

US EPA ARCHIVE DOCUMENT

# Energy Management Workshop



**December 18, 2008**

EPA Office of Water, EPA Region 9

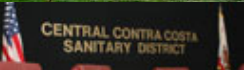
Sacramento, California

# Welcome and Introductions



**Sanger**

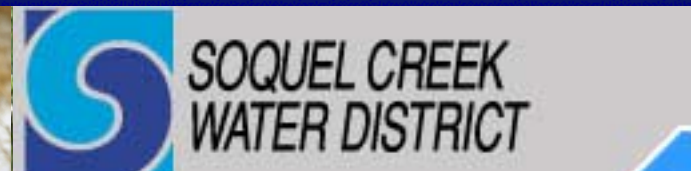
The Official Web Site of Sanger, California



AMADOR  
*Water Agency*

A Countywide Water Agency Since 1959

Serving the Water Needs of Your Community



[SJGov.org](http://SJGov.org)

Official Site for the County Of San Joaquin

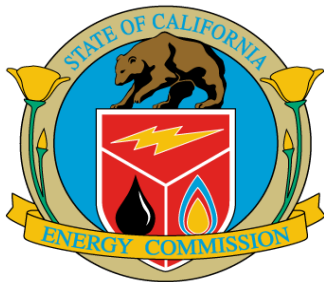


**DUBLIN SAN RAMON SERVICES DISTRICT**



# Sponsors

- U.S. EPA:
  - Office of Water
  - Pacific Southwest, Region 9



California Water Environment Association





# Energy Use and Water Utilities

**Water and Wastewater treatment represents ~3% of the nation's energy consumption**

- \$4 billion spent annually for energy
- Equivalent to ~56 billion kilowatt hours (kWh)
- Equates to adding ~45 million tons of greenhouse gases

**Energy represents the largest controllable cost of providing water or wastewater services to the public**

- 16,583 municipal treatment plants in the US
- Energy represents 25-30% of total plant O&M
  - Raw sewage pumping (12%)
  - Aeration (25%)
  - Solids handling (30%)
  - Lighting, heating, AC and other (6%)
- As energy costs rise, operating costs rise



# Energy Reduction at Water Utilities

## Water and Energy Efficiency at Utilities =

- Reduced energy usage
- Reduced operating costs
- Reduced climate impacts / carbon footprint
- Sustainability of water infrastructure
- Water savings

# Why Focus on Energy Management?

- Energy issues are here to stay and will only get more serious—no quick fixes!
- Individual projects are fine, but something is needed to pull it all together (a system)
- Systematic management will ensure continuing focus on energy efficiency
- The Plan-Do-Check-Act approach has worked in many different sectors
- Enables consistent, organized, and integrated management of utility operations

# Managing to Maximize Energy Efficiency

## Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities



JANUARY 2008



## Designed to help utilities:

- Systematically assess current energy costs and practices
- Set measurable performance improvement goals
- Monitor and measure progress over time

**Uses a management system approach for energy conservation, based on the successful Plan-Do-Check- Act process [based on Environmental Management Systems (EMS)]**





- More information is available at:

[www.epa.gov/waterinfrastructure/bettermanagement\\_energy.htm](http://www.epa.gov/waterinfrastructure/bettermanagement_energy.htm)

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# Morning Break



# What Energy Challenges Do You Face Today?

- What have you done already?
- What is missing?

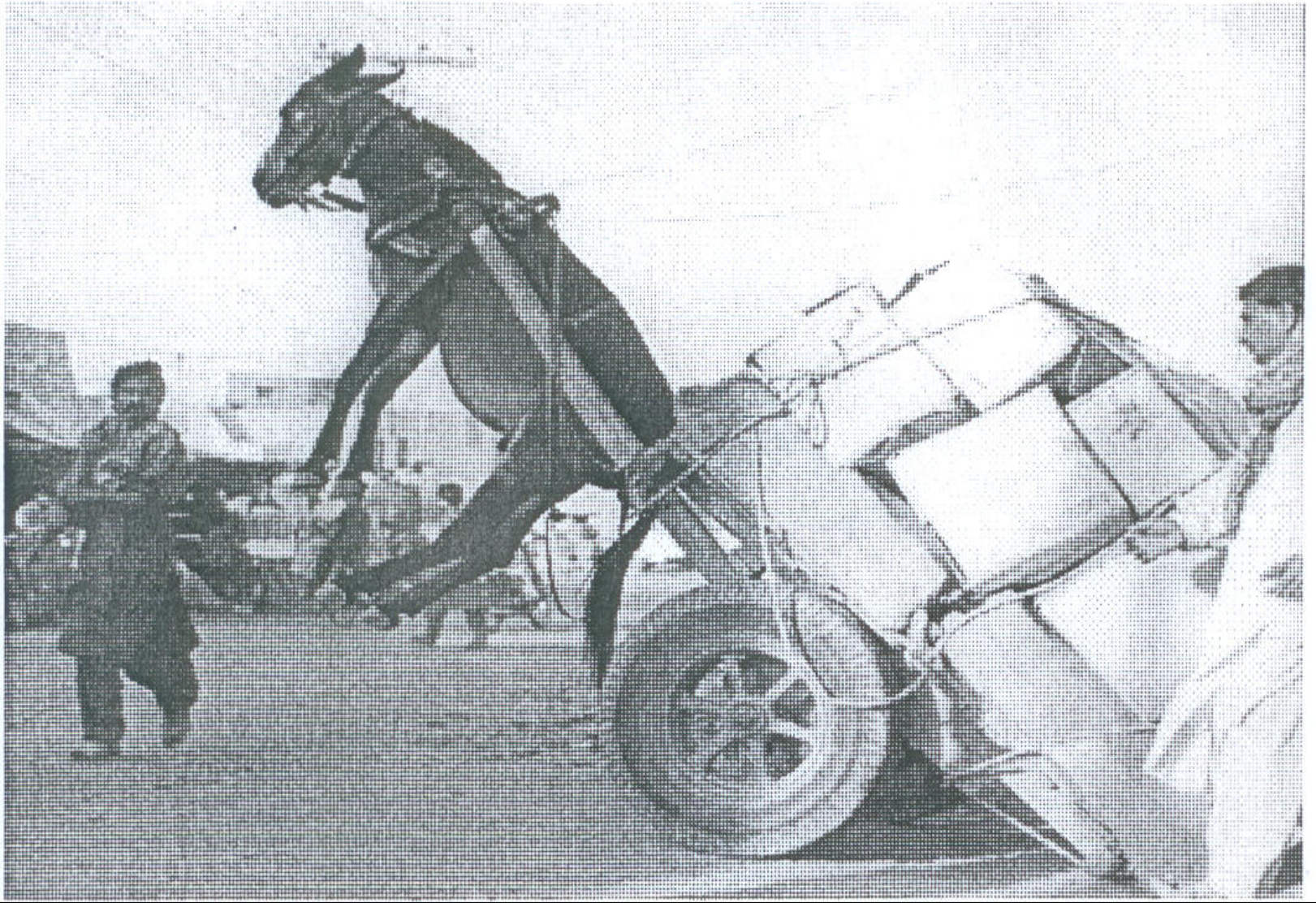


# Plan Do Check Act





## Greater effort in an existing framework



Is not always the answer

# The PLAN-DO-CHECK-ACT Framework





# Plan

- 1: Getting Ready
- 2: Assessing Current Energy Baseline
- 3: Establishing Energy Vision & Priorities
- 4: Identify Objectives and Targets

# Do

- 5: Implement Energy Improvement Programs (and a Management System to Support Them)



# Check & Act

- 6: Monitor & Measure Energy Improvement Management Programs
- 7: Maintain, Improve & Communicate

- **PLAN:**

Say what you do.



- **DO:**

Do what you say.

- **CHECK & ACT:**

Verify, Maintain and Continue



# Plan-Do-Check-Act Experiences



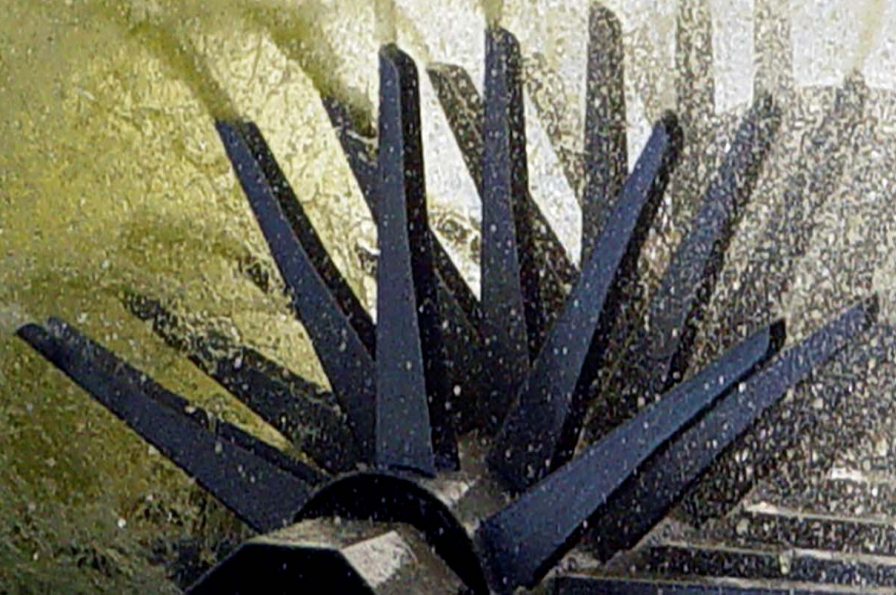
# Developing Energy Management Programs:



***“hands on exercise”***



**How much energy do we  
use and where do we  
use it?**





1. Activities  
Operations  
*Pages 36, 37*



# Assessing energy baseline

- Benchmark
  - Try Energy Star
- Energy assessment or audit
  - Note 2 kinds of audits
- Review legal/other requirement and do a compliance baseline

*Tools: Energy Star benchmarking, Portfolio Manager; Worksheets, Session 2*



# Benchmarking Wastewater Facilities in Portfolio Manager

## Introduction

U.S. Environmental Protection Agency

December 16, 2008

Cheryl McGovern



Learn more at [energystar.gov](http://energystar.gov)



# Today's Agenda



- Introduction
- ENERGY STAR Portfolio Manager
- Q&As

# What is ENERGY STAR?



- The mission of EPA's ENERGY STAR Program is to reduce greenhouse gas emissions through energy efficiency
- ENERGY STAR establishes specifications and labeling for Products; Home Improvements; Buildings and Plants; and New Homes
- Energy saving guidelines, technology information, recommendations, and contractors

# What is Portfolio Manager?



**An assessment tool that measures your facility's energy efficiency now and over time – benchmark and track improvements**

**Potential award, educate functions for WWTP**

**Mirror that shows your facility in a new light**



# What is Portfolio Manager?



- ENERGY STAR Portfolio Manager is an interactive energy management tool that allows buildings to get an energy efficiency rating, and then track and assess energy and water consumption
- Originally it was designed for buildings and industrial applications – more functionality
- October 1, 2007, wastewater treatment plants added to assess and track energy efficiency functions of Portfolio Manager – not drinking wtr at this point – awards may be added



# Benchmarking - Assessment



- Accessed online through ENERGY STAR Portfolio Manager
- Regression analysis – energy use per unit of flow
- Normalized for external factors
- Wastewater – results against model shows statistical significance at 90% confidence level
- Energy generated onsite is not included in calculation so energy purchased per unit of flow is lower to reflect greater energy efficiency

# Benefits of Portfolio Manager



- Facilities can see how their energy use compares against similar facilities in a national database
- A rating is given from 1-100 (100 most efficient, 50 being average) using uniform, tested criteria
- Portfolio Manager uses emissions factors, which vary by geographic region based on the type of power generation used, to determine the carbon emissions
- Facilities baseline benchmark and improvements can be tracked easily and show energy reductions and increased ratings from your desktop and the web

# What Do I Need To Get My Score?



1. Zip Code
2. Energy use for all fuel types – monthly for one year
3. Average Daily Influent Flow
4. Average Influent BOD and Effluent BOD – averaged over 12 months (mg/l)
5. Plant Design Capacity – treatment design – mgd
6. Fixed Film Trickle Filtration Process (y/n)
7. Nutrient Removal (y/n)

# Why Bother With All This?



- U.S. drinking water and wastewater systems spend about \$4 billion a year on energy to pump, treat, deliver, collect and clean water – with much of this cost borne by ratepayers and municipalities.
- Nationwide, **drinking water and wastewater systems use 75 billion kilowatt hours per year – as much as the pulp and paper, and petroleum industries combined (enough electricity to power 6.75 million homes for an entire year).**
- Energy costs to run these systems can represent as much as one-third of a municipality's electricity use.
- Reducing energy and water at wastewater facilities can make a significant difference for the environment and for the pocket book



# How Can Wastewater Facilities Get Involved Now?



- Sign up with us to establish an account in Portfolio Manager and get your benchmark score and a free energy audit
- Use ENERGY STAR Guidelines for Energy Management
- Measure and Verify Energy Use
- **STEP 1: Make Commitment**
- **STEP 2: Assess Performance**
- **STEP 3: Set Goals**
- **STEP 4: Create Action Plan**
- **STEP 5: Implement Action Plan**
- **STEP 6: Evaluate Progress**
- **STEP 7: Recognize Achievements**

# How Can Wastewater Facilities Get Involved Now?

- Use EPA's January 2008 Guidebook "Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities">
  - [http://www.epa.gov/infrastructure/bettermanagement\\_energy.html](http://www.epa.gov/infrastructure/bettermanagement_energy.html)
- Obtain a free energy audit from the local power company or California Energy Commission to create an action plan and implement it – SRF funds are available for energy efficiency

# How Can Wastewater Facilities Get Involved Now?

- Get your score! Two hour class Jan. 28th
- Class is a partnership with PG&E
- EPA will walk you through the online Energy Star Portfolio Manager website
- You'll get your score and more
- PG&E will schedule a free audit of your facility!
- Class limited to first 9 facilities, more to come depending on interest

# Contact Information

[www.energystar.gov](http://www.energystar.gov)

[buildings@energystar.gov](mailto:buildings@energystar.gov)

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If you have any questions, contact:

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# Lunch

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