

US EPA ARCHIVE DOCUMENT

Energy Management Workshop



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EPA Region 9

Irwindale, California



Sponsors

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Sustainable Earth Initiative

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Overview

- Introductions
- Agenda
- EPA Region 9's Sustainable Water Infrastructure Program
- Rationale for Energy Management Systems
- Overview of "Plan-Do-Check-Act"
- Funding Opportunities

Agenda

- **Three Morning Breakout Sessions**
 - Understand your Energy Bill
 - ENERGY STAR Portfolio Manager
 - Opportunities for Energy Management
- **Lunch / Sunnyvale WWTP experience**
- **Energy Audits at WWT Facilities**
 - Breakout sessions with SCE, SDGE
- **Setting Priorities**
- **Moving to Action**
- **Resources**



EPA Region 9 Sustainable Water Infrastructure and Climate Change Initiative



Origin

EPA Headquarters Office of Water

- National Water Program Strategy: Response to Climate Change

EPA Region 9

- Energy and Climate Change Strategy
- Created Infrastructure Office in Water Division



Infrastructure Office

- Created in February 2008
- Responsibilities include Earmark Grant Management, State Revolving Fund, Border Infrastructure, Sustainable Infrastructure, and coordinating Water Division climate change activities



Background

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



Why focus on Sustainable Infrastructure?

- Water systems are aging, Population increasing
 - \$500 Billion payment gap over next 20 years
- Climate change will impact infrastructure needs
 - weather changes, storm severity, snow pack losses
 - rising sea levels, storm surges, saltwater intrusion
- Water infrastructure uses a large amount of energy
 - For CA: 1/5 electricity, 1/3 natural gas
 - In U.S.: 75 million metric tons CO₂ eq. emitted per year
- Rising energy costs, already 1/3 (on average) of utility operating costs
- Energy efficiency projects have reduced operating costs by over 30%



Why focus on Sustainable Infrastructure?

Energy efficiency at water/wastewater facilities....

- Reduces operating costs
- Frees up funding for capital improvements and/or hiring more operators
- Leads to improved effluent (and receiving water) quality
- Reduces greenhouse house emissions, and incrementally reduces adaptation needs



Sustainable Infrastructure Program Goals

- (1) Use EPA's program and funding resources to implement energy and water efficiency projects and activities in Region 9 water and wastewater utilities**
- (2) Help organize other major sources of fed/State/Local/Nonprofit funding and technical assistance for energy and water efficiency for utilities of all sizes**
- (3) Communicate local and national water industry sustainability successes and innovation throughout Region 9 and between small, medium, and large utilities**
- (4) Develop and outreach a tangible energy management process water and wastewater utilities can follow to become more energy efficient**



SI Program Goals - Implementation

Our Process: 4 Steps to Sustainability

Step 1- Conduct Energy STAR Portfolio Manager Analysis

Step 2- Conduct Energy Audit

Step 3- Implement Recommendations/Replace Equipment

**Developing an EMS program is common

Step 4- Repeat Step 1

Coordination with State programs and Utilities

Outreach and Training

Website

<http://epa.gov/region09/waterinfrastructure>

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

What Energy Challenges Do You Face Today?

- What have you done already?
- What is missing?
- How low can you go?



Managing to Maximize Energy Efficiency

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



JANUARY 2008



Designed to help utilities:

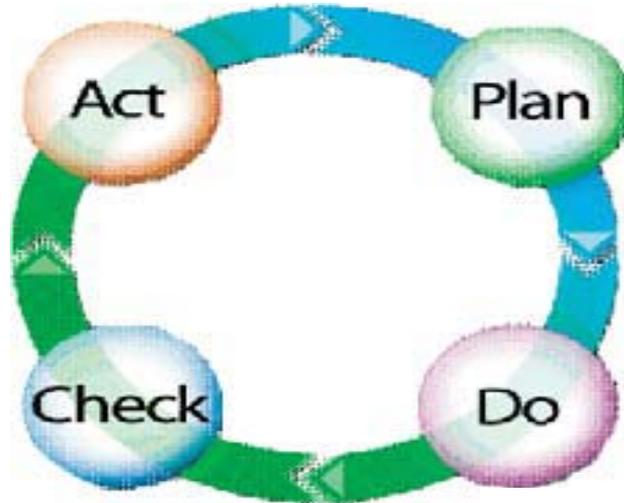
- Systematically assess current energy costs and practices
- Set measurable performance improvement goals
- Monitor and measure progress over time

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

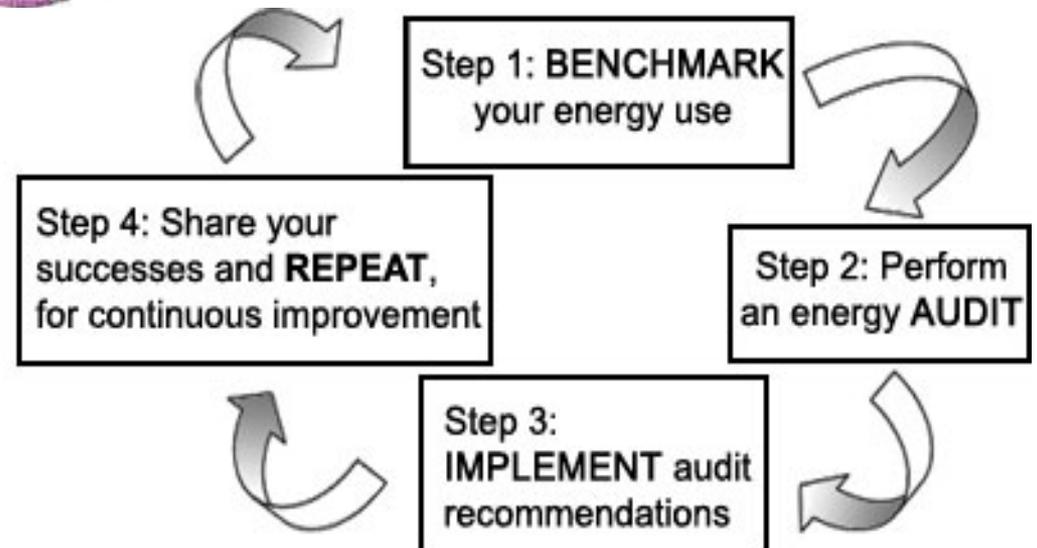
Plan Do Check Act



The PLAN-DO-CHECK-ACT Framework



CONTINUOUS IMPROVEMENT



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



Sources of Energy Efficiency Funding and Assistance

- Maintained on our website:
<http://epa.gov/region09/waterinfrastructure>
- State Revolving Fund Programs
- US Dept of Energy
- California
- Power Companies
- Energy Service Companies

...establishing an Energy Management System at your utility provides a ready source of information for developing grant proposals