Pacific Gas and Electric Company's Integrated Demand Side Management (IDSM) Strategy for Agricultural Customers

Patsy Dugger
Senior Program Manager Supervisor
Agriculture and Food Processing Program

PG&E's New Integrated Demand Side Management Targeted Market Structure

December, 2003: California's Energy Action Plan (EAP) established the state's preferred "loading order" - Energy efficiency, demand response, and distributed generation before building new generation - to meet CA's growing energy needs

January 2005: CPUC established CA statewide utilities as Portfolio Managers and established Program Advisory Groups (PAGs) and Program Review Groups (PRGs) to support the design and implementation process.

June 2005: Utilities submitted Program Implementation Plans to the CPUC for approval.

September 2005: CPUC approved $2 Billion in program budgets for PG&E, SCE, SDG&E, SoCalGas over 3 years

PG&E's New Integrated Demand Side Management Targeted Market Structure

- **2006-08 Energy Efficiency Budgets**
  - Total CA IOU budget - **$2 billion**
  - PG&E territory budget **$986 million**

- **Funding sources**
  - Public Goods Charge (PGC)
  - Utility "Procurement" funds offset new gen and spot market purchases

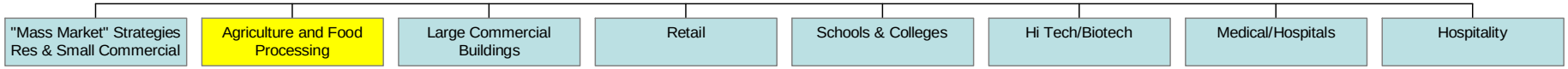
- **PG&E Funding Allocation**
  - 20% or more to non-PG&E third party implementers for "innovative" programs won through RFP
  - 20% to 21 Local Government Partnerships throughout the service territory

- **DG and DR:** Funding for DR and DG is additional and budgeted separately, however programs are being designed to be implemented "seamlessly" to the customer as much as possible

Targeted Markets

1. Agricultural and Food Processing
2. Heavy Industry and Fabrication
3. High Technology and Medical
4. Schools, Colleges, and Universities
5. Retail
6. Large Commercial and Institutional
7. Hospitality
8. Residential New Construction
9. Mass Markets – small commercial, residential

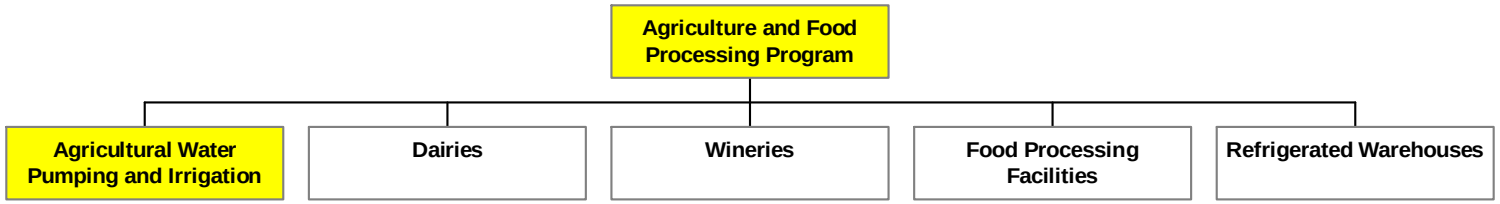
PG&E's Targeted Markets Strategy



Programs structured to deliver comprehensive products and services to each market sector, customized to optimize results for that segment:

- Market specific marketing materials and collateral, web information
- Audits, Benchmarking, and project Commissioning
- Education and Training – market targeted and crosscutting
- Design Assistance and engineering support for more complex new construction and retrofit projects
- Rebates and incentives – prescriptive and calculated
- Emerging Technologies case studies and demonstrations
- New Product Development department will pilot test new offerings
- Demand Response and Self Generation information and resources

Agriculture and Food Processing Targeted Market Program



• 2006-2008 Budget for Agriculture and Food Processing is approximately $49 Million for 3 years

- Agricultural Water Pumping and Irrigation ($10-15 million)
- Dairies ($5 Million)
- Wineries ($5 Million)
- Food Processors ($10-15 Million)
- Refrigerated Warehouses ($10 Million)

•CPUC has allowed utilities broad fund shifting ability between programs categories and elements to allow for managing program successes and failures.

Agriculture and Irrigation

- Agricultural customers alone account for 7% of California statewide electricity and 7% of PG&E's electric revenue.
- Approximately 100,000 agricultural accounts, most related to irrigation and pumping. 97% are small accounts at 200 kW and below.
- California farms vary widely:
  - Size: Small family farms to very large agri-businesses
  - Climate Zones – Steamy central coast to moderate/cool Central Coast and North Coast regions
  - Production: row crops, orchards, fruits, nuts, vegetables, cotton, greenhouses…
- Rates: 7 ag rates available, available when customers electricity is at least 70% to support "production agriculture".

On-Farm Water Electricity Conservation & DR Opportunities:

- Average pumping plant efficiency between 52 and 55%, cost effective repairs can increase productivity by 10%, if:
  - Irrigation system efficiency is at 90% or better with potential for automatic control systems to adopt Time of Use rate schedules
  - Most cost effective water management practices use scientific method to determine when to irrigate and how much water to apply

Water Agencies Electricity Conservation & DR Opportunities:

- Average pumping plant efficiency above 55%, cost effective repairs can increase productivity by 10%, if:
  - Adopting automated control systems to optimize operation and meet TOU schedules
  - Adopting infrastructure to offer flexible water delivery services to reduce on-farm groundwater pumping loads

Ag Program Resources, Services & Incentives

- Education/outreach (including case studies & demonstrations)
- Pump testing (offered in CA since the 1920s)
- Irrigation System Evaluations, integrated to optimize system performance, demand reduction, demand response & overall enterprise efficiencies
- Design support for new additions and system retrofits
- Emerging Technologies, Codes and Standards efforts in conjunction with CEC and other utilities
- Project Incentives
  - Energy Efficiency (prescriptive and calculated on kWh)
  - Demand Reduction – KW Kickers being considered
  - Demand Response (special rates and tariffs)
  - Self Generation ($/KW generated)

2006-8 Energy Efficiency Rebates & Incentives

- **Energy Efficiency Equipment Rebates**
  - For automatic control systems, irrigation scheduling software/hardware, flow measurement and soil moisture meters, lower pressure filters and emitters
  - Rebates vary by measure. No customer funding caps

- **Customized/Calculated Incentives for Retrofits at standard rates**
  - Full system retrofit
  - .08/kWh permanently saved
  - Up to $500,000 per project

- **New Construction Design Support and Customized/Calculated Incentives at standard rates**
  - New total system design and integration
  - .08/kWh permanently saved
  - Up to $150,000 per project

Current Agricultural Pumping Efficiency Program

- Current Program Administrator: Fresno State University Center for Irrigation Technology, http://www.pumpefficiency.org/
- Farms, irrigation districts and municipal water agencies directly contact participating pump test companies for service
- Customer can receive up to 50% cost rebate for projects like:
  - Well cleaning that reduces draw down.
  - Removal/replacement of valves and fittings with high-pressure losses, if they are within 10 feet of the pump head discharge.
  - Retrofit/repair of the pump itself.
  - Actions that reduce air entrainment.
  - Comprehensive water and irrigation education program promotes scientific management practices
  - Rebates are paid at .10/kWh saved

Current Agricultural Pumping Efficiency Program Results

- As of 09/01/05 the Ag Pumping Efficiency Program has provided:
  - 434 pump retrofit / repair rebates
  - $1,320,000 in incentive rebates for those projects
  - 18,200,00 kwh saved
  - 360,000 therms saved
  - 6,562 pump tests
  - $1,200,000 in pump test subsidies
  - 80 educational seminars

Data from the Fresno State University Center for Irrigation Technology website, http://www.pumpefficiency.org/

Plan for 2006-08 Program

- Continue to implement Agricultural Pumping Efficiency Program through a third party implementer
  - Ideally expand services to include whole-systems approach integrating pumping plant performance with irrigation system evaluation.
  - Aggressively promote scientific water management practices utilizing existing public and private resources, i.e., DWR/CIMIS.

- Initiate energy efficiency program targeting irrigation districts and water agencies
  - Conduct site audits to assess conservation and efficiency opportunities as well as how to adopt DR programs
  - Co-sponsor water agency modernization projects to provide flexible water deliveries to farms, accruing savings from reduced on-farm groundwater pumping from drip irrigation systems

- Support development of irrigation system energy efficiency standards
  - Irrigation system manufacturers will be encouraged to bring to market new products that use less energy

PGE Agricultural Partnerships

Supporting the CEC's RD&D Agricultural Water Efficiency Program:

- **Energy Efficiency:** Improving the efficiency of pumping systems and wells; reducing the energy intensity of pressurized irrigation systems, including filters, pipes and emitters.
- **Off Peak Pumping from Water Districts:** Improving the infrastructure of water districts to deliver water to farms using flexible schedules and reduce on-farm groundwater pumping loads.
- **Technology Transfer for Peak Demand Reduction Programs:** Improving the equipment and methods needed by farms and irrigation districts to participate in peak demand reduction programs.
- **Voluntary Standards Development:** Establishing new voluntary efficiency standards for the development of low-energy intensity agricultural water equipment, including pumps, wells and irrigation systems.

PGE Partnerships

- Supporting DWR Water Conservation Program goals:
  - Promoting the use of CIMIS based scientific water management practices
  - Co-sponsoring irrigation system evaluation mobile laboratory program with Resource Conservation Districts
- Supporting USDA Water Conservation Program goals:
  - Matching water conservation installation improvement incentives
  - Matching self-generation system installation incentives
- Supporting Water Agencies Resource Conservation goals:
  - Collaborating with water agencies to better understand the water energy relationship and apply strategies to optimize the use of both resources
    - “AG/ICE” program to promote diesel to efficient electric pump conversion

For More Information

- Contact:

  Patsy Dugger

  Pacific Gas and Electric Company

  Pwd2@pge.com

  415-973-1019