for reps at CTAC				Product rollout for customers at CTAC		Statewide and SCE packets sent out	DBP website training sessions		
			Newsletter					Newsletter	Newsletter		Newsletter		Newsletter	
			DR dicussed in California Electricity Marketplace Updates								Full-scale marketing			
								Internal training for reps						
								Internal collateral developed, used in customer presentations						
	No. of Accts.	DBP								9	39	131	384	393
		CPP												
SDG&E	**Marketing Activities**							Initial one-on-one meetings with customers						
					Internal workshops preparing customers for DR programs									
						Internal collateral done								Full scale marketing kickoff
	No. of Accts.	DBP												5
		CPP												10
		HPO												0

Examples of Potential End User Bill Savings

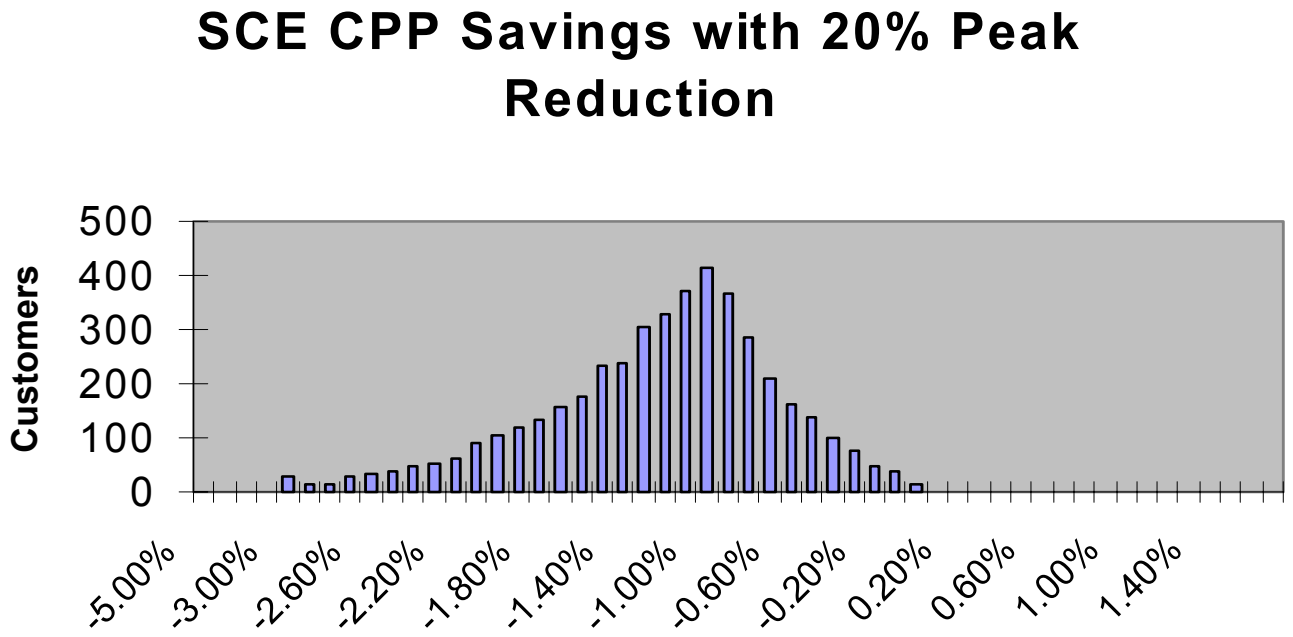
- For both PG&E and SCE,* of the roughly half of eligible customers who would benefit from CPP rates without doing anything, 75% of them would save less than 1% per year, or roughly $2,000 per year
- For SDG&E, of roughly 2/3^{rds} that would benefit on CPP without any change, 75% of them would have savings less than 1.7% per year



*Based on GS-2 rate

Examples of Potential End User Bill Savings (continued)

- For both PG&E and SCE, of the 99% of eligible customers who would benefit from CPP rates with a roughly 20% reduction, 75% of them would save less than 1.6% per year, or roughly $4,000 per year
- For SDG&E, of roughly 75% that would benefit on CPP with a 10% reduction,* 75% of them would have savings less than 2% per year



*SDG&E data received included only 0% and 10% reduction cases

Examples of Potential End User Bill Savings (continued)

- Potential savings for DBP customers are estimated below based on amount of demand reduction and the type of bid
  - Assumes 4 demand reduction incidents per year
  - Assumes 4 hours per demand reduction incident
  - Day Before savings calculated at 15 cents/kWh, Day Of calculated at 50 cents/kWh

Savings (KW)	Day Before Bid	Day Of Bid
100	$240	$800
200	$480	$1,600
500	$1,200	$4,000

Summary of Total & Eligible Populations (excludes DA)

3 IOUs	Total Accounts	Elligible Accounts	Eligible Accounts MW Sum*	Eligible Accounts GWh Sum
Size				
Very Small (SDG&E only)	2,406	2,076	297	897
Small	12,391	10,951	3,921	13,528
Medium	3,457	3,048	2,515	9,058
Large	1,272	1,079	1,925	6,770
Extra Large	751	577	3,747	11,592
Business Type				
Institutional	3,349	2,945	1,565	5,769
Other Commercial	2,926	2,536	1,524	6,129
Office	3,254	3,045	1,954	5,976
Retail/Grocery	2,966	2,018	847	3,740
Transportation/Communication/Utility	1,461	1,366	988	2,559
Electronic, Machinery, Fabricated Metals	1,705	1,531	1,075	4,226
Other Industrial and Agriculture	2,522	2,359	1,926	6,724
Petroleum, Plastic, Rubber and Chemicals	838	763	1,038	3,340
Mining, Metals, Stone, Glass, Concrete	647	601	619	2,784
Unknown	610	567	869	598
Totals	20,278	17,731	12,405	41,845

*Non-coincident customer peak demand

III. Analysis of Results

Findings – Marketing Efforts to Date

- SCE and PG&E marketed aggressively since late summer last year; SDG&E actively marketing now
  - One-on-one meetings between reps and customers primary method for assigned accounts
  - Statewide and utility-specific collateral are consistent
  - Utility marketing strategies differed
    - SDG&E chose later rollout for in-person contact; SCE focused reps on info & signups; PG&E focused reps more on info/feedback for '03
  - All utilities conducted in-house rate analyses for CPP for all eligible customers – reps provided with this information
  - Utilities required to focus on AB970 DR participants – many of these may be Direct Access and therefore ineligible
- A large majority of the market appears to be aware of and somewhat familiar with the programs
  - However, awareness and familiarity with the supporting assistance programs is low
  - Almost 90% of customers interviewed are familiar with the demand response program "concept"

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Key Findings - Customer Response to Date

- Participation to date varies widely
  - Close to 400 accounts (~150 customers) on DBP statewide, ~90% for SCE (~60 MW)
  - Only 45 accounts (~22 customers) on CPP, ~90% PG&E
  - SCE had virtually no CPP benefitters because of inconsistency in CPP and otherwise applicable tariff between September and December
- Load reduction potential from signups to date is uncertain
  - CPP participants tend to benefit without on-peak reduction, level of DBP participant commitment to bidding and reductions appears mixed
- Most non-participants appear to have made a decision not to participate, particularly in CPP
  - Fraction of market that is "undecided" low for CPP, higher for DBP
- Inability to shift load is cited most often as the reason for non-participation, secondary factors include lack of financial motivation and uncertainty/changes in programs over time

Issues - Marketing

- PG&E and SCE reps succeeded in contacting the eligible customers before the end of 2003 (SDG&E chose to initiate full marketing in early 2004)
  - Significant achievement on awareness & tracking response
  - However, level of customer familiarity is somewhat shallow
  - Awareness and familiarity with assistance programs appears low
- Role of account representatives
  - Strong, effective role in outreach function
  - Reps everyday goal is to maintain long-term credibility with customers
  - Hence, reps unlikely/uncomfortable pushing programs:
    1. If customer shows resistance; or,
    2. If reps think customer's best interests might not be met.

Questions - Marketing

- Is there a need to market programs and support harder?
  - CPP marketing challenge: overcoming initial resistance
  - Some of market still undecided on DBP – opportunity here
  - Additional push may be needed for transitional incentives
    - However, more market feedback on these is needed
- How could such a next level of market push be made?
  - Reps likely to continue existing efforts to keep customers aware and help those that show interest
  - Are reps concerned about nudging customers out of their DR comfort zone?
  - Is there a need to consider other marketing approaches?
  - In other parts of the country, other entities are also involved in DR marketing and support
    - Enhanced Automation an example of this in CA

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Issues - Customer Adoption

- Any new product/service adoption takes time!
- At this time, programs seem complex to end users
  - This perception may decrease over time
- Decision making process appears somewhat binary
  - Those with previous DR experience more interested and able to make relatively quick decision on whether to participate in new programs
  - Those with no previous experience likely to either:
    - Immediately reject programs out of hand
    - Move into a passive "uncertain/undecided" mode
- More market feedback is needed to help answer:
  - Impact on participation of greater financial motivation?
  - Impact on participation of increased DR knowledge and capability?
  - Will participation increase simply with more time?
  - Utilities conducting some market research related to these Questions
    - Next phase of WG2 evaluation may do so as well

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Issues – Program/Tariff Design

- Interviews with PMs and Account Reps raised a number of issues regarding current tariff design:
  1. Risk versus reward in tariff (e.g., DBP versus CPP or HPO)
  2. Lack of value from current tariffs
  3. Limitations imposed on design by revenue neutrality
  4. Complexity -- some customers say it is not worth the time
  5. Transitional incentives not yet widely noticed or effective
  6. Various structural issues: *One SDG&E PM noted that some customers on interruptible rates would benefit from going to CPP, but they would have to go on the regular TOU rate and stay on it for 12 months before being eligible for CPP*
  7. Current tariffs need support by reps after the participation agreement is signed

Issues - Transitional Incentives Programs

- Awareness and interest levels are low
- Unclear whether low interest so far due to low interest in programs, low familiarity, or intrinsic unattractiveness
- For technical assistance – a chicken and egg
  - Large sophisticated customers believe they know their load better than anyone – may want incentives for in-house staff
- These incentive programs may be perceived as carrying too much of their own hassle and risk
- However, even Enhanced Automation has had little uptake for its free site-specific services (still has a "time" cost)
- Building infrastructure capabilities may help
  - e.g. new research by PIER DR Center on automated DR

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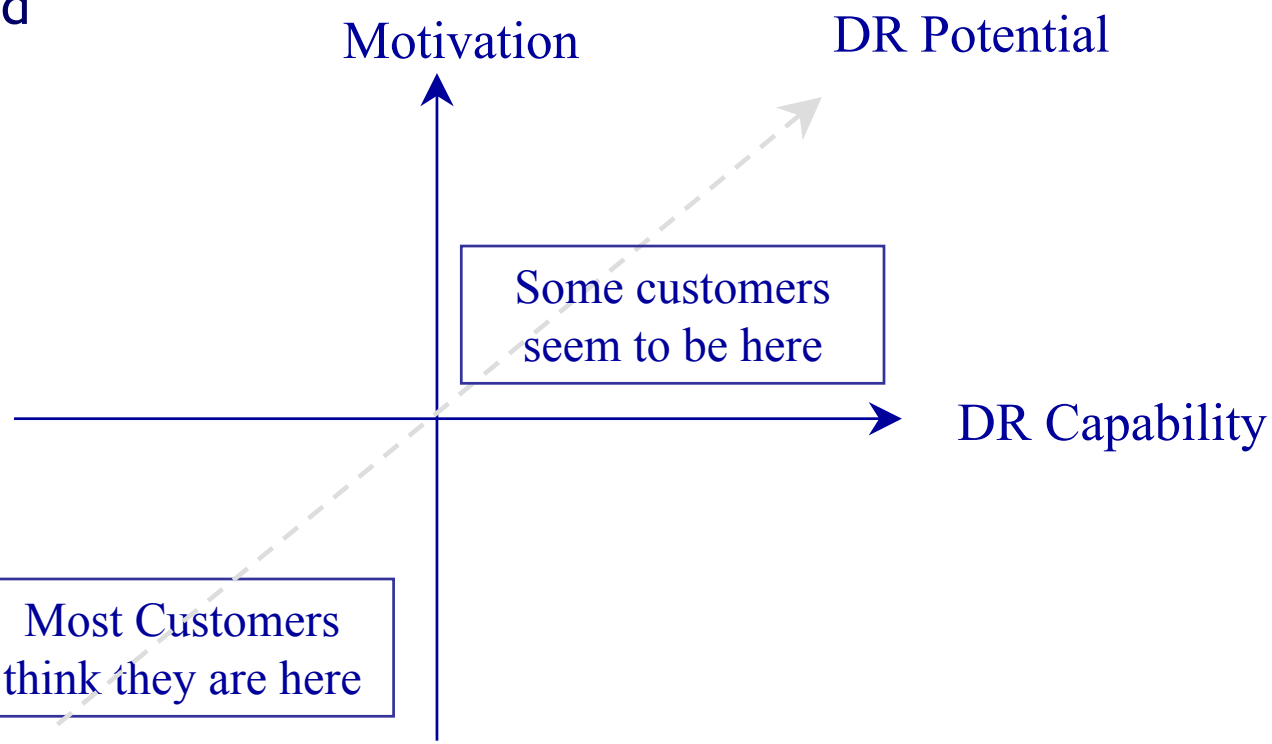
Issues - Program Attractiveness Vs. DR Capability

- DR potential a function of motivation and capability
  - Energy crisis carried motivation for awhile but motivation for much of market is now low
  - To achieve DR goals, more motivation and capability will be needed



Issues – If/When to Modify Pilot Programs

- Learning should be part of the process of rolling out new offers
- Difficult to get right the first time
  - Learning occurs both at the agencies, utilities, and among the customer community
  - Looking at other utilities -- some programs that have been tried for three years are still not achieving their hoped for impacts (e.g., NY ISO Day-Ahead Pricing Program)
  - Other programs are doing better than expected
- Different views on timing and process changes:
  - Need to let sales cycle play out for awhile versus making modifications sooner
  - Balancing short term versus long term goals

Analysis of Issues – If/When to Modify Programs

- Should programs be modified?
  - Answer not yet obvious
    - Fairly strong evidence financial motivation is weak
    - Yet programs still fairly new and market is concerned about credibility of regulators/utilities v-a-v number of changes in programs over past few years
  - Timing for CPUC-approved changes for Summer 2004 likely prohibitive
  - Continue/expand research on whether and what to change or modify to get ahead of 2005
    - Including actual Summer 2004 experience
- Research this summer should provide examples of active participation and contribute to on-going learning

IV. Conclusions and Recommendations

Overall Conclusions

- Market is aware of CPP and DBP, but level of familiarity is shallow
- Transitional incentive programs have little traction so far
- DBP signups higher for SCE; CPP very low across the board
  - Unclear how much these DBP participants will deliver
  - Differences in marketing strategy (e.g., specific goals for account reps) may explain differences in signups
- Much of market's *initial* reaction is not to participate
  - Modest fraction undecided for DBP, low fraction for CPP
- Programs are still fairly new, adoption takes time
- However, fairly strong evidence that programs in current form, with current market conditions, may not make major contribution to achieving overall DR goals
- Market appears to need stronger motivation, knowledge, and capability

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Overall Recommendations

- Continue/expand research on potential modifications for 2005
- Continue marketing and support for current programs through Summer 2004
- Re-assess Transitional Incentives Programs and consider more immediate modifications
- Consider options for motivating customers to leave their current "comfort zone" on DR capability?
  - Which market actors, what resources are available?
  - Participation in PIER DR automated DR research?
  - Dissemination of case studies, results and tools?

V. Next Steps for Evaluation Research

Next Steps for Evaluation Research

- Quantitative baseline survey of 500 customers is currently being fielded to further assess:
  - DR program familiarity, decision-making, barriers, motivation, capability, potential, and needs
- Impact evaluation to be conducted for Summer 2004
- On-site data and measurement to better understand DR impacts, potential, constraints
- Additional process evaluation to assess implementation and participation experiences
- Customer in-depth research to further assess program/tariff preferences?