



Pacific Gas & Electric Heavy Industry Energy Efficiency Program Overview

California consumers are not obligated to purchase any full-fee service or other service not funded by this Program. This program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission (CPUC).

Energy Solutions Overview

Commercial Energy Efficiency

Utility Efficiency Programs

FEMP

City Efficiency Programs

Efficiency/Sustainability

Wave

Ocean thermal

Solar

Wind

Biomass

Nuclear

Storage

Renewable Energy

Advanced Tools and Systems

SEEsuite

Demand Response

Operational Optimization

Cyber Security

Microgrids

Substation

Line

Utility Meter

Public Utility Electric

Web Energy Apps

Home Area Network (HAN)

Home Devices

WWW

Submeter

Controller

Bus

MicroGrid

Solar

Distributed Generation

Wind

Batteries

Fuel Cells

Distributed Storage

Thermal Storage

PHEV

Data

Power



Presentation Overview

- 1. Program Objectives**
- 2. Lockheed Martin Services, inc. (LMSI)
Experience with Utilities**
- 3. LMSI Experience with Projects**
- 4. Program Services**
- 5. Incentive rates**
- 6. Program Steps**
- 7. Program Summary and Contacts**
- 8. Air Conditioning & Refrigeration Incentives**



1. Program Objectives

Assist PG&E “Heavy Industry” customers to:

- **Identify process-focused energy efficiency improvements and other cost cutting opportunities**
- **Reduce operating costs per unit of product**
- **Improve product quality and production rate**
- **Reduce waste, pollutants, and emissions**
- **Remain competitive in marketplace**

Increase Operational Profitability



2. LMSI Experience with Utilities

PG&E – Heavy Industry Energy Efficiency Program

- Supports Both Gas & Electric Customers
- Started 2006
- Current 2010-2012 contract awarded

Southern California Edison – Industrial Energy Efficiency

- Started 2006

Energy Trust of Oregon – Production Efficiency

- Started 2002

Other Utility Energy Programs

- NYSERDA
- PEPCO
- NOVEC
- AMEREN
- Consolidated Edison



3. LMSI Project Experience

- LMSI - PG&E Energy Projects (2006-2010)**

Process	# of Projects	kWh Saved	Therms Saved
Air Abatement	7	527,122	2,585,316
Compressed Air	23	21,465,853	0
Heat Recovery	13	2,070,000	2,803,316
HVAC	39	20,033,676	1,219,789
Insulation	14	1,297	455,177
Lighting	76	28,027,926	0
Process Cooling	15	11,391,128	0
Process Improvement	42	29,165,166	4,385,070
Pumping	3	776,365	0
Motors / VFDs	17	5,396,319	0
Total	249	118,854,852	11,448,668



4. Program Services

- **Conduct Detailed Technical Studies**
 - **Performed by Senior Energy Engineers**
 - **Comprehensive in nature**
 - **No cost to customer – “one stop shop”**
- **Project supplier support**
- **Installation oversight**
- **Savings verification**
- **Coordination with other energy efficiency programs**
- **Qualify and deliver financial incentives**
 - **\$11 MM available in 2010-2012**
 - **Electric and gas measures served**
 - **Project costs and incentives may be aggregated**
 - **Incentives typically reduce payback time by one year**
- **Potential 100% financing for qualified projects > \$300K**



5. Incentive Rates

Incentive Rates	
Lighting	\$0.05 / kWh
Process, motor & other equipment	\$0.09 / kWh
Air Conditioning & Refrigeration I	\$0.15 /kWh
Air Conditioning & Refrigeration II	\$0.09 / kWh
Peak Electrical Demand Savings	\$100 / kW
Natural Gas Measures	\$1.00 / therm

- **Incentive capped at 50% of total project cost**
 - Customer may aggregate project costs against applicable incentives maximize incentives and minimize lost opportunity
- **Electric demand savings are added to all measures at \$100/KW**
 - Based on average demand reduction from 2PM - 5PM during the three hottest consecutive days of the year per respective geographic zone
- **Air conditioning & Refrigeration Projects:**
 - I - Complete unit Replacements * See details, slide 8, page 10
 - II – Component unit Upgrades * See details, slide 9, page 11



6. Program Steps

1. **With PG&E Account Managers, meet with decision-makers:**
 - **Identify uncommitted projects**
 - **Understand capital investment process**
 - **Identify existing technical consultants**
 - **Perform Plant “Walk-Through”**
 - **Define Scope of Studies**
2. **Conduct Studies & Prepare Reports**
3. **Deliver Reports and Projected Benefits**
4. **Help Customer to Prioritize Projects**
5. **Prepare & Execute Customer Incentive Agreement**
6. **Monitor Implementation**
 - **Suggest Vendors if Needed**
 - **QA Checking of Specifications**
 - **Installation Oversight**
7. **Verify Completion**
8. **Issue Incentive**



7. Program Summary and contacts

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- **Conduct Detailed Technical Studies**
 - Studies performed by “Senior Engineers”
 - Comprehensive in nature
 - No cost to customer, one stop shop
- **Project Implementation Assistance**
 - Coordinate other programs
 - Assist with financing
 - Project supplier support
 - Installation oversight
 - Post-installation verification
- **Financial Incentives**
 - Lighting - \$0.05/kWh
 - Process, motors, other equip - \$0.09/kWh
 - AC&R I - \$0.15/kWh – replacements
 - AC&R II - \$0.09/kWh – upgrades
 - Peak electrical demand savings - \$100/kW
 - Natural gas measures - \$1.00/therm
 - 50% of the aggregate project cost cap



8. AC&R I- Incentives

Type I Measures - \$0.15/kWh & \$100/kw

- Retrofits that improve the A/C system kW/ton efficiency
- High-efficiency chillers replacements
- Packaged air conditioners and heat pumps (>760,000 Btu/hr or 63.3 tons)
- Variable Speed Drive installations on air conditioning or refrigeration compressor motors.
- Air conditioning complete subsystem replacements (evaporative condensers, air-cooled condensers, cooling towers, or compressors)
- Refrigeration complete subsystem replacements (condensers, evaporators, cooling towers, or compressors)
- Constant air volume to variable air volume conversions
- Chiller heat reclaim
- Evaporative cooling and evaporative condenser retrofits
- Evaporative pre-cooling unit installations
- Indirect evaporative cooling (single stage and dual stage)
- Heat transfer (including heat pumps) to heat sinks, such as ground source cooling in air-conditioned buildings
- A/C compressor replacements
- Data center free cooling
- Refrigeration floating head controller installations



9. AC&R II – Incentives

Type II Measures - \$0.09/kWh & \$100/kw

- Reduced operation/load controls, building shell component retrofits
- Controls and energy management systems for HVAC or refrigeration equipment
- Variable speed drives on fans (including supply, exhaust, and cooling tower fans)
- Variable speed drives on pump motors (chilled water and cooling tower pumps)
- Fan, pump, and/or motor replacements
- Refrigeration evaporator fan controls
- Insulating chilled water, condenser water, or refrigerant pipes
- Insulating cool air ducts
- Insulating storage tanks
- Demand control ventilation installation (CO2 sensors)
- Installation of high-speed cold storage doors
- Air Conditioner air-side or water-side economizer installations on units not already equipped with a 100% economizer
- Building shell improvements
- Cooling tower upgrades
- Refrigerated case doors

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❖ *retrofits involving both Type I&II may be incented at \$0.15/kWh for the system*