

“Know Your Customers”

Why utility expectations of demand response from small customers are overblown

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UCEI Policy Conference

December 10, 2007

JBS Energy, Inc.

- ❑ Consulting firm serving consumers, environmentalists, government agencies, and renewable energy producers since 1984
 - ❑ Economic analysis of utility operations, plans, and rate design
 - ❑ Manufacture and sell Aquacalc (handheld computer for surface water measurement)
 - ❑ www.jbsenergy.com
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Rate Design Can Be Controversial

**IT IS UNLAWFUL TO CARRY A HANDGUN OR
OTHER FIREARMS ON THE PREMISES OF THE
PUBLIC UTILITY COMMISSION OF TEXAS**



**ESTA PROHIBIDO POR LA LEY CARGAR
REVOLVERES, PISTOLAS Y OTRAS ARMAS
DE FUEGO EN CUALQUIER ÁREA DE LA
COMISIÓN PÚBLICA DE UTILIDADES DE TEXAS**

Who Are Small Customers

- Lower Use of Peak Power Relative to Average Energy Use
 - Lower Saturation of Air Conditioning
 - Smaller Dwelling Units
 - Smaller Household Sizes
 - Lower Incomes
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Data Sources

- ❑ Aggregate Billing Data (Use by Tier, Month, and Climate Zone)
 - ❑ Disaggregate Billing Data (Borenstein study)
 - ❑ Load Research Studies (Hourly Data)
 - ❑ Residential Appliance Saturation Survey (RASS)
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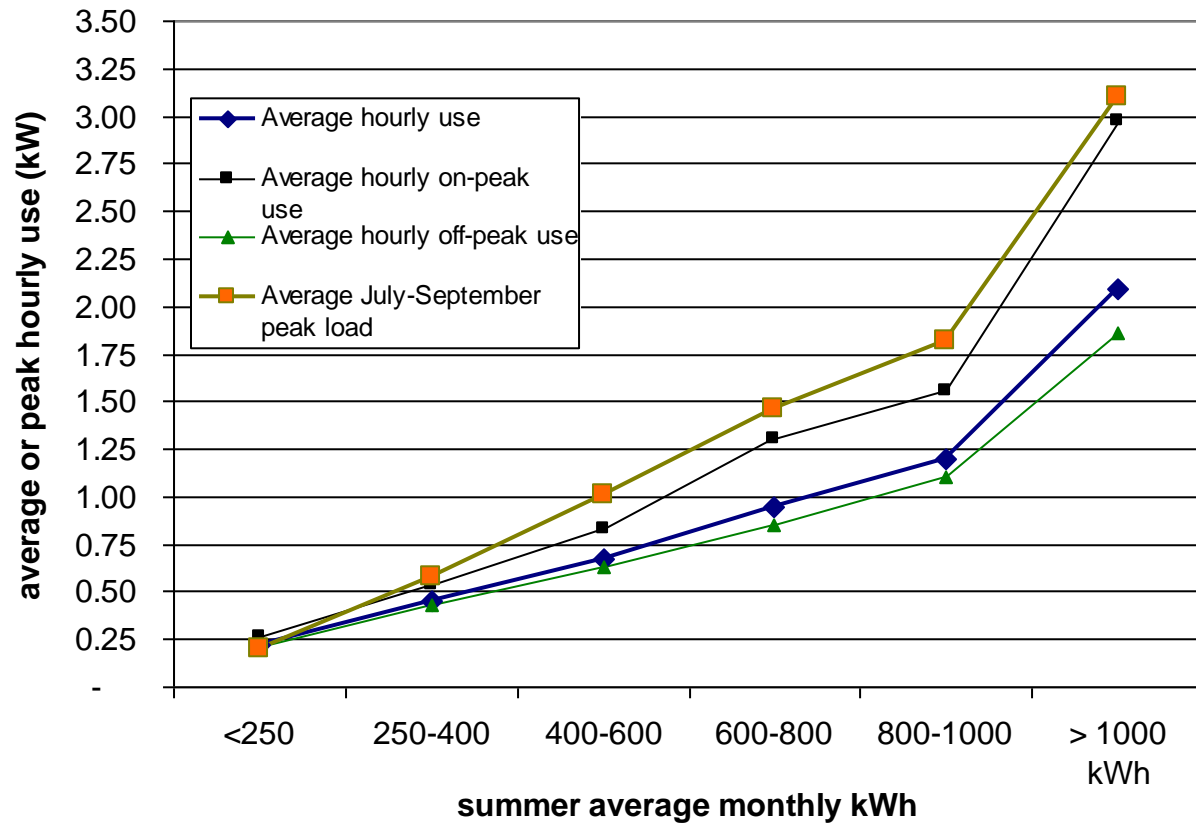
Load Research

- ❑ Data provides use by time period and peak loads for sample of customers
 - ❑ Stratify by size of customer
 - ❑ May be able to stratify by location (PG&E)
 - ❑ May contain other information (e.g., CARE, all-electric, etc.)
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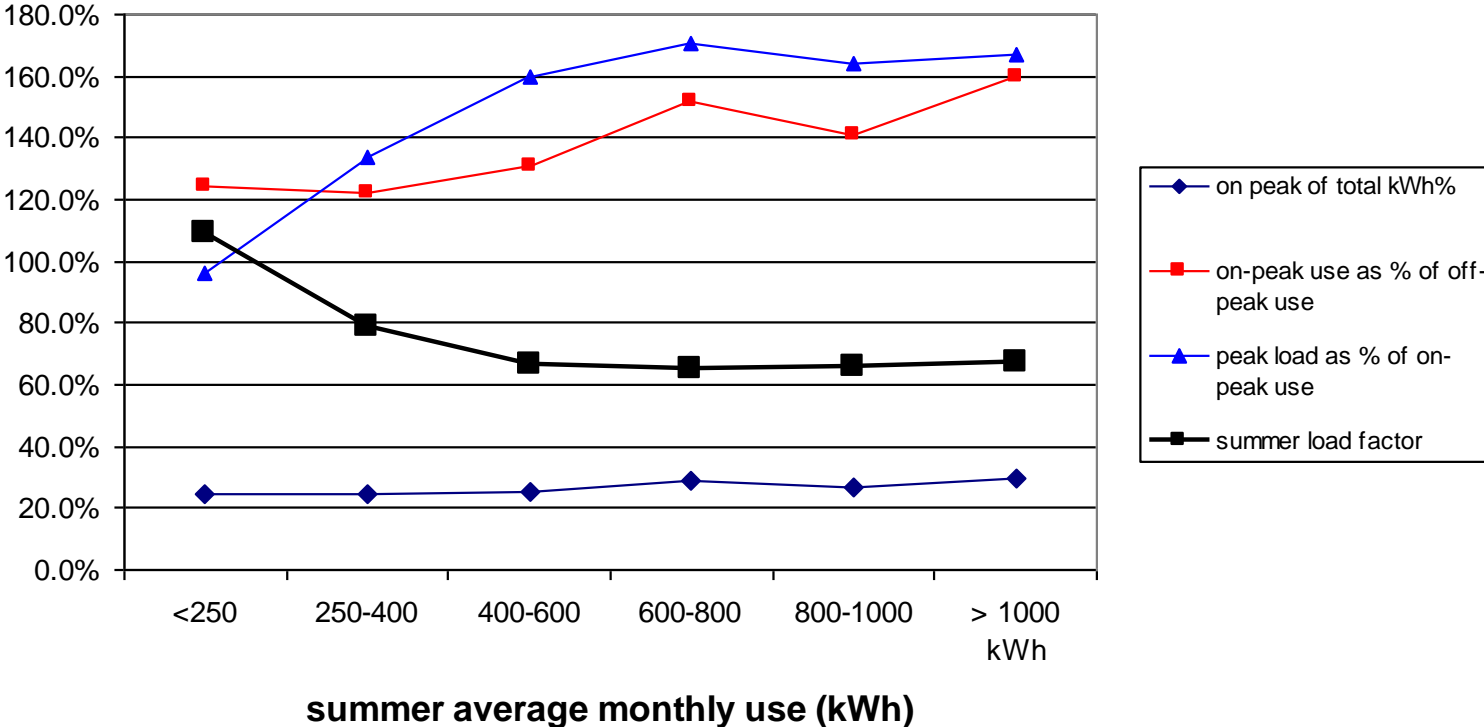
Load Research

- ❑ JBS has analyzed load research data for all 3 California utilities in the past.
 - ❑ For all three utilities, smaller customers use less peak power than larger customers.
 - ❑ This fact is true after controlling for climate zones on the PG&E system (which had that information)
 - ❑ Voluntary TOU customers also use less peak power
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SDG&E Load Research Data



SDG&E Load Research Data 2



RASS Data

- ❑ Over 20,000 stratified sampled data points for 4 major electric utilities (3 IOUs + LADWP)
 - ❑ Type of Appliances
 - ❑ Appliance Usage
 - ❑ Income
 - ❑ Household Size
 - ❑ Housing Unit Type and Size
 - ❑ Link to Electric and Gas Billing Data
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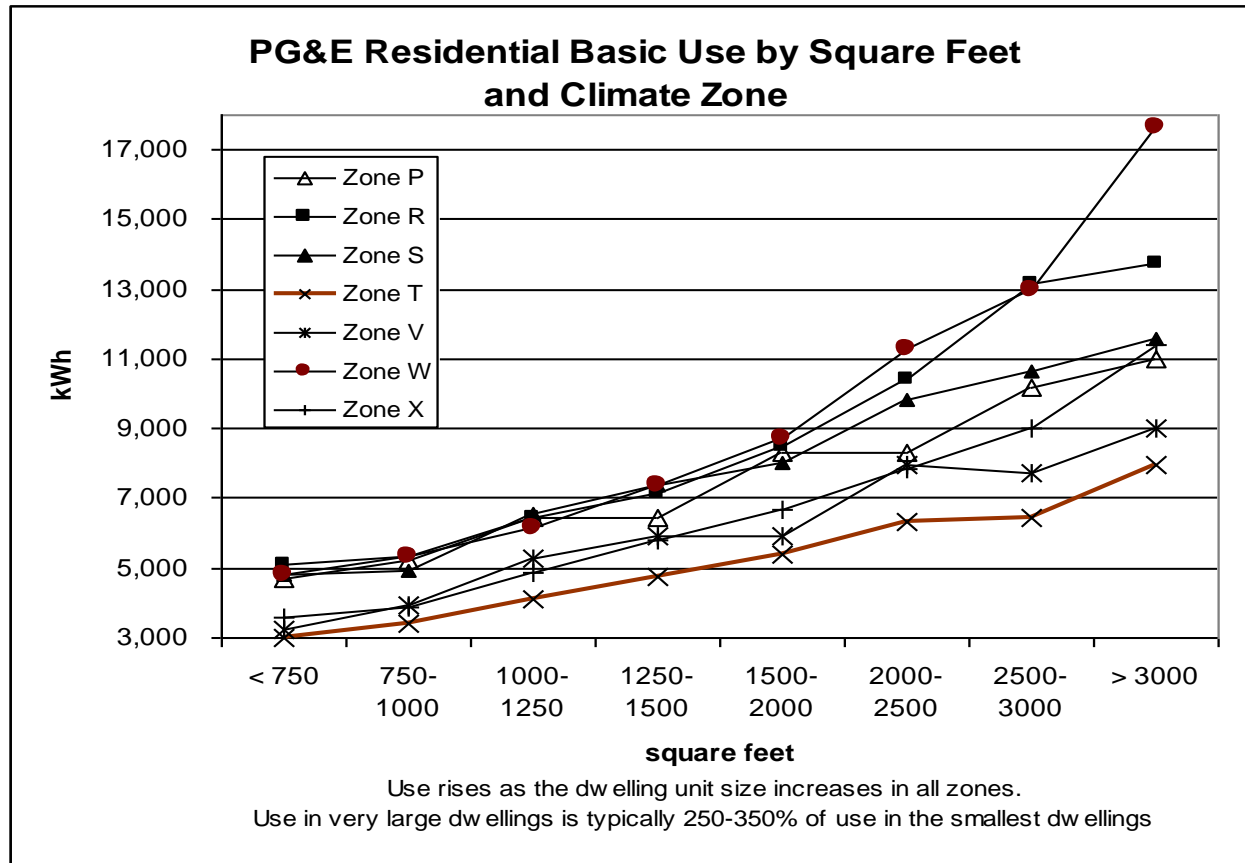
Why Use RASS Data?

- ❑ RASS explains **why** load research shows that small customers don't use much peak load.
 - ❑ RASS has income data from customer survey – don't need census data inference.
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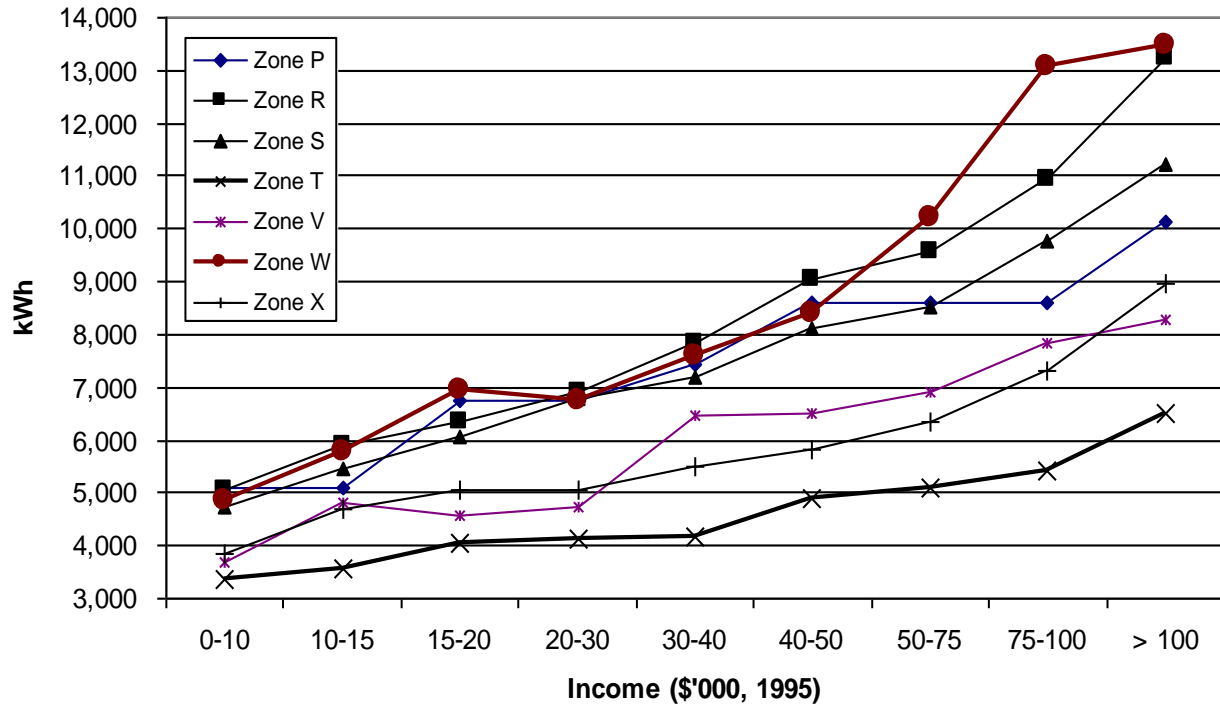
What Can I Tell You

- ❑ Not much that is current - research in progress
 - ❑ Data under confidentiality agreements from utilities that allow me only to use it in specific cases. When I present the work in a case, I can tell you more about it.
 - ❑ 2002 study using 1994-95 RASS - "Economic and Demographic Factors Affecting California Residential Energy Use." on JBS website.
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Examples from 2002 Report on our website

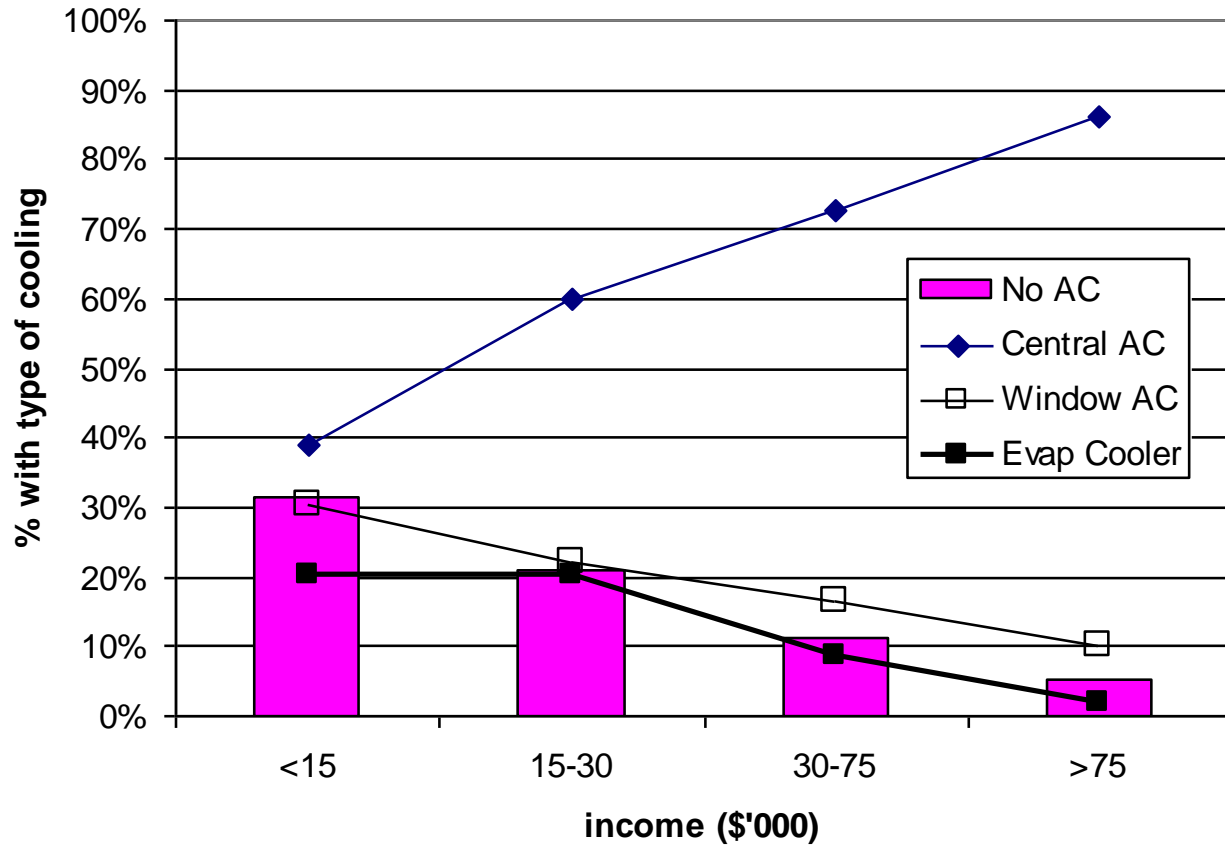


PG&E Residential Basic Use vs. Income by Climate Zone



use at least doubles from the low est to the highest income in all zones. Use is more sensitive to income in Central Valley zones R, S, and W and less sensitive in Bay Area Zone T.

Air Conditioning Type by Income (SCE Zone 17 Basic)



Themes from new work

- ❑ Small customers have considerably lower air conditioning saturations, even in hot climate zones.
 - ❑ Small customers have much lower average incomes than large ones – Tier 5 over \$100K in most areas.
 - ❑ Small customers live predominantly in apartments and small houses.
 - ❑ Fewer small customers have other energy consuming equipment (laundry, electric stoves, etc.)
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Edison Slide on Average Residential Rate Differentials by City

- Highest 10

- Lowest 10

CITY	Residential Average Rate - per kWh
LEISURE WORLD	\$0.2230
HIDDEN HILLS	\$0.2130
VILLA PARK	\$0.2105
BRADBURY	\$0.2089
MALIBU	\$0.2054
PASADENA	\$0.2035
LA HABRA HEIGHTS	\$0.1990
LA CAN-FLINTRIDGE	\$0.1937
SAN DIEGO COUNTY	\$0.1922
INDIAN WELLS	\$0.1919

CITY	Residential Average Rate - per kWh
MC FARLAND	\$0.1038
BORON	\$0.1112
MAYWOOD	\$0.1133
SOUTH GATE	\$0.1143
BELL GARDENS	\$0.1157
ROSEMEAD	\$0.1166
AZUSA	\$0.1166
IMPERIAL COUNTY	\$0.1182
LOMITA	\$0.1195
VENTURA	\$0.1199

Data for 12-months ending July-2006. Includes all residential customers regardless of rate schedule.

Deconstructing Edison Analysis of Rates by Community

- ❑ High rates associated with income >100K
- ❑ Most low-using communities have low income

Average Residential Rate Differentials by City

Highest 10	household income	rate	Lowest 10
Leisure World	(1)	0.2230	McFarland
Hidden Hills	244221	0.2130	Boron
Villa Park	141927	0.2105	Maywood
Bradbury	122665	0.2089	Southgate
...

Conclusion

- ❑ Utilities need to “know your customers.”
 - ❑ Small customers use less peak power because they have lower incomes, smaller dwellings, and fewer air conditioners across the state.
 - ❑ Small customers provide little demand response potential that could theoretically be unlocked by repealing AB-1X.
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