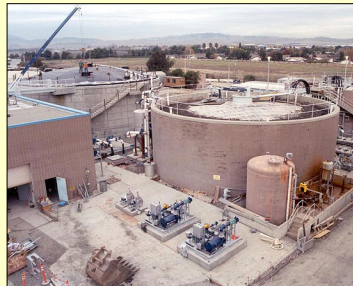


CEE PROGRAM MEETING
June 14-16, 2006 Boston

**PG&E MUNICIPAL WATER &
WASTEWATER BASELINE STUDY**

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**PG&E MUNICIPAL WATER &
WASTEWATER BASELINE STUDY**

METHODOLOGY:

- Survey of water & wastewater customers in PG&E service territories.
- Identify energy efficiency market penetrations
- Identify water and wastewater treatment technologies and energy-saving measures.



PG&E MUNICIPAL WATER & WASTEWATER BASELINE STUDY

SURVEY RESULTS from:

- Municipal Water Treatment Industry = Response Rate of 40% approx. from 18 major customers
- Municipal Wastewater Treatment Industry = Response Rate of 25% approx. from 300+ customers

*** See handouts for survey forms ***



PG&E MUNICIPAL WATER TREATMENT BASELINE STUDY

TREATMENT TECHNIQUE

BASELINE DESIGNS

- | | |
|--|--|
| (1) Pretreatment - Screening, Aeration, Coagulation & Flocculation, Sedimentation, Granular Filtration, Ion Exchange, Membrane | EPACT Motors |
| (2) Disinfection – UV, UV/Peroxide | Medium Pressure lamps |
| (3) Disinfection – Ozone, Ozone/Peroxide | Fine Bubble Diffusers
Oxygen Based Gen. |
| (4) Raw & Finished Water Pumping | On/Off Level Control
EPACT Motors |



PG&E MUNICIPAL WATER TREATMENT BASELINE STUDY

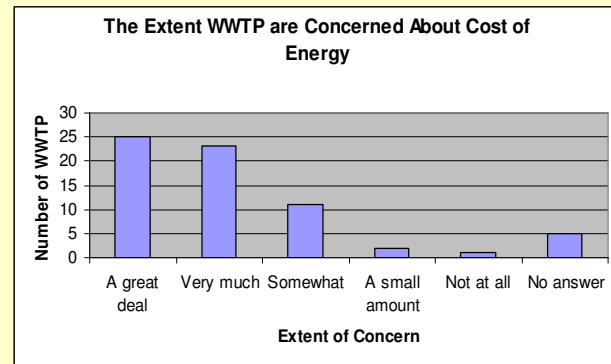
TREATMENT TECHNIQUE

SAMPLE EE MEASURE

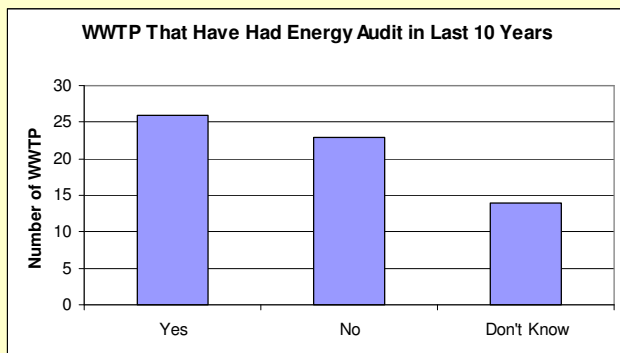
(1) Pretreatment - Screening, Aeration, Coagulation & Flocculation, Sedimentation, Granular Filtration, Ion Exchange, Membrane	High Eff. Pumps Premium Eff. Motors
(2) Disinfection – UV, UV/Peroxide	Low Pressure lamps
(3) Disinfection – Ozone, Ozone/Peroxide	Ozone Gen from pure Oxygen
(4) Raw & Finished Water Pumping	VSD, High Eff. Pumps Premium Eff. Motors



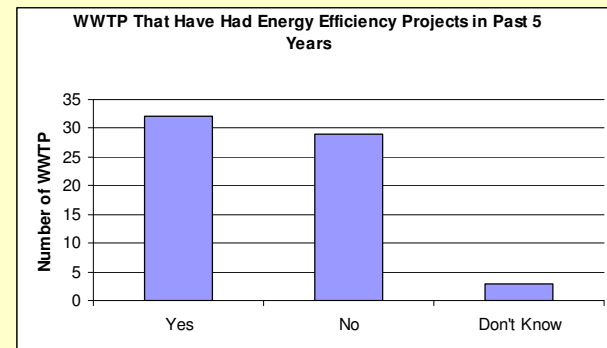
PG&E MUNICIPAL WASTEWATER BASELINE STUDY



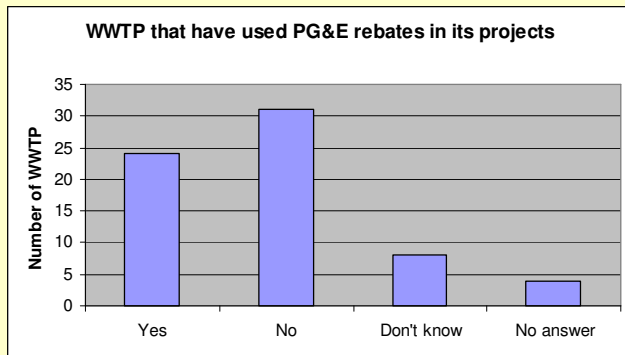
PG&E MUNICIPAL WASTEWATER BASELINE STUDY



PG&E MUNICIPAL WASTEWATER BASELINE STUDY



PG&E MUNICIPAL WASTEWATER BASELINE STUDY



PG&E MUNICIPAL WASTEWATER BASELINE STUDY

TREATMENT TECHNIQUE

BASELINE DESIGNS

(1) Pumping System	Throttle, by-pass or no control. EPACT Motors
(2) Aeration System	Coarse Bubble Aerators Manual DO System Multiple-stage Centrifugal blowers
(3) UV Disinfection System	Medium Pressure Lamps
(4) Compressed Air System	Pneumatic Air Pump Rotary Screw Compressor with load/unload control.
(5) Sludge Dewatering System	Centrifuge or Belt Thickening



PG&E MUNICIPAL WASTEWATER BASELINE STUDY

TREATMENT TECHNIQUE

SAMPLE EE MEASURE

(1) Pumping System	VSD, High Eff. Pumps, Preium Eff. Motors
(2) Aeration System	Fine Bubble Aerators Auto SCADA/ DO System Single-stage VSD Centrifugal blowers
(3) UV Disinfection System	Low Pressure Lamps
(4) Compressed Air System	Electric Air Pump High Eff. Air Compressor with VSD.
(5) Sludge Dewatering System	Screw Press Thickening



PG&E MUNICIPAL WATER & WASTEWATER BASELINE STUDY

- Raise awareness among municipal decision-makers
- Support Incentive Program Design & Implementation
- Identify and promote best practices to demonstrate energy-efficiency's benefits via workshops & audits

