
PG&E's Energy Efficiency Programs

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Integrated Demand Side Management

Pacific Gas and Electric Company



*Pacific Gas and
Electric Company™*

Cost-Effective Energy Efficiency is the Lowest-Cost Resource

- Cost-effective energy efficiency is by definition cheaper than any supply alternative
- A kilowatt-hour saved from energy efficiency is like a kilowatt-hour from a power plant
- But a kilowatt-hour from energy efficiency:
 - Does not produce any greenhouse gases
 - Does not incur transmission, distribution or transformation losses
 - Does not require the permitting or construction of a power plant or transmission lines
 - It is quick to “construct” and begins to “produce” power almost immediately

Why Would Utilities Support Energy Efficiency?

- Our customers want it
- Helps utilities mitigate the impact of demand growth on infrastructure
- Reduces long-term bill impacts for our customers
 - Energy efficiency is less expensive than new generation
- Allows utilities to allocate capital to other needed infrastructure projects

What Holds Utilities Back?



“Decoupling”

Perceived Risk of Revenue Loss



Utility Economics: Decoupling Background

- In California, the investor-owned utilities' **revenues** and **energy sales** are decoupled
- So, increasing conservation/efficiency does not reduce the utilities' revenues in a way that reduces the utilities' earnings
- This flows from how the investor-owned utilities' rates are set and how the California Public Utility Commission (CPUC) implements key laws

Traditionally Sales Impact Utility Earnings (Returns)

Forecasted Sales Underlie Forecasted Costs (Including Allowed Return)

Approved Revenues = Approved, Forecasted Costs

$$\text{Approved Rates} = \frac{\text{Forecasted Costs}}{\text{Forecasted Sales}}$$

Actual Sales Determine Actual Costs, Revenues and Return

Actual Sales below Forecasted Sales:

- Reduce Revenues (usually proportionally to sales),
- Reduce Costs (less than proportionally because of fixed costs)

Reducing Actual Return below Allowed Return

Solution: “True-Up” Actual To Authorized Revenues

If Actual Sales Below Forecasted Sales (Revenue Shortfall Or Undercollection),

- Allow Future Collection Of Revenue Shortfall

If Actual Sales Above Forecasted Sales (Overcollection)

- Return Overcollection In Lower Future Rates.

Implications:

- The Utility Is Indifferent To Energy Efficiency's Effects On Actual Sales
- The Utility Focuses On Cost Control To Ensure Receiving Allowed Returns

Refinement:

If Energy Efficiency Savings Are Built Into The Rate-setting Sales Forecast, The “True-up” Is Only For Relatively Minor Sales Forecast Errors

Decoupling Summary

- A decoupled utility has no incentive to prefer higher or lower sales – it is held neutral
 - Historically adjustments have been regular, annual and small
 - Because they're based on known factors, adjustments are generally uncontested
- Decoupling tends to reduce earnings volatility
- Decoupling mechanisms work best in economically stable environments



“Decoupling Plus”

Shareholder Earnings from Efficiency



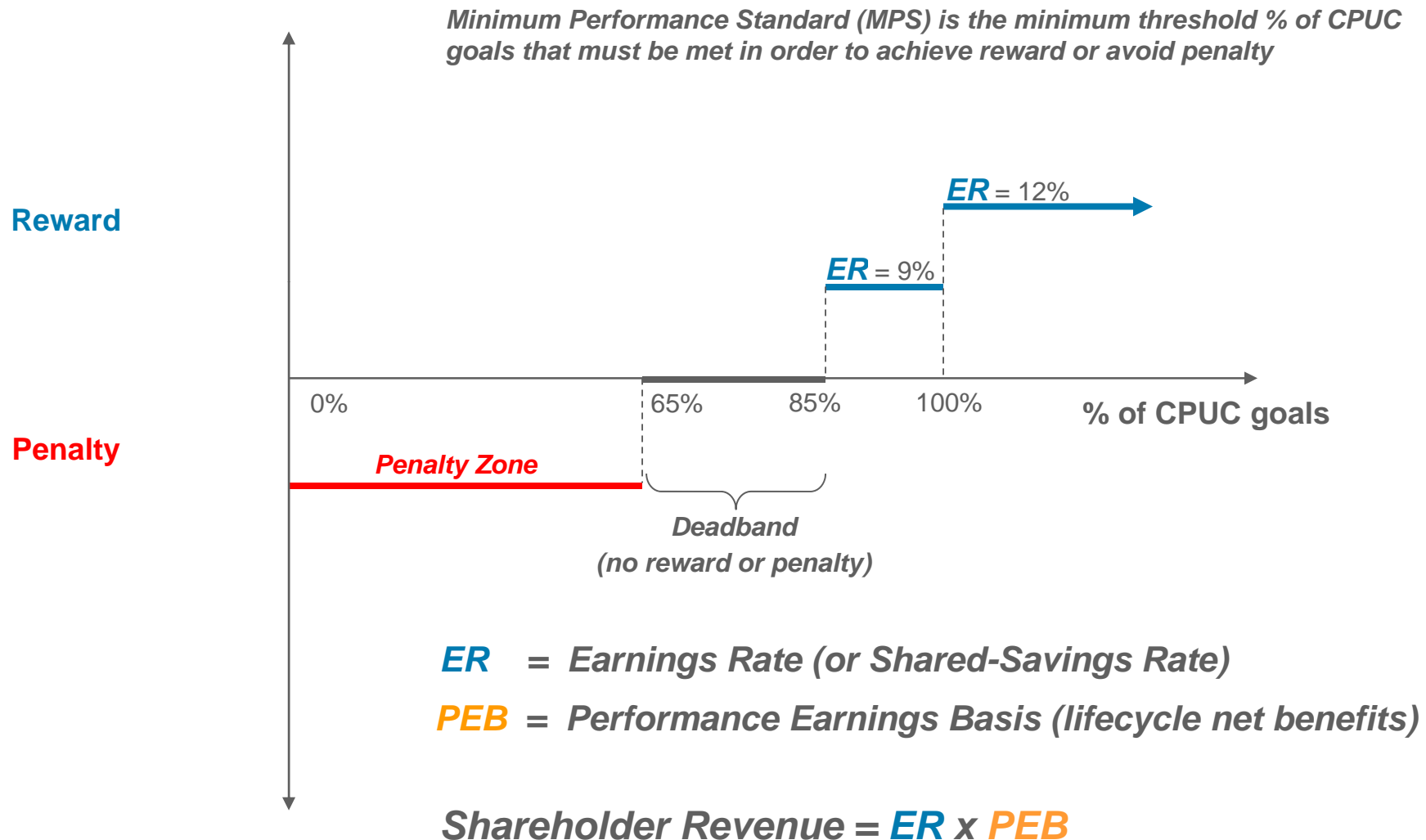
Earning on Energy Efficiency: California's Risk-Reward Mechanism

- Over the last two decades California has rewarded investor-owned utilities for energy efficiency accomplishments
- Several different mechanisms have been in place at different times
- These mechanisms have proven to be extremely motivating to California utilities.
- The key to the success to these mechanisms have been:
 - Stakeholder support
 - Outcomes close to expectations
 - Transparent and (relatively) simple mechanisms
 - Meaningful opportunity

Earning on Energy Efficiency: California's Risk-Reward Mechanism (2006-2008 programs)

- Incentive mechanism has two parts:
 - Qualification thresholds, based on savings achieved
 - Actual earnings, based on thresholds reached and customer benefits
- Incentive mechanism is applied over the three-year program period
 - Includes provisions for interim and true-up assessments

2006-2008 Shareholder Incentive Mechanism – PG&E Reward/Penalty Curve





Decoupling Plus Enables Energy Efficiency to Thrive



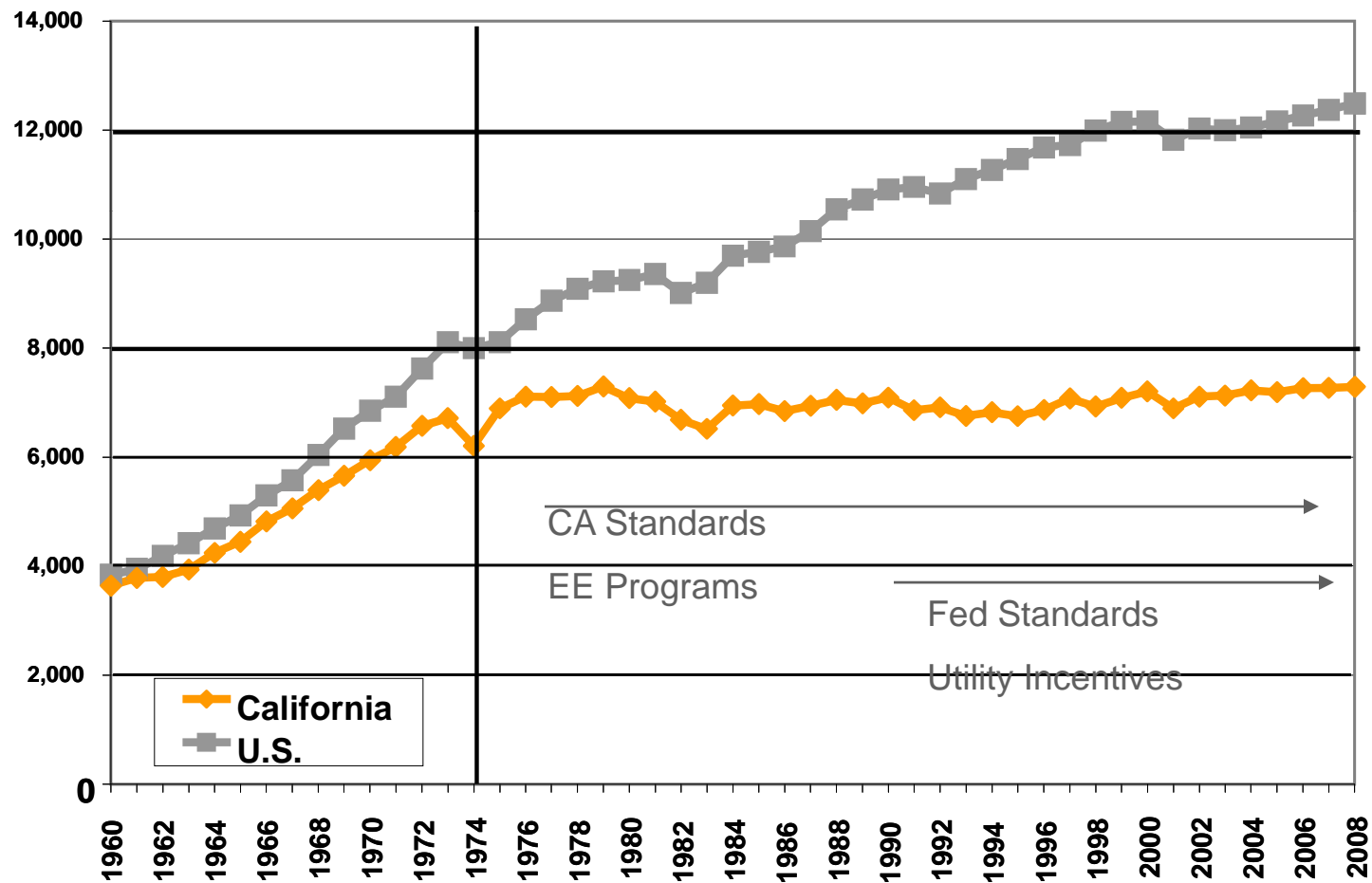
The Numbers Talk...

In 1976, PG&E became one of the first utilities in the United States to offer energy efficiency and demand management programs for our customers.

Since 1976, PG&E's energy efficiency programs have:

- Saved more than 155 million megawatt-hours and 12.5 billion therms from installed measures (cumulative lifecycle savings)
- Saved enough annual electricity to power over 23.5 million homes and enough annual natural gas to heat 25 million homes
- Helped California avoid building 24 large power plants
- Saved customers over \$24 billion
- Kept over 155 million tons of CO₂ out of the atmosphere, based on combined electric and natural gas cumulative lifecycle savings

Results: Decoupling Works!



2006-2008 Portfolio: Developing the Customer Focus

- Portfolio included 85 programs delivered through multiple delivery channels to all customer segments:
 - financial incentives and rebates
 - training and education
 - energy audits
 - emerging technology projects
 - low income energy efficiency
 - energy codes and standards support
- PG&E delivered record energy savings and GHG reductions to California

	PG&E Goal	PG&E Achieved* (net)	Percent of Goal
Megawatts	613	899	147%
Gigawatt-Hours	2,826	5,465	193%
Million Therms	44.9	72.5	161%

What's Worked?

Focus on the Customer!

- 2006-2008 portfolio was completely redesigned around customer needs and natural market segments
 - New programs were tailored to meet segment-specific needs (i.e. high tech energy efficiency)
 - Allowed PG&E to optimize savings based on market-specific load profiles and energy use
- Established solid, on-going relationship with customers
- Worked with customers to create business case for EE projects and define energy savings

What Worked?

Flexible Strategy Targeted High Potential Savings

- Profiled the market and forecast the potential
- Determined the strategy (and delivery channels) that best matched the opportunities
- Established the implementation tactics for achieving the potential
- Modified or revised elements as they were influenced by market changes and customer responses
- Regulatory permission to shift funds from under-performing to high performing programs/sectors

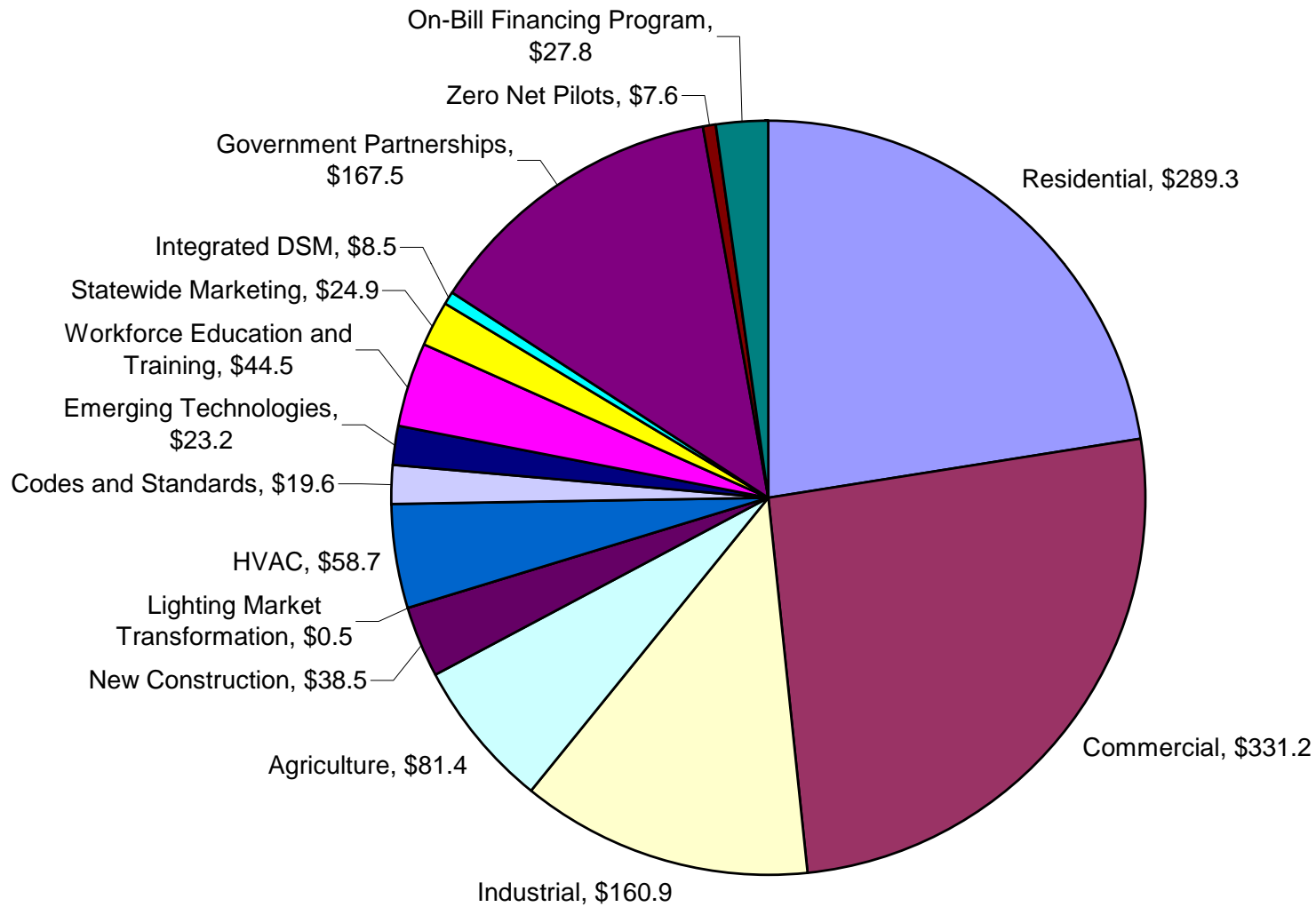
Program Barriers

- Customers often lacked information, time and resources to assess their own energy efficiency needs
- Lack of benchmarking data can negatively impact energy efficiency programs
- Insufficient feedback from industry participants
- [Efficient] Product availability

2010-2012 Energy Efficiency Portfolio

- \$1.338 billion over 3 years
- Rely less on lighting and more on new areas: consumer electronics and commercial space conditioning
- Test new pilot approaches (zero net energy buildings and innovative partnerships with local governments)
- Moving more toward actions that mean permanent changes in the market place (market transformation)
- Concerns
 - Economic downturn
 - Interaction with ARRA (Economic Stimulus)
 - Updating evaluation to include all savings (spillover)

Proposed program budgets (millions)



2010-2012 Portfolio of Programs

- **Residential**

- Home Energy Efficiency Surveys
- Residential Lighting Incentive
- Advanced Consumer Lighting
- Home Energy Efficiency Rebates
- Appliance Recycling
- Business and Consumer Electronics
- Multifamily Energy Efficiency Rebates
- Whole House Performance Program

- **Commercial, Industrial & Agriculture Programs**

- Audits
- Incentive and Rebates for High Efficiency Equipment
- Continuous Energy Improvement
- Direct Install (commercial only)
- Pump Test and Repair (ag only)

- **New Construction**

- Residential
- Savings By Design (Commercial)

- **Lighting Market Transformation**

2010-2012 Portfolio of Programs (cont'd)

- **HVAC**
 - Quality Installation and Maintenance
 - Upstream Incentives
 - Technologies and Systems Diagnostics
- **Codes and Standards**
 - Advocacy for Building Codes and Appliance Standards
 - Compliance Enhancement
- **Emerging Technologies**
- **Workforce Education and Training**
- **Marketing Education and Outreach**
- **Local Government and Institutional Partnerships**
- **Third Party Programs**
- **Zero Net Energy Pilots**

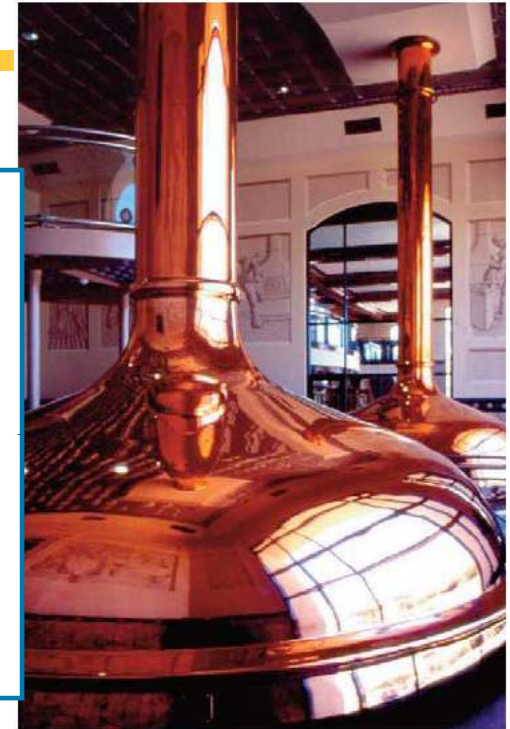
EE success stories – PG&E Customers share in the benefits

Sierra Nevada Brewing Co., the second largest craft brewery in the U.S., fully embraced EE upgrades:

- New Lighting systems
- Replaced outdated motors with variable frequency drives
- Insulated boilers
- Upgraded compression system
- New software to monitor and control energy use from computers
- Updated appliances and fixtures

These upgrades significantly lowered overall energy usage:

- 2006 Electrical Usage: ~19 kWh/Barrel
- 2008 Electrical Usage: ~18 kWh/Barrel
- 2006 Gas Usage: 1.5 Therms/Barrel
- 2008 Gas Usage: 1.3 Therms/Barrel



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Ace Armature & Motor, a 5 employee company, embraced PG&E programs and cut their electric bill in half!

- New Lighting Systems
- Premium Efficiency Motors
- HVAC Upgrades
- Improved Insulation

The lighting retrofit Ace completed with support from PG&E has saved 35 kilowatts and 17,800 kilowatt hours of electricity



Questions?

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