

Energy Efficiency and Demand Response at PG&E: Exploring the Past, Present, and Future

Utility Energy Forum

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"I'm also issuing a new goal for America: let's cut in half the energy wasted by our homes and businesses over the next twenty years."



President Barack Obama State of the Union address February 12, 2013

Per capita consumption in California has remained flat since the 1970s



PER CAPITA ELECTRICITY CONSUMPTION:

UNITED STATES vs. CALIFORNIA

(source: U.S. Energy Information Administration)



Policy

- 35+ years of energy efficiency
- First in the loading order
- Decoupling and shareholder incentive mechanism

Programs

- 3 year cycles of \$1.5B+ per year of investment
- Delivered to all customer segments via multiple channels and broad technology families
- Codes and Standards

Enabling the Future

- AB32 EE critical to success
- Flexibility to help with grid reliability













Energy services to 15M people:

- 5.1M Electric customer accounts
- 4.3M Natural Gas accounts

70,000 square miles with diverse topography and climate zones

20,000 employees

A regulated investor-owned utility

2013 PG&E Energy Efficiency and Demand Response Budget





2011 Generation Mix

2011 Theoretical Resource Mix including Energy Efficiency



2011 Generation: ~75,000 GWhs

2011 Generation, adjusted for EE impact: ~88,500 GWhs

Source: 2011 PG&E Corporate Responsibility and Sustainability Report; 2010 EIA data.

- EE accumulated savings is gross savings over 20 years and has been adjusted for decay.
- Note figures on right are theoretical calculations. PG&E is committed to reaching RPS targets; had load been higher in 2011, PG&E would have procured additional renewables.





Source: PG&E data.

- Peak demand is weather adjusted; August 13, 2012
- EE accumulated savings over 20 years and adjusted for decay.
- DR savings is ex post evaluated.





Note: GWh and therm savings are in addition to energy efficiency embedded in the IEPR forecasts.

- Original Scoping Memo targets (issued 2008): 32,000 GWh + 800 MMT
- 2010 implied natural gas target of 250 MMTherms was adjusted based on ARB revised MMT and electric targets.







Load, Wind & Solar Profiles – High Load Case January 2020



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Load, Wind & Solar Profiles – High Load Case January 2020









Smooth average, but great day-to-day variability



Source: CAISO

MW

Hour





Nevada 70 KW polycrystalline array(ten second data)



Energy Audits



HELP CONSERVE ENERGY... TURN OFF OFF

-0

WHEN

Standard Rebates

Fax-base DR







Partnerships





Deeper savings



Price Responsive DR





Big Data



AutoDR and HAN





Water-Energy Nexus



Financing solutions

Project Cost	\$100,000
Rebates and/or Incentives	\$25,000
Loan Amount	\$75,000
Estimated Monthly Savings from Retrofit	\$3,000
loop Torm (months)	¢5,000 60
Loan Term (months)	60
Monthly Loan Installment on your PG&E Bill	\$1,250
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Monthly Savings	\$1,750









Sources: Association of Home Appliance Manufacturers (AHAM) for energy consumption and volume; U.S. Census Bureau for price

Notes: a. Data includes standard-size and compact refrigerators.

- b. Energy consumption and volume reflect the DOE test procedure published in 2010.
- c. Volume is adjusted volume, which is equal to the fresh food volume + 1.76 * freezer volume.
- d. Prices represent the manufacturer selling price (e.g. excluding retailer markups) and reflect products manufactured in the U.S.



West coast utilities approached retailers/manufacturers with incentives

TVs were required to surpass the Energy Star efficiency level by at least 15% to qualify

By 2011, all major retailers and 352 stores were participating in PG&E's service territory



Notice of the set of

Estimated Unit Energy Consumption by Size Range for New TVs

Source: Navitas Partners' Analysis of U.S. Market

Testimonials

".....do you have next year's rebate rates available and could share with me? Samsung will be planning our product lineup based on those rebates."

Derek Dao, Samsung, 12/8/11

"Best Buy just told me that suddenly TV manufacturers realize that they must pay close attention to ENERGY STAR's Most Efficient because progressive utilities are going to incent on it...PG&E is driving interest in ENERGY STAR Most Efficient for TVs."

- Katherine Kaplan, ENERGY STAR

























Commercial Kitchen Ice Machines for Permanent Load Shifting













OBF Originations by Month



How does it work?

Project Cost	\$100,000
Rebates and/or Incentives	\$25,000
Loan Amount	\$75,000
Ectimated Monthly Savings from Potrofit	\$2,000
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Loan Term (months)	60
Monthly Loan Installment on your PG&E Bill	\$1,250
Monthly Savings	\$1,750













8. Customer insights for better program management

Residential Energy Efficiency Opportunity Map for City of Fresno

Select either Usage or Energy Effiency Opportunity to color code the map

93720-54

93720-40

93722-90

93720-46

93722-28

93720-18

93702-38

93710-74

93720-36

93722-25

93722-33

93722-36





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Energy Efficiency Opportunity



EE communication opportunity when customers call about:

- Bills
- Reliability
- Safety

EE cross-sell opportunities when we communicate about:

- Dynamic pricing
- How to manage energy usage
- SmartMeter infrastructure

























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