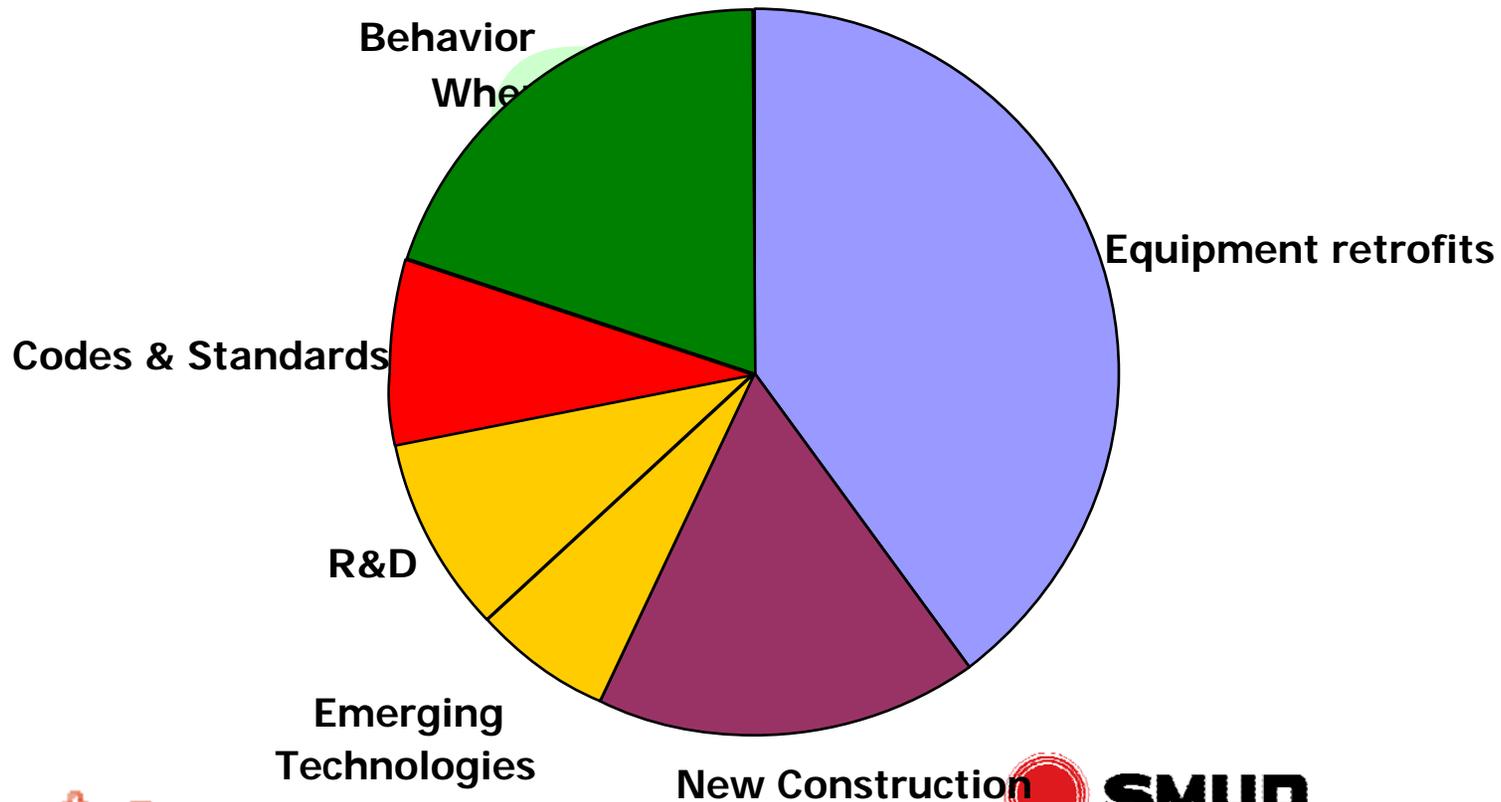


Why this Program is Important

- SMUD Board Adopted 10-Yr Goals in 2007: 1940 GWh by 2017
The Problem: 2006 Energy Efficiency Potential Study said Only 1220 GWh were available to tap* (Based on installing efficient widgets)



*Itron, Inc. Energy Efficiency Potential Study. (Sacramento, CA: Sacramento Municipal Utility District, 2006).



SMUD

SACRAMENTO MUNICIPAL UTILITY DISTRICT

The Power To Do More.



Persistence of Savings: What We Know, and What We Don't

- Continuing Report Recipients:
 - 17,500 Original SMUD pilot participants still receiving reports after nearly 3 years
 - Nov 2010 Navigant report: Savings have held up for as long as 30 months (2.7% for high users)
 - SMUD will measure savings trend after 39 months (fall 2011)
- Discontinued Recipients:
 - Stopped reports to 6,500 pilot recipients in July, 2010 after 2 years
 - Evaluation planned fall, 2011.
- Reported energy-saving actions:
 - 2009 SMUD survey, ADM impact evaluation showed about half of reported actions involved equipment improvements
 - Collecting right baseline data is critical
- Think differently: what does "persistence" mean for conservation behaviors?



Evaluation Challenges for Behavior Programs

- Verify Savings, but focus energy on generating information that will allow optimizing strategies:
 - What actions did participants take?
 - What, specifically, motivated them?
 - How much of savings is from behavior versus equipment?
 - Who saved the most?
 - How did they feel about the program? Did they participate actively?
- Cross-program influences: know how you will isolate effects of behavior strategy up front and collect the right baseline information before you begin.
 - SMUD lacked customer-specific data on which measures were rebated so we could not estimate savings attributable to rebated measures



Pros and Cons of Opt-out

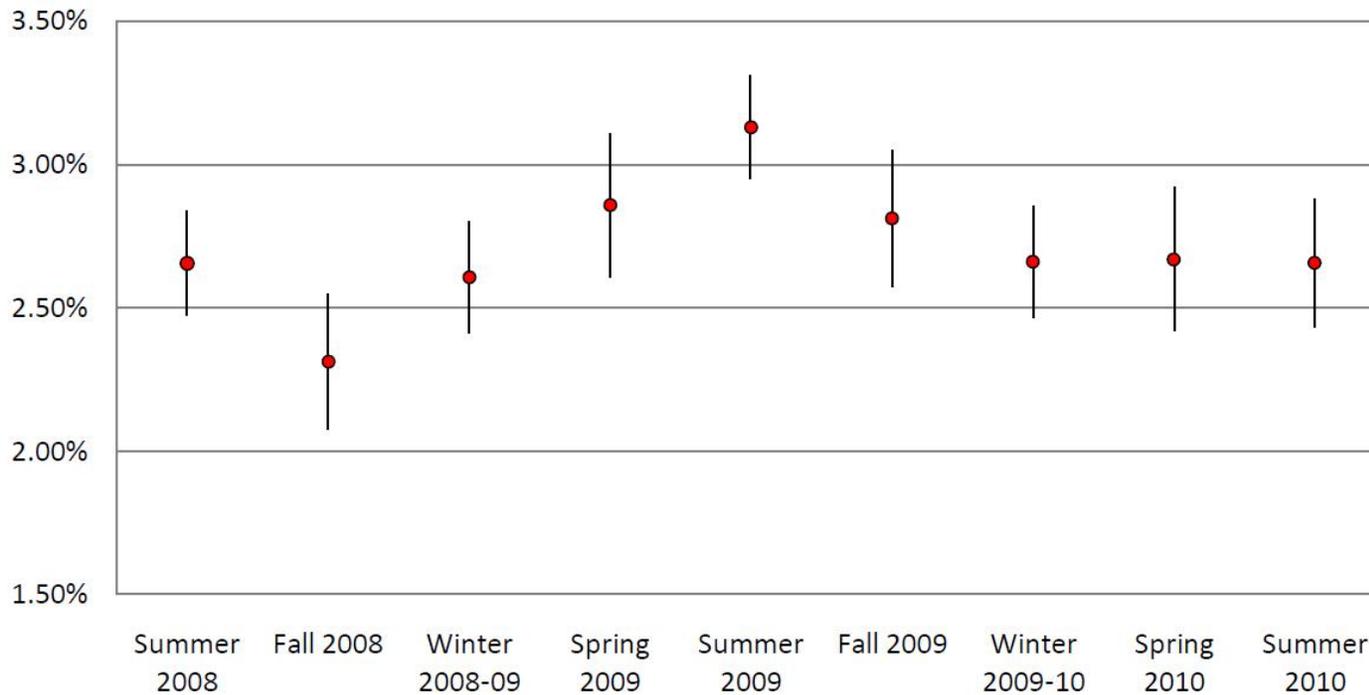
- Delivers MUCH higher participation from target market than opt-in (SMUD's pilot group retained 96% after 3 years)
- Reach customers who would not bother to participate in your other programs
- Enrolls people who did not and would not ask for this



SLIDES FOR REFERENCE DURING Q&A



Savings Trend for first 30 months for high energy users (quarterly report recipients)



“Difference in differences” estimates of seasonal savings with 90% confidence intervals; High Energy Consumers (monthly reports). Navigant Consulting, November, 2010.



Report Format



Account number: 594860

Home electricity report

bill period: 07/14/07 - 08/13/07

Adam Smith
1400 45th St.
Sacramento, CA 95819

This home energy report is intended to help you understand and make choices about your electricity usage and costs. Each month you will see:

- A comparison of your use to your neighbors
- A comparison to your own use last year
- Personalized tips for reducing your cost

We hope this helps you manage your home electricity use!

Last Month Neighborhood Comparison

You used 17% MORE electricity than your neighbors last month.



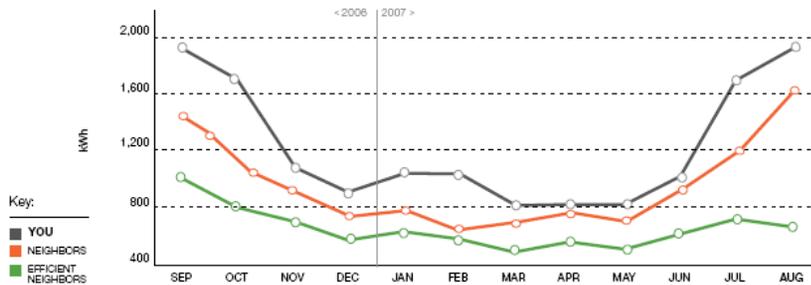
*A 100-Watt bulb left on for 10 hours uses 1 kilowatt-hour (kWh).

HOW YOU'RE DOING:

GREAT (two smiley faces)
 GOOD (one smiley face)
 ROOM TO IMPROVE (arrow pointing right)

12 Month Neighborhood Comparison

In the last 12 months you used 32% MORE electricity than your neighbors. This cost you \$645.



WHO ARE YOUR "NEIGHBORS"? We're comparing your usage to 100 homes nearby and similar in size to yours (average 2340 square feet). Your most efficient neighbors are the top 20 in terms of energy efficiency.

Personalized Action Steps

- Change your A/C filter Upgrade to efficient A/C Install solar panels

TURN OVER TO LEARN MORE →

Personal Comparison

How your energy use compares to last year

July Average kWh/day



Average Temperature
July 2006: 67° | July 2007: 72°

You used 10% LESS this July. You earned a star!



STARS EARNED THIS YEAR:

		★				★	?	?	?	?	?
J	F	M	A	M	J	J	A	S	O	N	D

* You earn a star when you use less than last year.

So far this year, you're using 5% LESS than last year.

ACTION STEPS

Personalized tips to reduce your electricity bill and environmental impact

Quick Fixes

Things you can do right now

- Reduce phantom loads

In the average home, 75% of electricity used to power home electronics is consumed while the products are turned off. That's a lot of wasted energy and cost!

Cell phone chargers, computers, and televisions are examples of devices which consume electricity when turned off. Eliminate this waste by unplugging the devices or using a powerstrip which can be turned off.

\$100 SAVED OVER 1 YEAR

Smart Purchases

Save a lot by spending a little.

- Switch to Compact Fluorescent Bulbs (CFLs)

CFLs use 75% less energy and last up to 10 times longer than standard incandescent light-bulbs.

They greatly reduce energy usage and saves you money on electricity bills and replacement costs. Today's CFLs provide high-quality light output and are available in many sizes and shapes to fit most lighting fixtures.

Replace 5 bulbs and save up to:

\$65 EACH YEAR

Reduce your Impact

Offset your emissions

- Enroll in SMUD's carbon offset program

Your electricity use for 2007 created **11.2 TONS** of carbon emissions. Your carbon output can be offset by funding carbon reduction programs.

You can offset the emissions from your electric use for: **\$4.51 a month!**

Order online at livegreen.smud.org

Don't forget your account number: 594860

11 TONS OF CO2 SAVED



1-888-742-SMUD (7683)
www.smud.org | info@smud.org



www.positiveenergyusa.com

PRINTED ON RECYCLED PAPER WITH SOYBASED INK

Experimental Design

- Pilot group (April 2008 through today)
 - Randomly selected from within geographic pilot areas:
 - Control group: 50,000 residential customers
 - Test group: 35,000 residential customers
 - 17,500 still receiving reports as of 3/2011 to test persistence
 - 6,500 were discontinued in July, 2010 to measure persistence
- New Target Group
 - Targeting 20,000 segments that saved most during the pilot:
 - 5,000 highest users (projected savings: 179 kWh/yr/household)
 - 5,000 SMUD market segment “Big Toys Big Spenders” (677 kWh)
 - 5,000 UCLA regression model (584 kWh)
 - 5,000 electronic reports
 - Control group: 25,000 randomly selected from same targeted pool



Market Research and Evaluation Efforts

- ☑ Baseline behavior and attitude customer survey to pilot & control groups (March, 2008)
- ☑ Report design customer focus groups (May, 2008)
- ☑ First quarter evaluation by Positive Energy (August, 2008)
- ☑ Second quarter evaluation by Positive Energy (October, 2008)
- ☑ Impact evaluation by SMUD Bus. Planning (October, 2008)
- ☑ Customer survey of actions taken (Jan, 2009)
- ☑ Final behavior and attitude customer survey (June, 2009)
- ☑ First-year evaluation by SMUD contractor (November, 2009)
- ☑ Analysis of savings data by market segment



Review of Mid-term Evaluation Results

- 1.9% average energy savings
- There were measureable savings across all ages, income brackets, and levels of energy use.
- Certain customers saved more than average
 - Large energy users
 - Green energy supporters
 - Lower income customers
 - Seniors
- Below-average energy users also saved (these customers are compared to “most efficient” neighbors)
- Goal-setters saved 10% (N=177)



Research Questions for 1-Year Evaluation

- How much did participants save after a full year?
- What actions did people take to reduce energy use?
- How much of savings is attributable to changing operating behavior versus equipment?
- How much of the savings resulted from participation in other SMUD programs?
- For how long does savings persist?
- How, specifically, did the reports motivate them to save?
- Who saved the most, and why? Can these segments be targeted?
- Who saved the least, and why? Can the reports be modified to induce more savings from these segments?
- How did they feel about the reports? Did they read them? How did they use them?



Mail Survey: Topics Addressed

1. Overall satisfaction with SMUD
2. The degree to which they feel SMUD helps them in specific areas
3. General interest in energy-related areas
4. Previous year's EE behavior
5. Planned EE behavior changes for coming year
6. Recollection of SMUD EE communications
7. General open-ended questions to provide depth to responses in the above categories



Methodology

- Initial invitations and questionnaires mailed in May, 2009 to a sample of 5,000¹ Pilot group participants
- A reminder postcard sent three weeks following initial invitation with option to take the survey online
- Margin of error = $\pm 2.2\%$ at 95% confidence level
- n=1,375
- Data were not weighted for analysis, though demographic distributions varied from Census data²
- Respondents were told the survey was affiliated with the Home Electricity Reports
- A visual and narrative depiction of the report was included with the cover letter to assist in recall

1. The sample did not include customers who had moved during the pilot period, opted out from the program, or were no longer in the program for some other reason. Opt outs account for about 2% of initial pilot sample.

2. Because reports are distributed via mail, weighting data of a mail survey may have introduced considerable bias to the analysis of key questions. Weighting the data may have increased the appeared propensity of some segments to behave or respond in a specific way that was not representative of the group overall due to open-

rates and read-rates



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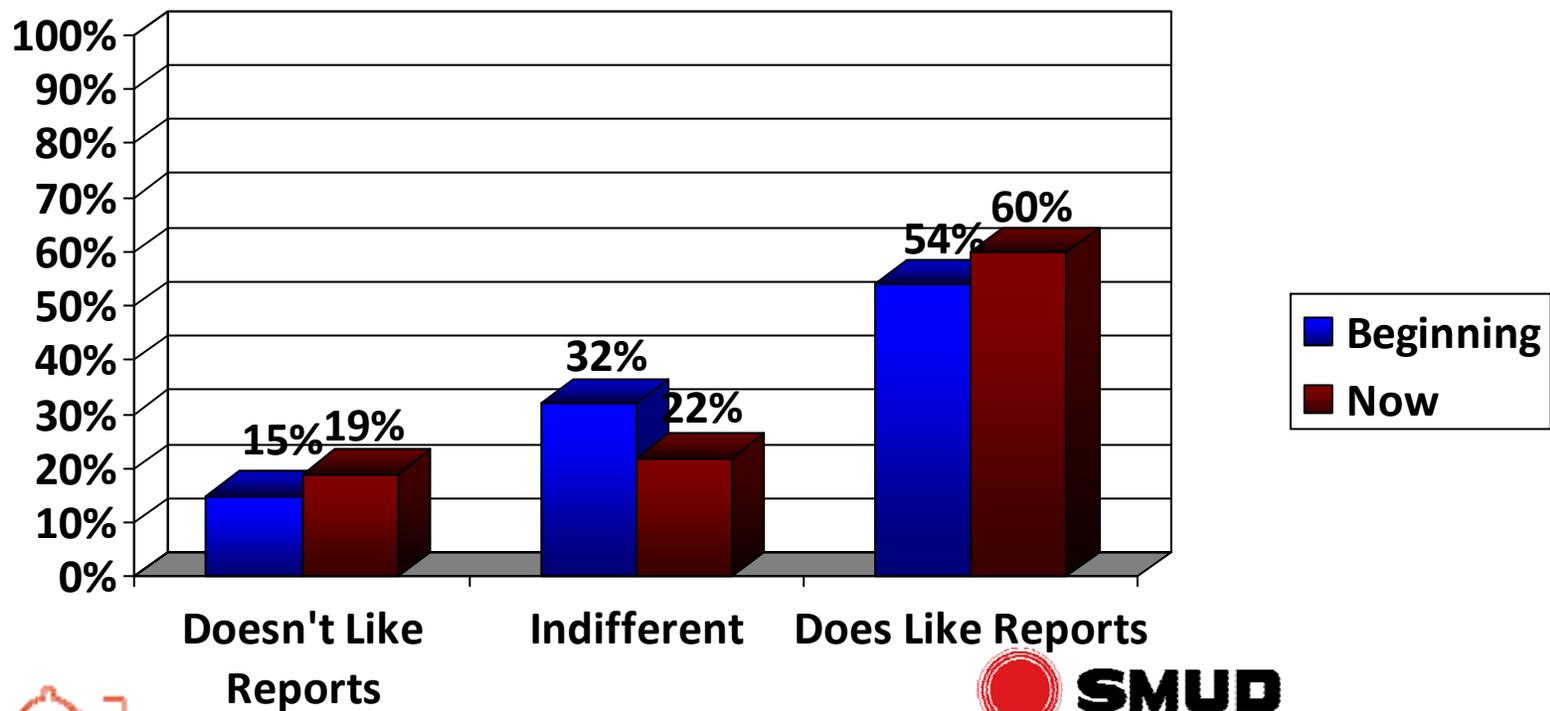
Highlights

- 98% recall receiving the reports
- 90% read all or most of the reports, most carefully
- 70% find them easy to understand
- 67% find them valuable
- Customers are talking about the reports
- Customers aren't clear about how their neighbors are selected and have mixed feelings about the relevance of the group and the appropriateness of the comparison.



Report Acceptance

Initial Sentiments Versus Current Sentiments



Impact Evaluation: Design

- General Linear Model (GLM) controlling for:
 - Selected housing characteristics
 - Billing time period (staggered)
 - Weather
- Subset analyses:
 - House size
 - Vintage
 - Heating fuel (gas vs electric)
 - Presence of pool
- Monthly billing data:
 - 12 months pretest (April, 2007-March, 2008)
 - 12 month test period (April, 2008-March, 2009)
- Phone survey of high savers (12-36 kWh/day, n=78)
 - Asked what actions were taken specifically in response to reports



Impact Evaluation: Results

- 1.9% savings overall (1.866%-1.873%, 95% confidence)
- 0.5% savings attributable to recipients who also took a SMUD rebate or loan (represents maximum attributable to those programs).
- Worst case levelized cost 6.9 cents/kWh (assumes zero persistence, 1.4% savings, zero contribution where rebates were taken)



High-Saver Survey Results: What Changes Were Made?

- 57% of changes reported by recipients were behavioral
- 43% equipment changes (but more research needed)



Pre-Post Results: What Changes Were Made?

Measure	Treatment Effect	Weight (kWh per year)	Annual Impact (kWh)
Recycled second refrigerator/freezer	0.007	1161	8.13
Installed whole-house fan	-0.007	22	-0.15
Unplugged appliances not in use	0.076	100	7.6
Turned off PC when not in use	0.013	390	5.07
Total			20.6



Feedback from Report Recipients

- 970 calls, letters, and emails (2.8% of test group)
- 579 Opt-outs (1.7%)
- Unlikely to be representative of entire test group, but can be very informative



Feedback from Report Recipients

*"I enjoy the monthly reports,
and they are an incentive to do
better."*

*"Thanks for the
kick in the pants."
(reduced usage 30%)*



*"This has been a
compelling sales tool for
selling my house."*



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Themes in Positive Feedback

- Appreciated SMUD proactively sharing this information with them
- Wanted more information or help with their home's efficiency
- Increased interest in energy efficiency, Medical Rate and Low Income bill assistance programs



Feedback from Report Recipients

"I resent being told I am below average. I pay my bill on time... leave me alone."

"Don't send this crap anymore!"



"Mind your own business."

"Build more plants and quit sending me these letters!"



27 February 2009

Mr. John D. Stasio
General Manager and Chief Executive Officer, SMUD
6201 S Street, Sacramento, CA 95817
P.O. Box 15830, Sacramento, CA, 95852-1830

Re: Home electricity report
Bill period 12/30/08-01/29/09

Dear Sir,

My wife and I have received another of SMUD's almost innumerable "Home electricity report" missives. We have suffered from your gross effrontery for too many months past.

As usual, we have had the "Black Letter" hung around our necks.

I have no idea how many of these basically useless multicolor "reports" are sent out each month, but over the past one or two years, these fly in the face of SMUD's smug pronouncements of how eco-friendly they are with the solar panels on their Highway 50 site, etc. How many trees have been sacrificed to send the "Neighborhood Comparison" to offending souls? And what is the postage cost?

Since we have no knowledge of the individual or individuals who developed this onerous program, we can only guess that they were quite young and full of ideological hubris, and certainly did no significant individual analysis, but hopefully they could get a "stat sig" letter going out to prove their worth.

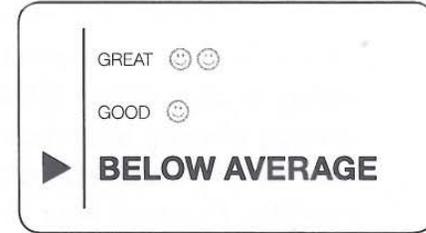
Sometime ago I had a lengthy telephone conversation with a nice lady at SMUD who informed me of all the things I could do to improve my status on this report. "Get double pane windows and doors" (Done several years ago). "Turn your pool sweep on only at night, if you have a pool, and do not turn on the pool heater" (Night time only for long time, and no pool heater). Get new energy efficient furnaces (How

Last Month Neighborhood Comparison

Last month you used **4% MORE** electricity than your neighbors.



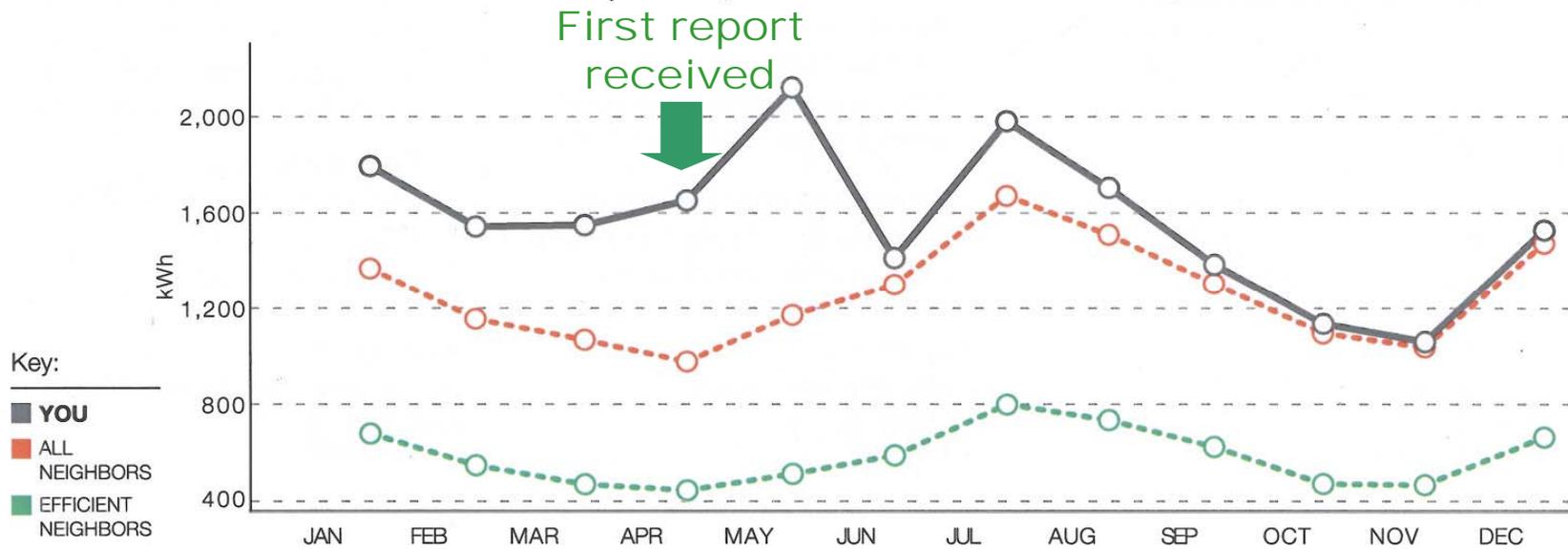
YOUR EFFICIENCY STANDING:



* A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour (kWh).

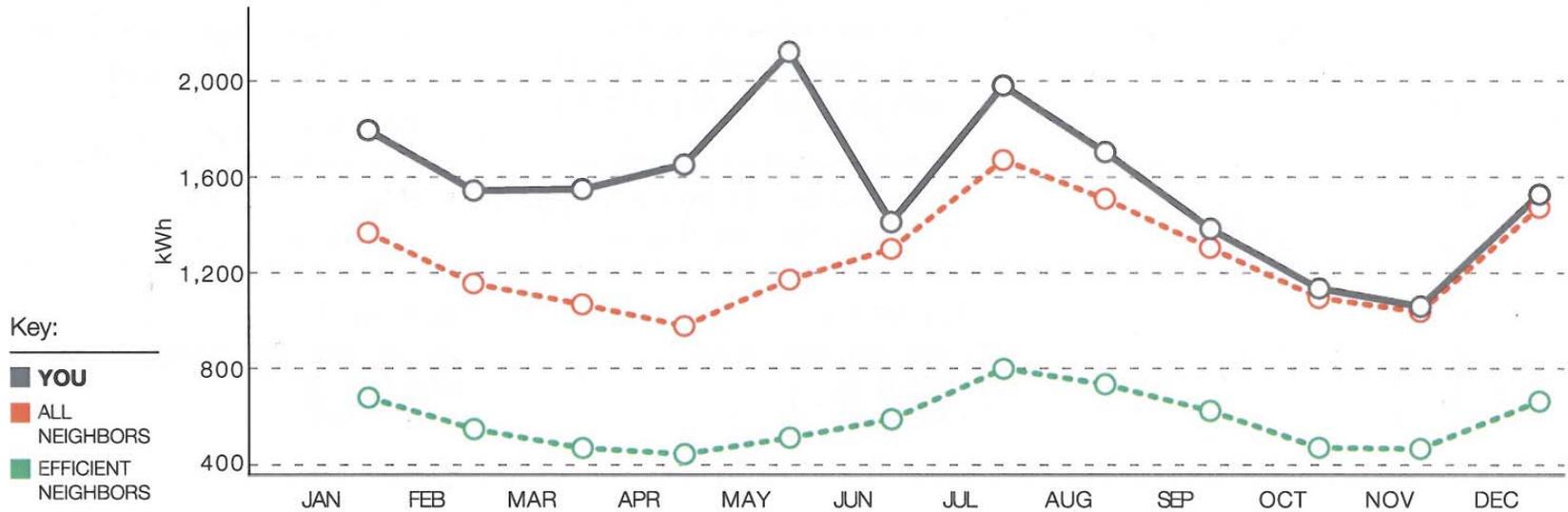
12 Month Neighborhood Comparison

In the last 12 months you used **25% MORE** than your neighbors.
 At today's rates this **COSTS YOU ABOUT \$625 EXTRA PER YEAR.**



12 Month Neighborhood Comparison

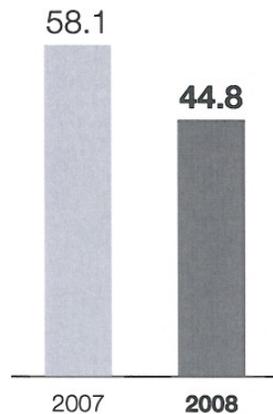
In the last 12 months you used **25% MORE** than your neighbors.
At today's rates this **COSTS YOU ABOUT \$625 EXTRA PER YEAR.**



Personal Comparison

How your electricity use compares to **First report received**

Dec 1 - Dec 31 Usage (kWh/day)



You used **23% LESS** electricity in December than you did last year.



STARS ARE AWARDED WHEN YOU USE LESS THAN IN 2007.

★	★				★	★	★	★	★	★	★
-1%	-3%	+9%	+20%	+35%	-22%	-12%	-13%	-25%	-21%	-26%	-23%

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

In all of 2008 you used **8% LESS** electricity than you did in 2007.

Common Themes from Negative Feedback

- Comparison is unfair because it fails to take lifestyle differences into account
- Some writers clearly fatigued by repeated negative feedback (feel “harassed”). This is compounded because 2-5% savings is imperceptible for those using 20-150% more than neighbor average.
- Reports are an invasion of privacy



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