



PG&E's Gas Efficiency Programs

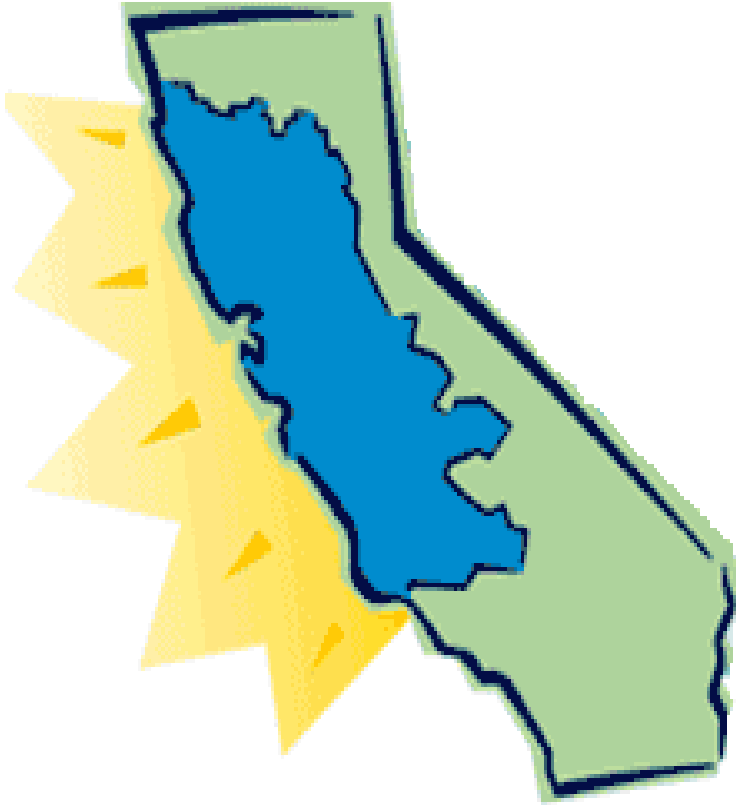
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PG&E Service Territory



- 70,000 square miles
- 15 million people
 - about 1 in every 20 Americans
- 6 million customers
 - 87% residential
 - 13% non-residential
- 139,000+ circuit miles of electric lines
- 45,800+ miles of natural gas pipeline
- Summer Peak (2007): 20,258 MW
- 2007 Electricity Sales: 86,313 GWH

Eras of Energy Efficiency at PG&E

- **1970s: Conservation**
 - Began information and audits with a focus on reducing usage
- **1980s: Demand-Side Management**
 - Expanded to include demand response (load management) and continued with conservation
- **1990s: Resource Acquisition**
 - Focus on installation of more efficient equipment with extensive post-installation savings measurement
- **1998 – 2000: Energy Efficiency Restructuring**
 - CPUC shifts policy to non-utility administration and “transforming markets”
- **2001: Energy Crisis**
 - Resurgence of resource focus; expansion of programs
- **2003: Energy Efficiency as a Resource**
- **2005: Long Term Energy Efficiency Portfolio Management**

Energy Efficiency: “Decoupling”

- California’s utility revenues and earnings are independent of sales.
 - Gas rates decoupled in 1978
 - Electric rates decoupled in 1982
- Under California’s decoupling framework, the state’s utilities collect no more and no less than the revenues authorized to run their business and provide a fair return to investors.
 - If sales rise above forecast levels, the extra revenues go back to customers, rather than to the bottom line.
 - If sales fall below forecast levels, utilities are assured they can recover the shortfall going forward.

California Energy Action Plans (EAP): Putting Energy Efficiency First

- Adopted by the CPUC, CEC, and Power Authority in 2003 and updated in 2005
- Established a “loading order” of energy resources to guide procurement decisions made by utilities
 - Energy efficiency
 - Demand response
 - Renewable generation
 - Cleanest available conventional generation
- Directed utilities to place cost-effective energy efficiency first in the loading order of resources used to meet customers’ energy needs

California's Legislative Landscape

- **Governor's Executive Order S-3-05, California's Emission Reduction Goals (June 2005)**
 - By 2010, reduce greenhouse gas (GHG) emissions below year 2000 levels
 - By 2020, reduce GHG emissions below year 1990 levels
 - By 2050, reduce GHG emissions 80% below year 1990 levels
- **AB 32: Global Warming Solutions Act (Sept. 2006)**
 - Establishes comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases
 - Reduce carbon emissions to 1990 levels by 2020 (25 percent reduction)
 - First statewide program in the U.S. to mandate an economy-wide emissions cap that includes enforceable penalties
- **California Energy Efficiency Strategic Plan (June 2008)**
 - All residential new construction will be zero net energy by 2020
 - All commercial new construction will be zero net energy by 2030
 - HVAC industry will be transformed

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 134 million megawatt-hours and 11.1 billion therms from installed measures (cumulative lifecycle savings)
- Saved enough annual electricity to power over 20 million homes and enough annual natural gas to heat 22 million homes
- Helped California avoid building 24 large power plants
- Saved customers over \$22 billion
- Kept over 135 million tons of CO₂ out of the atmosphere, based on combined electric and natural gas cumulative lifecycle savings

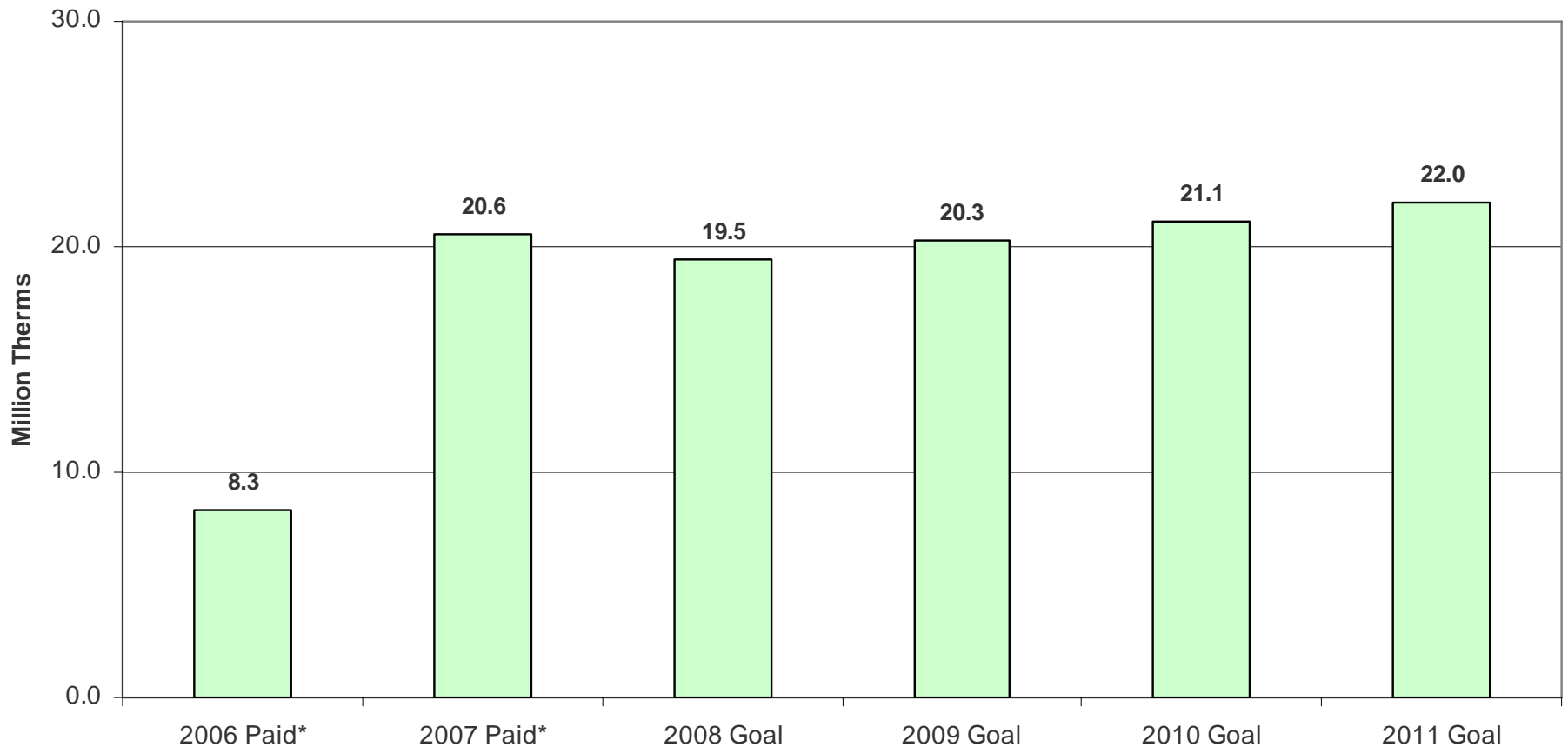
2006 - 2008 Energy Efficiency Portfolio

- Moves towards an integrated customer-based focus
- Portfolio includes: financial incentives and rebates, training, education, energy audits, emerging technology projects, energy codes and standards support, marketing and outreach, and evaluation activities
- Multiple delivery channel opportunities: utility programs, partnerships, third parties
- Mass Market: single family, multifamily and small business customers
- Targeted Markets:
 - Agriculture & Food Processing
 - Hospitality & Lodging
 - Health Care & Biotech
 - High Tech
 - Large Commercial & Institutional
 - Manufacturing & Heavy Industry
 - Residential New Construction
 - Retail
 - Schools, Colleges & Universities
 - Water Treatment

2006-08 Budget: Gas Only

Year	Budget
2006	\$35,926,985
2007	\$42,486,065
2008	\$52,575,089
2006-08 Total	\$130,988,139

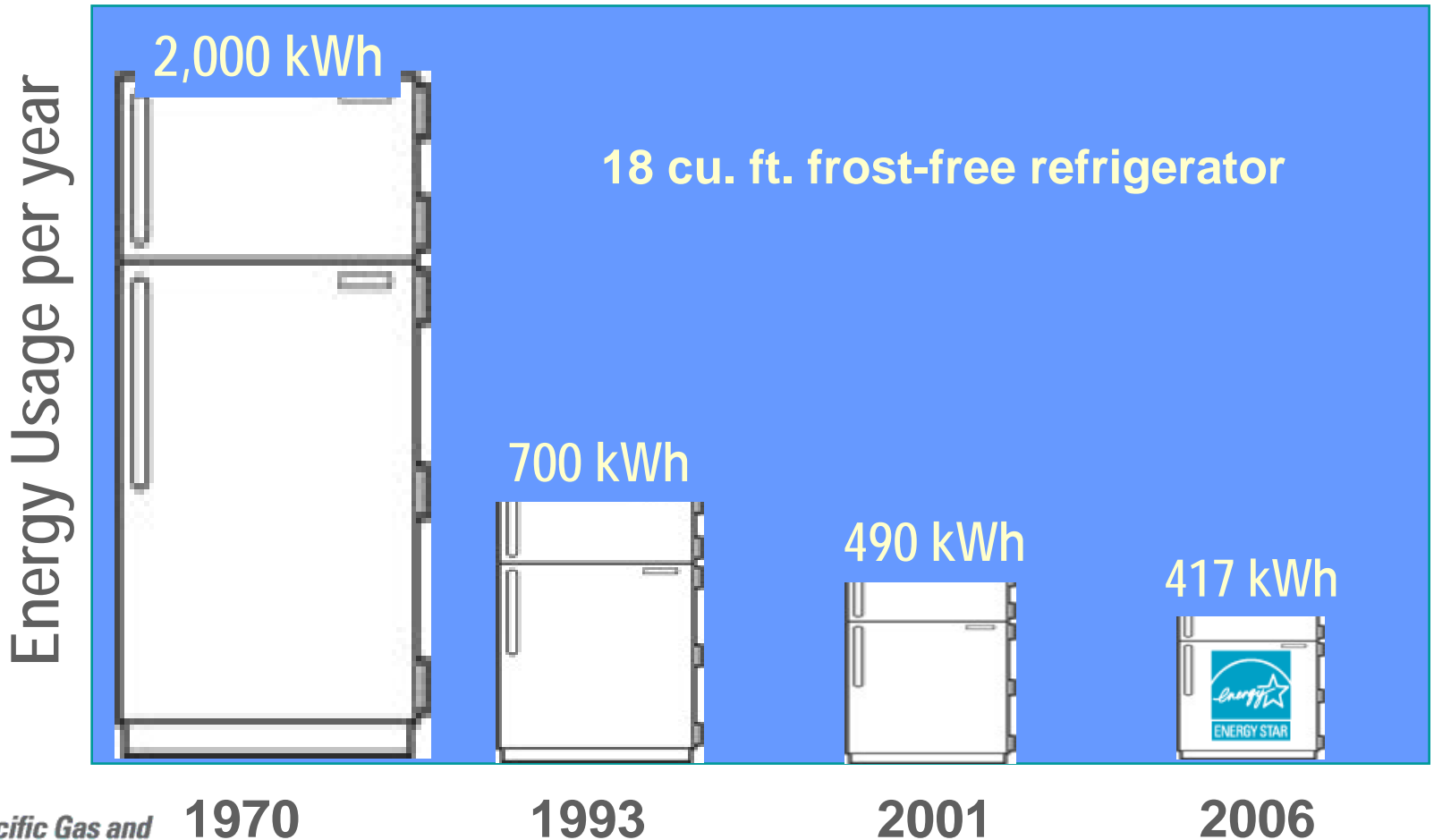
Program History and Goals: Million Therms



Gas Efficiency: Measures Delivering Major Savings

- Mass Market
 - Steam traps
 - Efficient boilers and hot water heaters
 - Efficient clothes washers
 - Greenhouse curtains
- Target Market
 - Efficient HVAC systems
 - Efficient water heaters
 - Efficient boilers
 - Increased efficiency of industrial process systems
 - Efficient equipment designed for each target market, including food service, wastewater treatment, and agriculture/food processing

Appliance Standards – A Big Impact

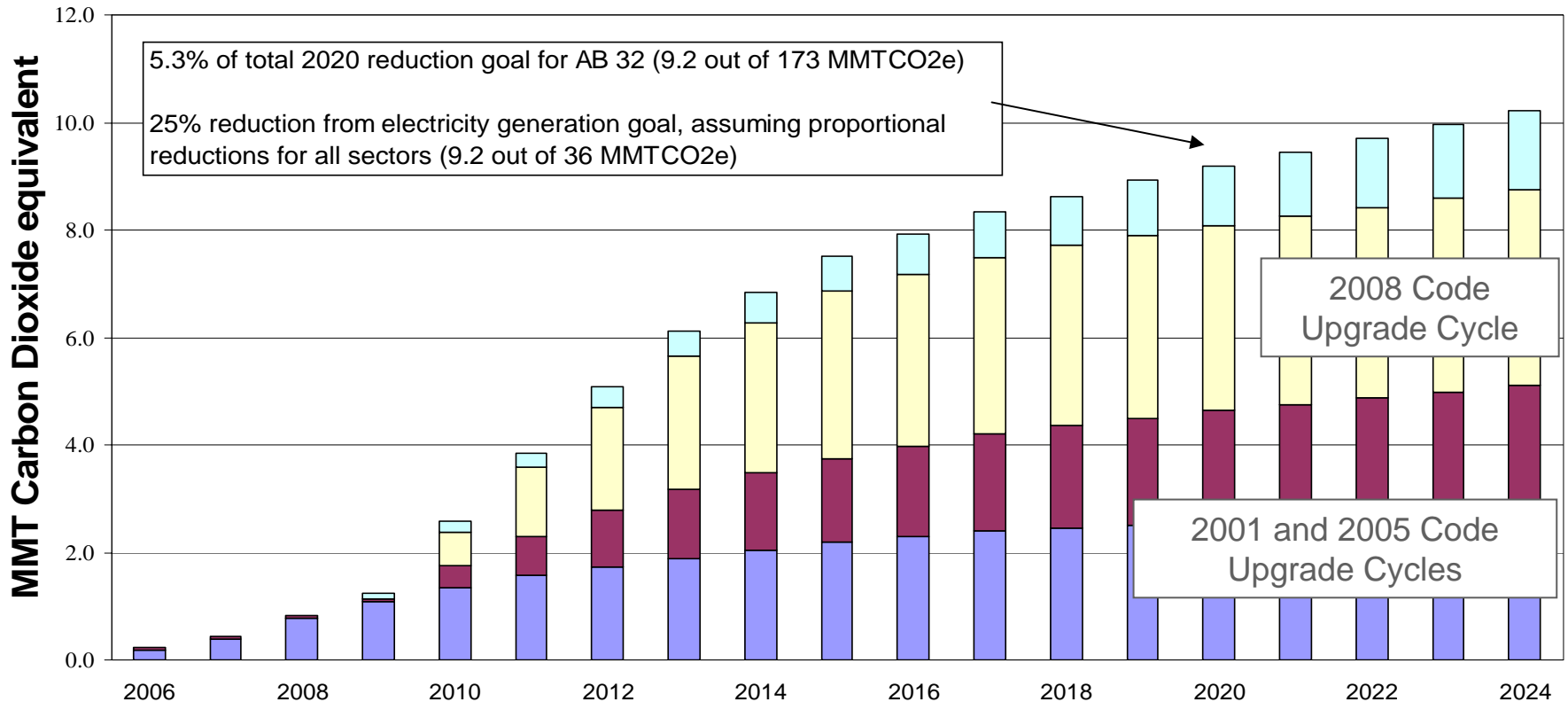


PG&E Codes and Standards Program

- Support upgrades to California codes and standards by showing:
 - Technical feasibility
 - Market readiness
 - Cost effectiveness
- Supported 2001 & 2005 code changes through studies that led to:
 - 18 new Title 20 appliance efficiency standards
 - 19 new Title 24 building efficiency standards
- Currently participating in the 2008 code upgrade (expected to continue through 2010)
 - CEC adopting 16 changes to building codes (Title 24) proposed by PG&E
 - PG&E developing over 25 appliance standards (Title 20) proposals for residential and nonresidential customers
- Worked with stakeholders across the US:
 - NRDC, ACEEE, ASHRAF, NFRC
 - Appliance standards adopted by 10 other states through efforts led by the Appliance Standards Awareness Project (ASAP)

Annual Greenhouse Gas Reduction from PG&E's Building Codes and Appliance Standards Efforts

Annual CA GHG Reductions from Title 20 and Title 24



Note: Based on an avoided greenhouse gas emissions factor for CA in 2004 of 0.00037 million metric tons of carbon dioxide equivalent (CO₂e) per gigawatt-hour delivered. The CO₂e figure includes the six greenhouse gases considered by the Intergovernmental Panel on Climate Change to be significant contributors to global climate change. (Source: based on values presented in, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. CEC. Dec. 2006). On September 27, 2006, Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act. The Act caps California's greenhouse gas emissions at 1990 levels by 2020.

Next Generation of Energy Efficiency Technologies

- Emerging Technologies Program contributes to energy savings by accelerating commercialization of new energy-efficient technologies and promoting them to customers
 - Screen and assess emerging and underutilized energy efficiency technologies
 - Inform PG&E on development of new energy efficiency solutions for customers
 - Identify channels for accelerating market adoption of emerging technologies, including working collaboratively with CEE
- Eight of ET's current energy efficiency projects are focused on natural gas savings
 - Target near term and sustainable energy savings projects

Emerging Technology - Gas Projects

- **Solar Wall**: Solar heated air for crop drying and commercial ventilation
 - Potential Savings - 2 MMtherms/yr
- **Enzymatic Soap Study**: Enzymatic soap allows residential cold water washing
 - Potential savings - 27.5 to 72 therms/yr per household
- **Ozone Laundry**: Ozone use in commercial laundries
 - Projected savings: 775 to 22,273 therms/yr per facility
- **Thermosorber for Food Processing/Hospitals**: Chill and hot water output
 - Potential savings: 8.6 MMtherms/yr
- **Fume Hood Auto Closure**: Laboratory Fume Hood automated closure
 - Potential savings: 10 MM therms/yr
- **Residential Water Heating**: Testing to deliver optimal performance of water heaters
 - Potential savings: 34.2 MM therms/yr
- **Hot Water Heating Retrocommissioning (Commercial)**: restaurant focus
 - Potential Savings: 800–1,000 therms/yr per site
- **Mechanical Vapor Recompression**: Evaporating water for dairy and tomato processing
 - Potential Savings: 45 MMtherms/yr

Enzymatic Soap and Ozone Laundry Assessments

- Enzymatic Soap Study

- Cold water soaps use enzymes to clean in cold water
- If all homes in PG&E's area washed laundry in cold water, annual savings could reach 27.5 to 72 therms/year per household

- Ozone Laundry Study

- Ozone use in commercial laundries
- Used in hotels, hospitals, central laundries and nursing care facilities
- Projected savings - 775 to 22,273 therms/year per facility



Fume Hood Auto Closure

- Fume Hood Auto Closure
 - 28,000 laboratory Fume Hoods in PG&E's territory require 800 GWh/year, 190 MW, and 60 million therms
 - Goal is to reduce airflow through fume hoods by 75%
 - Potential savings – 10 MMtherms/yr



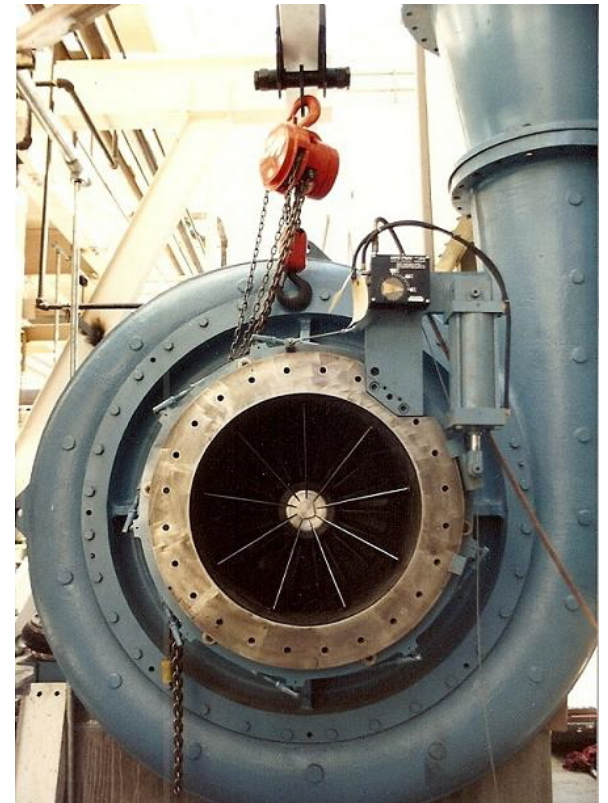
PG&E's Water Heater Test Lab

- Simulate site hot water operations to deliver performance information on commercial hot water heaters for residential and commercial applications.
- Evaluate the effects of different draw profiles on energy efficiency; define optimum usage habits and a load-pattern-dependent energy factor.
- Evaluate add-on devices to enhance efficiency.
- For commercial, look at effects and operating patterns for recirculation loops.



Mechanical Vapor Recompression (MVR)

- MVR Technology Basics
 - An efficient method of evaporating water
 - Uses a compressor to increase temperature of evaporated vapor to continue to drive evaporation
 - Primarily in use in the Dairy and Tomato processing industry
 - Possible applications in heavy industry
 - Potential Savings: 45 MMtherms/yr



Solar Water Heating Potential in California

- Less than 1 percent of California buildings have Solar Water Heaters installed today
- KEMA Study: solar hot water systems could save more natural gas than any other technology
 - 971 million therms per year in houses, apartments, and mobile homes across the state
 - solar hot water could save 219 million therms of natural gas per year in CA Commercial Buildings
 - Total this is 5.2 percent of all statewide therm consumption today.

ACEEE Study: efficiency measures leading to a 5.1 percent reduction in natural gas consumption would be accompanied by a 27 and 37 percent reduction in the wholesale price of natural gas in the Northern and Southern California markets, respectively

Goals of Solar Water Heating Pilot in PG&E Territory

- Identify/measure energy savings through solar water heating technologies
 - Estimated energy savings of 20-40% based on the energy use
- Address GHG reduction through lower gas usage and combustion-related emissions
- Data and program development to assist in AB1470 implementation
- Increase demand for and supply of lower energy solutions to the customers based on renewable technologies