

Consistency of Demand Response in C&I Aggregator Programs

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Outline

- ❑ Aggregator program characteristics
- ❑ Impact evaluation methodology
- ❑ Consistency of load impacts
- ❑ Conclusions

Aggregator Demand Response Programs – *Background*

- ❑ One of many DR programs in California
 - *Capacity Bidding Program (CBP)* – Tariff-based
 - Contract-based programs at each utility
 - Day-of (DO) and day-ahead (DA) options
- ❑ Third-party “aggregators” are curtailment service providers
 - Sign up large C&I customers at PG&E, SCE and SDG&E
 - Assist customers to reduce load during events

Enrollment in Day-of Programs

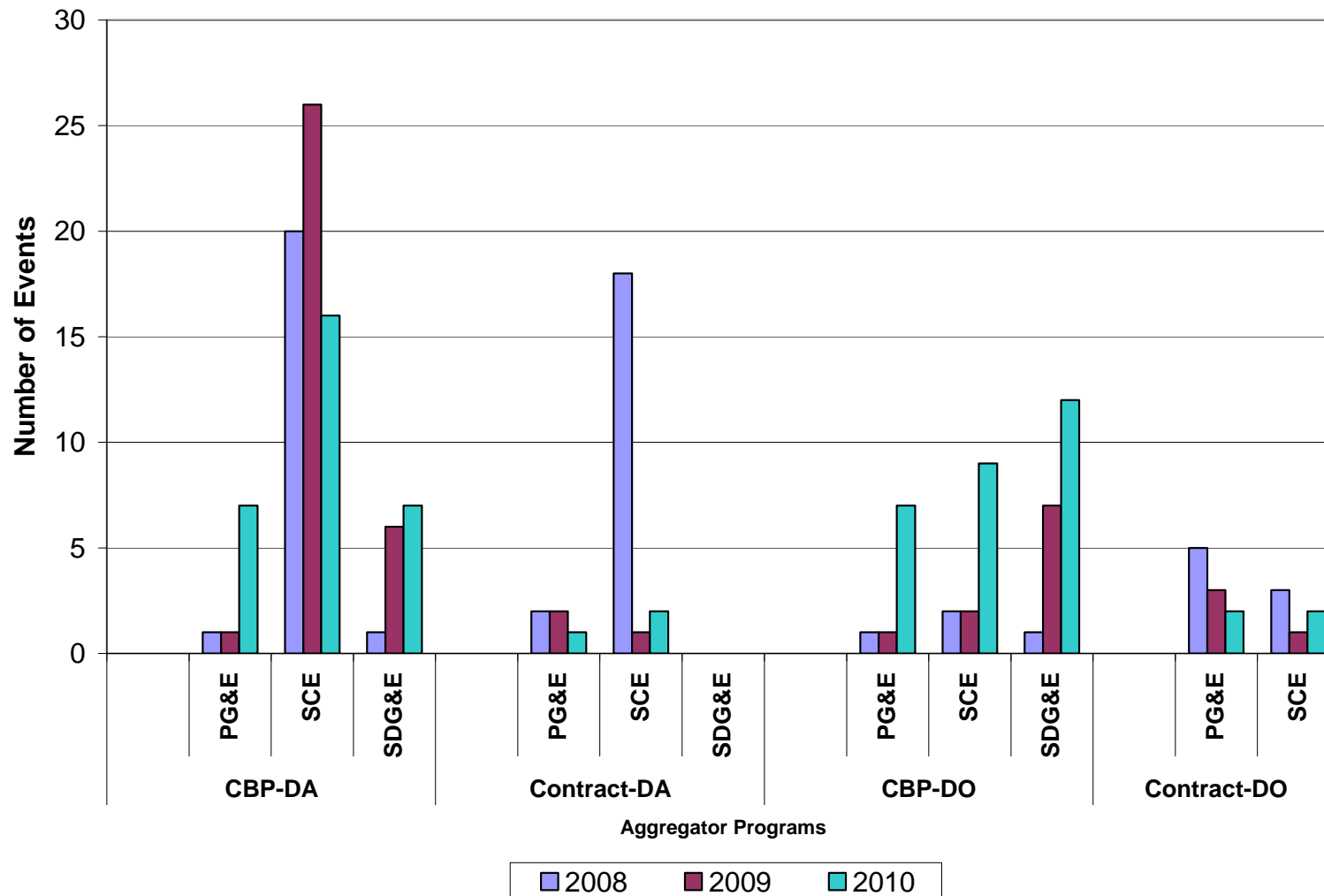
Number of Customer Accounts

Industry Type	CBP			Contract-Based		
	PG&E	SCE	SDG&E	AMP	DRC	DSP
1. Agriculture, Mining & Construction	35	2		211	51	
2. Manufacturing	25	3	12	120	174	15
3. Wholesale, Transport, other Utilities	32	2	21	113	786	21
4. Retail stores	273	364	196	129	553	24
5. Offices, Hotels, Health, Services	30	40	37	170	103	15
6. Schools	4	1	1	8	44	25
7. Entertainment, Other Services, Gov't	11		47	19	36	4
8. Other/Unknown			1	9		
Total	410	412	315	779	1747	104

Enrollment by Maximum Demand (MW)

Industry Type	CBP			Contract-Based		
	PG&E	SCE	SDG&E	AMP	DRC	DSP
1. Agriculture, Mining & Construction	8.2	0.5	0.0	96.6	8.0	0.0
2. Manufacturing	29.0	0.5	3.0	94.7	112.0	2.8
3. Wholesale, Transport, other Utilities	11.1	0.6	3.6	49.0	105.9	2.5
4. Retail stores	74.4	74.1	34.8	39.6	157.5	3.8
5. Offices, Hotels, Health, Services	26.8	4.6	6.9	96.6	46.6	3.6
6. Schools	10.0	2.2	0.1	19.5	55.4	10.2
7. Entertainment, Other Services, Gov't	5.4	0.0	6.5	12.1	21.3	0.9
8. Other/Unknown	0.0	0.0	0.1	1.5	0.0	0.0
Total	164.8	82.5	55.0	409.6	506.8	23.7

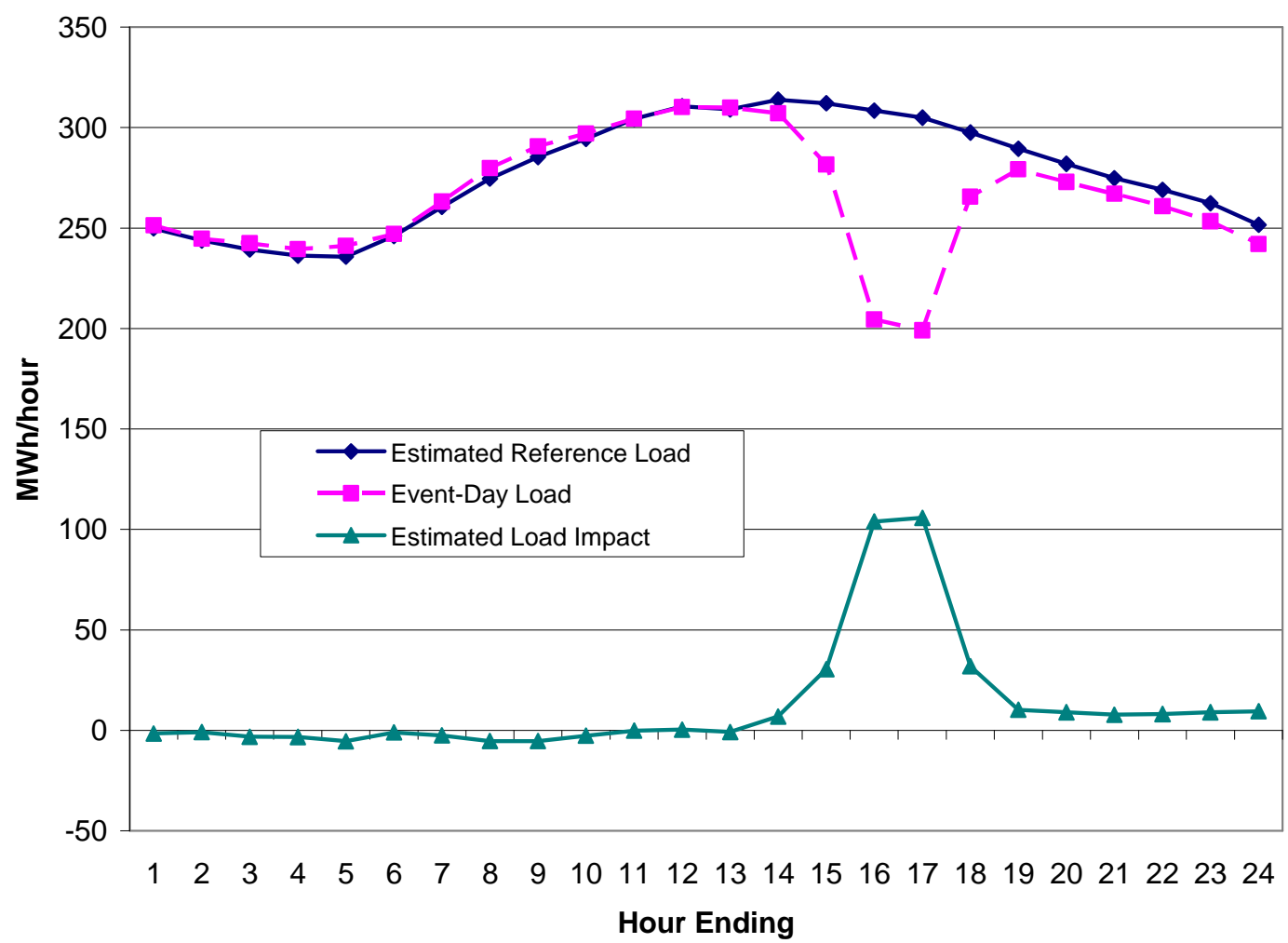
Number of Events – 2008 - 2010



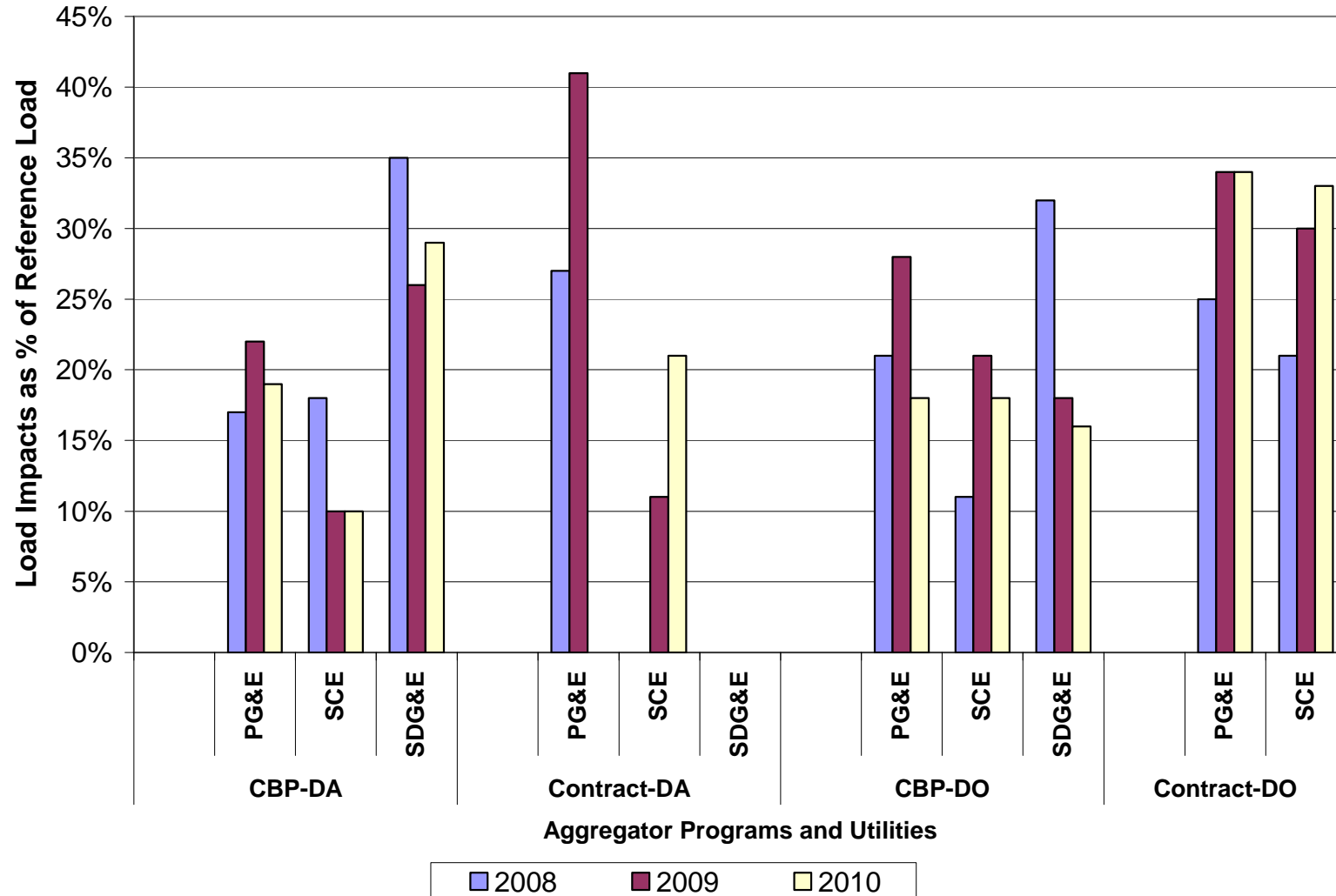
Impact Evaluation Methodology

- Customer-level regression analysis
 - Hourly data for summer months
 - Variables to control for typical load profiles by day-type
 - Variables to control for weather
 - *Event* variables x hour of day allows estimation of hourly load impacts for each event-day

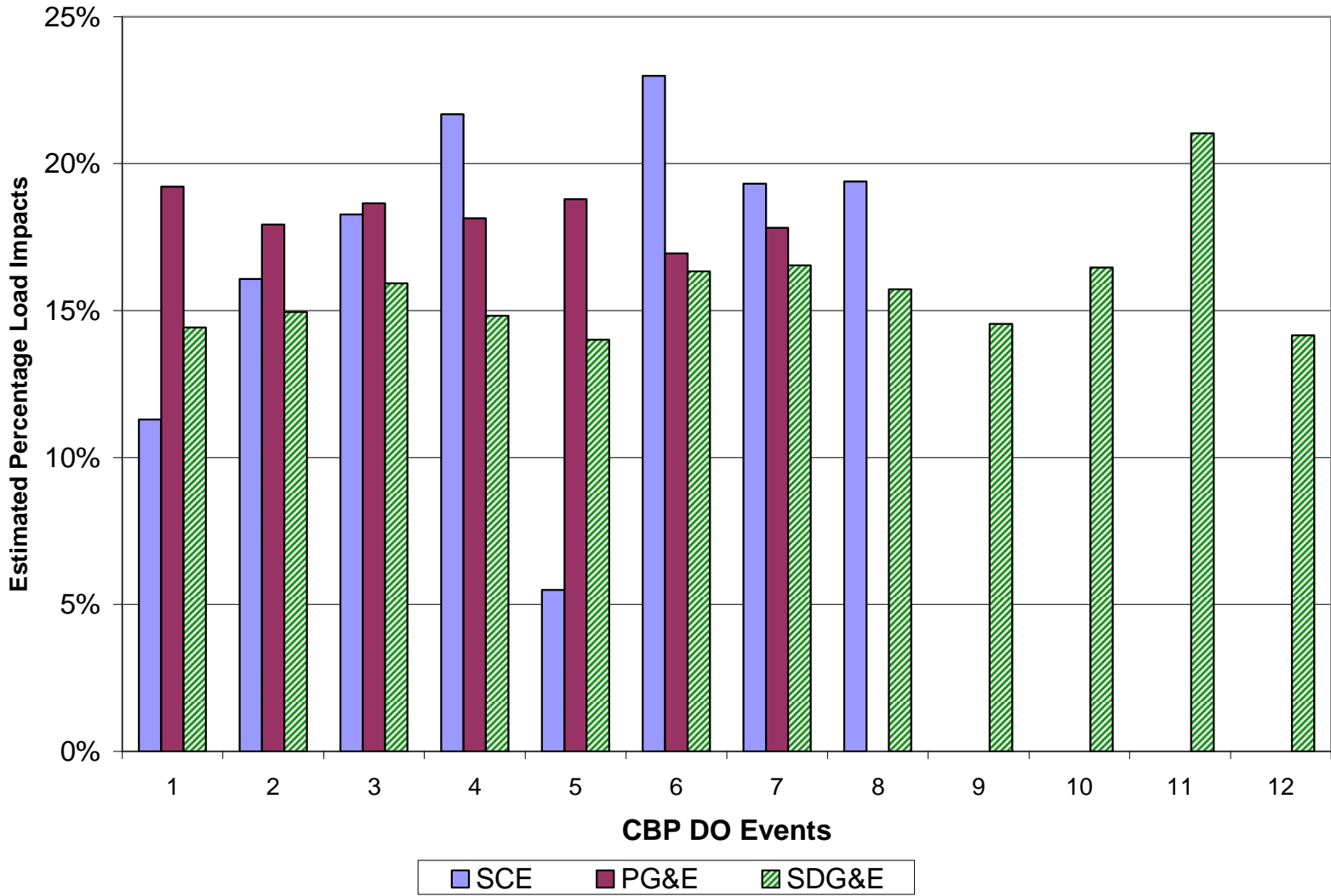
PG&E AMP Program – *Estimated Load Impacts for Typical Event (MW)*



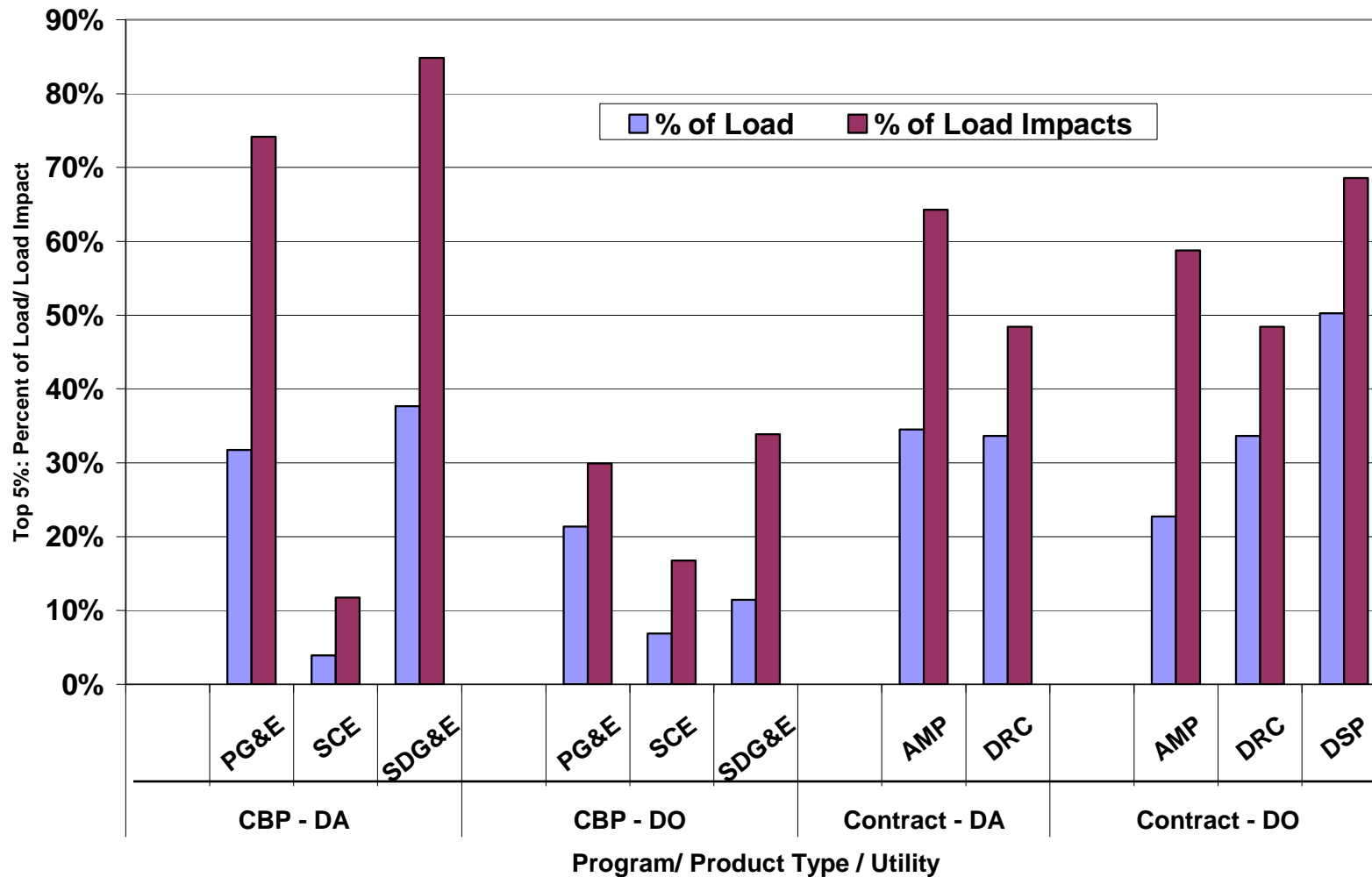
Consistency of % Load Impacts, by Program



Consistency of % Load Impacts across Events, by Utility (CBP-DO)



Concentration of Load Impacts (Top 5 percent of accounts)



Conclusions

- ❑ Steady enrollment of 5,000 customer accounts and 1,300 MW of maximum demand
- ❑ Estimated load impacts reasonably consistent across *events* and *years*
- ❑ Relatively large % load impacts: 15 to 35%

Questions?

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