Providing effective energy strategies for buildings and communities

IEPA Wastewater Treatment Energy Assessment Program

October 26, 2018
About the Program

• Illinois EPA has teamed up with the Smart Energy Design Assistance Center (SEDAC) and the Illinois Sustainable Technology Center (ISTC) to help local municipalities reduce the cost of wastewater treatment

• FREE energy assessment for your publically-owned wastewater treatment facility
  • Similar assessments: $6,000-$12,000

• Comprehensive report listing:
  • Cost of upgrades
  • Estimated payback period
  • Any applicable incentives or available funding opportunities
Applying for the Program

• **Step 1: Initial Application – Pre-Qualification**
  - Be located in Illinois
  - Allow SEDAC/ISTC to visit site
  - Be willing to share facility information
  - Share final assessment report with Illinois EPA

• **Step 2: Data Collection**
  - Facility information – energy use, discharge reports, process info
  - We’re here to assist!

• **Step 3: Site Visit Scheduled**
Site Visit Overview and Timeline

- Project leader contacts client to schedule site visit

- Site visit occurs – More detail later

- Receive short list of energy efficient opportunities

- Receive assessment report
  - ~6-8 weeks after site visit

- Project leader follows up ~two weeks

- IEPA follows up ~two weeks
Site Visit Process

Before Assessment Begins:

• Pre-Assessment Meeting – data review

• Gather information from client regarding known issues and desired foci for assessment

During the Assessment:

• Walk-through
  • Process flow
  • Geographic
  • Equipment

• As the walk through occurs, team members may ask about ideas they may have or things they may notice
  • Anticipate many photos to be taken 300+ per team member is not uncommon

• Wrap-up and discussion of next steps
Energy Assessment Report

Smart Energy Design Assistance Center (SEDAC)
Energy Assessment Report
Sample Wastewater Treatment Plant

Published: September 10, 2018
University of Illinois: Ryan Siegel, SEDAC
Energy Specialist: 217-300-6405, rjsiegel@illinois.edu
Facility Location: 111 Main St, Anytown, IL
Site Visit Date: July 1, 2018
Facility Contact: John Doe, Wastewater Treatment Supervisor 847-555-1234, j.doe@anytown.ill.us

Table E1: Energy Cost Reduction Measure Analysis

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Potential Energy Savings</th>
<th>Estimated Project Cost</th>
<th>Potential Incentive</th>
<th>SPB (^1) w/ Incentive (yrs)</th>
<th>SPB (^2) w/ Incentive (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Automated DO Control</td>
<td>7</td>
<td>55,750</td>
<td>0</td>
<td>$5,300</td>
<td>$48,000</td>
</tr>
<tr>
<td>2</td>
<td>Variable Frequency Drive on Pumps</td>
<td>10</td>
<td>54,500</td>
<td>0</td>
<td>$5,200</td>
<td>$9,000</td>
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<tr>
<td>3</td>
<td>Lighting Upgrades</td>
<td>6</td>
<td>28,500</td>
<td>0</td>
<td>$2,700</td>
<td>$25,000</td>
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<tr>
<td>4</td>
<td>HVAC Upgrades</td>
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<td>10,000</td>
<td>20,000</td>
<td>$15,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>PKG 1</td>
<td>Measures 2 &amp; 3</td>
<td>16</td>
<td>53,000</td>
<td>0</td>
<td>$7,900</td>
<td>$34,000</td>
</tr>
</tbody>
</table>

\(^1\) "SPB" refers to Simple Payback, or the amount of time for projected energy savings to exceed the estimated project cost

3.1 Measure 2 Variable Frequency Drives for Two Pumps

Project Cost
- Investment ($) 9,000
- Incentives ($) 5,750
- Total ($) 32,750

Annual Savings
- Consumption (kWh) 54,458
- Savings ($) 5,175
- CO₂ (kg) 34,035

Economic Data
- Simple Payback (yrs) 6.8
- Internal Rate of Return (%) >100%
- Net Present Value ($) 36,700

Current Issues and Observations:
Majority of pumps already have Variable Frequency Drives (VFDs) except two 25 HP influent pumps.
Lime Stabilized Sludge Mixing
Lighting Intensity
Is Thomas Edison Missing a Motor?
Blowers Are Complicated
Sand Filters are Difficult to Maintain
Looks Good, but Does it Work?
Chemical Disinfection
UV Disinfection
Old Lighting Technology
What About Classified Locations?
Is There a Light in There?
Oh HPS and Visibility
Effluent Cleaner than Intake
Unique Equipment
Rectangular clarifier
Indoor Clarifier
Drum Filter
Disk Filter
What a Belt
I Needed Some Storage Room
What a Find!
What an Odor
Fine Bubble Aeration
It Seemed Great at the Time...
Thank you!

Questions?

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