



# ENERGY STAR: Water and Water Utilities

*Katy Hatcher*

*U.S. Environmental Protection Agency (EPA)*

*March 5, 2009*



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



# 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 and plant owners and managers reduce their energy consumption, verify, and recognize their success.
- In 2008 alone, more than 3,300 commercial buildings and manufacturing plants earned the ENERGY STAR and saved more than \$1 billion in utility bills and more than 7 million metric tons of carbon dioxide emissions annually
- Thousands of partners operating more than 11 billion square feet of space (nearly 20% of space in the U.S.), including 40 states and about 300 local governments
- Over 80,000 buildings, representing nearly 11.5 billion square feet of space, have measured their energy performance with ENERGY STAR using Portfolio Manager.
- To date, more than 100 wastewater treatment plants benchmarked in Portfolio Manager.

# Energy use in Water and Wastewater



- Drinking water and wastewater services annually account for approximately:
  - 3% of national energy consumption (56-75B kWh)
  - \$4 billion in energy costs
  - 45 million tons of greenhouse gas emissions
- Wastewater treatment plants represent 30 to 40% of local government energy use, 2<sup>nd</sup> to salaries
- Fluctuating energy costs and increasing energy use from advanced treatment can further constrain tight operating budgets

# Clean Energy Opportunity



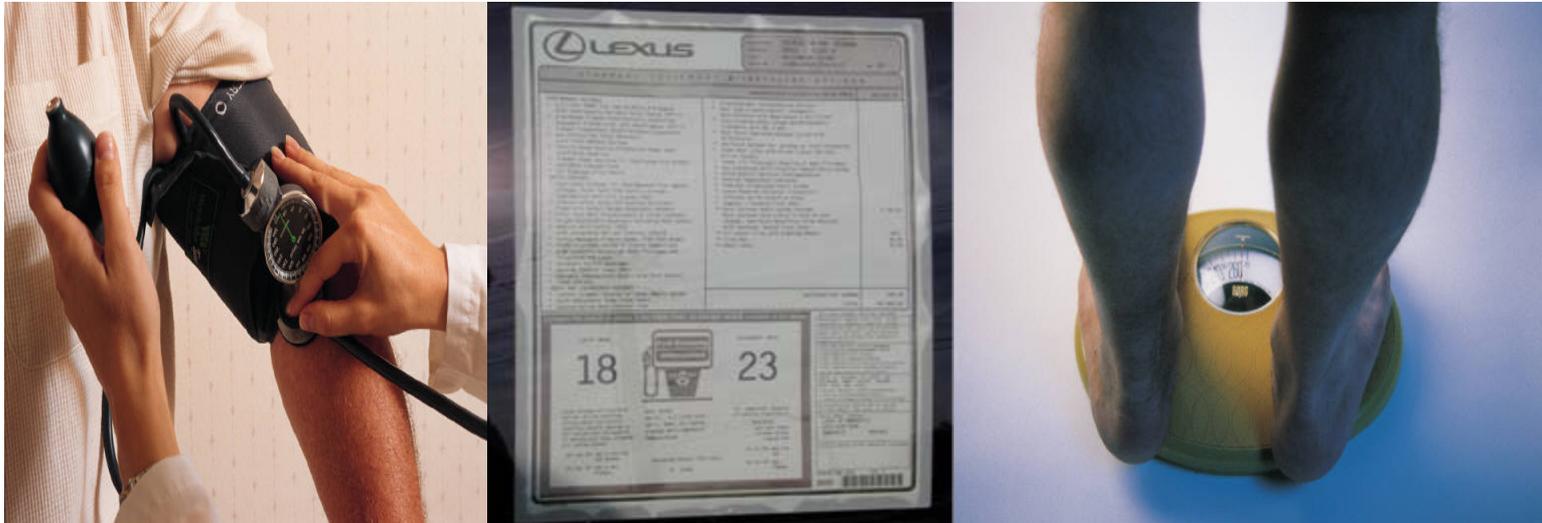
- Clean energy, including biogas, can reduce energy use, energy costs, and ghg emissions
- Numerous audits have identified that 10 to 20% savings are available through process optimization and equipment modifications.
- These opportunities include:
  - Premium efficiency motors/pumps, variable frequency drives, upgrades to aerations systems,
  - Methane capture and utilization, combined heat and power, solar and wind energy

# How Can Water and Wastewater Utilities Get Involved Now?



- Join ENERGY STAR
- Measure and Verify energy use
  - Portfolio Manager
    - Compare groups/sharing feature
    - Benchmark energy use against similar plants or national average
    - Track, report out, and verify improvement over baseline
    - Measure carbon reductions associated with energy efficiency
- Use ENERGY STAR Guidelines for Energy Management
- Calculators to track returns on EE investments
- Attend Energy Efficiency Best Practice Webcasts

# Benchmarking



A benchmark is a point of reference from which to make comparisons

# Why Benchmark?



Benchmarking enables you to *make more informed decisions*:

- Identify billing errors
- Assess effectiveness of current operations, policies, practices
- Assist in planning: set goals, targets, timelines, prioritize capital improvements
- Contribute to more responsible management

# ENERGY STAR Documentation



**Fuel Efficiency:**  
**MPG**



**Energy Efficiency:**  
**kBtu/gpd**



OMB No. 2060-0347

**STATEMENT OF ENERGY PERFORMANCE**  
**ABC Non-Ratable Facility**

Building ID: 1565443  
For 12-month Period Ending: December 31, 2007\*  
Date SEP becomes ineligible: N/A

Date SEP Generated: November 17, 2008

---

|  |                              |   |
|--|------------------------------|---|
| <b>Facility</b><br>ABC Non-Ratable Facility<br>123 ABC Street<br>Fairfax, VA 22031 | <b>Facility Owner</b><br>N/A | <b>Primary Contact for this Facility</b><br>N/A |
|--|------------------------------|---|

Year Built: 1980  
Gross Floor Area (ft<sup>2</sup>): 10,000

Energy Performance Rating<sup>1</sup> (1-100): N/A

**Site Energy Use Summary<sup>2</sup>**

|                            |                |
|----------------------------|----------------|
| Electricity (kBtu)         | 641,456        |
| Natural Gas (kBtu)*        | 0              |
| <b>Total Energy (kBtu)</b> | <b>641,456</b> |

**Energy Intensity<sup>3</sup>**

|                                  |     |
|----------------------------------|-----|
| Site (kBtu/ft <sup>2</sup> yr)   | 64  |
| Source (kBtu/ft <sup>2</sup> yr) | 214 |

**Emissions (based on site energy use)**

|  |    |
|--|----|
| Greenhouse Gas Emissions (MTC <sub>2</sub> e/year) | 96 |
|--|----|

**Electric Distribution Utility**  
Virginia Electric & Power Co

**National Average Comparison**

|   |                       |
|---|-----------------------|
| National Average Site EUI                     | 95                    |
| National Average Source EUI                   | 265                   |
| % Difference from National Average Source EUI | -19%                  |
| Building Type                                 | Entertainment/Culture |

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

**Certifying Professional**  
N/A

# 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 (yes/no)
- Nutrient Removal y/n
- Zip code for weather normalization

# View Performance Metrics in Portfolio Manager



Home > My Portfolio

| Group Averages  |   |
|---|---|
| Baseline Rating: N/A<br>Facilities Included: 0  | Current Rating: N/A<br>Facilities Included: 0 |
| Group Adjusted Percent Energy Reduction: N/A<br>Facilities Included: 0  |   |
| Averages are weighted by Total Floor Space.<br><a href="#">More about Baselines</a><br><a href="#">More about Adjusted Percent Energy Reduction</a> |   |
| Group Averages (for All Wastewater Facilities)  |   |
| Baseline Rating: 87<br>Facilities Included: 3   | Current Rating: 91<br>Facilities Included: 3  |
| Group Adjusted Percent Energy Reduction: 1<br>Facilities Included: 3  |   |
| Averages are weighted by Average Daily Flow.<br><a href="#">More about Wastewater</a>   |   |

[Add a Property](#)  
[Work with Facilities](#)  
[Share Facilities](#)  
[Update Multiple Meters](#)  
[Request Energy Performance Report](#)  
  
[Apply for Recognition](#)  
[Apply for the ENERGY STAR ENERGY STAR Leaders](#)  
  
 You have been granted access to [Shared Facilities!](#)

Track the following metrics:

- Energy use per flow rate reduction
- GHG emission reductions
- Annual energy cost
- EPA energy performance rating for wastewater treatment plants

GROUP:  [Create](#)

[Download in Excel](#)

Results 1 - 3 of 3

| Facility Name                                 | Current Source Energy per Flow (kBtu/gallons per day) | Adjusted Energy Reduction | CO2 Reduced (pounds) |
|---|---|---------------------------|----------------------|
| <a href="#">Wastewater Example Facility</a>   | 5,8483  | No Reduction              | 22,701.89            |
| <a href="#">Wastewater Example Facility 2</a> | 4,9614  | 13.8%                     | 213,784.10           |
| <a href="#">Wastewater Example Facility 3</a> | 4,1018  | 27.9%                     | 507,943.71           |

[Download in Excel](#)

Results 1 - 3 of 3

| Facility Name                                 | Current Source Energy per Flow (kBtu/gallons per day) | Annual Energy Cost (US Dollars (\$)) | Baseline Rating (1-100) | Current Rating (1-100) | Adjusted Energy Reduction (thousand Btu) | Adjusted Percent Energy Reduction | CO2 Reduced (pounds) |
|---|---|--------------------------------------|-------------------------|------------------------|--|-----------------------------------|----------------------|
| <a href="#">Wastewater Example Facility</a>   | 5.8483  | \$165,486.48                         | 87                      | 85                     | 97,126.97                                | No Reduction                      | 22,701.89            |
| <a href="#">Wastewater Example Facility 2</a> | 4.9614  | \$148,550.64                         | 87                      | 92                     | 930,247.68                               | 13.8%                             | 213,784.10           |
| <a href="#">Wastewater Example Facility 3</a> | 4.1018  | \$133,831.08                         | 87                      | 96                     | 2,175,012.06                             | 27.9%                             | 507,943.71           |

Search Facility Name:

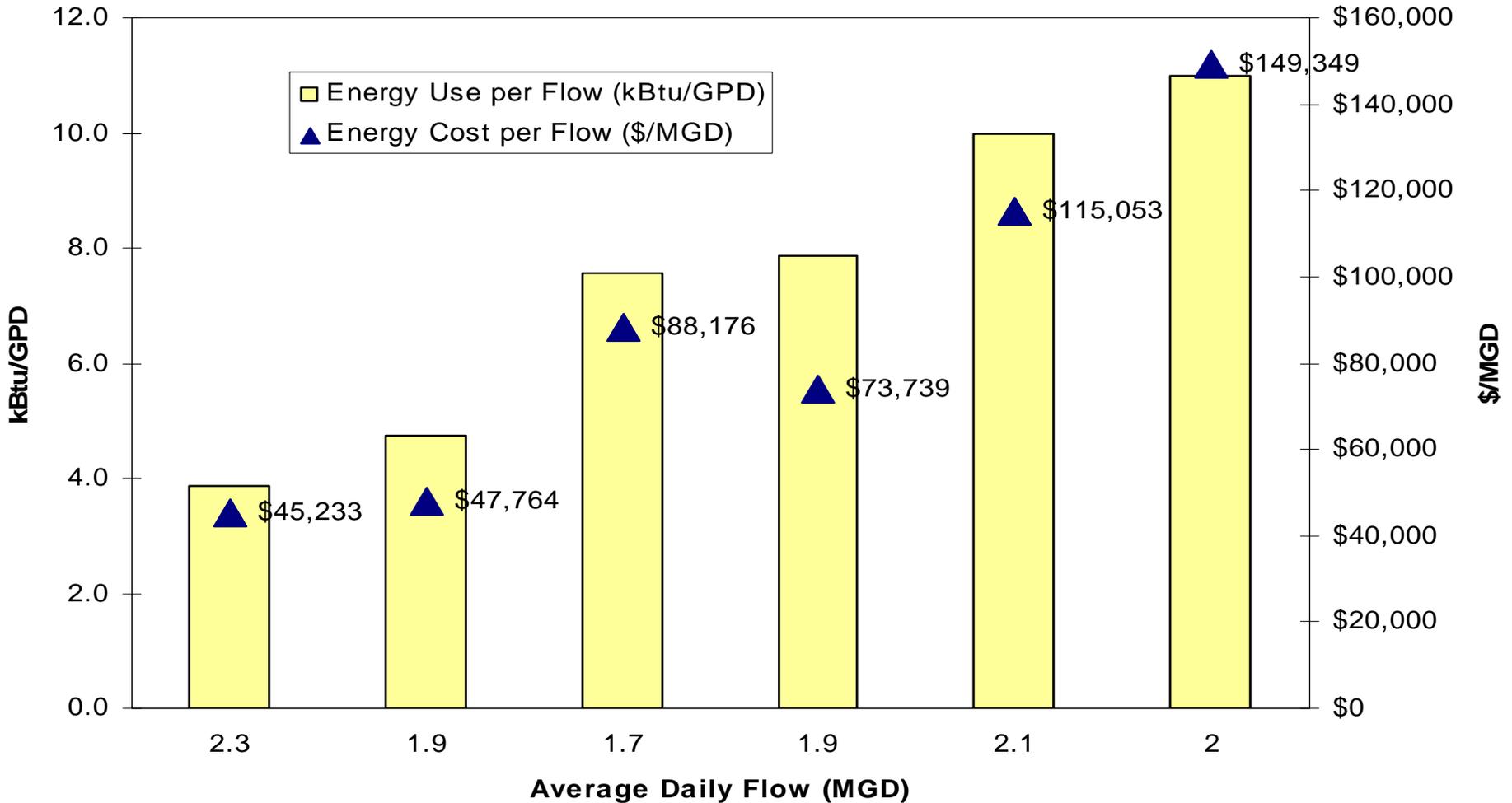
All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

The rating is calculated by using the last day of the latest full calendar month where all meters in the facility have meter entries; the Period Ending date reflects that particular date.

# Comparing Plants



### Energy Use and Cost vs Flow at similar sized plants



# Strategic Approach to Energy Management



A roadmap to help partners –

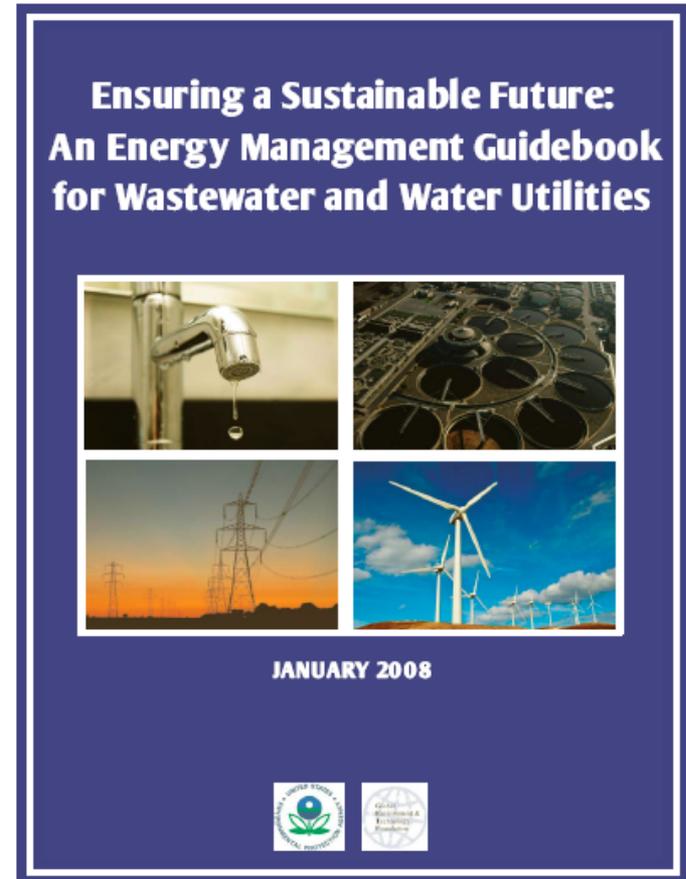
- Assess energy performance
- Set reduction goals
- Track savings over time
- Reward improvements



# Energy Management Guidebook



- ENERGY STAR integrated into this EPA OW resource
- Specifically for waster and wastewater utilities
- Used in EPA regional workshops



# Questions?



[www.energystar.gov/waterwastewater/buildings@energystar.gov](http://www.energystar.gov/waterwastewater/buildings@energystar.gov)

---

**If you have any questions, contact:**

**Katy Hatcher, National Manager for the Public Sector, EPA**  
**Hatcher.Caterina@epa.gov**  
**(202) 343-9676**

**Leslie Cook, Public Sector Manager, EPA**  
**Cook.Leslie@epa.gov**  
**(202) 343-9174**

---

**The Cadmus Group, Inc. (EPA contractor)**

**Kudret Utebay**  
**kutebay@cadmusgroup.com**  
**703-247-6138**

**Laura Dufresne**  
**ldufresne@cadmusgroup.com**  
**703-247-6152**

