

ENERGY STAR – Expanding into Water and Wastewater Energy Performance Improvement

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ENERGY STAR Products






ENERGY STAR Buildings


| | | |
|---|--|--|
|  500 Boylston St. Boston, MA |  Albuquerque Indian Hospital Albuquerque, NM |  1001 Pennsylvania Ave. Washington, DC |
|  Westin San Francisco Airport Millbrae, CA |  Parkside Elementary School Buffalo, MN |  Blue Earth County Courthouse Mankato, MN |



What is ENERGY STAR for Buildings and Plants?


- U.S. Environmental Protection Agency energy management program providing proven solutions to help public and private sector building owners and managers reduce their energy consumption.
- Thousands of Partners operating more than 11 billion square feet of space (nearly 20% of space in the U.S.).
- Over 35,000 buildings, representing nearly 6 billion square feet of space, have measured their energy performance with ENERGY STAR.
- Over 3,700 buildings have earned the ENERGY STAR label for energy efficiency.
- Expanding into more industrial markets....





Why Commercial Buildings and Plants?

- The buildings in which we work, shop, play, and educate our children use \$200 billion of electricity and natural gas each year.
- Commercial buildings and industrial facilities generate nearly 50% of U.S. carbon dioxide emissions.
- 30% of energy consumed in commercial buildings is used unnecessarily or inefficiently.
- Existing commercial buildings represent the biggest opportunity for **IMMEDIATE, LOW-COST** emission reductions.
- Drinking water and wastewater utilities represent a large energy efficiency opportunity



ENERGY STAR Plants

Four types of manufacturing plants are rated and are already eligible to earn the ENERGY STAR:

- Auto manufacturing plants
- Cement plants
- Petroleum refineries
- Wet corn milling plants

QuickTime™ and a TIFF (LZW) decompressor are needed to see this picture.

Expanding ratings to Drinking Water and Wastewater Utilities - not yet awarding the ENERGY STAR - TBD

- Wastewater Treat. Plants (Oct. 1st)
- Drinking Water Systems (Early 2008)

Who's Improving Energy Performance with ENERGY STAR


- **State and Local Governments** (California, Ohio, Blue Earth County, MN, Calhoun County, AL)
- **Major corporations** (Marriott, Food Lion, Wal-Mart, JC Penney, CVS, Staples)
- **Property owners and managers** (CB Richard Ellis, Jones Lang LaSalle, USAA Realty, Transwestern, Hines)
- **K-12 Schools** (Arlington County Schools, San Diego Schools)
- **Universities** (University of New Hampshire, City University of New York, University of Michigan)
- **Hospitals and health systems** (Providence Health, NY Presbyterian)

ENERGY STAR Partner Organizations

- US Conference of Mayors
- National Association of Counties (NACo)
- Building Owners and Managers Association (BOMA)
- CoStar (Commercial Building Multiple Listing Service)
- American Society of Healthcare Engineers (ASHE)
- National Automobile Dealers Association (NADA)
- American Bar Association (ABA)
- National Association of Evangelicals (NAE)

... and many more.


ENERGY STAR Challenge



Improve energy efficiency 10% or more!

The ENERGY STAR Challenge

- ENERGY STAR Challenge encourages everyone to improve the energy efficiency of America's existing buildings and plants by 10% or more.
- If this goal were met, each year we would save \$20 billion and reduce GHG emissions equivalent to those of 30 million vehicles.
- Nearly 200 organizations participating:
 - 32 States
 - Over 25 national associations
 - Over 100 cities and counties - many own or influence drinking water and wastewater utilities



Local Governments and the ENERGY STAR Challenge

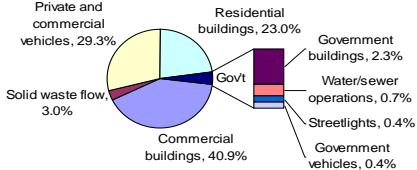
- Governments play a dual role in the Challenge:
 - Lead by example and improve their buildings and Plants - water and wastewater energy use represent large portion of total municipal energy bill
 - Promote energy efficiency to businesses and other organizations within their jurisdiction.
- Engaging the private sector is essential . . .

Community-wide Plan & Action

Total Arlington County Greenhouse Gas Emissions by Sector, 2000

Total community emissions: 2.9 million tons CO₂-equivalent

Government < 4% of total, so community outreach critical



| Sector | Percentage |
|---------------------------------|------------|
| Commercial buildings | 40.9% |
| Private and commercial vehicles | 29.3% |
| Residential buildings | 23.0% |
| Solid waste flow | 3.0% |
| Government buildings | 2.3% |
| Water/sewer operations | 0.7% |
| Streetlights | 0.4% |
| Government vehicles | 0.4% |

Slide Courtesy of: John Morrill, Energy Manager, Arlington County, VA

The ENERGY STAR Challenge Toolkit



- **Get Started!**
 - Quick Lists of ENERGY STAR Resources for Buildings and Homes.
 - Model for establishing an energy efficiency campaign for your community.
 - **Learn More!**
 - Fact sheets on energy use in different parts of the community (offices, hotels, schools, supermarkets, congregations, etc.)
 - Fast facts on energy use and climate change to help you craft your message.
 - **Spread the Word!**
 - Co-brandable information cards, posters, and other materials for distribution to constituents and employees.
 - Sample news releases.
 - Tips on working with the media to promote your efforts.
- ... and much more

Energy Efficiency Opportunities



ENERGY STAR labeled buildings use 35 percent less energy than average buildings.

How much will water and wastewater utilities typically save?

ENERGY STAR Water & Wastewater Focus



Participants - water and wastewater trade associations, utilities, and energy efficiency market transformation groups

EPA's ENERGY STAR Focus Support Team

- EPA – benchmark development support
- Cadmus Group – Overall support
- Catalyst Financial Group – financing solutions
- LBNL – ENERGY STAR Energy Guides and benchmark development support

Special Focus Participants

- EPA Office of Water
- Linda Reekie, AwwaRF
- Steve Carlson, CHD Energy supporting the AwwaRF Water and Wastewater Utility Energy Index

Goals for the ENERGY STAR Water and Wastewater Focus



- Create momentum for continued improvement of energy efficiency
- Identify and tackle barriers to energy efficiency in both industries
- Provide tools and resources to enhance energy performance
- Uncover new energy saving opportunities
- Encourage networking about EE/RE best practices

Components of Focus



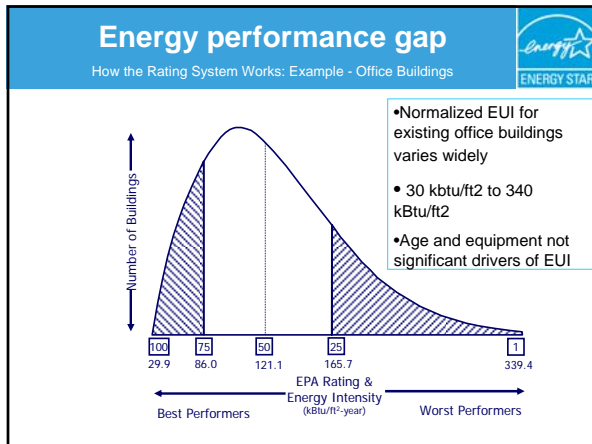
Development of program tools and resources:

- Energy performance rating/benchmarking system for each industry that is normalized for variable – weather, plant/system characteristics, etc. (wastewater - Oct 2007, drinking water - early 2008)
- ENERGY STAR Guides - technical energy efficiency opportunities assessment report for water and wastewater utility managers (public drafts in review this Fall)
- Financing solutions (primer and on-line training Fall 2007)
- Recognition opportunities (being developed)
- Energy efficiency discussions (ongoing)

Benchmarking

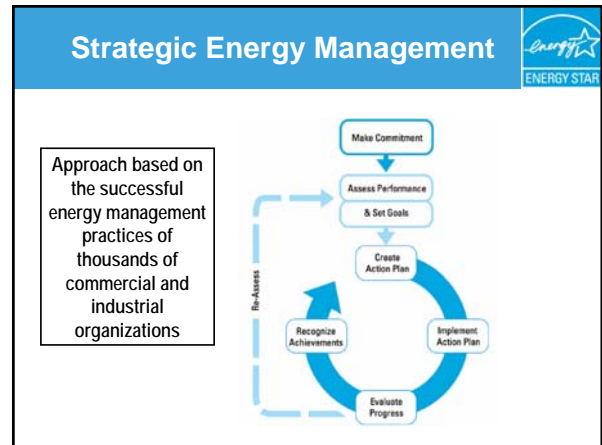


- Expanding EPA's Energy Performance Rating System for use by water and wastewater utilities to rate energy performance
 - Accessed on-line through Portfolio Manager (wastewater Oct. 1st)
 - Regression analysis - energy use per unit of flow
 - Normalized for external factors
 - Wastewater - Resulting model shows statistical significance at 90% confidence level
 - Translate regression prediction into rating - ratio actual source EUI to predicted source EUI, fitted to a two parameter gamma distribution
- Engine(s) behind the rating system
 - AwwaRF Project - National Survey Data: covers water and wastewater
 - Initial models developed - report to be published by AwwaRF by mid-October



- ## How Can Water and Wastewater Utilities Get Involved Now?
- Join ENERGY STAR
 - Use ENERGY STAR Guidelines for Energy Management
 - Measure and Verify energy use
 - Portfolio Manager (Wastewater Oct. 1st)
 - National rating
 - Compare groups/sharing feature
 - Track improvement over a normalized baseline
 - Measure carbon reductions
 - Ratings provided, but Label not yet being awarded for wastewater treatment plants
 - Use Energy Efficiency Best Practice Guides
- Take On-line Training to Help Get Started

- ## Portfolio Manager for Wastewater
- Data Needed:
- Energy use for all fuels - monthly
 - Average Daily Influent Flow
 - Average Influent Biological Oxygen Demand (BOD) - average over 12 months (mg/l)
 - Average Effluent BOD - average over 12 months (mg/l)
 - Plant Design Capacity - treatment design (mgd)
 - Fixed Film Trickle Filtration Process y/n
 - Nutrient Removal y/n



- ## ENERGY STAR Energy Guides
- Summarizes available knowledge on energy use and energy efficiency in a particular sector
 - Provides information on energy-efficient practices and technologies that are commercially available
 - Includes characteristics like costs, benefits, energy savings
 - Includes practical experiences of their use and application
 - Based on assessment of proven energy-efficient practices in the U.S. and *internationally*
 - Opportunities that can be used now
 - Energy Guides are *for operators* at plants and energy managers, made *with* operators and experts

- ## ENERGY STAR Energy Guides
- Audience:
 - targeting medium to large utilities
 - Within the utilities, for plant or system operators and energy managers
 - Function of Energy Guides:
 - identify opportunities
 - preliminarily evaluate opportunities
 - serve as a checklist for its users
 - improve efficiency of energy management
 - reduce information barriers
 - learn from experiences
- ... save energy, money and the environment...

Drinking Water Guide



Contents

- Overview of industry & process description
- Energy Efficiency Opportunities
 - Energy Management system/programs
 - Pumps
 - Motors
 - Other measures
- Energy Management Assessment Matrix and Teaming Checklist

ENERGY STAR in Your Program



- Common platform among many organizations working together to improve energy efficiency
 - Easy to use rating system accessible to anyone on-line
 - Measure and track weather normalized performance of any building type or campus of buildings (and now wastewater treatment plants)
 - Large network of partners
 - Co-brandable Campaign - ENERGY STAR Challenge
 - Focused on the community - public and private organizations, energy and water utilities, and product and service providers
 - Web-based training readily available to your customers

ENERGY STAR Water and Wastewater Focus



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