Water/Energy Nexus Program

Program Summary for Government Partnerships Task Force

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Energy Efficiency Programs
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Agenda

• Energy for water in PG&E’s territory
  – High level view of Water/Energy Nexus
  – Saving energy, saving water
  – End use sectors

• Program alignment with water/energy nexus
  – Technologies and programs in portfolio, sectors addressed

• Areas of interest and emerging technologies projects
  – Projects for irrigation systems
  – Partnerships with water agencies
  – Cost effectiveness procedures
Breakdown of Water-Related Electricity

CA Statewide: Annual Electricity Demand Associated with Water Consumption

- CRA
- SWP
- CVP
- WWT
- Utilities
- Ground Water
- Ag
- Large scale supply projects
- Groundwater pumping and other ag sector

Total: ~54,000 GWh/yr

PG&E Territory: Electricity Associated with Water
Includes More Ag and Less Embedded Energy

- Local water agencies
- Ground Water
- CVP
- WWT
- Utilities
- Groundwater pumping and other ag sector

1. Updated by Navigant for CEC 2006 and CPUC 2009 studies
### Three Levels of Water/Energy Efficiency

<table>
<thead>
<tr>
<th>Type of measure</th>
<th>Example opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Energy savings <em>associated with water</em></td>
<td>• Efficient water heater</td>
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<tr>
<td>2. <em>Combined</em> water and energy savings for end user</td>
<td>• Low flow showerhead</td>
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<tr>
<td>3. Water conservation <em>only</em> (upstream/ embedded energy)</td>
<td>• High efficiency toilet</td>
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</table>
# PG&E Water/Energy Program Examples

PC&E portfolio addresses several areas of water/energy

<table>
<thead>
<tr>
<th></th>
<th>Deemed EE Products (Prescriptive Savings)</th>
<th>Custom EE Products (Calculated Savings)</th>
<th>Demand Response &amp; Distributed Gen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential</strong></td>
<td>Clothes washers</td>
<td>N/A</td>
<td>Solar water heating</td>
</tr>
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<td></td>
<td>Water heaters</td>
<td></td>
<td></td>
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<tr>
<td><strong>Commercial</strong></td>
<td>Ozone laundry</td>
<td>Waste water treatment</td>
<td>Water utility auto-DR</td>
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<tr>
<td></td>
<td>Low flow faucet aerators</td>
<td>Condensing boilers</td>
<td>Wastewater plant self gen</td>
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<td></td>
<td>Steam Traps</td>
<td>Steam leaks</td>
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<tr>
<td></td>
<td></td>
<td>Pump VFDs</td>
<td>Pressure reduction turbines</td>
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<tr>
<td><strong>Industrial</strong></td>
<td>Pipe Insulation</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Boilers and steam systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agricultural</strong></td>
<td>Low flow sprinkler nozzles</td>
<td>Pump Efficiency Program</td>
<td>Ag Pump auto-DR</td>
</tr>
<tr>
<td></td>
<td>Sprinkler to drip conversion</td>
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</tbody>
</table>

Rebates/incentives determined based on facility level energy savings (not embedded)
Policy activity targeting the Nexus

Variety of recent activity: pilot projects and research work

CPUC 2013-2014 Program Guidance

“We direct the IOUs to propose 2013-2014 efforts (either through limited, water sector focused pilot programs or through targeted efforts within the existing calculated savings programs) on leak-loss detection and remediation and pressure management services for water entities that are IOU customers.”

PG&E 2013-2014 Compliance Filing

“PG&E’s expanded activities will focus on documenting water savings, water delivery system efficiency improvements including leak repair, closer coordination with water and waste water agencies, and expanded energy audits.”
PG&E Water/Energy Emerging Tech Projects

Water Agency Partnership Opportunities

- **Embedded Energy Variability**: Analysis of EBMUD system data to assess spatial/temporal trends in energy intensity (Partnership with UC-Davis)

- **Water Agency Efficiency**: Develop template for targeted efficiency evaluations that can provide water and energy recommendations (CalPoly SLO)

Sprinkler and Drip Irrigation Innovation

- **Combined Irrigation System Evaluations**: Combined approach to pump efficiency, pressure management and irrigation distribution uniformity (CSU-Fresno)

- **Low Pressure Irrigation Design**: Lab and field analysis testing of low pressure emitter, filter, and valve performance (CalPoly SLO)

Ag Water Management and Education

- **CSU Fresno Ag Water & Energy Center**: Creation of a center for education and demonstration activities related to agricultural water/energy issues
Water conservation and embedded energy

PROJECT UPDATE

EBMUD Embedded Energy Research (UC Davis)

- Characterizing embedded energy “hot spots”
- Determining energy savings associated with water savings

Best alignment with PG&E programs where energy intensity is highest
Water conservation and embedded energy

PROJECT UPDATE

Framework for Water Agency Audits (CalPoly)

• Validating approach at pilot municipalities
• Develop template for targeted efficiency evaluations

Consistent audit tools and data will help PG&E develop and target new programs
Water conservation and embedded energy

PROGRAM UPDATE

Residential Clothes Washer Rebate
(PG&E + Water Agency Partners)

- Improved volume through coordination
- Simplicity plus value for customers

The clothes washers program could be a template for future joint programs
Q&A

Further questions, please contact Sam Newman
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# PG&E Energy Efficiency Channels

## Sectors where water usage occurs:
- Water utilities
- Wastewater treatment
- Ag producers
- Food processing
- Industrial
- Residential
- Multifamily
- Large commercial
- Small commercial

## PG&E energy efficiency channels:
- Direct sales
- Midstream/upstream
- Trade alliances
- 3rd party partners
- Government partners

## Example Programs:
- Customized retrofit/new construction
- Appliance retailers
- Various opportunities provided by Trade Pro partners
- Wastewater program
- Ozone laundry program
- Food processing program
- Local government partnerships
# PG&E Solutions for Water & Wastewater facilities

<table>
<thead>
<tr>
<th>Service offering</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Energy Audits</td>
<td>Analysis of energy usage and identify potential energy savings opportunities</td>
</tr>
<tr>
<td>Energy Efficient Retrofits</td>
<td>Rebates and Incentives for installing energy efficient measures and processes</td>
</tr>
<tr>
<td>Energy Efficient New Construction</td>
<td>Resources and incentives for energy efficient design and construction</td>
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<tr>
<td>Demand Response</td>
<td>Incentives for voluntary, temporary load reduction during peak demand periods</td>
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<tr>
<td>Solar and other Self-Generation</td>
<td>Rebates for installation of qualified generation systems</td>
</tr>
<tr>
<td>On Bill Financing (OBF)</td>
<td>No-interest loans available to eligible customers for energy efficient retrofit projects that are repayable through PG&amp;E bills</td>
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PG&E also offers additional services such as Pricing Plans and Benchmarking that enable customers to understand their energy usage and rates to determine any changes to the facility operation and/or pricing plans.
Potential partnership opportunities

• New appliance rebate programs using joint funding from water and energy utilities

• Combined energy and water audits for end users

• Bundled efficiency upgrades, possibly including financing

• Messaging and marketing

• Water savings as energy efficiency: Agency Conservation programs, leak loss remediation