Tennessee Water and Wastewater Energy Efficiency Partnership

Bob Freeman & Brendan Held

EPA Region 4
Overview

• Introduction
• Background
  – Tennessee Water and Wastewater Energy Efficiency Partnership (TWWEEP)
  – TWWEEP structure – the team and its work process
  – Summary of total results to-date
• Individual examples
  – Fayetteville
  – Columbia
  – Franklin
• Lessons Learned
• Next Steps

EPA Region 4 – Energy Management Initiative
The TWEEP Program
The Team: Tennessee Water & Wastewater Energy Efficiency Partnership

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TN Utility Partners

- Nashville Dry Creek – 17 mgd
- Caryville-Jacksboro UC – 0.7 mgd
- Franklin – 10 mgd
- Columbia – 5 mgd
- Fayetteville – 1.6 mgd
- Lenoir City UB – 1.5 mgd
- First Utility District Knox County – 6.7 mgd

Actual Flows Shown
The Approach

Plan
- Benchmarking
- Needs assessment and goal setting
- Action Planning

Do
- Implementation
- Performance Contracts

Act
- Address issues
- Make adjustments

Check
- Updated benchmark
- Monitoring and Verification
- Identify problems
Results To-Date

- Average Energy Savings – over 18%

- **Measured** Annual Savings (September 2013)
  - Over 5,000,000 kWh
  - Over $400,000/year savings
  - Over 4800 tons/year CO2 Reduction

- **Additional Savings** of 1.5-2.0 million kWh is projected
Individual Examples
Fayetteville - Orbal Oxidation Ditch
Fayetteville – Measured Energy Savings

Fayetteville Yearly Energy Use/MG Treated

Energy Used kWh/MG Treated

<table>
<thead>
<tr>
<th>Period</th>
<th>kWh/MG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun'10-May'11</td>
<td>4631</td>
</tr>
<tr>
<td>Jun'11-May'12</td>
<td>4309</td>
</tr>
<tr>
<td>Jun'12-May'13</td>
<td>2994</td>
</tr>
</tbody>
</table>

>30% Savings
820,000 kWh/YR

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Columbia - WWTP

Nitrification Tower

Aeration Tanks
Columbia - Measured Energy Savings

Columbia Yearly Energy Use / MG Treated

Energy per MG Treated kWh/MG

Jan-Dec 2010: 4994
Jan-Dec 2011: 4552
Jan-Dec 2012: 3806

>20% Savings
1.9 million kWh/YR
Franklin - WWTP

Anoxic Zone

Solar Array

Denitrification Filter
Franklin – Measured Energy Savings

Franklin Yearly Energy Use/MG Treated

<table>
<thead>
<tr>
<th>Month</th>
<th>Energy Use per MG Treated kWh/MG</th>
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</thead>
<tbody>
<tr>
<td>May '10- Apr '11</td>
<td>3238</td>
</tr>
<tr>
<td>May '11- Apr '12</td>
<td>3343</td>
</tr>
<tr>
<td>May '12- Apr '13</td>
<td>2972, &gt;14% Savings, 1.9 million kWh/yr</td>
</tr>
</tbody>
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Lessons Learned

- Any size plant can find savings
- Minimal investment can produce big results – does not necessarily require expensive upgrades
- Savings beget savings – using savings $ for upgrades motivates staff to find more
- Team approach works best – operations and governance share responsibility for effective energy management
Next Steps

• Region 4 continues to support activity in this area
  – TN is set to implement a second round with 8-10 utilities in 2014
  – AL is in the planning stages for a similar program
  – United South and Eastern Tribes are developing capacity to support their member utilities
  – GA Environmental Financing Authority is highly interested in funding energy-related construction through SRF
Next Steps

• What if there is not a program in your area?
  – Start small
  – Energy Use Assessment Tool
  – Power company may be willing to support an assessment
  – SRF financing
  – Contact us
Energy Management Training

• **What?** Free two-day energy management training course
  ▶ Optimizing operations to save energy
  ▶ Equipment upgrade/improvements
  ▶ Techniques, Tools, Case Studies

• **Where?** EPA Office in Atlanta, and on the web
• **When?** January 7 & 8, 2014
• **Who?** Dr. Larry Moore, Univ. of Memphis

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