



New Pricing Strategies in California

Stephen S. George, Ph.D.
Principal Consultant



FREEMAN, SULLIVAN & CO.

A MEMBER OF THE FSC GROUP

California is getting serious about demand response

- The Joint Energy Action Plan (EAP) establishes DR as a preferred resource ahead of transmission or generation
- The CPUC adopted DR MW goals of 5% of system peak and approved a 3-yr DR program budget totaling \$262 million
- The CPUC approved PG&E's application to install advanced metering for 5+ million electric customers and SDG&E's application is currently under review
- The CEC is likely to modify building standards to require programmable communicating thermostats on all new buildings and possibly on major remodels

On the pricing front

- The CPUC directed each utility to propose CPP tariffs as a default tariff for all customers with peak demand >200 kW in their next general rate case
- PG&E proposed an aggressive marketing campaign for a voluntary CPP program targeted at residential air conditioning households and the large end of the small C&I market segment to coincide with AMI deployment
- TOU tariffs are mandatory in SDG&E's service territory for all C&I customers with peak demands exceeding 20 kW
- The CEC continues to lobby for time-based pricing as the default tariff for all customers, but there is a legislative constraint (AB1X) that prevents this from occurring in CA for at least another decade if not longer

SDG&E has proposed a Peak Time Rebate (PTR) tariff for all mass-market consumers

- A “carrot-only” pricing strategy that pays customers to reduce peak-period energy use on critical days
 - Customers would be paid 65 ¢/kWh for each kWh difference between usage on a critical day and a reference value
 - Customers would also avoid the average price of 15 ¢/kWh for each kWh not used, so the total financial savings is 80 ¢/kWh
- No proactive steps would be required to “participate” or sign up for this tariff
 - Customers would be notified of the opportunity to save money on critical days through mass media and other communication channels
- This approach avoids the AB1X barrier as well as the risk aversion that customers have when considering the carrot and stick nature of CPP tariffs

So what's the catch?

- Do people respond as much to a carrot-only tariff as they do to a carrot-stick tariff like a CPP rate?
- Is it possible to develop a reasonably accurate estimate for the reference value?
- Can consumers game the system?
- Will bill savings be large enough to sustain participation so that demand response benefits persist over time?

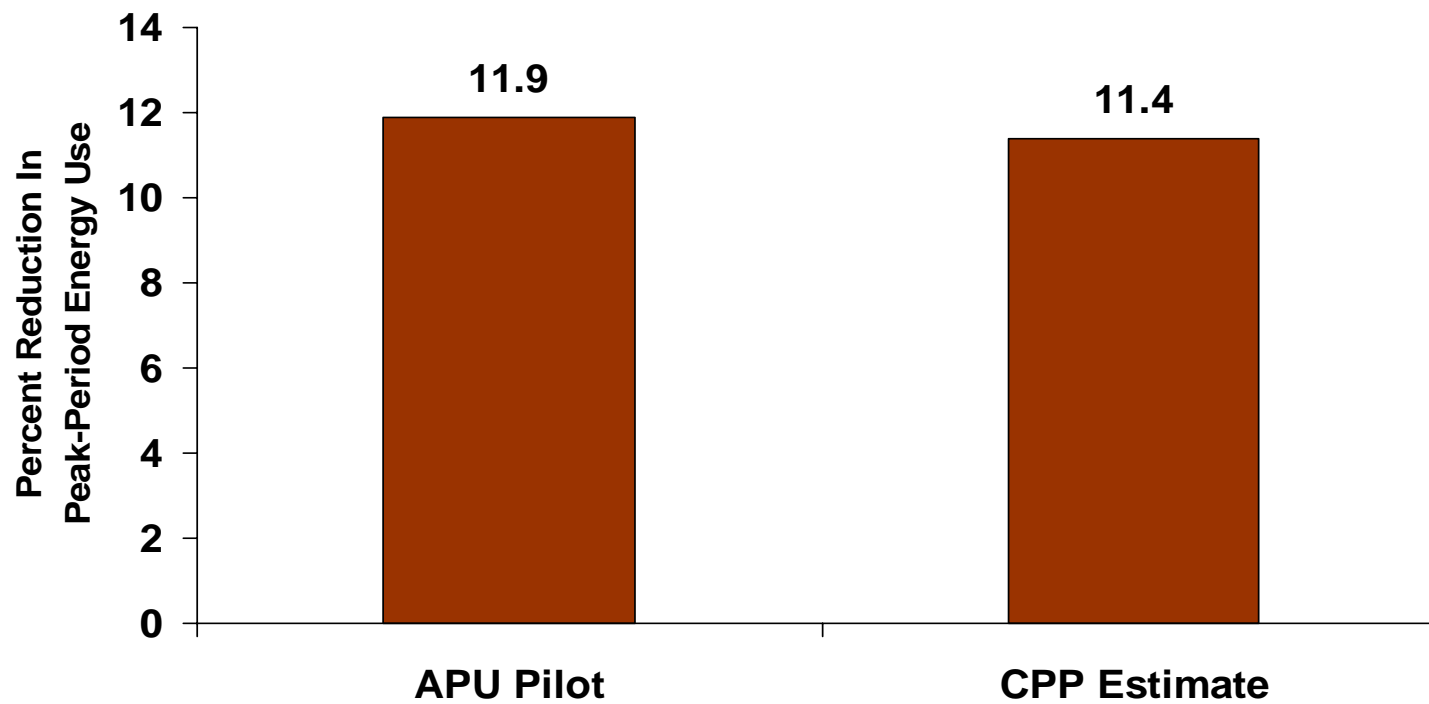


Evidence suggests that consumers respond the same to a PTR as to a CPP

- Anaheim Public Utility District (APU) tested a PTR with a 35 ¢/kWh incentive and a base price of 9.7 ¢/kWh
- We compared the estimated impact for the APU pilot to what the demand models estimated from CA's Statewide Pricing Pilot (SPP) would predict for the same price, after adjusting for APU air conditioning saturation and climate
 - The SPP demand models were based on a CPP/TOU rate, thus reflecting the carrot-and-stick incentives inherent in a CPP tariff



The average reduction from the PTR and CPP tariffs was remarkably similar



There are plenty of poor methods for estimating reference usage, but some good ones too

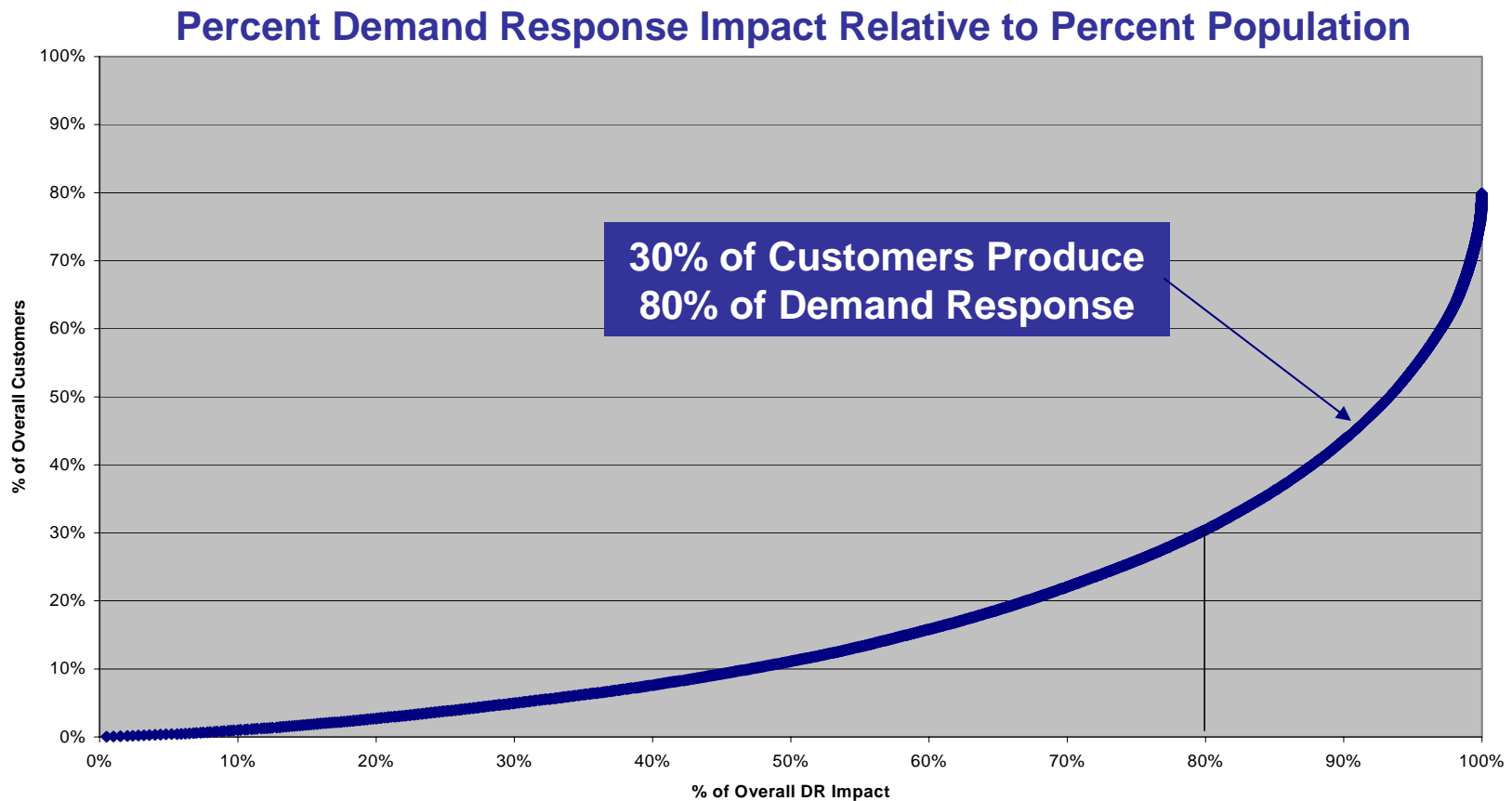
Errors Associated With Selected Reference Value Methodologies		
Reference Methodology	Average Error (On-peak KWh, top 13 days)	Sum-Squared Error (On-peak KWh, top 13 days) (million)
3 prior non-critical days	-0.75	361
5 prior non-critical days	-0.94	356
Highest 5 out of previous 10 non-critical days	0.18	356
5-day adjusted by residential class semi-peak load	-0.32	333
5-day adjusted by temperature	-0.03	348
5-day adjusted by customer semi-peak load	-0.02	243

Using a reference method that adjusts for same-day usage dramatically improves accuracy

There are many more important things to worry about than customer gaming

- General utility paranoia about customer gaming combined with “evidence” from the APU pilot has raised concern about the issue
 - Honestly folks, customers have more important things on their minds
 - The so-called “evidence” presented by Professor Wolak of Stanford indicating wide spread gaming makes no sense
 - Wolak claimed that customers in the APU pilot had an incentive to increase peak-period energy use on non-critical days in order to receive a bigger incentive for reductions on critical days
 - Given the reference methodology used by APU, customers would have had to increase usage on every non-critical day of the summer, which would have cost them twice as much in increased energy use than they would have gained in terms of incentive payments
- Focus on accuracy and don't worry about gaming

Average bill savings with a PTR (or CPP) tariff are small, but it's not the average that matters



High responders can achieve reasonably attractive savings & sustain DR benefits

- High responder bills are twice as large as low responder bills
- Average peak-period use for high responders is twice that of low responders
- Air conditioning saturation of high responders (66%) is more than twice that of low responders (29%)
- Average peak period reduction on critical days is 29% for high responders, and less than 7% for low responders
 - The elasticity of substitution is more than 6 times larger for high responders
- High responders use a greater percent of their energy on peak than do low responders

Actions required to achieve meaningful savings are not draconian

Savings From Possible Actions Taken By Consumers (7 hr peak period, 65 ¢/kWh incentive, 15 ¢/kWh average price)	
Demand Response Action	Monthly PTR Payment + Bill Savings (assumes 4 critical events per month)
Turn off 1 100 watt light for 7 hours	\$2.24
Shift washer (electric water heater) and electric dryer to off peak (1 load)	\$14.64
Shift washer (gas water heater) and gas dryer to off peak (1 load)	\$5.97
Shift dishwasher to off-peak (1 load)	\$6.33
Shift pool pump to off-peak	\$24.27
Raise air conditioning thermostat 4 degrees	\$11.20
Shift oven use to off peak (1 hour)	\$3.99

California is out to show that “smart meters and dumb prices” is bad public policy

- Of course, the road to _____ is paved with good intentions and there is a long way to go before some of these good intentions will be realized
- Within the next decade, it is likely that CA will have the most comprehensive demand-response technology infrastructure in place in North America, one that can support any sensible pricing option and facilitate customer response through enabling technology
- It is also reasonable to expect that many customers will face a time-varying rate with several options to choose from
- Maybe this is what we really meant by “customer choice”

