Sustainable Water/Wastewater Infrastructure: "Selling" Your Facility Upgrades

Thursday, August 23rd
10:30am-12pm
Agenda

- Welcome and Introductions
  - Sapna Gheewala, U.S. Department of Energy
- Business Case Evaluation
  - Jenita Warner, Northeast Ohio Regional Sewer District
- Public Private Partnerships
  - Robert Munro, Avon Lake Regional Water
- Community/Customer Engagement
  - Bruce Bartel, NEW Water, Green Bay, WI
- Internal Employees Communication Strategy
  - Nathan Casey, Des Moines Water Works
- City Wide Partnerships and Messaging Best Practices
  - Mayor Summers, Lakewood, OH
- Questions & Answers
Welcome and Introductions

Sapna Gheewala
U.S. Department of Energy
Business Case Evaluation

Jenita Warner, Sustainability Manager
Northeast Ohio Regional Sewer District
Making the Case for Efficiency Improvements

Northeast Ohio Regional Sewer District
Largest wastewater treatment provider in the State of Ohio
- Own, operate 3 wastewater treatment plants
- 1 million residents
- 90+ billion gallons annually
- 330 miles of sewers

Regional Stormwater Management:
- 420 miles of regional stormwater system

Water Quality Testing and Beach Monitoring

Northeast Ohio Regional Sewer District
Sustainability Program
Objectives

1. Be an efficient and financially responsible user of natural and material resources
2. Be a socially responsible utility
3. Protect and enhance the natural environment

https://www.neorsd.org/about/what-we-do/sustainability-program/
Greenhouse Gas Emissions

Emissions by Source
- Biogenic: 9%
- Biosolids Incineration: 31%
- Stationary: 10%
- Electricity: 48%
- All Other Emissions: 2%

Greenhouse Gas Emissions

- 2014: 200,000 Metric Tons of Co2e
- 2015: 200,000 Metric Tons of Co2e
- 2016: 200,000 Metric Tons of Co2e
Energy Use

Electricity Consumption

- **Annual kWh**
  - 2016
  - 2017

Electricity Intensity

- **KWH/MG**
  - 2016
  - 2017

Natural Gas Consumption

- **Annual MCF**
  - 2013
  - 2014
  - 2015
  - 2016
  - 2017

Renewable Energy

- Purchased Renewables CPP
- Purchased Renewables CEI
- On-Site Renewables
- Conventional
Recent Projects

Energy Efficiency Project at EMSC
• $2.5 Million Design-Build
• Guarantee Savings

LED Retrofits at Southerly WWTP
• $530,000 O&M led Retrofits
• $2 Million Capital Project Retrofits

1st Stage Aeration Improvements
• Reduction to 3 blowers from 4,
• Lower energy consumption by 3,100,000 kWh per year saving the District approximately $200,000
Environmental Maintenance Service Center

- Energy Performance Contract
- Lighting retrofit, HVAC modifications, power monitoring, walk-in cooler monitoring
- Guaranteed to provide an annual energy savings of at least $106,514
- Guaranteed Cumulative Savings of $2,950,310 over 15 years

<table>
<thead>
<tr>
<th>Electricity Savings</th>
<th>Natural Gas Savings</th>
<th>Annual Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,934,958 kWh</td>
<td>656 MCF</td>
<td>$300,000</td>
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<tr>
<td>$186,312</td>
<td>$6,570</td>
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</table>
Wastewater Treatment Plant LED Lighting Retrofits

O&M Pain Point:
3 Miles of Tunnel Lighting
Tunnels, Interior & Exterior

Tunnels:
- 1-3 Replacement
- Occupancy Sensors

Interior: Multiple Buildings and Process Areas
- Occupancy Sensors

Exterior: High Mast and Wall Packs
- 1,000 Watt \( \rightarrow \) less than 500 Watts/Fixture
- 6 Fixtures/Mast, 31 Masts
Business Risk Evaluation: Capital Project Nomination Process

• Probability of Failure (40%): Time until Failure and Redundancy Factor

• Consequence of Failure (60%)
  • Based on the result if we don’t do the project. Based on the Additional cost incurred if the project is not completed, not the cost of the project itself.
Consequence of Failure Continued:

• Financial Impact (13%)
  • Impact on net income in a 12-month period. Compliance: Impact on compliance with laws and regulations

• Reputational (9%)
  • Impact on customer, stakeholder and employee confidence (9%)

• Environmental Stewardship (9%)
  • Impact on water quality, watershed protection or core mission of environmental stewardship

• Strategic/Operational (9%)
  • Impact on the achievement of strategic or operational business objectives (9%)

• Safety (7%):
  • Impact on the health and safety of employees, contractors and visitors within the workplace.
<table>
<thead>
<tr>
<th>Redundancy</th>
<th>1</th>
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<tbody>
<tr>
<td>1-No backup</td>
<td></td>
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<tr>
<td>2-With 50% backup</td>
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<tr>
<td>3-With 100% backup</td>
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<table>
<thead>
<tr>
<th>Financial Score</th>
<th>4.33</th>
<th>Compliance Score</th>
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<tbody>
<tr>
<td>Reputational Score</td>
<td>3</td>
<td>Environmental Stewardship Score</td>
<td>3</td>
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<tr>
<td>Strategic/Operational Score</td>
<td>6</td>
<td>Safety Score</td>
<td>0</td>
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<tr>
<td>Total Business Impact</td>
<td>16</td>
<td></td>
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<tr>
<td>Years to 100% Probability of Failure Score</td>
<td>14.4</td>
<td>Redundancy Score</td>
<td>1</td>
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<tr>
<td>Probability Score</td>
<td>7</td>
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</table>

**Total BRE Score:** 24

**Alternatives Considered**

During the cost analysis, replacing the existing fixtures on a regular maintenance cycle with like fixtures was examined. As shown above, return on investment is around 5 years and the entire LED system will save close to $3,000,000 over its 23 year lifetime.
Savings and Payback Estimates

- Estimated electricity savings of 3,404,051 kWh/Year (3.4%)
- Reduction of peak demand by about 356 kW
- Initial Payback Estimate: 5 Years
  - Improved with Energy Efficiency Incentive
- 40 Month DSE2 Rider Removal = approximately $200,000 - $300,000 in additional cost avoidance
Life Cycle Cost Analysis: Compare Alternatives
Life Cycle Cost Analysis: Compare Alternatives

- Project Characteristics, Inflation, Financing Terms, Useful Life/Salvage Value

- Capital Alternatives: cost, funding source, construction start date, capital inflation factor and asset type (useful life).

- O&M Alternatives: incremental O&M costs associated with each project to be input into the model. The input requires a present value cost, a start year and an inflation factor.
# 1st Stage Aeration Alternatives Analysis

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Capital Cost(^\text{1})</th>
<th>Annual Maintenance Costs(^\text{2})</th>
<th>15-year Major Maintenance(^\text{3})</th>
<th>Annual Energy(^\text{4}) 2017-2032</th>
<th>Annual Energy(^\text{4}) 2032-2047</th>
<th>30-Year NPV(^\text{5})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Operation (Status Quo)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>520,000</td>
<td>669,000</td>
<td>NA</td>
</tr>
<tr>
<td>Alternative 1 – Rehabilitate Existing PACs</td>
<td>4,340,600</td>
<td>140,000</td>
<td>130,000</td>
<td>320,000</td>
<td>522,000</td>
<td>21,300,000</td>
</tr>
<tr>
<td>Alternative 2 – Rehabilitate Existing PACs and Modify Impellers</td>
<td>4,877,400</td>
<td>191,000</td>
<td>130,000</td>
<td>311,000</td>
<td>490,000</td>
<td>22,750,000</td>
</tr>
<tr>
<td>Alternative 3 – New Single Stage PACs</td>
<td>4,266,900</td>
<td>194,000</td>
<td>130,000</td>
<td>303,000</td>
<td>486,000</td>
<td>22,050,000</td>
</tr>
<tr>
<td>Alternative 4 – New High Speed Direct Drive 480V Turbo Blow-</td>
<td>4,546,300</td>
<td>189,000</td>
<td>200,000</td>
<td>286,000</td>
<td>463,000</td>
<td>21,650,000</td>
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</tbody>
</table>

\(^\text{1}\) Capital Cost (in dollars)

\(^\text{2}\) Annual Maintenance Costs (in dollars)

\(^\text{3}\) 15-year Major Maintenance (in dollars)

\(^\text{4}\) Annual Energy (in dollars)

\(^\text{5}\) 30-Year Net Present Value (NPV) (in dollars)
• **Guidance on sustainable best practices**
  • Planning and Design Tool

• **Evaluate a Completed Infrastructure Projects**
  • Rating the community, environmental, and economic benefits
  • Project’s impact on the surrounding community and environment,
  • Technical considerations regarding materials and processes
  • Self-Assessment OR Third Party Verification and Awards
Envision Categories and Sub-Categories

Quality of Life
- Purpose, Community, Wellbeing
- 13 Credits

Leadership
- Collaboration, Management, Planning
- 10 Credits

Resource Allocation
- Materials, Energy, Water
- 14 Credits

Natural World
- Siting, Land & Water, Biodiversity
- 15 Credits

Climate and Risk
- Emissions, Resilience
- 8 Credits
### Envision Categories and Sub-Categories

**Quality of Life**
- Purpose, Community, Wellbeing

#### Leadership
- Collaboration, Management, Planning

#### Resource Allocation
- Materials, Energy, Water

#### Natural World
- Siting, Land & Water, Biodiversity

#### Climate and Risk
- Emissions, Resilience

### Purpose

<table>
<thead>
<tr>
<th>Description</th>
<th>Quality of Life</th>
<th>Leadership</th>
<th>Resource Allocation</th>
<th>Natural World</th>
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</thead>
<tbody>
<tr>
<td>QL1.1 Improve Community Quality of Life</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>QL1.2 Stimulate Sustainable Growth and Development</td>
<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.3 Develop Local Skills and Capabilities</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.4 Enhance Public Health and Safety</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.5 Minimize Noise and Vibration</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>QL1.6 Minimize Light Pollution</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.7 Improve Community Mobility and Access</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.8 Encourage Alternative Modes of Transportation</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL1.9 Improve Site Accessibility, Safety and Wayfinding</td>
<td>2</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>QL2.1 Preserve Historic and Cultural Resources</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL2.2 Preserve Views and Local Character</td>
<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>QL2.3 Enhance Public Space</td>
<td>2</td>
<td>0</td>
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</table>

**Total for Quality of Life:** 10 Credits

### Collaboration

<table>
<thead>
<tr>
<th>Description</th>
<th>Quality of Life</th>
<th>Leadership</th>
<th>Resource Allocation</th>
<th>Natural World</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD1.1 Provide Effective Leadership and Commitment</td>
<td>1</td>
<td>2</td>
<td>0</td>
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<tr>
<td>LD1.2 Establish a Sustainability Management System</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>LD1.3 Foster Collaboration and Teamwork</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>LD1.4 Provide for Stakeholder Involvement</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>LD1.5 Pursue By-product Synergy Opportunities</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>LD1.6 Improve Infrastructure Integration</td>
<td>2</td>
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<tr>
<td>LD1.7 Plan for Long-term Monitoring and Maintenance</td>
<td>2</td>
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<td>0</td>
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<tr>
<td>LD1.8 Address Conflicting Regulations and Policies</td>
<td>2</td>
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<tr>
<td>LD1.9 Extend Useful Life</td>
<td>1</td>
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</table>

**Total for Leadership:** 10 Credits

### Management

<table>
<thead>
<tr>
<th>Description</th>
<th>Quality of Life</th>
<th>Leadership</th>
<th>Resource Allocation</th>
<th>Natural World</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA1.1 Reduce Net Embodied Energy</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>RA1.2 Support Sustainable Procurement Practices</td>
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<td>0</td>
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<tr>
<td>RA1.3 Use Recycled Materials</td>
<td>2</td>
<td>0</td>
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<tr>
<td>RA1.4 Use Regional Materials</td>
<td>2</td>
<td>0</td>
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<tr>
<td>RA1.5 Reduce Waste from Landfills</td>
<td>2</td>
<td>0</td>
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<tr>
<td>RA1.6 Reduce Excavated Materials Taken of Site</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RA2.1 Provide for Decommissioning and Recycling</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>RA2.2 Use Renewable Energy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RA2.3 Commission and Monitor Energy Systems</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>RA2.4 Protect Fresh Water Availability</td>
<td>0</td>
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**Total for Resource Allocation:** 15 Credits
Southerly Awarded Envision Silver

- Envision® Silver award for sustainable infrastructure from the Institute for Sustainable Infrastructure (ISII)
- Envision system rates infrastructure projects across the full range of environmental, social, and economic impacts.
- The oldest infrastructure project that has been verified by the Envision sustainable infrastructure rating system.
Thank You

Jenita McGowan-Warner
Sustainability Manager
Northeast Ohio Regional Sewer District
warnerj@neorsd.org
216-881-6600 x6845
“Selling” Our Facility Upgrades
Better Buildings Summit
August 23, 2018

Robert K. Munro
Chief of Utility Operations
munro@avonlakewater.org
System Background

- Supply water to 200,000 people in a 680-square-mile area
- Provide wastewater treatment services for Avon Lake, northern sections of Avon, and Lorain County Rural Wastewater District (LORCO)
- $80 million Wastewater Capital Improvement Program (CIP)
Infrastructure Improvements

**WRF**

- Trojan UV Disinfection units
- Power Generation System
- Duperon Fine Screens
- New Headworks Screening Building
- Improved Grit Removal Facilities
- New Dewatering Screw Presses
- Nueros Turbo Air Blowers
- Aeration System Enhancements

**Combined Sewer Separations**

- Eliminating all combined sewers
- Lateral separations for homeowners
- Included in construction projects were new water mains, hydrants, and road base rehabilitation
• 0% Interest Loan through Ohio EPA Revolving Loan Fund

• Saved customers $13.8 million in interest expenses over a 30-year payback

• Improvements reduced wastewater treatment/collection energy expenses by $50,000/year
“Buy-In”

- 0% interest loans helped “sell” the increased debt service to stakeholders
- Simplified to a per customer savings
- Reduction in energy expenses
- Protecting our natural resource (Lake Erie)
- Lateral Loan Program
- Communicate, Communicate, Communicate...
Communication

• Social Media
• Public Meetings
• Website
• Transparency is key!
Questions?

Avon Lake Regional Water

Serving the region, protecting our resource.

Robert K. Munro
Chief of Utility Operations
munro@avonlakewater.org
Community/Customer Engagement
Bruce Bartel, Treatment Manager
NEW Water, Green Bay, WI
US DOE Better Plants Summit

Community / Customer Engagement

August 23, 2018

Bruce Bartel – NEW Water
Treatment Manager
Who or What is NEW Water?

• Brand of Green Bay Metropolitan Sewerage District (GBMSD)
• Two treatment facilities serving NE Wisconsin 24/7/365
• Governed by five member Commission
About NEW Water

- Wholesale provider of wastewater conveyance and treatment services
- 18 municipal customers (217,000 people) and two direct industrial customer
- Service area of 285 square miles
- Third largest wastewater treatment plant in Wisconsin
- Treats 38 million gallons of wastewater per day on average
Protecting our most valuable resource, water
Green Bay Facility
32 mgd
De Pere Facility
8 mgd
R2E2
Resource Recovery Electrical Energy Project

Most cost-effective solution to replace solids handling at the Green Bay Facility

Tools to treat wastewater as a resource
Collaborative Approach

• Used three advisory committees – external, internal, and Commission
  • External Committee: Tom Collins, Sanimax; Kevin Erb, UW-Extension; Jodi Arndt, Isaac Walton League; Jeff DeLaune, Johnson Controls; Michael Finney, Oneida Nation; John Katers, UWGB; Rich Jones, Georgia-Pacific; Trisha Cooper, citizen; Joshua Smith, Village of Howard; Karen Heyrman, City of De Pere; and Matt Heckenlaible, City of Green Bay

• Meeting objectives:
  • A list of attributes and weighting to decide alternative
  • Input on strengths and weaknesses of the selected alternative
Collaborative Approach

Municipal and industrial customer working group

**Communities:** Allouez, Ashwaubenon, Bellevue, De Pere, Green Bay, Hobart, Howard, Lawrence, Ledgeview, and Suamico

**Industries:** Fox River Fiber, Georgia-Pacific, JBS, Pioneer Metal, Thilmany, US Paper Mills, Procter & Gamble, and Sanimax

**Civic Group:** Green Bay Area Chamber of Commerce
Project Approach

GBMSD Strategic Vision

Stakeholder Involvement

Confirm Goals and Approach
Assess Current and Future Conditions
Screening of End Uses and Technologies
Identify and Screen Alternatives
Evaluate Alternatives

Identify Plan
GBMSD Commission Approval
Solids Management Plan Alternatives

• Alternative 2: Incineration with Energy Recovery
• Alternative 3A: Digestion with Thermal Processing
• Alternative 3B: Digestion with Thermal Processing and Electrical Generation (known as R2E2 Project)
• Alternative 11: Composting
• Alternative 14: Incineration and Drying
• Alternative 16: Rehabilitate Existing Solids Handling System
Alternative Analysis: Process and Criteria

- Employed structured, rigorous analysis framework to consider monetary and non-monetary factors
- Defined criteria for weighting, scoring, and ranking across alternatives
  - Criteria and criteria weights based on advisory committee input and consistent with Commission values
- Criteria employed:
  - Financial impact (30%)
  - Operational flexibility (35%)
  - Social/community acceptance (15%)
  - Environmental impact (20%)
Alternative Scoring

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Environmental</th>
<th>Social/Community</th>
<th>Operations</th>
<th>Financial</th>
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<tbody>
<tr>
<td>Alt. 2</td>
<td>6.2</td>
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<td></td>
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<tr>
<td>Alt. 3A</td>
<td>6.3</td>
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<td>Alt. 3B</td>
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<td>Alt. 11</td>
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<td>Alt. 16</td>
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## Alternative Costs

<table>
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<tr>
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<th>Alt. 2</th>
<th>Alt. 3A</th>
<th>Alt. 3B</th>
<th>Alt. 11</th>
<th>Alt. 14</th>
<th>Alt. 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost</td>
<td>$112.7 M</td>
<td>$154.9 M</td>
<td>$146.9 M</td>
<td>$80.6 M</td>
<td>$109.1 M</td>
<td>$88.4 M</td>
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<tr>
<td>Total Present</td>
<td>$121.5 M</td>
<td>$121.6 M</td>
<td>$112.6 M</td>
<td>$143.4 M</td>
<td>$123.5 M</td>
<td>$130.3 M</td>
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<tr>
<td>Worth*</td>
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</tbody>
</table>

- Project capital cost: **$147 million**
- 9% per year wholesale rate increase through 2016
Public Information Meeting (PIM)

- Commission Approval
- Total 5 PIMs held throughout service area
  - 1 – Village of Ashwaubenon
  - 2 & 3 – Village of Allouez
  - 4 – GBMSD
  - 5 – Brown County Library Weyers-Hilliard Branch
Additional Outreach Efforts

• Comprehensive Outreach Plan
  • 54 Tasks
• Mayor’s Corner
• City Council Meetings
• Village Board Meetings

• Project Fact Sheets
• FAQ Sheets
• Quarterly Customer Meetings
  • Continues today
Project Support

- Met with Green Bay Press Gazette Editorial Board
  - Article in paper
  - Some incorrect facts, overall very supportive

- Municipal Support
  - Village of Allouez – Craig Berndt Public Works Director

- Not all on board with project
Background Information

Three main drivers:

• Aging infrastructure
• Environmental regulations
• Increased capacity needs
R2E2

- R2E2: Solids & Digestion Facilities
  - Includes:
    - Anaerobic Digestion
    - New Solids Building
    - Centrifuge Dewatering
    - Dryer
  - Biogas Storage
  - Electrical Energy Generation
  - Nutrient Recovery
  - Ash Dewatering and Storage
  - Installation of Fluid Bed Incinerator Equipment
R2E2

- R2E2: Solids & Digestion Facilities
  - Energy Recovery:
    - Biogas to run two – 2.2 MGW I.C. Engines
    - Heat from the I.C. engines to heat the anaerobic digesters
    - Heat recovery from the fluid bed incinerator to run dryer
    - Autogenous incinerator operation
    - Nutrient harvesting to produce fertilizer product
R2E2 Benefits

• Addresses the original project drivers:
  • Aging infrastructure
  • Environmental regulations
  • Increased capacity needs
• Lowest cost plan over a 20-year planning period
• Generate about 50% of NEW Water’s energy needs
# R2E2 Costs

<table>
<thead>
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<th>Project Phase</th>
<th>Approximate Costs</th>
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</thead>
<tbody>
<tr>
<td>Engineering Services</td>
<td>$25,000,000</td>
</tr>
<tr>
<td>Fluidized Bed Incinerator Equipment</td>
<td>$21,200,000</td>
</tr>
<tr>
<td>Construction Project #1</td>
<td>$6,300,000</td>
</tr>
<tr>
<td>Construction Project #2</td>
<td>$114,000,000</td>
</tr>
<tr>
<td>Construction Project #3</td>
<td>$2,500,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$169,000,000</strong></td>
</tr>
</tbody>
</table>

$147M?
Thank You!

Questions / Comments?

Contact Information:
Bruce Bartel, Treatment Manager
bbartel@newwater.us
(920) 438-1006

For more information please visit:
www.newwater.us

Stay connected with us:
Internal Employees Communication Strategy

Nathan Casey, Infrastructure Planning Manager
Des Moines Water Works
Des Moines Water Works

ISO 50001 and Superior Energy Performance Internal Employee Communication

August 2018
Presentation Overview

- Background on Des Moines Water Works
- ISO 50001 and Superior Energy Performance
- Employee communication
- Continued communication and employee involvement
- Incentives
Background on Des Moines Water Works

• Public Drinking Water Utility managed by a Board of Trustees
• Provide Drinking Water to approximately 500,000 residence in the Des Moines Metro Area
  – Three Water Treatment Plants Fleur, Maffitt, and Saylorville
  – Average Demand 50 million gallons per day (mgd)
  – Peak Demand 96 million gallons per day (mgd)
  – 1,500 miles of water distribution system, from 2-inch to 60-inch
• Utility has approximately 200 employees
Project Background

• Implement ISO 50001 energy management systems
  – Formal energy management system recognized world-wide
  – Provides a pathway to saving energy and encourages continual improvement
• Project was less of a capital project and more a change in attitudes toward energy use
• Implement ISO 50001 Fleur Drive, our largest facility
  – Working on other facilities now
Employee Communication

• Management behind the project from the beginning
• Who is involved in the Energy Management System

EVERYONE!

• Everyone has a responsibility for energy awareness and energy management in their work areas
• This includes anyone working in our facilities
Energy Team

• Management appointed an energy team
• Team includes members from all over the utility including:
  – Office of the CEO
  – Water Production
  – Water Distribution
  – Maintenance
  – Engineering
  – A union representative
• Energy team is also responsible for communications
Why energy management

- Economics
  - $2,965,785 spent on energy in 2017
  - $165 for every million gallons of water pumped in 2017
  - Energy is one of our largest costs
Employee Impact

Treatment & pumping accounts for 75% of DMWW's energy consumption.

Heating & cooling – 10% of all energy consumed!

Office lights & computers – 5% of all energy consumed.

Fleet consumes 10% of all our energy!

Air Conditioning

Steam boiler for heat
Internal Employee Communication

- Existing Employees
  - All had to attend initial training

- New employees
  - All new employees watch a training video

- Operations and maintenance personnel who work with significant energy users get additional training
Employee Suggestions and Comments

• Employees can submit energy efficiency ideas to the core energy team
  – Email to energy.idea@dmww.com
  – In person, by phone, or email to a energy team member
  – Suggestion through internal website
  – Use of the ideas form.

• Comments can also come from the General public, contractors, and suppliers.
Continued communication and employee involvement

- Continued training for all employees
- Feedback on how well we’re doing
- Energy monitor project
Incentives

• Incorporate incentives for employees
  – Suggestions that are used are rewarded

• Future incentives
  – Still looking into future incentives
ISO 50001 Certification

Conferrered Upon
DES MOINES WATER WORKS
2001 George Flagg Parkway, Des Moines, IA 50321

SCOPES OF CERTIFICATION: All energy related processes and operations of the Fleur Drive Campus including the Des Moines River Intake & Pumping Station and General Office Facility.

Having been examined in detail for conformance to the requirements of ISO 50001:2011, and having been determined by Advanced Waste Management Systems, Inc. to conform in all respects to the requirements of ISO 50001:2011, the Certificate hereby issued certifies that the organization is meeting the requirements of ISO 50001:2011. The scope of this certification includes all operations and activities of the organization as specified above. This document is subject to the terms and conditions of AWMS Rights and Diligence agreement.

Certification: 19-00552
Date: 11/01/2017
Recertification Due: 11/01/2020

Superior Energy Performance Certification

Conferrered Upon
Des Moines Water Works
2001 George Flagg Parkway, Des Moines, IA 50321

SCOPES OF CERTIFICATION: "All energy related processes and operations of the Fleur Drive Campus including the Des Moines River Intake & Pumping Station and General Office Facility."

Having been examined in detail for conformance to the requirements of Superior Energy Performance 2017, and having been determined by Advanced Waste Management Systems, Inc. to conform in all respects to the requirements of Superior Energy Performance 2017, the Certificate hereby issued certifies that the organization is meeting the requirements of Superior Energy Performance 2017. The scope of this certification includes all operations and activities of the organization as specified above. This document is subject to the terms and conditions of AWMS Rights and Diligence agreement.

Superior Energy Performance Level: Bronze
Certification #: SEP272
Date: 11/01/2017
Recertification Due: 11/01/2020
City Wide Partnerships and Messaging
Best Practices

Mayor Summers, Lakewood, OH
Lakewood, Ohio
Established 1911
Street Car on Detroit Avenue
<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6 square miles</td>
<td>50,866</td>
</tr>
<tr>
<td>17,000 employers</td>
<td>4,300</td>
</tr>
<tr>
<td>18 parks</td>
<td>9,285</td>
</tr>
<tr>
<td>3,000 structures/square mile</td>
<td>3.7%</td>
</tr>
<tr>
<td>180 miles of sidewalks</td>
<td>#125</td>
</tr>
<tr>
<td>30,000 housing units</td>
<td>14.4%</td>
</tr>
<tr>
<td>92 miles of roads</td>
<td>10th</td>
</tr>
<tr>
<td>$152,000 median housing value</td>
<td>55%</td>
</tr>
<tr>
<td>160 miles of sewers</td>
<td>31%</td>
</tr>
<tr>
<td>50% houses built pre-1920</td>
<td>$47,000</td>
</tr>
<tr>
<td>92% Millennials</td>
<td>10th largest workforce in Ohio</td>
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Wastewater Treatment Plant Improvements

- LED lighting
- High-efficiency aeration blowers
- Methane powered generator (Operational fall 2019)
Long-term Control Plan System Improvements

- Plan Due March 2019
- Approximately $300 M
- Conventional solutions of Storage, Source Control, Green Infrastructure
- 139 years of projects
How can mayors push thinking beyond conventional solutions and “sell” the upgrades?
1. Utilize LOCAL TALENT
RESILLIENCY

- Federal Government
- prepared
- market
- Madison on the Move
- social forces
- alignment
- energy reliability
- density
- active living engagement
- transportation
- political engagement
- partnerships
- sidewalk repair program
- diversification
- bike lanes
- clean water Lakewood
- innovation
- vision
- education
- population
- housingforward
- political
- economic development
- community
- parks
- block clubs
- severe weather
- police cameras
- smart grid technology
- USEPA
- driverless cars
- big data pilot
- public safety
2. DREAM BIG
Go beyond engineering best practices
The Bill & Melinda Gates Foundation Call For The Reinvention Of The Toilet, Offers $42 Million In Potty Grants
Residents Expect MORE FOR THEIR MONEY
4. PARTNER to gain expertise and cost efficiency
5. Prove problems & solutions with DATA
New ideas WELCOME & NEEDED
Lakewood’s Second Century
Leading Thinking Beyond Conventional Solutions

Mayor Michael P. Summers
August 23, 2018
Questions & Answers