California Overview:
Update on the Groundbreaking California Utility Energy Efficiency Efforts

SCE –	**Shareholder Incentive**
Sempra –	**Goals**
PG&E –	**Innovative Programs**
SMUD –	**Emerging Technologies**

ACEEE

October 1, 2007

California Policy on Energy Efficiency Incentives

Gene Rodrigues

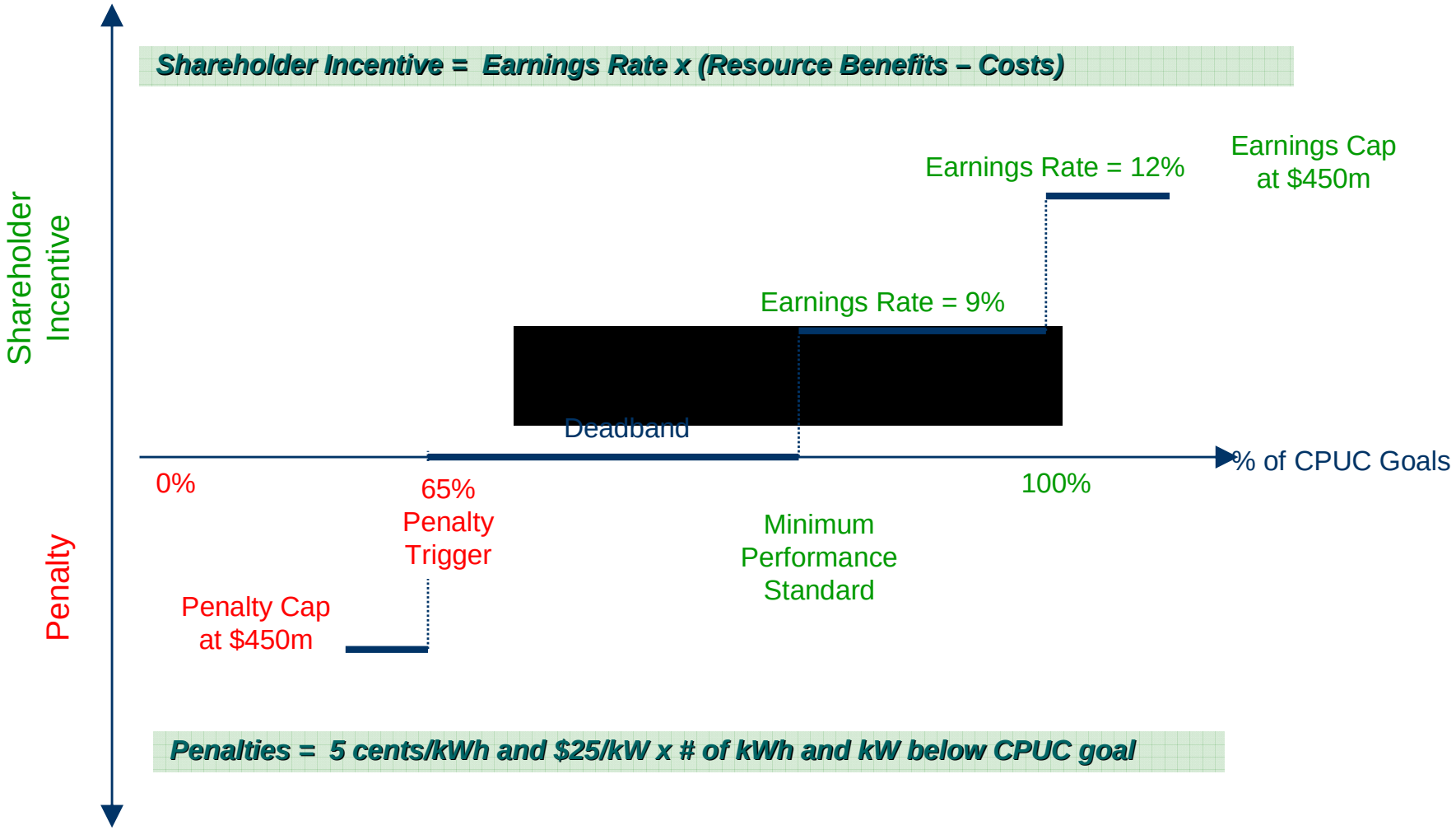
Director of Energy Efficiency
Southern California Edison

Policy

- Risk/reward mechanism designed to extend California's commitment to making energy efficiency the highest energy resource priority
- Creates incentives of sufficient level to ensure utility investors and managers view energy efficiency as a core part of the utility's regulated operations
- Earnings to shareholders accrue only when utility portfolio managers produce positive net benefits for ratepayers
- Earnings accrue only as the utilities reach to meet and surpass the Commission's goals

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Shared Savings Mechanism



Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

California Energy Efficiency Goals

Mark Gaines
Customer Programs
Director
San Diego Gas & Electric company
Southern California Gas company

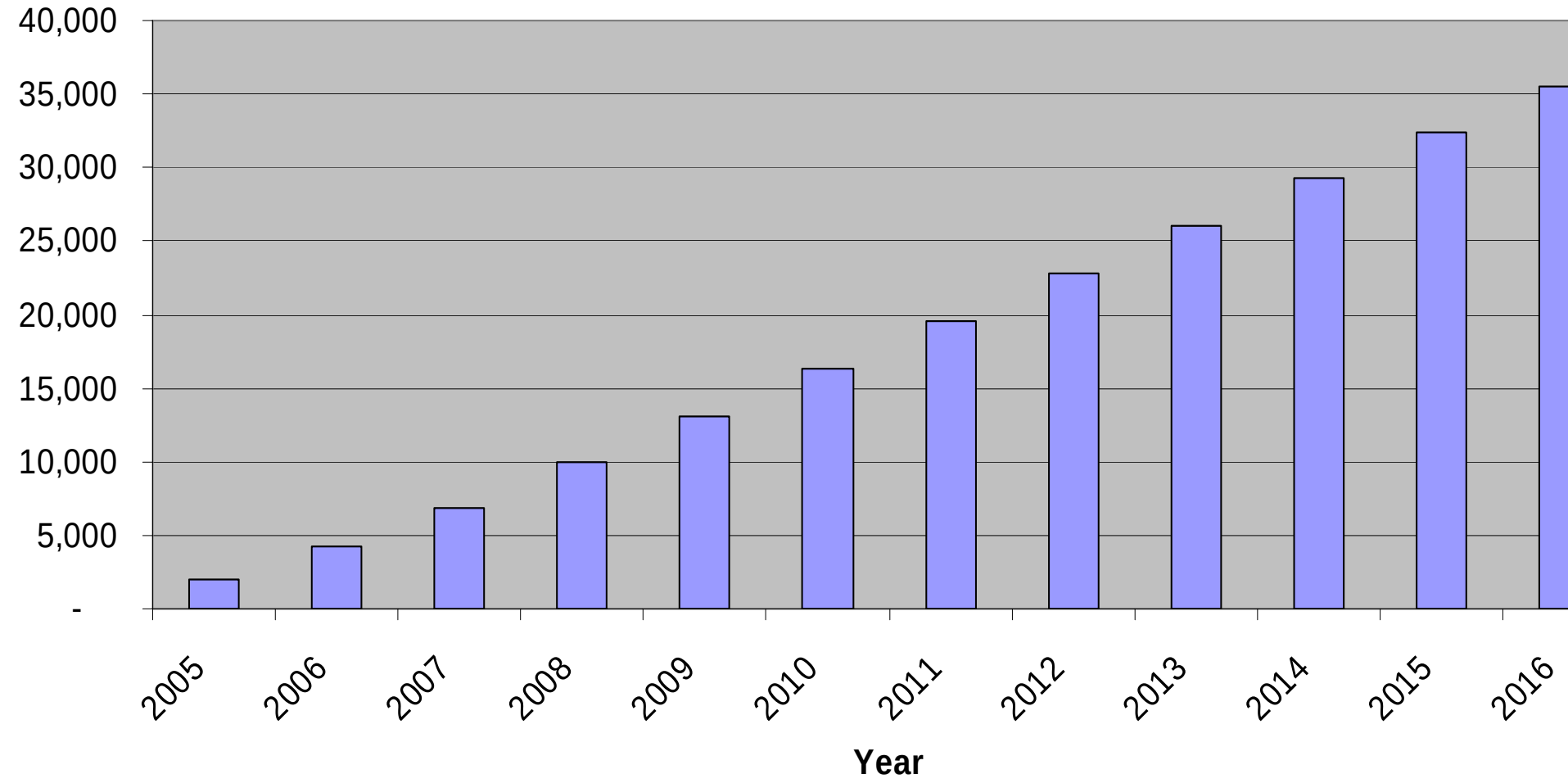
Long Term Energy Goals For California

- **AB2021**
  - Policy to procure all cost-effective energy efficiency
  - CEC to estimate cost effective energy efficiency potential
  - Goal of reducing total forecasted electrical consumption by 10 perce of the next 10 years
  - Requires CEC to develop 10 year energy efficiency savings targets f both private and public utilities

- **CPUC Goals Planning Proposed Decision**
  - Proposed Big Bold Strategies (new construction, HVAC)
  - Commissioned study for 2012-2020 goals

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

CA Utilities Cumulative Energy Savings Goals (GWH) 2005-2016



Source: CEC Statewide Energy Efficiency Potential Estimates & Targets for California Utilities, Appendix A, August 2007

Pacific Gas and Electric Company

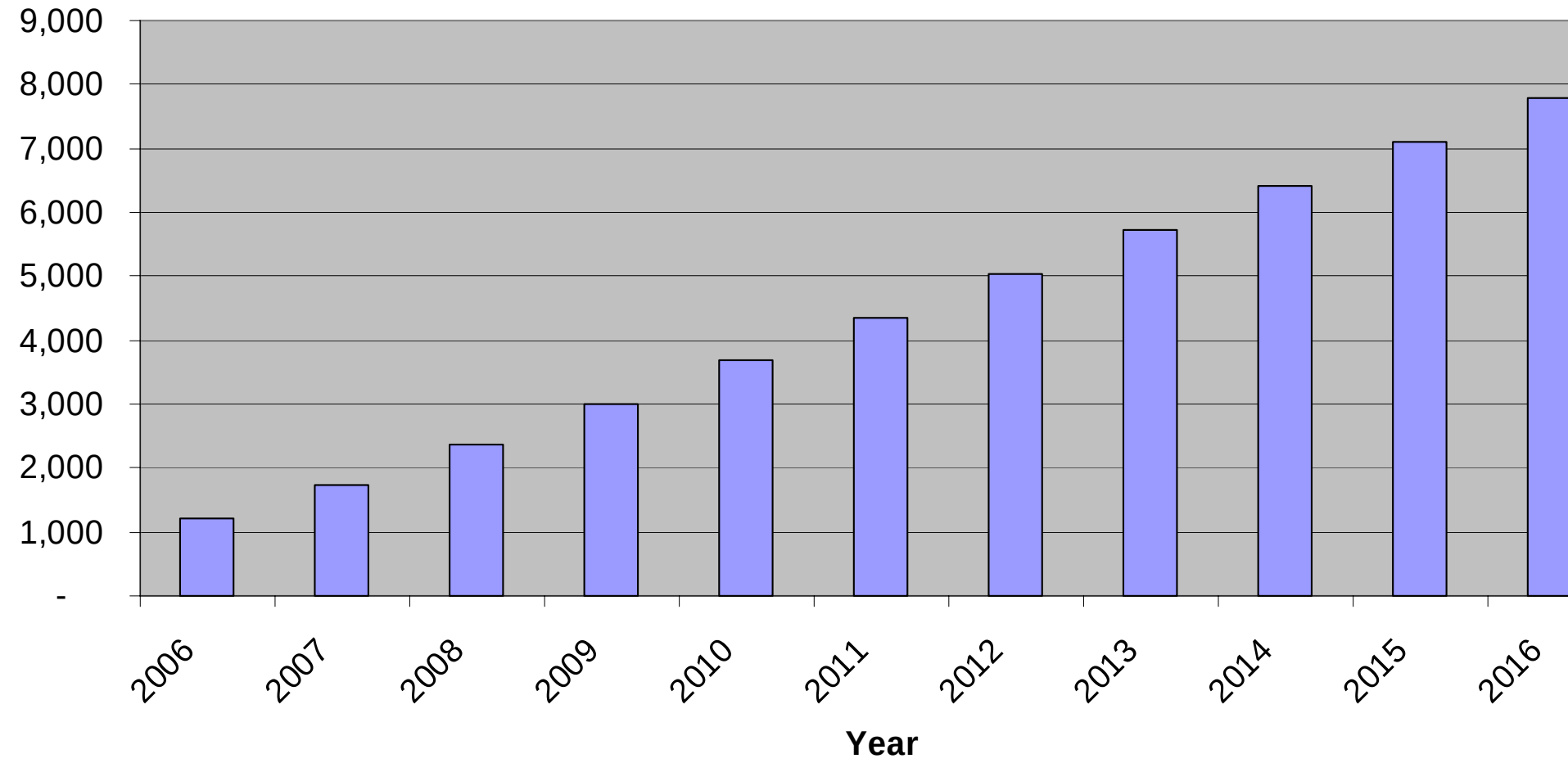
SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE
A Sempra Energy utility

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

CA Utilities Cumulative Demand Reduction Goals (MW) 2005-2016



Source: CEC Statewide Energy Efficiency Potential Estimates & Targets for California Utilities, Appendix A, August 2007

Pacific Gas and Electric Company

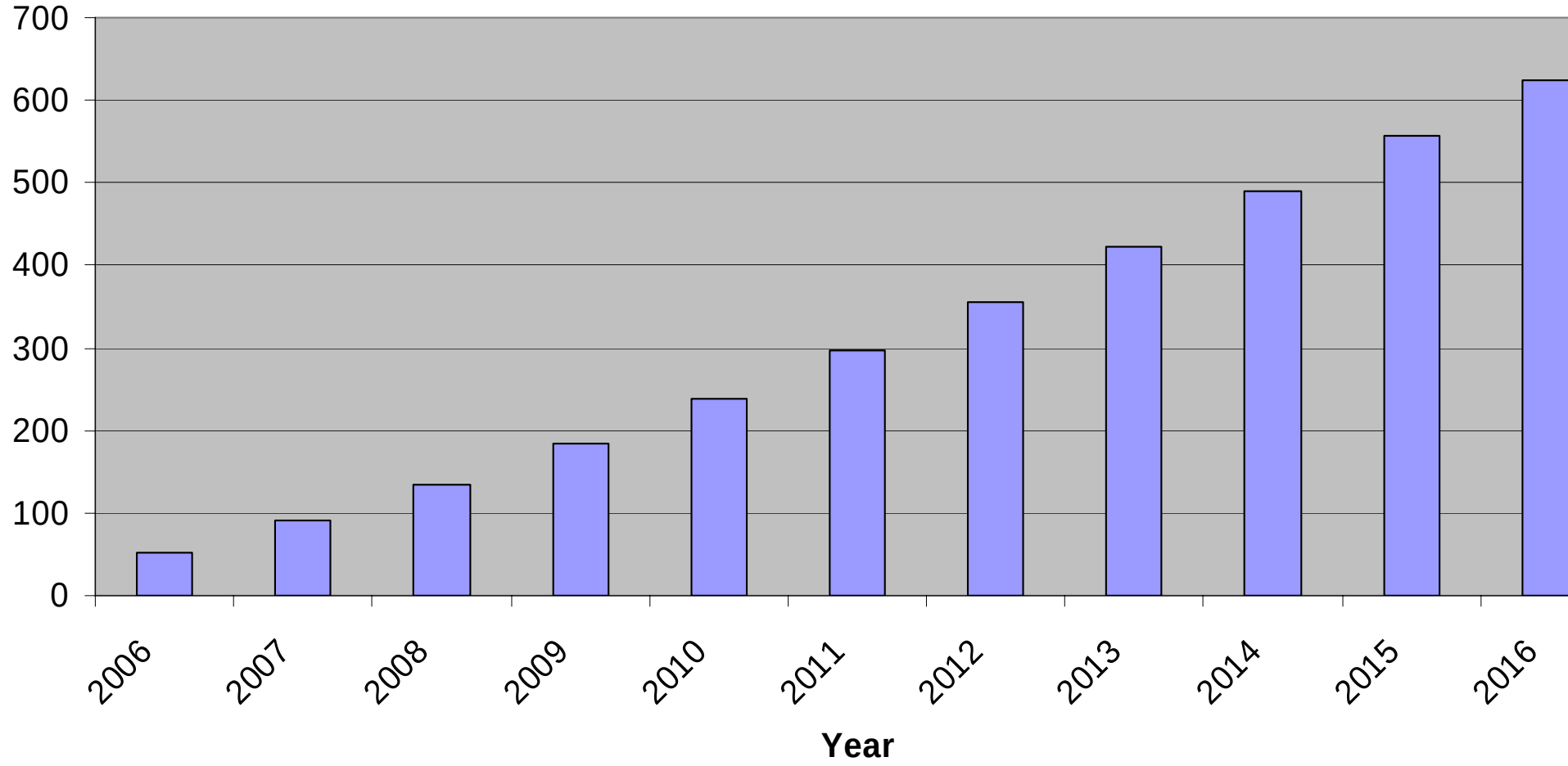
SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

CA Utilities Cumulative Energy Savings Goals (MMThm) 2005-2016



Source: CEC Statewide Energy Efficiency Potential Estimates & Targets for California Utilities, Appendix A, August 2007

Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Key Results of CEC's Analysis

If utilities meet their feasible targets, they will achieve:

- **GWH**
  - 67% of potential electric savings
  - 89% of electric consumption growth
- **MW**
  - 85% of potential peak electric demand savings
  - 70% of peak demand growth
- **Therms**
  - 65% of potential gas savings
  - 68% of gas consumption growth

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Current Status of California IOU Programs:

[redacted]

Pacific Gas and Electric Company

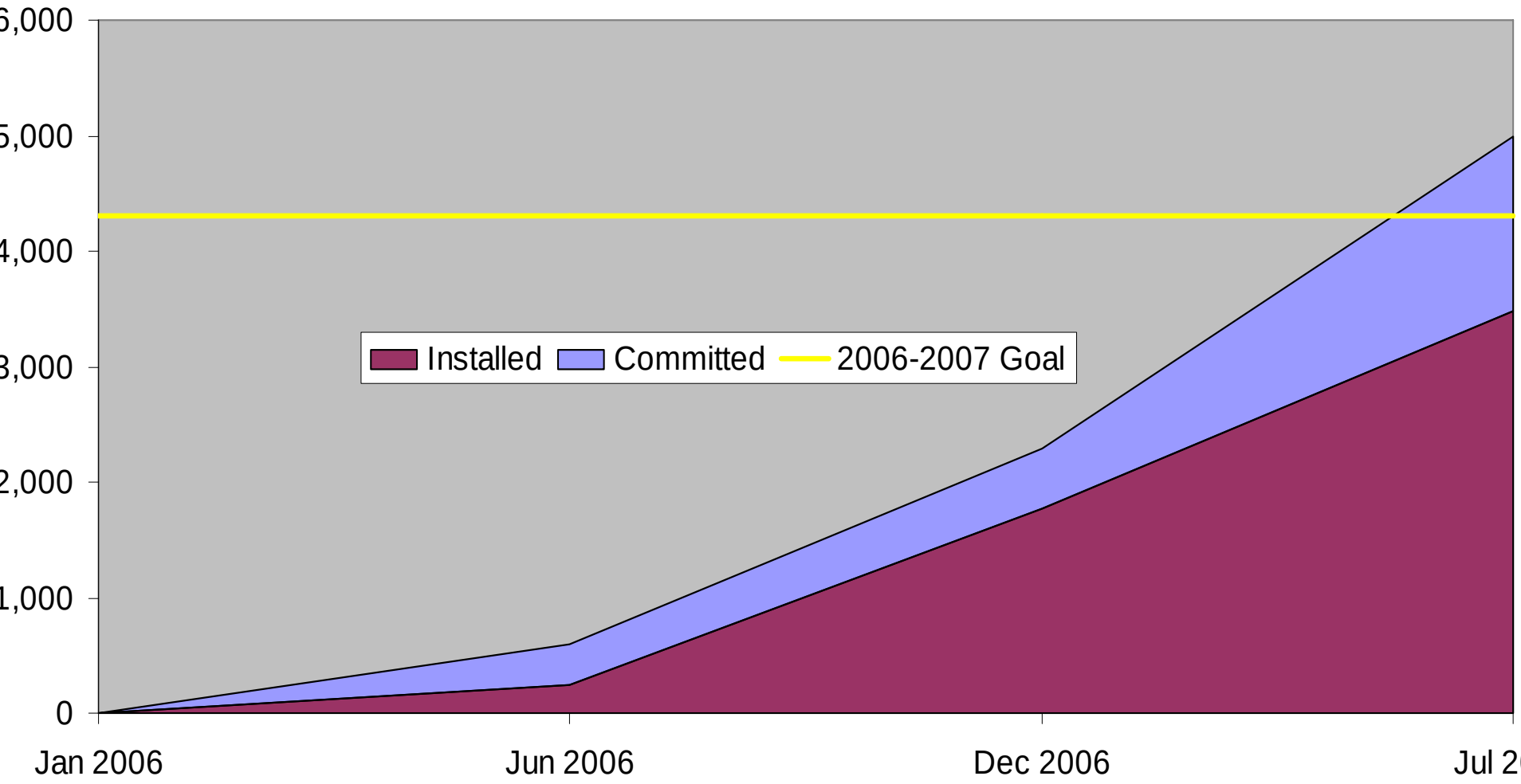
SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Current Status of California's IOU Programs: Electric Energy Savings (GWH)



Pacific Gas and Electric Company

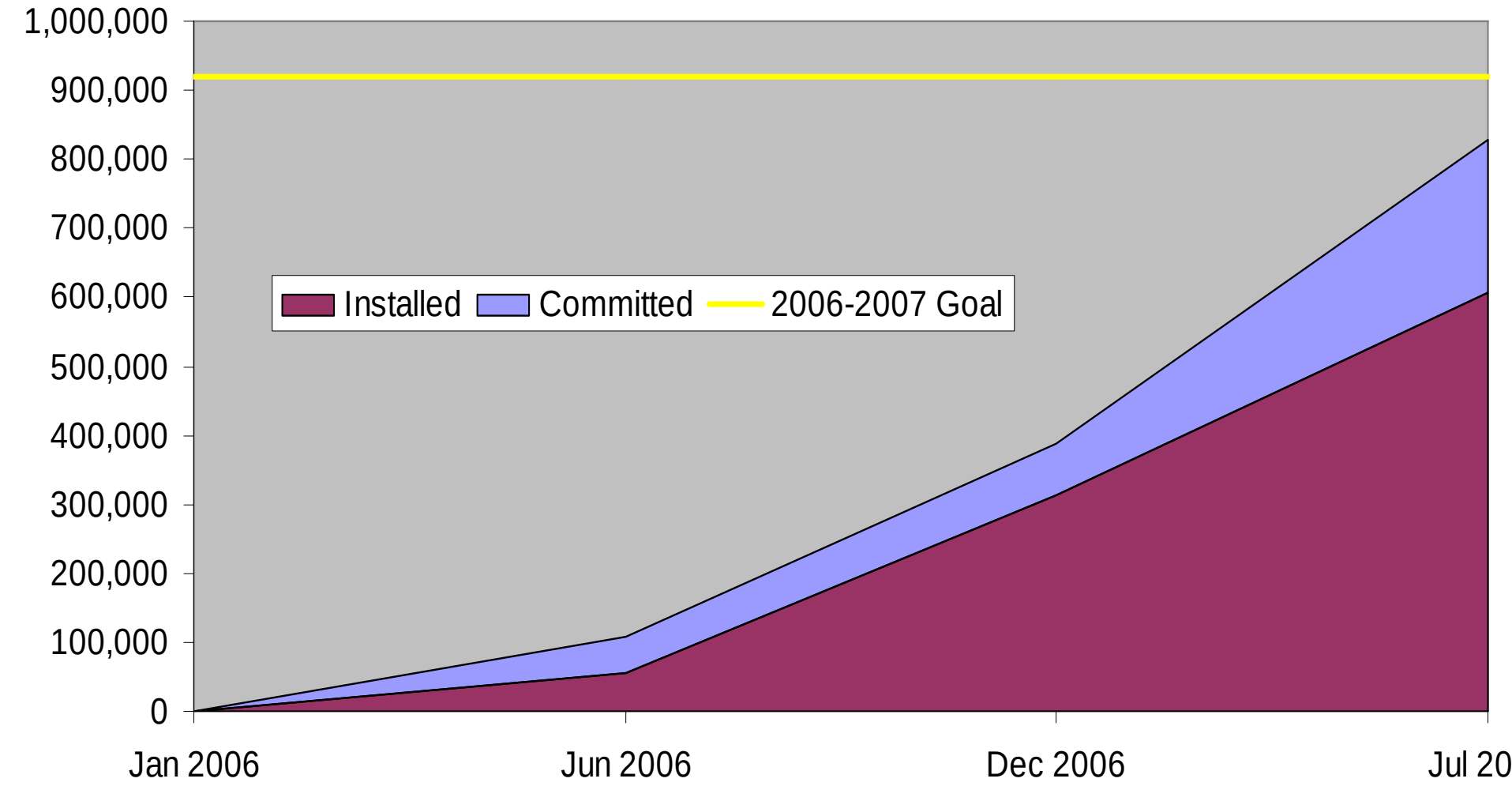
SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Current Status of California's IOU Programs: Demand Reductions (KW)



Pacific Gas and Electric Company

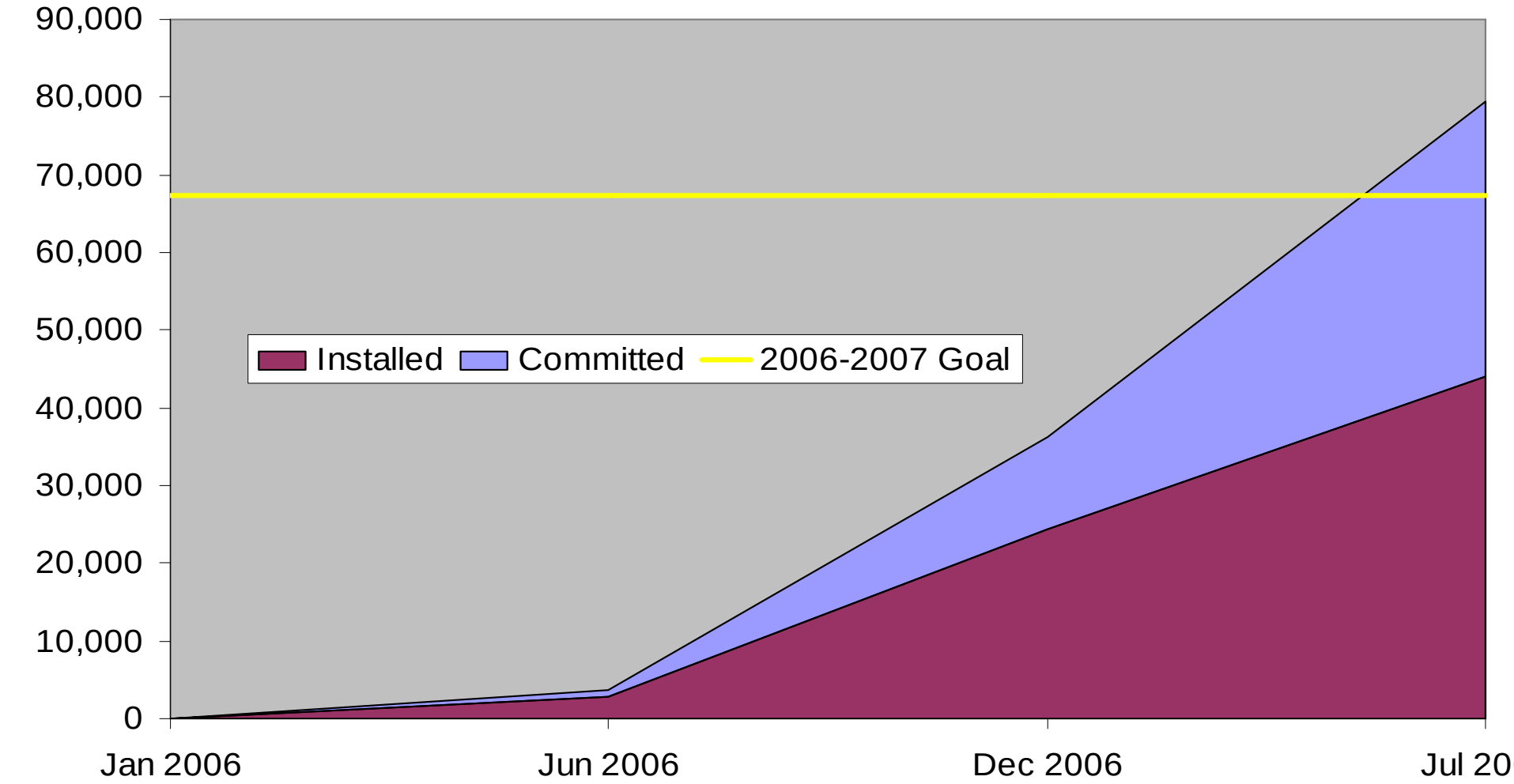
SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Current Status of California's IOU Programs: Natural Gas Energy Savings (MTherms)



Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Keys to Success

- Regular analysis of achievable potential
- Regular evaluation, measurement and verification
- Set aggressive but reasonable goals
- Establish longer term program cycles (3+ years)
- Establish short-term and long-term strategies:
  - Incentives and rebates for short term
  - Education, outreach and market transformation for long-term

Integrating Demand Side Management Progress Since 2005

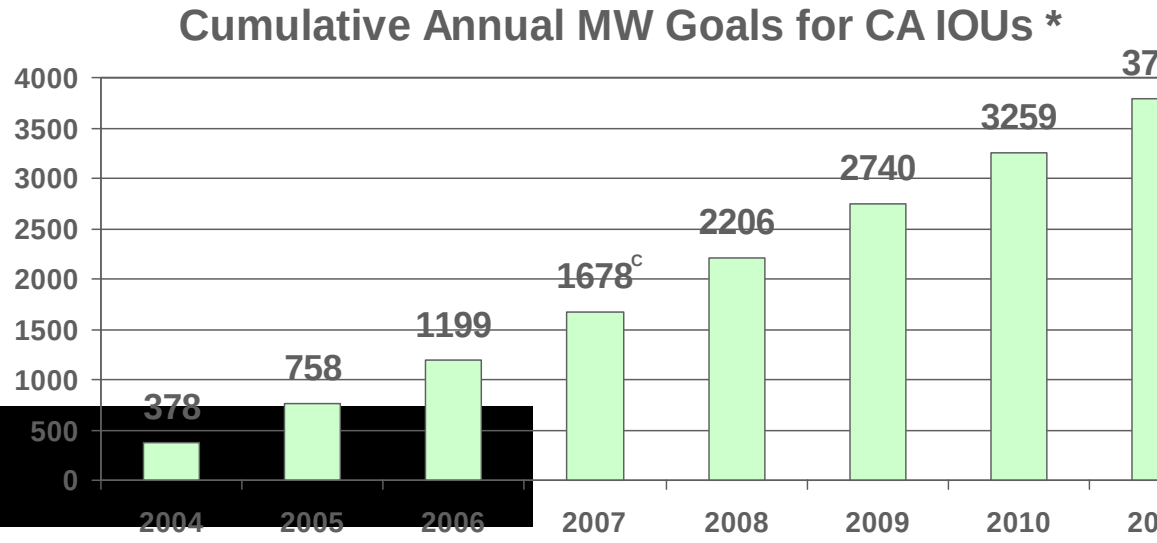
Roland Risser, Director

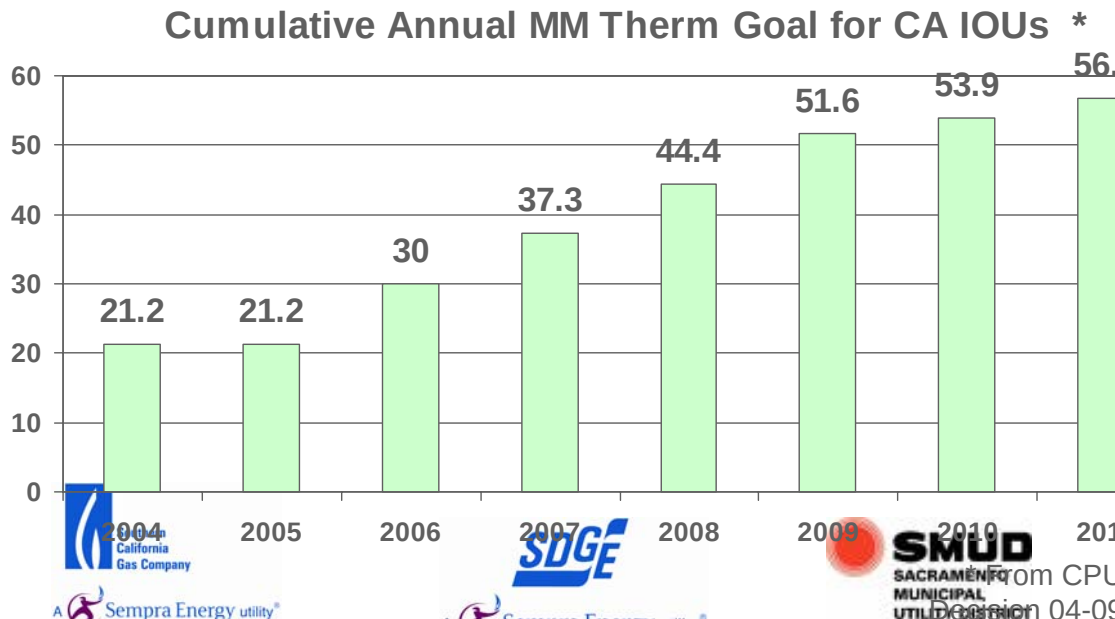
Customer Energy Efficiency

Pacific Gas and Electric Company

Energy Efficiency Goals Are Going Up

- California energy efficiency goals are increasing significantly
- Expect to meet approximately half of demand growth with energy efficiency through 2013, with net savings of $10 billion





* From CPU Decision 04-09

Helping Customers Calculate Their Carbon Footprint

- Web-based tool allows customers to enter information about their home and lifestyle
- Customers can calculate their carbon footprint based on:
  - Home energy use
  - Transportation (i.e. driving, air travel, etc.)
- Calculators suggests strategies to reduce greenhouse gas emissions
- Promote projects to offset carbon emissions

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

[redacted]ntegrated Energy Solutions

- Establishing “one-stop” integrated energy management solutions for our customers
- Offering information that encompasses all aspects of demand-side management
  - Energy efficiency
  - Demand management
  - Self-generation
- Coordinated offerings are increasingly important as customers respond to goals and requirements of California’s climate change legislation (AB 32: Global Warming Solutions Act)

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Partnering with Customers

Foothill-DeAnza Community College District

- Eagerly participate in PG&E's energy efficiency programs
  - Technologies installed include efficient boilers, chillers, lighting, variable frequency drives (VFDs), and energy management systems
  - Have received approximately $1 million in energy efficiency incentives/rebates
- Installed co-generation systems
  - Tracking and fixed PV solar systems (non-exporting net 99 KW)
  - Tecogen co-generation systems (non-exporting approximately net 249 KW)
- Active demand response participant
  - Regularly use PG&E's Inter-Act system for time-of-use analysis

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

ntegrating Energy Efficiency and Solar

- IOU's ENERGY STAR® New Homes Program aligned their Residential New Construction program requirements with those of the CEC New Solar Homes Partnership (NSHP)
  - Builders can participate in both programs simultaneously
  - NSHP to provide incentives to builders who install solar photovoltaic panels on new homes
  - Before incentives are paid through the NSHP, builders are required to maximize the energy efficiency of their building

Tier	Energy Efficiency Requirements under NSHP	Solar Incentive from CEC*	Energy Efficiency Incentive from IOU ^
Tier 1	15% above California building codes Installation of ENERGY STAR appliances	$2.50/watt (base rate)	$400/500 per home
Tier 2	35% above California building codes 40% cooling reduction Installation of ENERGY STAR appliances	$2.50/watt (base rate)	$2000 per home

* Incentives decline over time and vary by building type. ^ *incentives vary based on California Climate Zone, as defined by the CE*

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

nnovative Rooftop PVs

- Rooftop PV in Premiere Gardens subdivision in Sacramento
- Built to Zero Energy Home guidelines
- Utilities are working with builders to design new homes that use low peak energy, are super efficient, and incorporate renewables into the home design

Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

ood Processing: Continuous Energy Improvement Pilot

- Provide comprehensive energy management services to 3 - 5 large motivated food processing customers
  - Asses energy management practices
  - Benchmark current energy use using key performance indicators
  - Inventory greenhouse gas (GHG), including direct and indirect emissions impacts
  - Write corporate commitment to energy efficiency
  - Develop energy management action plans that incorporate GHG reduction goals
- Help large customers develop strategic energy solutions and establish the basis for energy efficiency, load management, and self-generation projects
- Proactive and solution-oriented program designed to help customers anticipate and address climate change concerns
- Customers will commit to long term energy savings, future projects, and continuous energy improvement through action plan

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Local Government Initiatives & District Energy

- **SMUD Local Government Initiatives**
  - Working to incorporate energy efficiency in general plans and developer agreements
  - Eliminate permit fees for retrofit photovoltaic installations. Also streamlined, consistent application process, over the counter review, and final inspection within 24 hours
  - Started the "Build It Green" Public Agency Council to bring together city managers, building officials, planning and development directors to promote efficiency on a broad scale
- **SMUD District Energy**
  - Working to develop district energy projects at several locations including the airport, Railyards, Kaiser Hospital and others.

Pacific Gas and Electric Company | Southern California Edison | Southern California Gas Company, A Sempra Energy utility | SDGE, A Sempra Energy utility | SMUD Sacramento Municipal Utility District

[redacted]igh Tech Energy Efficiency

- Comprehensive approach to data centers: HVAC, equipment, and processes
  - Incorporates energy efficiency and demand management
- Partnered with industry leaders to develop measures specifically for data centers
  - Virtualization/consolidation
  - High-efficiency power supplies
  - High-efficiency data storage equipment
  - High efficiency servers (replacement only)
- Future directions being explored:
  - Data center airflow management program for small data centers
  - Incentives for conversion of PC networks to thin client systems
  - Renewed focus on air-side and water-side economizer retrofits for data centers

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

CFLs: Moving Towards Market Transformation

- Upstream incentive programs offering instant rebates have increased availability and market penetration of CFLs

PG&E Service Territory: Then and Now		
	2000	**2006**
CFLs Sold	0.2 million	7.9 million
Energy Savings	~ 57 GWH	~ 514 GWH
Availability	Single packs, difficult to find, only available in limited locations	Multi-packs sold in most major outlets and smaller stores, often receive prime shelf space

- Utilities' programs have sparked greater awareness of CFL benefits
  - Legislation now pending in CA to make CFLs standard and ban incandescent lighting (Assembly Bill 1109; waiting for governor's signature)
  - Discussions pending on national level and in other states

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Advocating for Stronger Codes and Standards

Type	Proposed Standard	1st Year Savings (GWH)	Peak Load Reduction (MW)	Natural Gas Savings (MM Therms)
Building Code	Cool Roofs in Nonresidential New Construction	69	6.3	
Building Code	Residential Swimming Pools	57	34	
Building Code	Envelope Insulation	27.4	[redacted]	1.2
Appliance/ Equipment Standard	Video display equipment	217	29.6	
Appliance/ Equipment Standard	Linear Fluorescent Fixtures	78	19	
Appliance/ Equipment Standard	Electronic Ballast Systems or Equivalent for HID lamps	70	10.5	

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

What's Next for California?

- Further integration of energy efficiency, demand response, and renewables
- Ongoing advocacy for stricter building codes and appliance standards to maximize energy efficiency
  - Address energy usage of new technologies (i.e. set-top boxes, plug loads, etc.)
- CPUC pursuing new Big and Bold strategies and aspirational goals
  - All new residential construction in California to be zero net energy by 2020
  - All new commercial construction in California to be zero net energy by 2030
  - HVAC industry will be reshaped to ensure optimal equipment performance
- All IOUs will develop long term plans through 2020

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

California Statewide Emerging Technology Program

Jim Parks

Sacramento Municipal Utility District

Program Objectives

- Accelerate the introduction of energy efficiency technologies, and analysis tools that are not widely adopted in various California markets
- Demonstrate the technologies in actual field conditions
- Transfer the knowledge to customers as well as engineering and design communities
- Coordinate with other utilities through the Emerging Technology Coordinating Counsel
- Provide next generation of energy efficiency technologies to programs

rogram Budget and Goals

006-2008 Funding Cycle)

Utility	Budget, $Million	Technologies
PG&E	$11.26	45
SCE	$11.43	45
SDG&E	$4.09	20
SCG	$3.00	18
SMUD	$6.00	25
Total	$35.78	115

Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

[redacted]merging Technologies
(Partial List)

- Solid State Lighting
  - Bi-level refrigerated case lights
  - Bi-level garage lighting
  - Kitchen lighting system
- Hot & Dry Air Conditioning Units
- Residential Evaporative Condensers
- Advanced evaporative/compressor hybrid cooling
- Waste Water Treatment Optimization
- Office of the Future

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Recent Winners
(Partial List)

- Bi-Level Stairwell Lighting Control
- Auto Demand Response Control
- Auto Fume Hood Control
- Evaporative condensing small air conditioners

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Coordination

- Emerging Technology Coordinating Council (www.etcc-ca.com)
- University of California, Davis:
  - California Lighting Technology Center (CLTC)
  - Western Cooling Energy Center (WCEC)
- CEC PIER
- LBNL
- SMUD
- Emerging Technology Lighting Sub-Group
  - SCE, SDG&E, PG&E, SMUD, CEC)

Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
Southern California Gas Company
A Sempra Energy utility
SDGE
SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

Coordinated Projects

(Partial List)

- Evaporative Cooling
- Electrodialysis for Wine Industry
- Residential Evaporative Condensers
- Hot Dry air conditioning
- Hybrid Solar Lighting System
- Office of the Future
- Home of the Future – low peak, hi E
- Wet Cleaning
- Solid state lighting

Pacific Gas and Electric Company

SOUTHERN CALIFORNIA EDISON

Southern California Gas Company
A Sempra Energy utility

SDGE

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT

[redacted]merging Tech Will Play a Big Role

- A large portion of future energy savings is expected from emerging technologies
- In order to meet aggressive goals, multiple strategies (silver buckshot), including emerging tech will be needed [redacted]