



# Improving Energy Management at Water and Wastewater Utilities

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## EPA Supports Sustainable Infrastructure and Energy Management Improvements

Improving energy management is a critical part of EPA's efforts to promote "sustainable infrastructure". In January 2008, the Office of Wastewater Management issued an Energy Management Guidebook for Wastewater and Water Utilities [http://www.epa.gov/waterinfrastructure/pdfs/guidebook\\_si\\_energymanagement.pdf](http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf).

This guide is based on the Plan-Do-Check-Act management system approach and takes utilities through a step by step process to assess their energy "footprint", identify opportunities to use energy more efficiently, establish energy efficiency goals, and monitor and measure progress toward these goals. Using this approach, utilities can develop a comprehensive energy management system and successful programs

that they can communicate to the communities they serve. The Guide also includes information on energy auditing and how to use the *Energy Star Portfolio Manager Benchmarking Tool* [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager).



Workshop in Region 10, Worley, Idaho

*"Wastewater and water utilities face many challenges in providing services, meeting public expectations, and meeting standards as energy use and costs increase. More and more utilities are embracing a systematic approach to integrate improved energy management into their daily operations and long-term planning. This system can help them address a number of important emerging issues like energy management, climate change, and sustainability. The Energy Management Guidebook and EPA-sponsored workshops are designed to show utilities how its proven management approach can help ensure that energy issues are managed effectively and sustainably."*

*-Jim Horne, U.S. EPA Office of Water*

### Energy Management System Benefits

*Santa Clara Valley Water District, California*

- Solar energy providing 20% of energy needs
- \$70,000 reduction of energy costs
- Reducing carbon dioxide emissions by an estimated 412,699 pounds per year

*Lowell Regional Wastewater Utility, Massachusetts*

- Decrease from 10 million kWh/year 1990-1996 to 6.5 million kWh/year in 2007

*Camden County, NJ*

- Using the P-D-C-A management system, Camden County saved \$30 million over the past 10 years in energy costs

### Energy Use Facts

**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

### Plan-Do-Check-Act

The 'Plan-Do-Check-Act' management framework helps utilities better understand their energy consumption, identify opportunities for improvement, prioritize projects for potential funding, measure success, reduce or avoid energy costs, and reduce greenhouse gas emissions that contribute to climate change.

*"Plan-Do-Check-Act is a process, not a project—a new way of thinking, of systematically looking at your operations."*

*-David Six, Water/Wastewater Services Manager, City of Lewiston, Idaho*

*"Reducing energy usage and managing costs is a win-win situation. It makes good business sense, it aids rate payers, and it helps the environment. The Plan-Do-Check-Act framework helps utilities reach their energy management goals step-by-step."*

*- Cyndi Grafe, EPA Region 10*

## Energy Management Workshops



Attendees at the Region 4 Workshop in Nashville, TN review the Energy Management Guidebook.

Starting with two workshops in New England, EPA's Office of Water offered eight workshops across the United States. Co-sponsors included EPA regional offices, state environmental and energy agencies, and professional trade associations. Over 750 participants learned how to apply the Plan-Do-Check-Act framework and heard from water and wastewater practitioners about their experiences in improving energy management at their utilities.

## Quotes from Workshops

*"The workshop was a great way for Region 7 to start a conversation with our water utilities about the benefits of reducing energy consumption and planning for future energy needs. Next we plan to assist them in using available tools and in creating partnerships to achieve their goals."*

- Kerry Herndon, EPA Region 7

*"I wish I had brought my whole team to the workshop."*

-- Steve Moehlman, Des Moines Metropolitan Wastewater Reclamation Authority

## Energy Management Systems in Action: Lowell, MA

The Lowell Regional Wastewater Utility in Massachusetts has applied the 'Plan-Do-Check-Act' approach from 1996 to the present to address energy issues. Applying this continuous improvement approach, the utility has implemented: fine bubble aeration; high efficiency and variable frequency drive pumps; locked thermostats in pump houses; replacement of sodium vapor light bulbs; motion sensors; process changes to reduce electricity load; 'duty cycling' of pumps; enhanced operation controls through SCADA system; regular review of energy bills; comprehensive audit for planning capital improvements; efficiency incentives through its energy provider; and aggressive elimination of infiltration inflow. The utility is currently investigating high efficiency blowers, 'green roofs', sludge reduction through pore control fiber, solar panels, and potential generation of hydro power from effluent discharges.



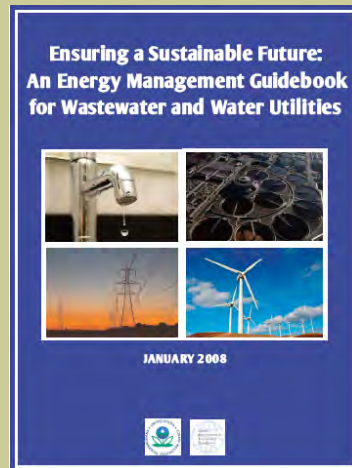
Workshop participants in Lowell, MA

*"Our 3 biggest costs are energy, payroll, and sludge handling. If you're not managing your process, you're not managing energy or your budget."*

--Mark Young Executive Director, Lowell Regional Wastewater Utility, Massachusetts

## The Guide

[Ensuring a Sustainable Future: An Energy Management Guidebook for Water and Wastewater Utilities](#)



## Response from EPA Regional Offices

*"EPA New England encourages all water and wastewater utilities to utilize the approaches found in the Energy Management Guidebook as a way to achieve measureable reductions in energy use, reduce costs and improve the environment."*

- Ira Leighton, Acting Administrator, EPA Region 1

## Next Steps

Future workshops in the remaining EPA Regions (2, 3, 6, and 8) are anticipated in 2009. EPA Regions continue to reach out to utilities, following up on actions after the workshops.

### For More Information, Please Contact:

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