Committee on Energy Resources and the Environment

Time for TOU?

A Paper by

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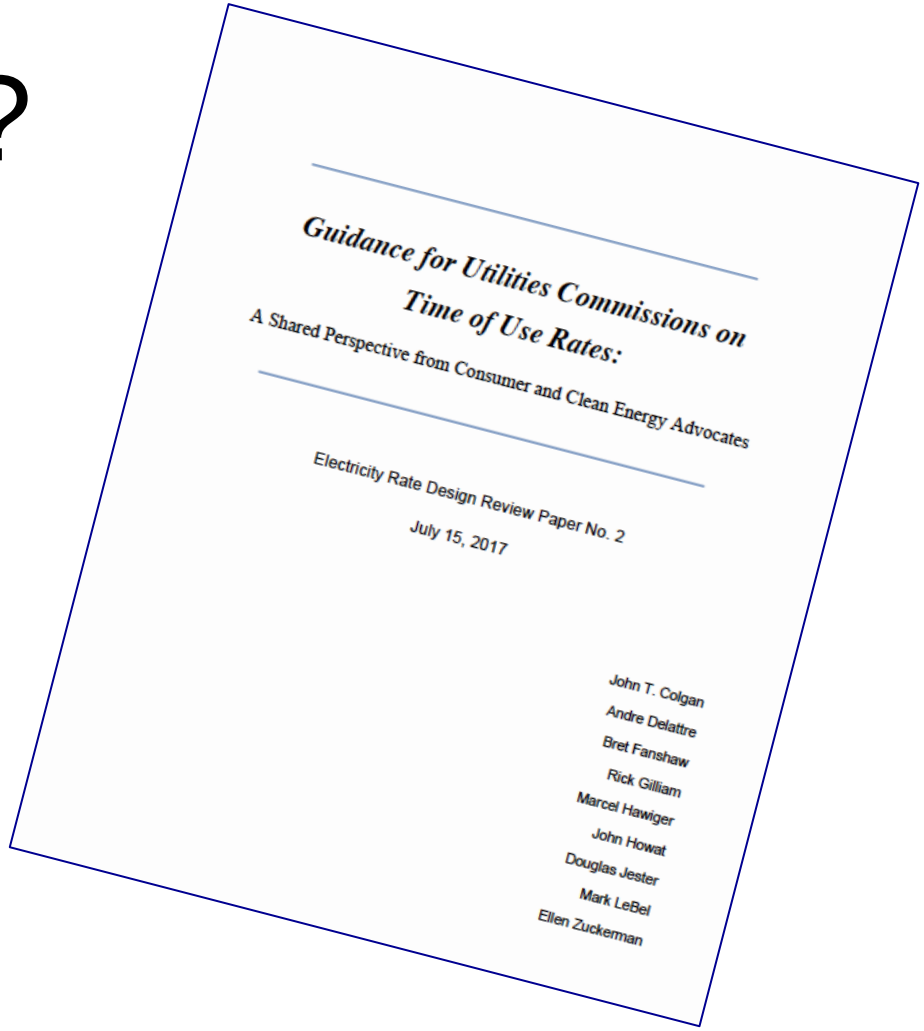


Considering TOU rates

1. Define goals up front
2. Evaluate all alternatives
   - Will load profile change?
   - Will that affect system cost drivers and customer cost allocation?
3. Understandable + actionable
4. Advance education + technology to respond

Commission Objectives

- Economic Efficiency
- Rate Reduction
- Consumer Protection
- Emissions Reduction
- Distributed Energy Resources (DER) Deployment
- Financially Viable Utility

Alternatives to Achieving Goals

Non-TVR Alternatives

- Volumetric variants, e.g. tiered rates
- Utility direct control load programs
- Performance-based incentives to encourage goals
- Increased efficiency spending

Time-varying Alternatives

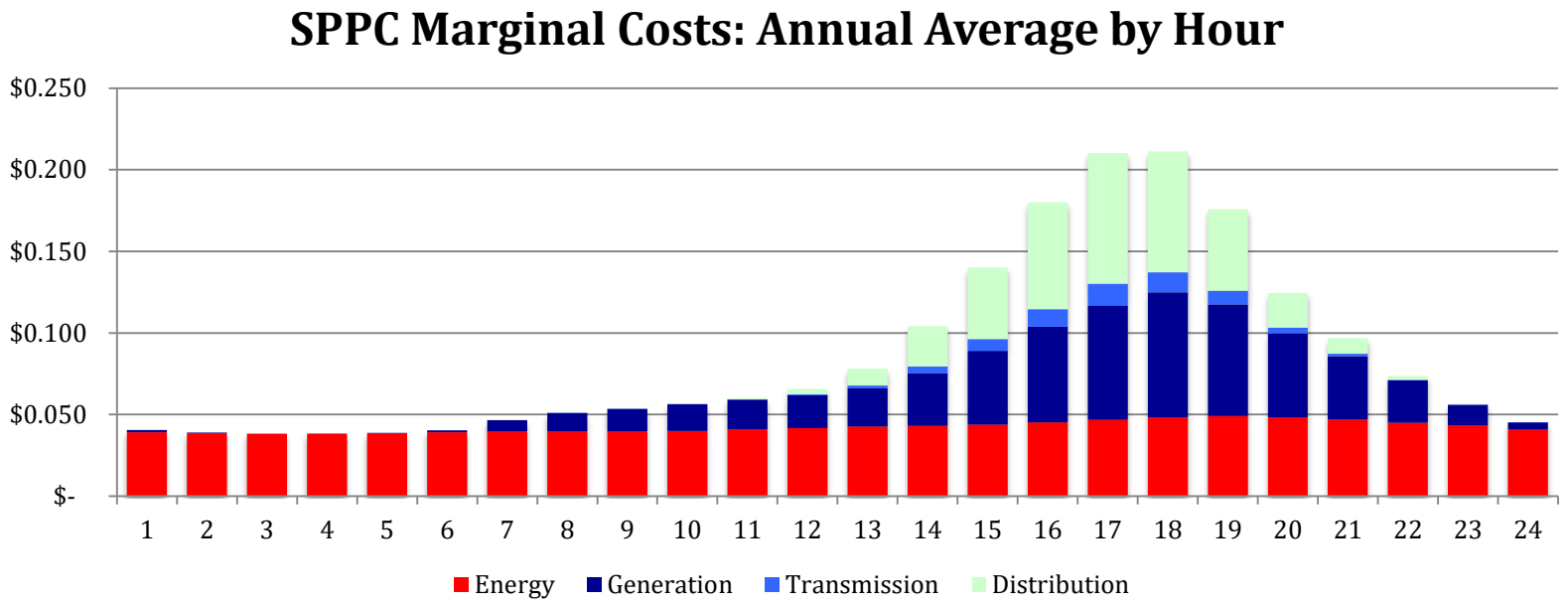
- Classic time of use
- Peak-time rebates
- Critical peak pricing
- Technology enablers for Time-varying rates

Price Signal: Understandable and Actionable?

- Concept of “rush hour pricing” generally understood
- Two elements needed to allow customer action:
  - Price for each time period
  - Timing of each time period
- No significant penalties for occasional transgressions

Consumer Protections:

- Offer TOU as optional rate, targeting early adopters or specific loads (e.g. EVs).
- If default, ensure easy access to rate information and opt-out.
- Offer shadow billing and rate comparisons.
- Exclude vulnerable groups from default.
- Expand LMI efficiency programs, and include cost-effective energy management equipment.

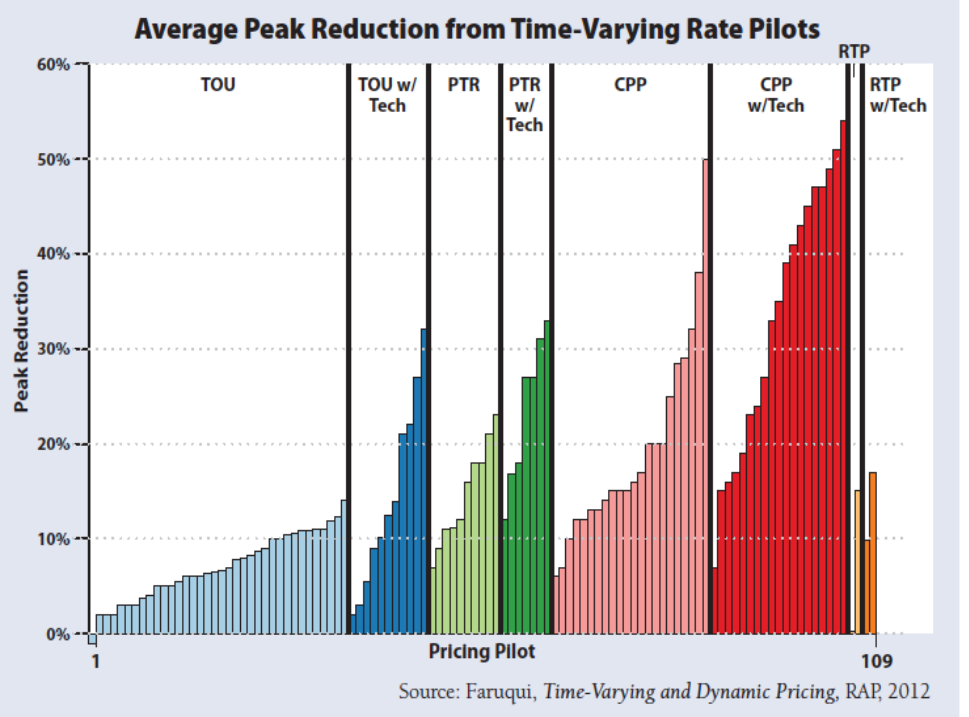


Cost Causation

- Hourly costs vary throughout the day, week and year
- Reducing loads during high cost periods should reduce overall costs.

What Does Success Mean?

- Rates that reflect cost causation, are actionable, and minimize volatility
- Responding to TOU price signal yields
  - Flattened load curve, i.e. higher load factor
  - Better asset utilization
- Reduced capital spending over time => lower rates
- Emissions reductions
- Barriers to customer-driven DER removed



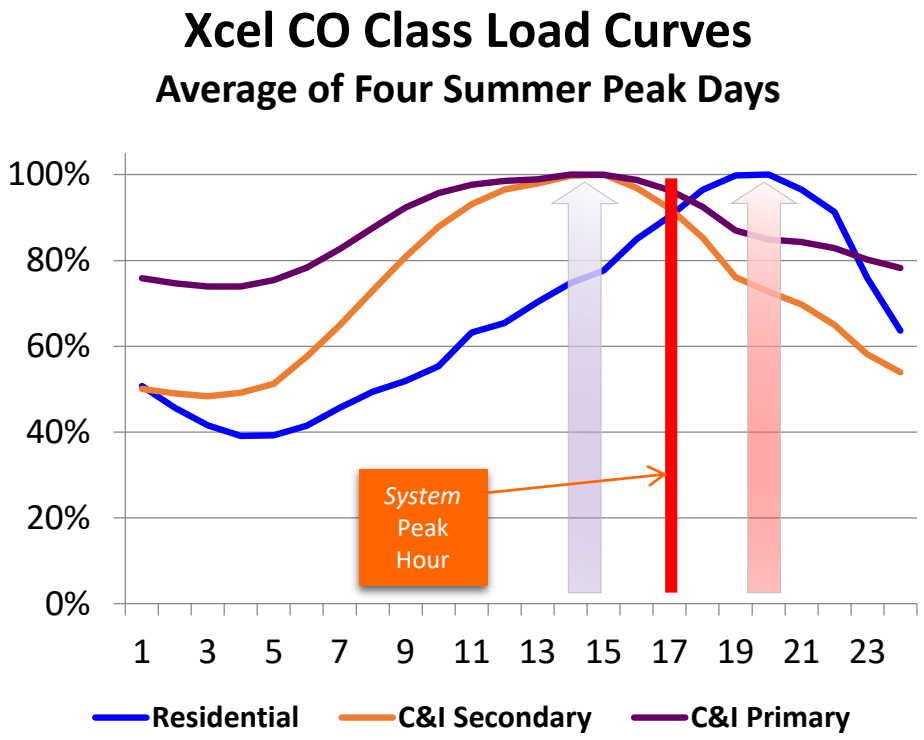

Thank You!
Ellen Zuckerman
Douglas Jester
Marcel Hawiger
Rick Gilliam

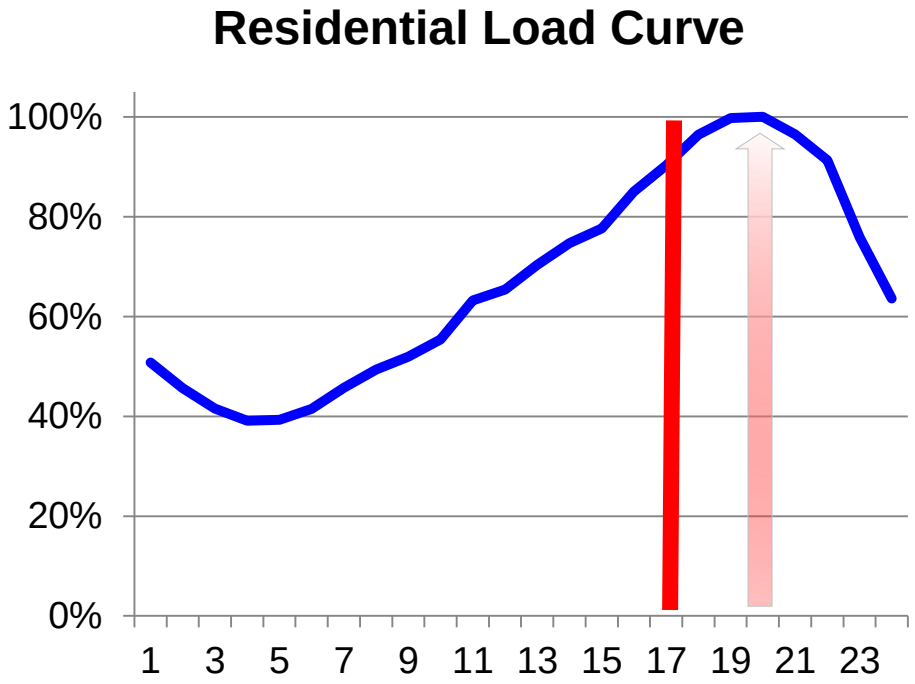
Appendix: Load profiles

[Only if needed]

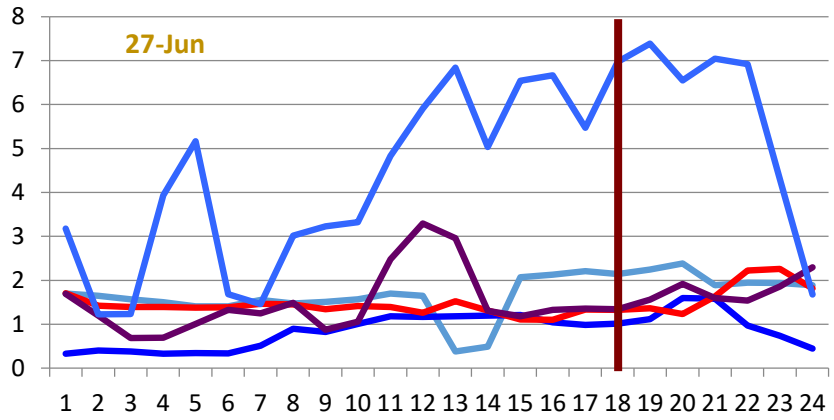
Load Profile Example

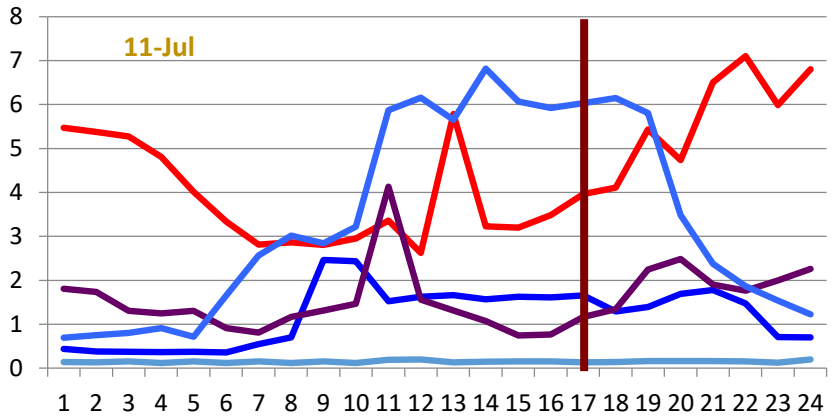
Use caution when drawing conclusions about average, typical and actual load curves.

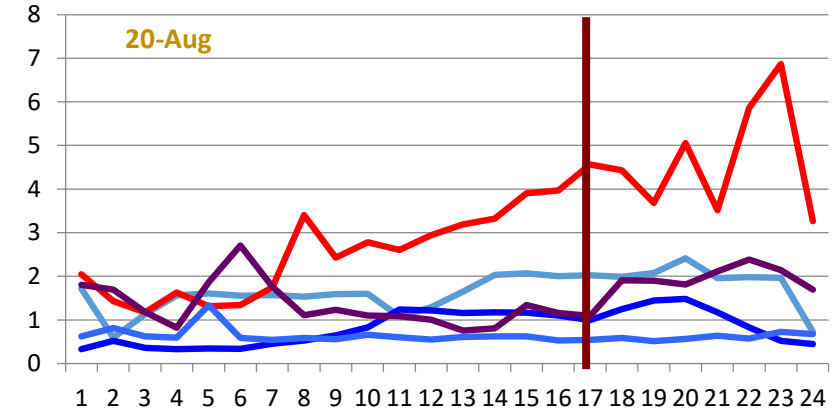


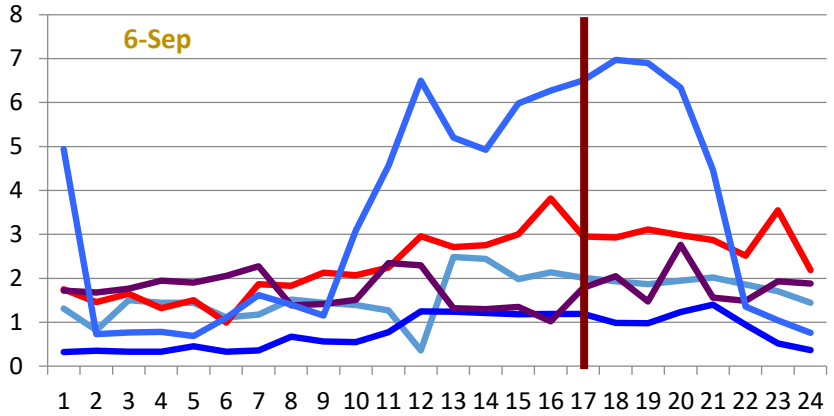


Hourly individual Residential Loads: Jun-Sep 2013









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Selected Results from 2016 TOU Opt-In Pilot:

- SCE, PG&E and SDG&E put about 40,000 residential customers on a pilot TOU rate. About 17,000 control customers on standard inclining block rate
- Customers received $200 participation payment to mitigate self-selection bias.
- Each of the utilities tested 3 rates, with TOU period of around 4-9 pm
- Tested for 3 months in summer of 2016

PG&E 2016 Pilot TOU Rates:

Rate	Peak Period Time	Price		
		On-Peak	Off-Peak	Notes
1	4-9 pm	42	32	
2	6-9 pm	44	30	Partial peak period 4-6 pm
3	4-9 pm	57	29	

The rates do not include a baseline credit of 11.7 cents/kwh for each kwh below the baseline amount.

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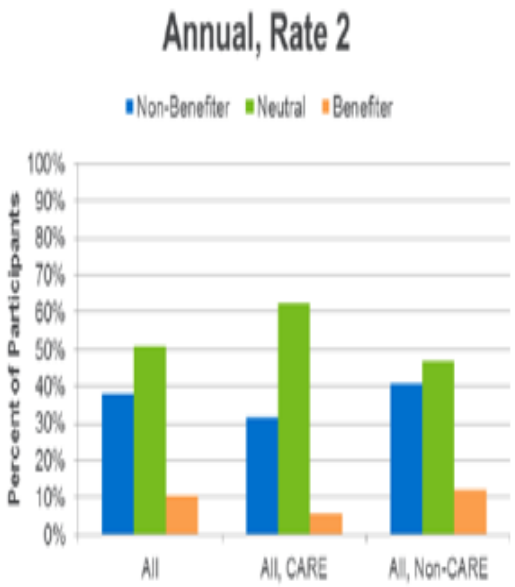
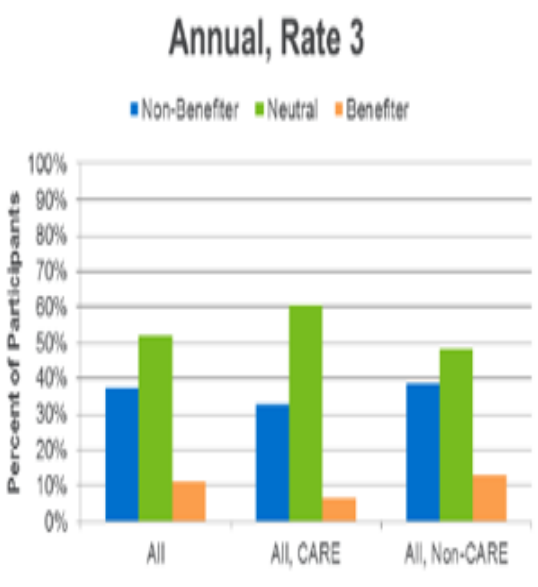
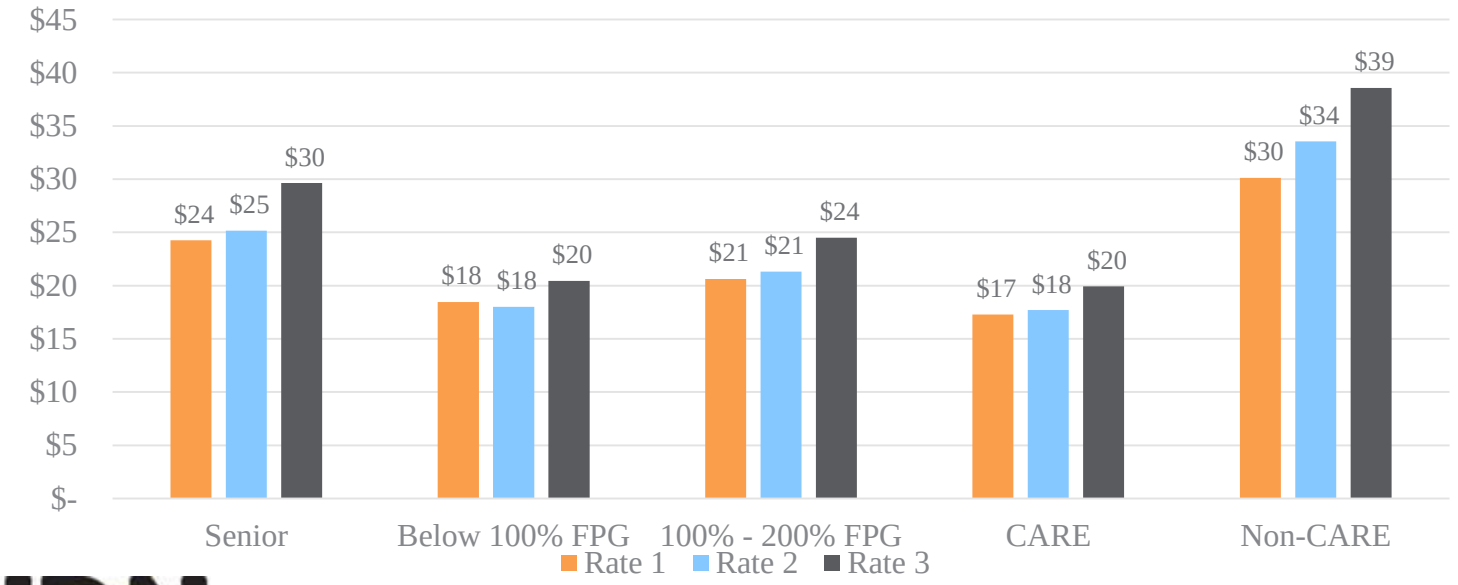
PG&E: Less than 10% of Customers Gain by Shifting from from IBR to TOU





PG&E: Summer TOU Bill Impacts (Structural) in Hot Climate Zones Vary from $17 to $39 per Month



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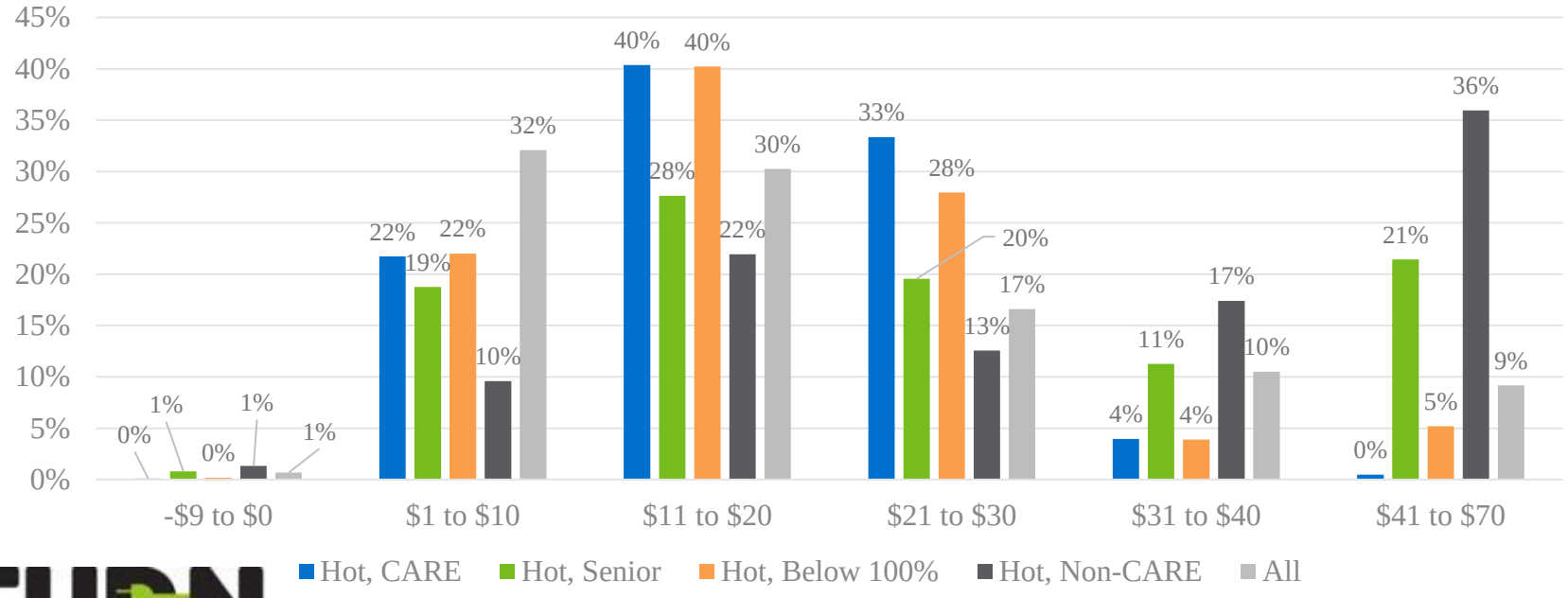
PG&E: Distribution of Summer TOU Bill Impacts



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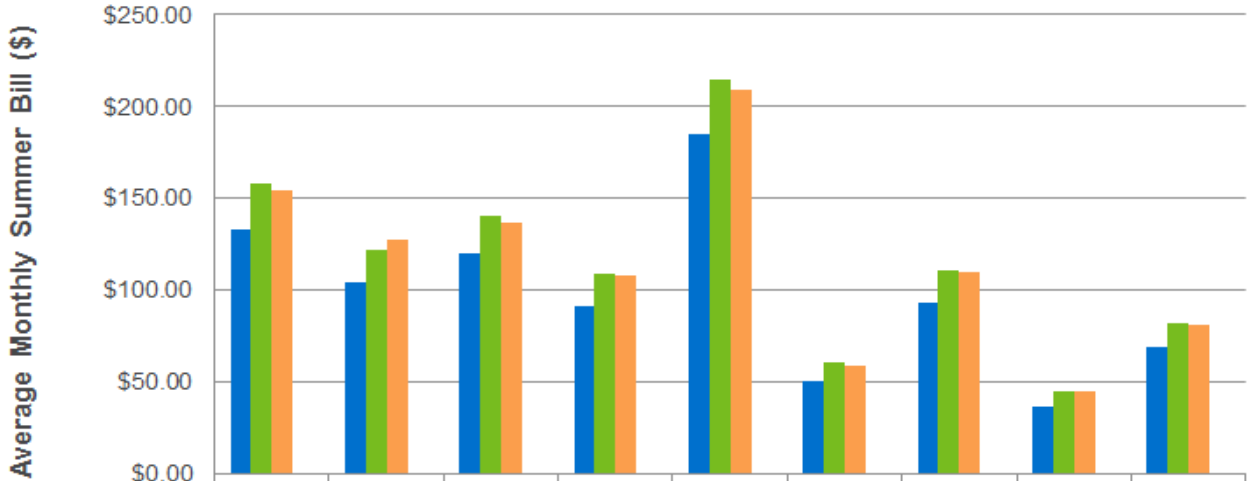
PG&E: Impact of Load Shifting on Summer Bills Minimal



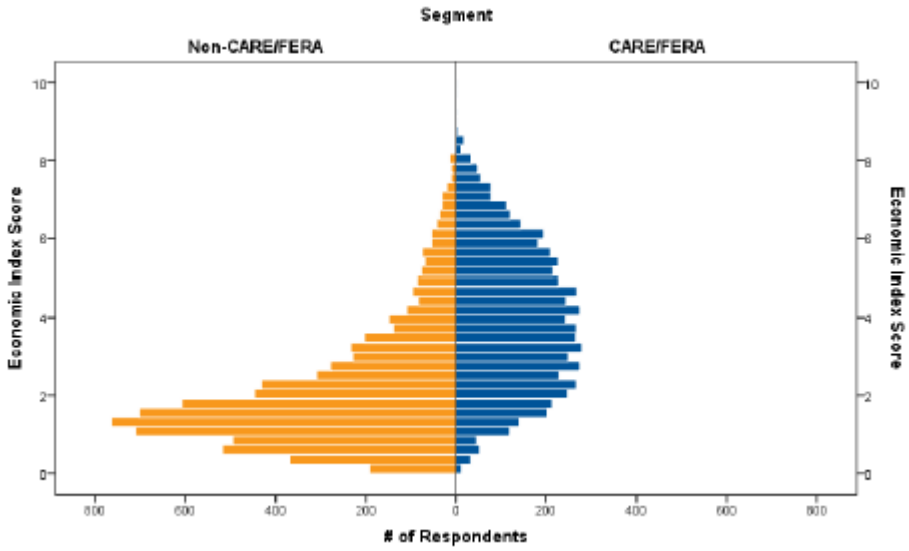
	Senior	Below 100% FPG	100% - 200% FPG	CARE	Non-CARE	CARE	Non-CARE	CARE	Non-CARE
	Hot					Moderate		Cool	
No Change in Behavior or Tariff	$133.23	$103.69	$119.80	$91.16	$184.43	$50.39	$93.25	$35.92	$68.99
No Change in Behavior, Change in Tariff	$157.49	$122.15	$140.42	$108.46	$214.55	$60.82	$110.46	$44.66	$81.80
With Change in Behavior and Tariff	$153.94	$127.48	$136.32	$107.67	$208.68	$58.67	$109.91	$44.96	$81.26
% of structural loss mitigated by change in behavior	14.7%*	-28.8%*	19.9%*	4.6%	19.5%*	20.7%*	3.2%	-3.5%	4.2%

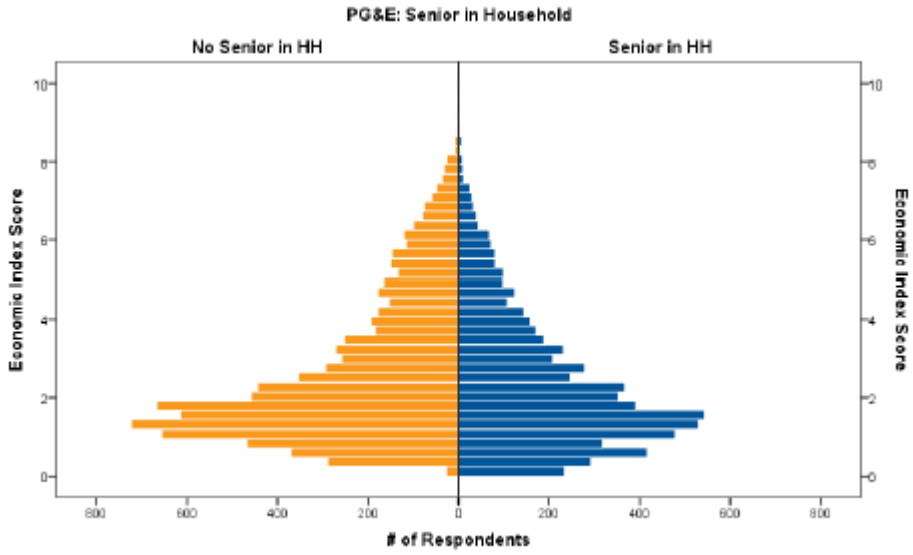
* Indicates statistically significant result

PG&E: Low Income Customers Reduce Peak Load Much Less Than Other Customers, but Seniors Similar to Others

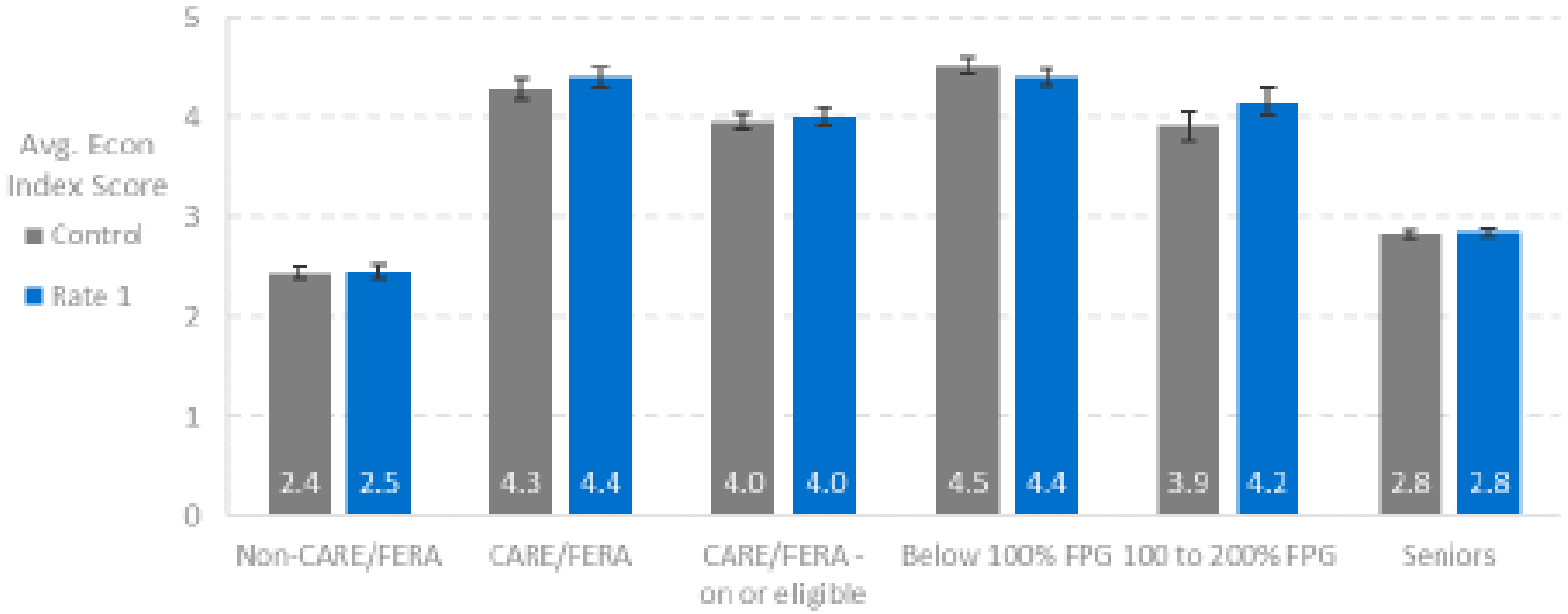
	Percentage of Peak Load Reduction			
Rate/	All Customers	non-CARE Hot Climate	CARE Hot Climate	CARE Hot/ Non-CARE Hot
PG&E 1	5.8	8.7	3.2	37%
PG&E 2	6.1	9	2.8	31%
PG&E 3	5.5	9.5	1.9	20%

SURVEY RESULTS: Low Income Customers Have Greater Economic Insecurity, but Seniors Do Not





SURVEY RESULTS: No Difference Between Treatment (TOU) And Control (IBR) Groups



CPUC Decision 17-09-036

- Order PG&E, SCE and SDG&E not to include CARE (Low Income) customers in hot climate zones from the 2017 default TOU pilot
- Will revisit whether to exclude those customers from default TOU to be implemented in 2019
- No exception for seniors

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