Opportunities To Reduce Energy Use and Greenhouse Gas Emissions in Wastewater Treatment Plants

Jason Turgeon
US Environmental Protection Agency
Energy-Environment Technical Forum
1/15/2009
Maximum Ozone Levels in 2007

Maximum 8-hour ozone concentration* in parts per billion recorded during 2007

* Data are preliminary, and subject to change

Source: United States Environmental Protection Agency
The END is NEAR!

Do you know Holden's endangered power heater sources?

Copper Glacier

Lyman Glacier
Image: USAF Defense Meteorological Satellite Program.
Industry Average O&M Budgets

Wastewater Plant

- energy: 28%
- staffing: 46%
- solids: 12%
- Other: 7%
- maintenance: 3%
- Chemicals: 4%
Hartford WPCF Energy Cost vs. Use

- Cost, millions
- BTUs, $10^{11}$
New Regulations May Drive Energy Use
Successful Energy Management

1. Make Commitment
2. Assess Performance & Set Goals
3. Create Action Plan
4. Implement Action Plan
5. Evaluate Progress
6. Recognize Achievements
7. Re-Assess
www.energystar.gov/benchmark
Portfolio Manager
What Does it Do?
Uses 1999 Commercial Building Energy Consumption Survey (CBECS) data
Compares subject building to similar buildings
Provides a statistically normalized score from 1 to 100
Calculates annual energy use intensity (kBtu/sq. ft)
Normalizes data for weather and climate
Securely hosts user’s database of building data

Jason TURGEON, 8/7/2007
Energy Use per Flow vs. Facility Size

Source Energy Used to Treat 1 Gallon per Day (kBtu/GPD)

- Higher Energy use than average = Low Score
- Average Energy Use = Average Score (50)
- Lower Energy Use than Average = High Score

Facility Size (Average MGD)

Normalization: line position adjusted
Energy Use and Cost vs Flow at similar sized plants
FY 2006 data

- Source Energy per Flow (kBtu/GPD)
- Energy Cost per MGD ($/MGD)

<table>
<thead>
<tr>
<th>Average Daily Flow (MGD)</th>
<th>Energy Use (kBtu/GPD)</th>
<th>Energy Cost ($/MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>$45,233</td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>$47,764</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>$88,176</td>
<td>$73,739</td>
</tr>
<tr>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td></td>
<td>$115,053</td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td>$149,349</td>
</tr>
</tbody>
</table>

Average Daily Flow (MGD)
Plan
Now What?

INVEST

ADJUST

MAINTAIN

ENERGY PERFORMANCE RATING
Do
Do!
DO!!!
Check

Weight Loss
Act
Photo Credits

Some photos used under Creative Commons licenses. Thanks to the following flickr users:
• The End is Near: Delayed Gratification
• Pile of Money: noahwesley
• Fear of Commitment: Leslie Duss
• Inspection: kquedquest
• People Looking at Map: threelayercake
• Jumping Swimmers: Hidden side
• Plumber: NoMoTo
• Roller Coaster: Sven Werk
• Downward Trend: nogwater
• Target: Matthew McVickar
• Award: shannonmary
• Fine Current Adjustment Dial: thespacesuitcatalyst
• Apples and Oranges: rebel prince
• Bad Apple: atypically_me
• Basketball: sgoogle
• Building with Cactus: ralphTQ
• Building with Snow: Justin Russell
• Calculator: Tube Design
• Changed Priorities: redvers
• Padlock: Zebble
• Dial 1-100: Leo Reynolds
• Swiss Army Knife: Kaptain Kobold
• Green Jobs in Pittsfield: greenjobsnow.org
• Firefighter: djarvinen
• Two Tankers: SeraphimC
Contact Us

If it’s not energy efficient …

…it’s not sustainable

EPA New England

Jason Turgeon
turgeon.jason@epa.gov
617-918-1637

Gina Snyder
snyder.gina@epa.gov
617-918-1837

www.epa.gov/region01/eco/energy