Meeting Growing Demand: Energy Efficiency as a Resource

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PG&E and Our Customers

• Serve 1 in 20 Americans (~15 million)
  – 5.1 million electricity customer connections
  – 4.2 million natural gas customer connections
Energy Efficiency as a Resource

- A kilowatt-hour saved from energy efficiency does just as much work as a kilowatt-hour from a power plant.

- But a kilowatt-hour from energy efficiency is preferable:
  - 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
PG&E’s Energy Efficiency Investments

• Over past 30 years, our customer energy efficiency programs have:
  – Achieved life-cycle savings of approximately 118 million MWh of electricity and 10.6 billion therms of natural gas
  – Saved enough electricity to power over 18 million homes for one year
  – Avoided the need to build approximately 24 power plants
  – Saved PG&E’s customer’s approximately $9.9 billion
  – Prevented more than 125 million tons of carbon dioxide emissions from being emitted into the atmosphere

• Energy efficiency played a critical role in helping California manage the electricity crisis:
  – Ramped up efforts and programs and reduced demand
  – On a lifecycle basis, PG&E’s energy efficiency cost, on average, 1.6 cents per kWh saved in 2001
Committed to Energy Efficiency

Kilowatt-hours per person

Year

California
U.S.
California Energy Action Plan

- Adopted by the CPUC, Energy Commission and Power Authority in Spring 2003

- Establishes a “loading order” of energy resources to guide procurement decisions made by utilities

- Directs utilities to place cost effective energy efficiency first in the loading order of resources used to meet their customers’ energy service needs

- Expects energy efficiency to capture approximately 6 of the 11GWs in demand growth over next decade

- California investing more than $7 billion in energy efficiency and alternative energy over the next 10 years
PG&E’s Long-Term Resource Plan

• PG&E will meet its customer demand through:

  – Energy Efficiency Programs: reduce load by 2,500 MW over 10 years at a cost of $3.4 billion
  – Demand Response Programs: 5% of peak demand by 2007
  – Renewable generation: 20% by 2010
  – Distributed Generation: 60,000 - 100,000 MWH/year

• To meet remaining demand, we will secure power competitively and build new, clean generation.

  – When evaluating supply bids, we apply a “greenhouse gas adder,” which essentially monetizes the cost of carbon to allow us to factor in potential future carbon costs.
PG&E's Recommended Plan
Average Projected Growth Rates for 2007-2016

- Energy Efficiency meets 67% to 48% of load growth (depending on the scenario)
- Distributed Generation meets 10% to 15% of load growth (depending on the scenario)

Low Scenario
High Scenario

PG&E’s Load Growth Projections
# Energy Efficiency Lifecycle Costs per Measure

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<th>Energy Efficiency Measure</th>
<th>Lifecycle Costs  $/kWh</th>
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Why PG&E Does Energy Efficiency

- It is cost effective
- Provides customers benefits
- Protects the environment
- Provides a “low-risk” resource option
Keys To Energy Efficiency Success in California

- Decoupled utility revenues and sales

- Commitment by and involvement of utilities, regulators, customers, and other stakeholders to improve the environment -- partnerships

- Aggressive efficiency improvements in building codes and appliance standards

- Manufacturers and distributors included in efficiency efforts

- Coordinated customer outreach and education efforts
Energy Efficiency Lessons Learned

• Develop a policy that encourages cooperation and collaboration among industry stakeholders

• Clearly define roles and responsibilities

• Maintain consistent policy direction and goals, and ensure goals are aligned with policy objectives

• Plan multiple-year program cycles and ensure timely approval

• Establish clear, simple and meaningful reporting requirements

• Allow administrative flexibility to respond to market conditions and make necessary program adjustments
Barriers to Energy Efficiency

- Recent McKinsey study suggests that worldwide energy consumption could be reduced by 50% over the next 15 years through employing existing energy efficiency technologies, processes, and practices.

- NRDC study suggests that if the rest of the U.S. had achieved energy efficiency reductions similar in scale to California, the U.S. would have already met Kyoto targets.

- But, there are significant barriers realizing full potential of energy efficiency:
  - Imperfect information
  - Consumer attitudes
  - Limited access to capital, cost disincentives
  - Product lifecycles
  - High consumer discount rates
  - Electric rate distortions and regulatory uncertainty
  - Externalities
Policies Are Needed to Address Barriers and Accelerate Deployment

- Align incentives to facilitate utilities pursuing energy efficiency as a resource option
- Implement aggressive, yet achievable, codes and standards for appliances and buildings in a timely manner
- Facilitate development of the infrastructure to support the “smart grid” to fully leverage energy-efficient technologies, distributed generation and advanced transportation technologies
- Educate energy consumers
- Develop consistent and appropriate monitoring evaluation and verification procedures
- Establish a long-term price signal for carbon
“Decoupling” or Other Ways to Align Incentives

• Many rate designs create financial disincentives for utilities to promote energy efficiency

• California’s model of decoupling removes these disincentives
  – Utility revenues and earnings are independent of actual energy sales.

• Decoupling eliminates the upside that comes with selling ever-increasing amounts of energy, and it helps promote broad, long-term environmental goals

• Under California’s decoupling framework, the state’s utilities collect no more and no less than the revenues necessary to run their business and provide a fair return to investors
  – If sales rise above these levels, the extra revenues go back to customers, rather than to the bottom line
  – If sales fall below intended levels, utilities are assured they can recover the shortfall going forward

• These goals can be achieved even more effectively if decoupling is combined with incentives that help motivate utilities to promote and embrace energy efficiency

• Alternative business models exist, in addition to decoupling, to align incentives for utilities
Next Generation Energy Efficiency Technologies

• PG&E operates an Emerging Technologies program to accelerate commercialization of new energy-efficient technologies

• The program identifies promising technologies for PG&E to promote to our customers
  – Screen and assess newly-commercialized technologies
  – Connect program outcomes with PG&E development of new energy efficiency solutions for customers
  – Identify channels for energy efficiency marketing programs to deploy our solutions to customers

• With a $3.7 million annual budget, PG&E’s Emerging Technologies program is targeting more than 60 technologies
  – Technology solutions recently deployed include:
    • Dimming light fixtures for commercial building stairwells that go to full brightness when someone enters the stairwell
    • Energy saving cooling systems for computer data centers
    • High-performance lighting for classrooms
Example Programs and Initiatives
Sonoma County Energy Watch Partnership

- New, innovative partnership – one of 20 throughout our service territory
- Will promote energy efficiency as a way to achieve Sonoma’s GHG reduction goals
- PG&E’s Partners:
  - QUEST
  - Sonoma County Climate Protection Campaign
  - GeoPraxis, Inc.
  - Synergy
Sonoma County Energy Watch Partnership

• Will focus on improving energy efficiency/reducing GHG emissions from:
  – Residential customers
  – Schools/colleges, retail stores, office buildings, high-tech
  – Agricultural

• Key activities:
  – Building tune ups
  – Energy efficiency retrofits in wastewater and water treatment facilities
  – Outreach to realtors/home inspectors to use building/home inspections to identify energy saving opportunities
  – Targeted energy audits, outreach, and training/education

• Projected savings of 7.6 million kWh for 2006 – 2008 program
Agricultural & Food Processing
Dairies

- PG&E has worked with more than 30 new and expanding dairies to help them build energy-efficient dairies and improve operational cost-effectiveness
- PG&E offers design assistance and financial incentives up to $75,000
- Energy efficient measures include premium-efficiency motors, fans, refrigeration systems, compressed air systems and lighting
Agricultural & Food Processing
Refrigerated Warehouse

- Design assistance and incentives for energy-efficient measures included evaporative and air condensers, computer controls and high-efficiency lighting and controls
- The combined measure can reduce energy use by 25 – 35% annually

Case Study
- Stamoules Produce planned a 60,000 square foot expansion of their cold storage facility
- Projected annual energy savings: 937,535 kWh
- Annual utility cost savings: $93,000
- Stamoules Produce received a $75,003 incentive from PG&E
Fabrication, Process & Heavy Industrial Manufacturing Wastewater Treatment Facilities

- The Dublin San Ramon Waste Services District plant expanded from 11.5 to 17 million gallons per day (mgd)
- PG&E helped the district evaluate and implement energy-efficient design options
- Projected annual energy savings: 2,323,650 kWh
- Annual utility cost savings: $290,000
- Incentive paid: $67,000