Energy Exchange℠

Better Buildings® SUMMIT

AUGUST 21-23, 2018 • CLEVELAND, OHIO

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

Thursday, August 23rd

10:30am-12pm

Energy Exchange | Better Buildings SUMMIT

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

Northeast Ohio Regional Sewer District

Making the Case for Efficiency Improvements

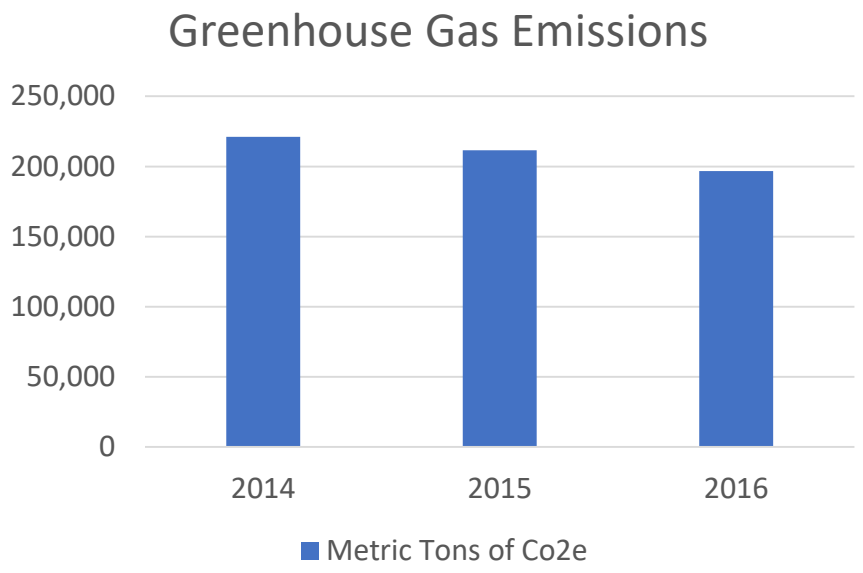
Northeast Ohio Regional Sewer District

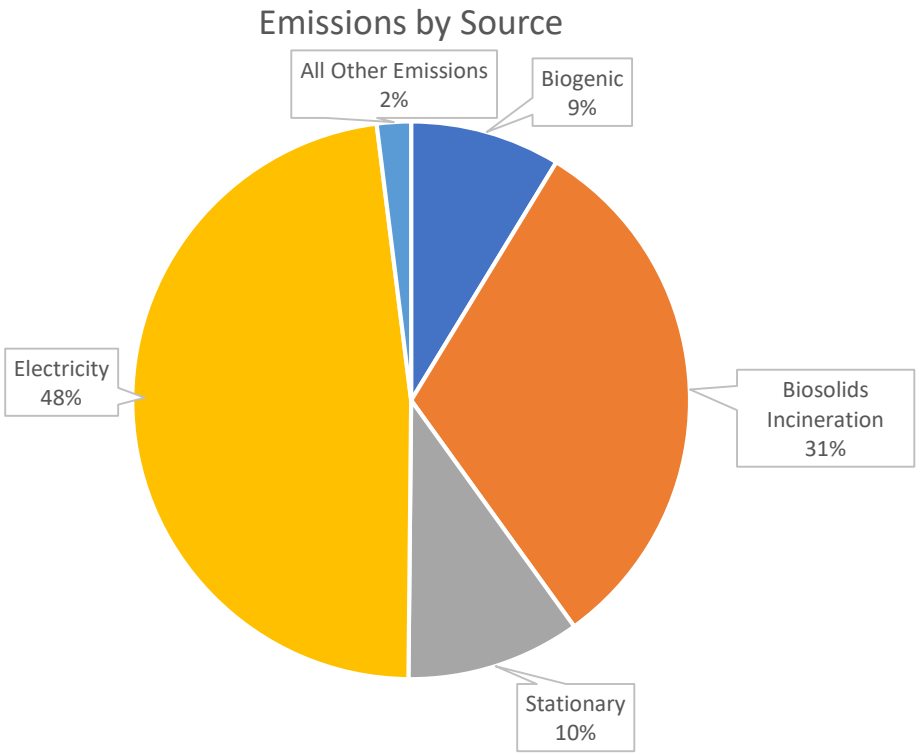
- **Largest wastewater treatment provider in the State of Ohio**
  - Own, operate 3 wastewater treatment plants
  - 1 million residents
  - 90+ billion gallons annually
  - 330 miles of sewers
- **Regional Stormwater Management:**
  - 420 miles of regional stormwater system
- **Water Quality Testing and Beach Monitoring**

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/

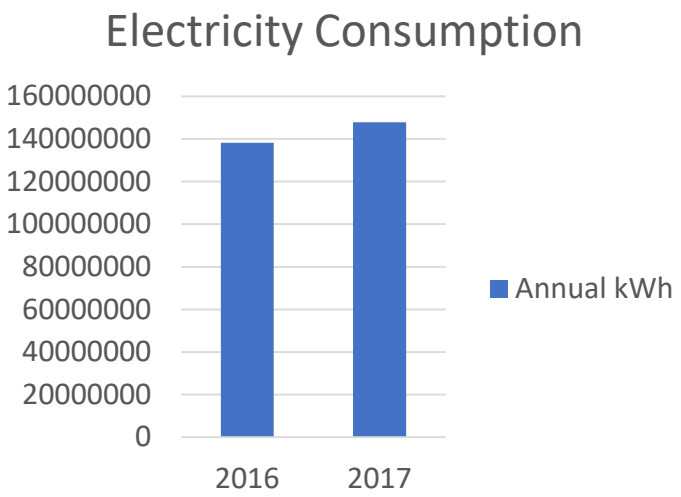


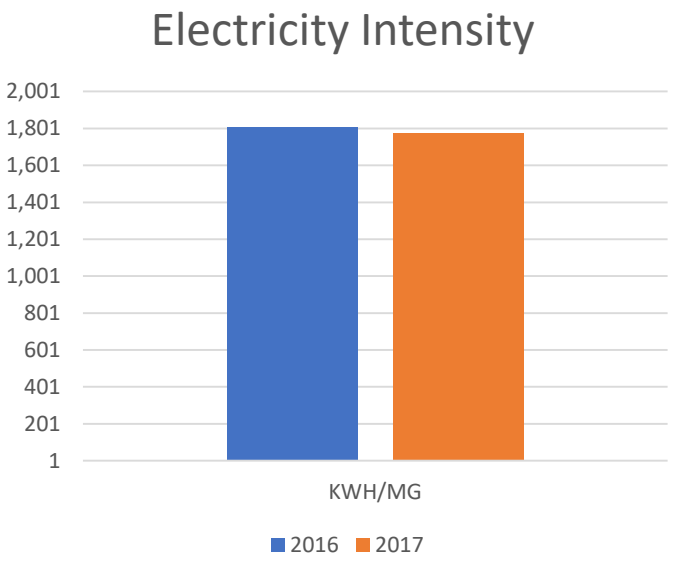


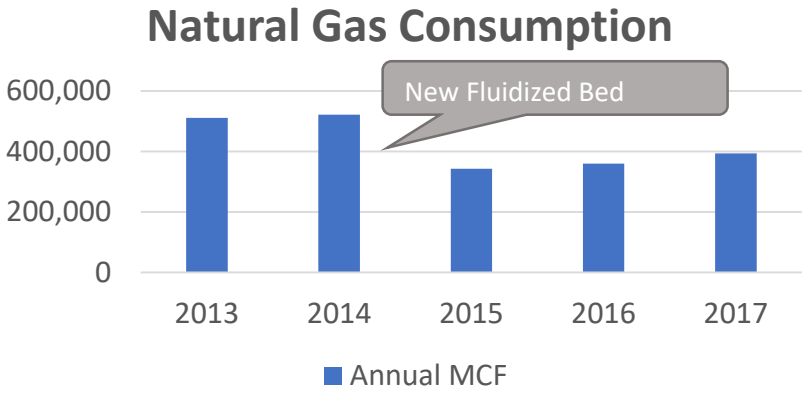
Greenhouse Gas Emissions

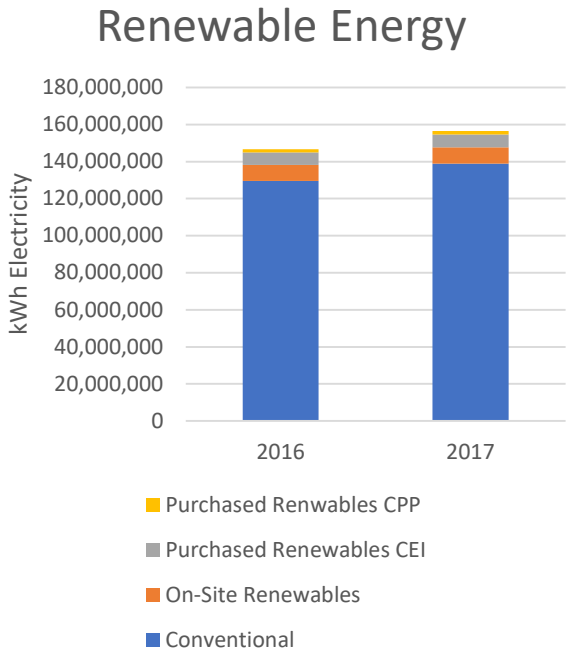
Energy Use

LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN
LEED
GOLD
2015


Electricity Consumption
160000000
140000000
120000000
100000000
80000000
60000000
40000000
20000000
0
2016
2017
Annual kWh


Electricity Intensity
2,001
1,801
1,601
1,401
1,201
1,001
801
601
401
201
1
KWH/MG
2016
2017


Natural Gas Consumption
New Fluidized Bed
600,000
400,000
200,000
0
2013
2014
2015
2016
2017
Annual MCF


Renewable Energy
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
kWh Electricity
2016
2017
Purchased Renwables 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

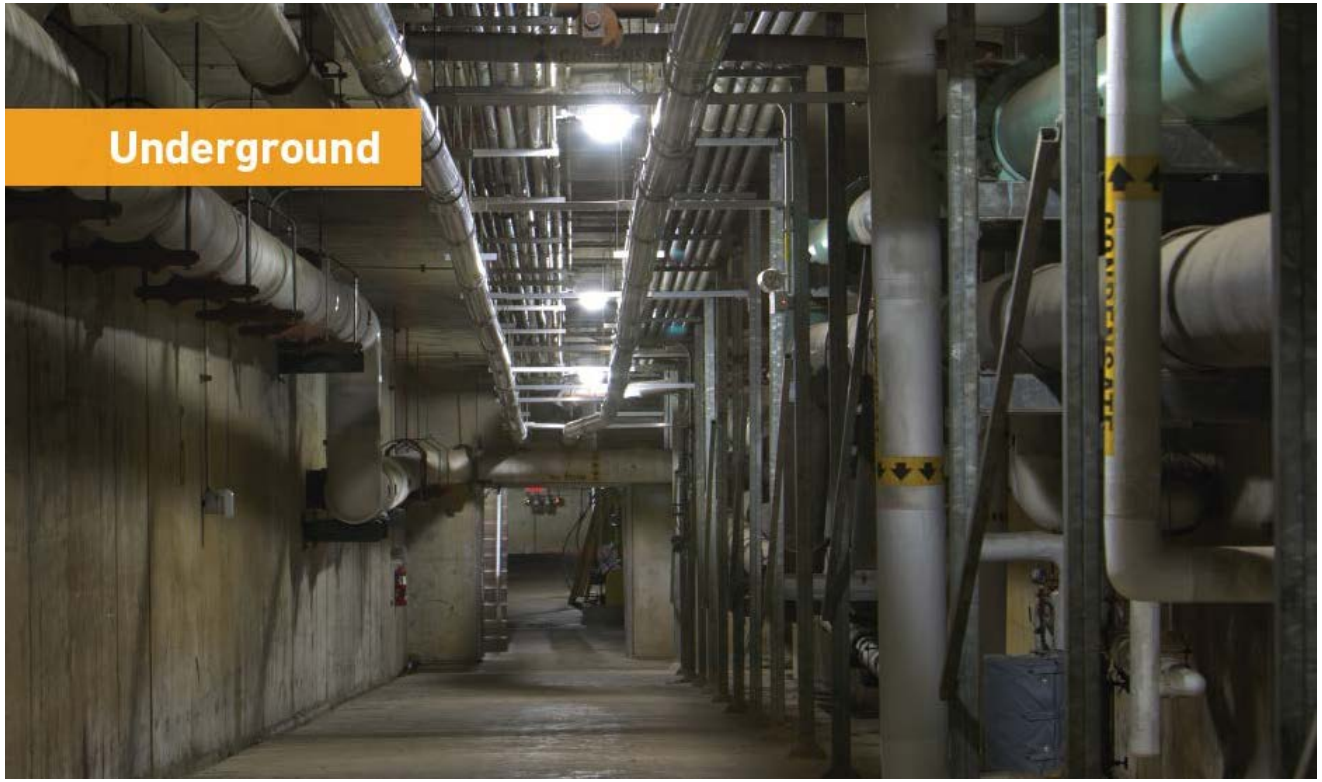
- Energy Performance Contract
- Lighting retrofit, HVAC modifications, power monitoring, walk-in cooler monitoring
- Guaranteed to provide an annual energy savings of at least $106,514
- Guaranteed Cumulative Savings of $2,950,310 over 15 years

Electricity Savings	Natural Gas Savings	Annual Savings
2,934,958 kWh	656 MCF	
$186,312	$6,570	$300,000

Wastewater Treatment Plant LED Lighting Retrofits

O&M Pain Point:

3 Miles of Tunnel Lighting



Tunnels, Interior & Exterior

Tunnels:

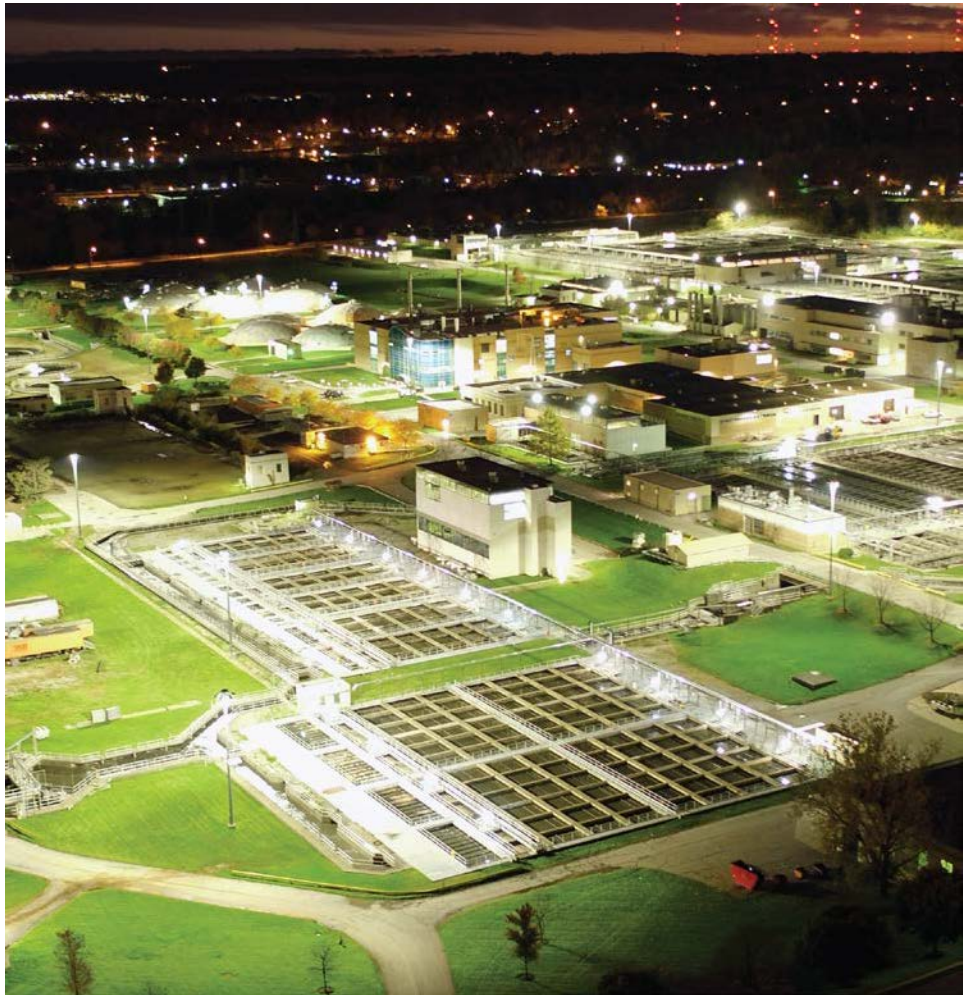
- 1-3 Replacement
- Occupancy Sensors

Interior: Multiple Buildings and Process Areas

- Occupancy Sensors

Exterior: High Mast and Wall Packs

- 1,000 Watt → 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.

Redundancy	1
	1-No backup
	2-With 50% backup
	3-With 100% backup

Financial Score	4.33	*Compliance Score*	0
Reputational Score	3	*Environmental Stewardship Score*	3
Strategic/Operational Score	6	*Safety Score*	0
Total Business Impact	16		
Years to 100% Probability of Failure Score	14.4	*Redundancy Score*	1
Probability Score	7		

Total BRE Score: 24

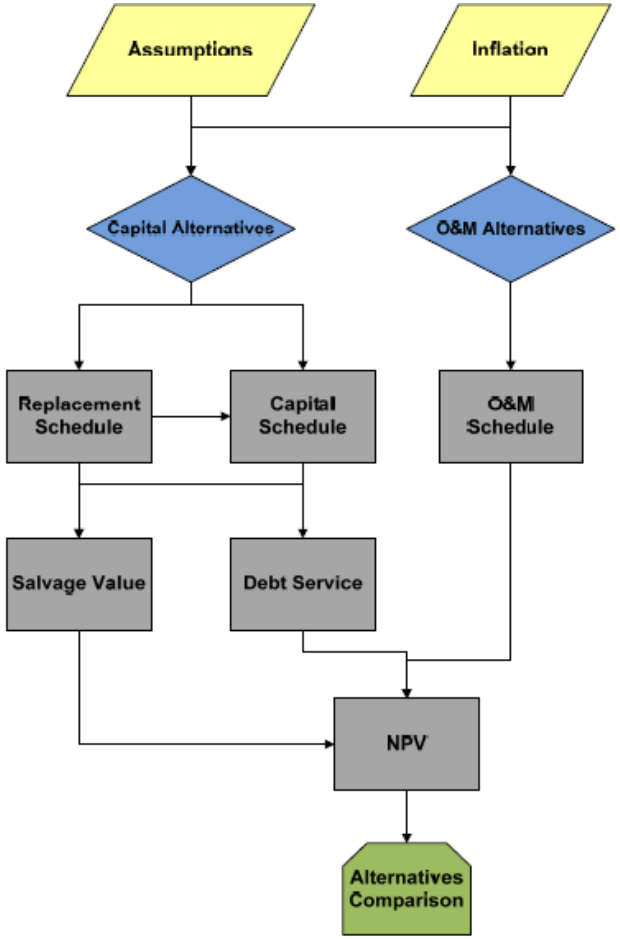
Alternatives Considered

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 sytem 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

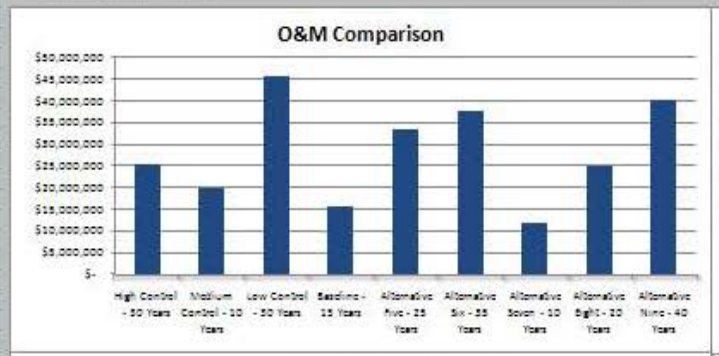
- Project Characteristics, Inflation, Financing Terms, Useful Life/Salvage Value

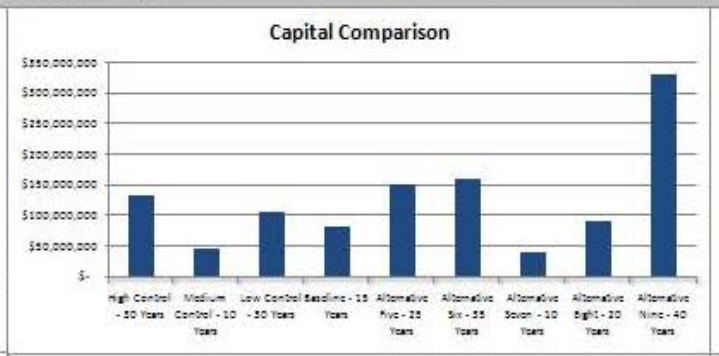
- Capital Alternatives: cost, funding source, construction start date, capital inflation factor and asset type (useful life).

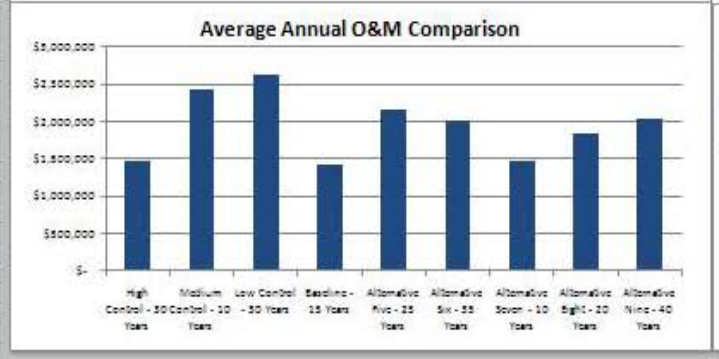
- O&M Alternatives: incremental O&M costs associated with each project to be input into the model. The input requires a present value cost, a start year and an inflation factor.

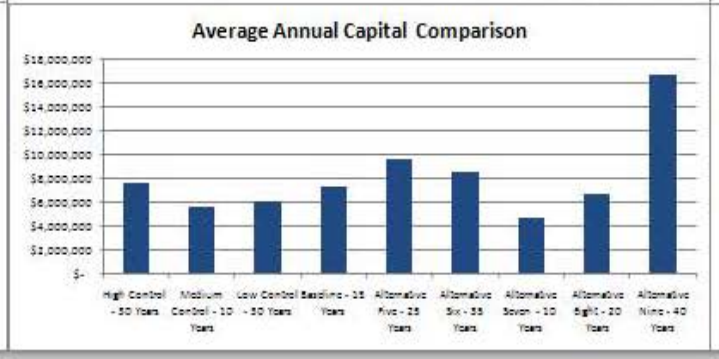
Total Present Value Cost			
Column1	O&M	Capital	Total
High Control - 30 Years	$25,320,691	$132,218,684	$157,539,374
Medium Control - 10 Years	$19,697,526	$46,188,815	$65,886,341
Low Control - 30 Years	$45,534,598	$104,440,128	$149,974,727
Baseline - 15 Years	$15,740,342	$81,697,773	$97,438,115
Alternative Five - 25 Years	$33,508,785	$150,690,133	$184,198,918
Alternative Six - 35 Years	$37,698,862	$158,653,284	$196,352,146
Alternative Seven - 10 Years	$11,935,866	$38,558,015	$50,493,881
Alternative Eight - 20 Years	$24,904,750	$91,000,000	$115,904,750
Alternative Nine - 40 Years	$40,257,455	$330,358,705	$370,616,160
Alternative Ten - 40 Years			

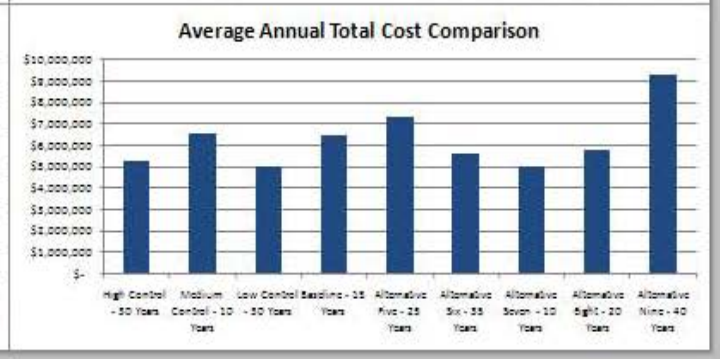
Equivalent Uniform Annual Cost (EUAC)			
Column1	O&M	Capital	Total
High Control - 30 Years	$1,464,298	$7,646,220	$5,251,312
Medium Control - 10 Years	$2,428,527	$5,694,663	$6,588,634
Low Control - 30 Years	$2,633,270	$6,039,783	$4,399,158
Baseline - 15 Years	$1,415,704	$7,347,388	$6,495,874
Alternative Five - 25 Years	$2,144,363	$9,645,371	$7,367,357
Alternative Six - 35 Years	$2,019,804	$8,500,218	$5,610,061
Alternative Seven - 10 Years	$1,471,584	$4,753,854	$5,049,388
Alternative Eight - 20 Years	$1,832,535	$6,695,939	$5,795,238
Alternative Nine - 40 Years	$2,033,947	$16,690,874	$9,265,404
Alternative Ten - 40 Years			











TOC | LCCA Comparison | Assumptions | Inflation Factors | O&M Alternative Inputs | Capital Alternative Inputs | Replacem

Ready 55%

1st Stage Aeration Alternatives Analysis

Table 4-3: Summary of Life Cycle Analysis Costs for Alternatives						
Alternative	Capital Cost[1] $	Annual Maintenance Costs[2] $	15-year Major Maintenance[3] $	Annual Energy[4] 2017-2032 $	Annual Energy[4] 2032-2047 $	30-Year NPV[5] $
Current Operation (Status Quo)	NA	NA	NA	520,000	669,000	NA
Alternative 1 – Rehabilitate Existing PACs	4,340,600	140,000	130,000	320,000	522,000	21,300,000
Alternative 2 – Rehabilitate Existing PACs and Modify Impellers	4,877,400	191,000	130,000	311,000	490,000	22,750,000
Alternative 3– New Singe Stage PACs	4,266,900	194,000	130,000	303,000	486,000	22,050,000
Alternative 4 –New High Speed Direct Drive 480V Turbo Blow-	4,546,300	189,000	200,000	286,000	463,000	21,650,000

ENVISION™

- **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	13 Credits	Purpose, Community, Wellbeing
LEADERSHIP	10 Credits	Collaboration, Management, Planning
RESOURCE ALLOCATION	14 Credits	Materials, Energy, Water
NATURAL WORLD	15 Credits	Siting, Land & Water, Biodiversity
CLIMATE AND RISK	8 Credits	Emissions, Resilience

ability Criteria Across 5 Categories

				Y	N	NA	
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	2	1	0	2 of 3
2			QL1.2 Stimulate Sustainable Growth and Development	2	1	0	2 of 3
3			QL1.3 Develop Local Skills and Capabilities	2	1	0	2 of 3
4		COMMUNITY	QL2.1 Enhance Public Health and Safety	0	0	1	0 of 0
5			QL2.2 Minimize Noise and Vibration	1	0	0	1 of 1
6			QL2.3 Minimize Light Pollution	0	0	1	0 of 0
7			QL2.4 Improve Community Mobility and Access	3	0	0	3 of 3
8			QL2.5 Encourage Alternative Modes of Transportation	2	0	0	2 of 2
9			QL2.6 Improve Site Accessibility, Safety and Wayfinding	2	0	1	2 of 2
10		WELLBEING	QL3.1 Preserve Historic and Cultural Resources	0	0	2	0 of 0
11			QL3.2 Preserve Views and Local Character	2	0	0	2 of 2
12			QL3.3 Enhance Public Space	2	0	0	2 of 2
			TOTAL	18	3	5	18 of 21
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership and Commitment	1	2	0	1 of 3
14			LD1.2 Establish a Sustainability Management System	0	1	0	0 of 1
15			LD1.3 Foster Collaboration and Teamwork	3	0	0	3 of 3
16			LD1.4 Provide for Stakeholder Involvement	3	0	0	3 of 3
17		MANAGEMENT	LD2.1 Pursue By-product Synergy Opportunities	1	0	0	1 of 1
18			LD2.2 Improve Infrastructure Integration	3	0	0	3 of 3
19		PLANNING	LD3.1 Plan for Long-term Monitoring and Maintenance	2	0	0	2 of 2
20			LD3.2 Address Conflicting Regulations and Policies	2	0	0	2 of 2
21			LD3.3 Extend Useful Life	1	0	0	1 of 1
			TOTAL	16	3	0	16 of 19
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	2	0	0 of 2
23			RA1.2 Support Sustainable Procurement Practices	0	3	0	0 of 3
24			RA1.3 Use Recycled Materials	2	0	0	2 of 2
25			RA1.4 Use Regional Materials	2	0	0	2 of 2
26			RA1.5 Divert Waste from Landfills	2	1	0	2 of 3
27			RA1.6 Reduce Excavated Materials Taken off Site	3	0	0	3 of 3
28			RA1.7 Provide for Deconstruction and Recycling	0	0	3	0 of 0
29		ENERGY	RA2.1 Reduce Energy Consumption	0	0	3	0 of 0
30			RA2.2 Use Renewable Energy	0	0	2	0 of 0
31			RA2.3 Commission and Monitor Energy Systems	0	0	3	0 of 0
32		WATER	RA3.1 Protect Fresh Water Availability	0	0	7	0 of 0

Description | **Results Table** | Quality of Life | Leadership | Resource Allocation | Natural World ...

: 1 of 1

Envision Categories and Sub-Categories

QUALITY OF LIFE — 13 Credits — Purpose, Community, Wellbeing

LEADERSHIP — 10 Credits — Collaboration, Management, Planning

RESOURCE ALLOCATION — 14 Credits — Materials, Energy, Water

NATURAL WORLD — 15 Credits — Siting, Land & Water, Biodiversity

CLIMATE AND RISK — 8 Credits — Emissions, Resilience

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.

THE ENVISION™ RATING SYSTEM

INSTITUTE FOR SUSTAINABLE INFRASTRUCTURE
I S I

ZOFNASS PROGRAM FOR SUSTAINABLE INFRASTRUCTURE
Graduate School of Design Harvard University

Thank You

Jenita McGowan-Warner

Sustainability Manager

Northeast Ohio Regional Sewer District

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216-881-6600 x6845

Northeast Ohio Regional Sewer District

Public Private Partnerships

Robert Munro, Chief of Utility Operations

Avon Lake Regional Water

Avon Lake Regional Water

“Selling” Our Facility Upgrades

Better Buildings Summit
August 23, 2018

Robert K. Munro
Chief of Utility Operations
rmunro@avonlakewater.org

Avon Lake Regional Water

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)

Avon Lake Regional Water

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

Avon Lake Regional Water

Funding

- 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

Avon Lake Regional Water

"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…

Avon Lake Regional Water

Communication

- Social Media
- Public Meetings
- Website
- Transparency is key!

Find us on Facebook

twitter

Instagram

Questions?

Avon Lake Regional Water

Serving the region, protecting our resource.

Robert K. Munro

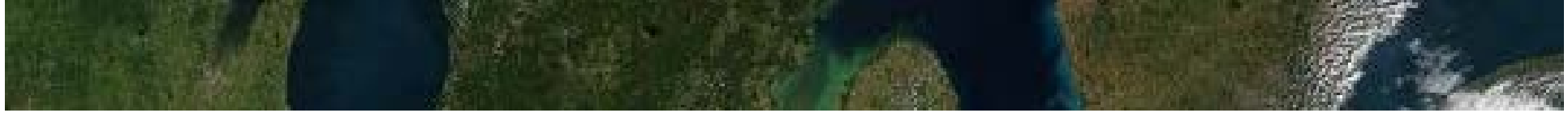
Chief of Utility Operations

rmunro@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

R2E2 PROJECT

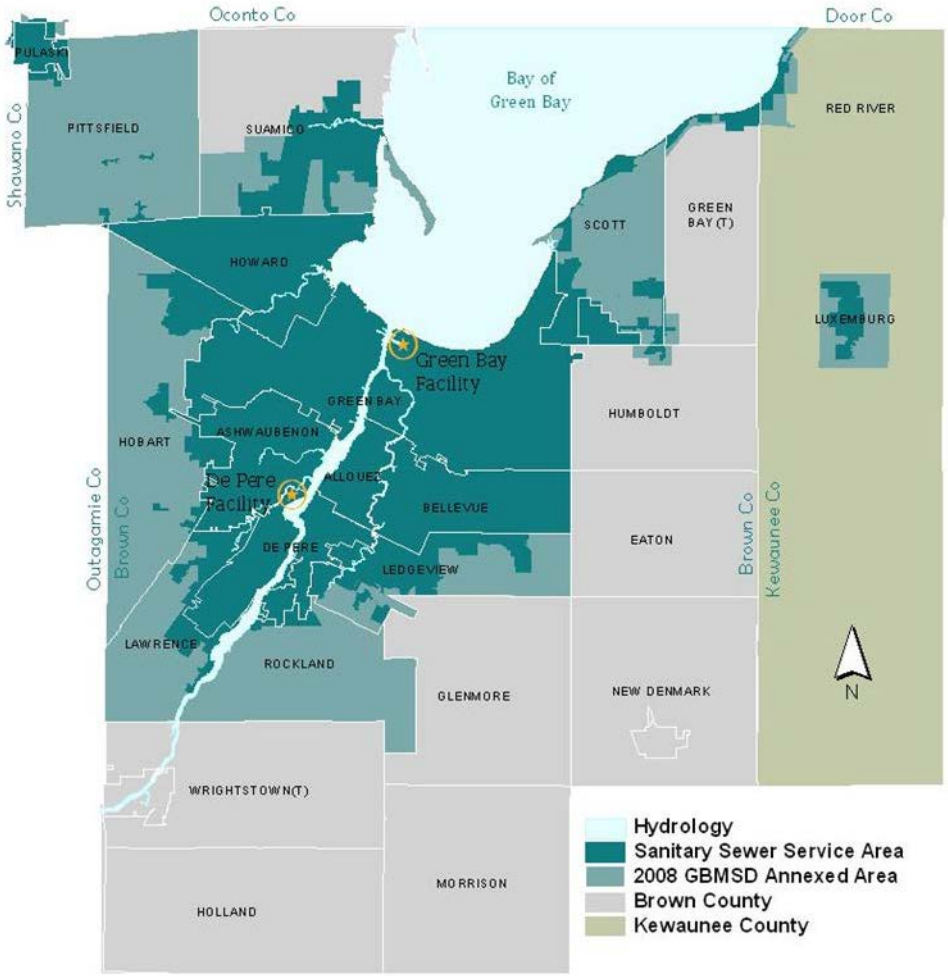
NEW Water
The brand of the Green Bay Metropolitan Sewerage District

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



R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

NEW Water

The brand of the Green Bay Metropolitan Sewerage District

Protecting our most valuable resource, water

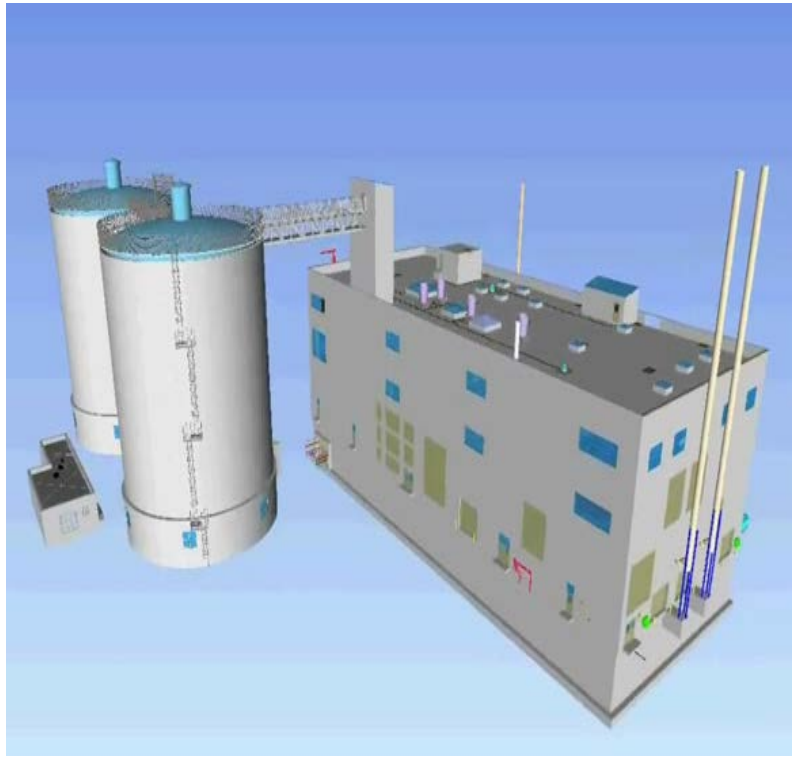
Green Bay Facility
32 mgd

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 <u>treat wastewater as a resource</u>



R2E2 PROJECT

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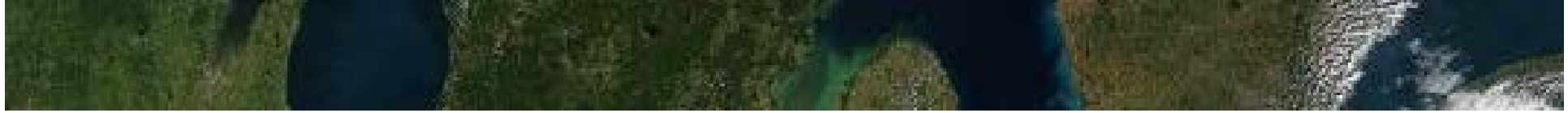


Collaborative Approach

- 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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Project Approach

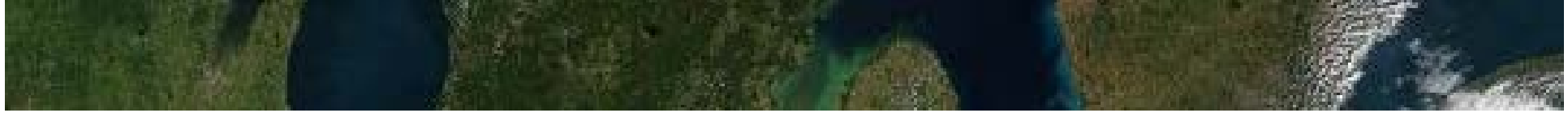
GBMSD Strategic Vision — Stakeholder Involvement

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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District



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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

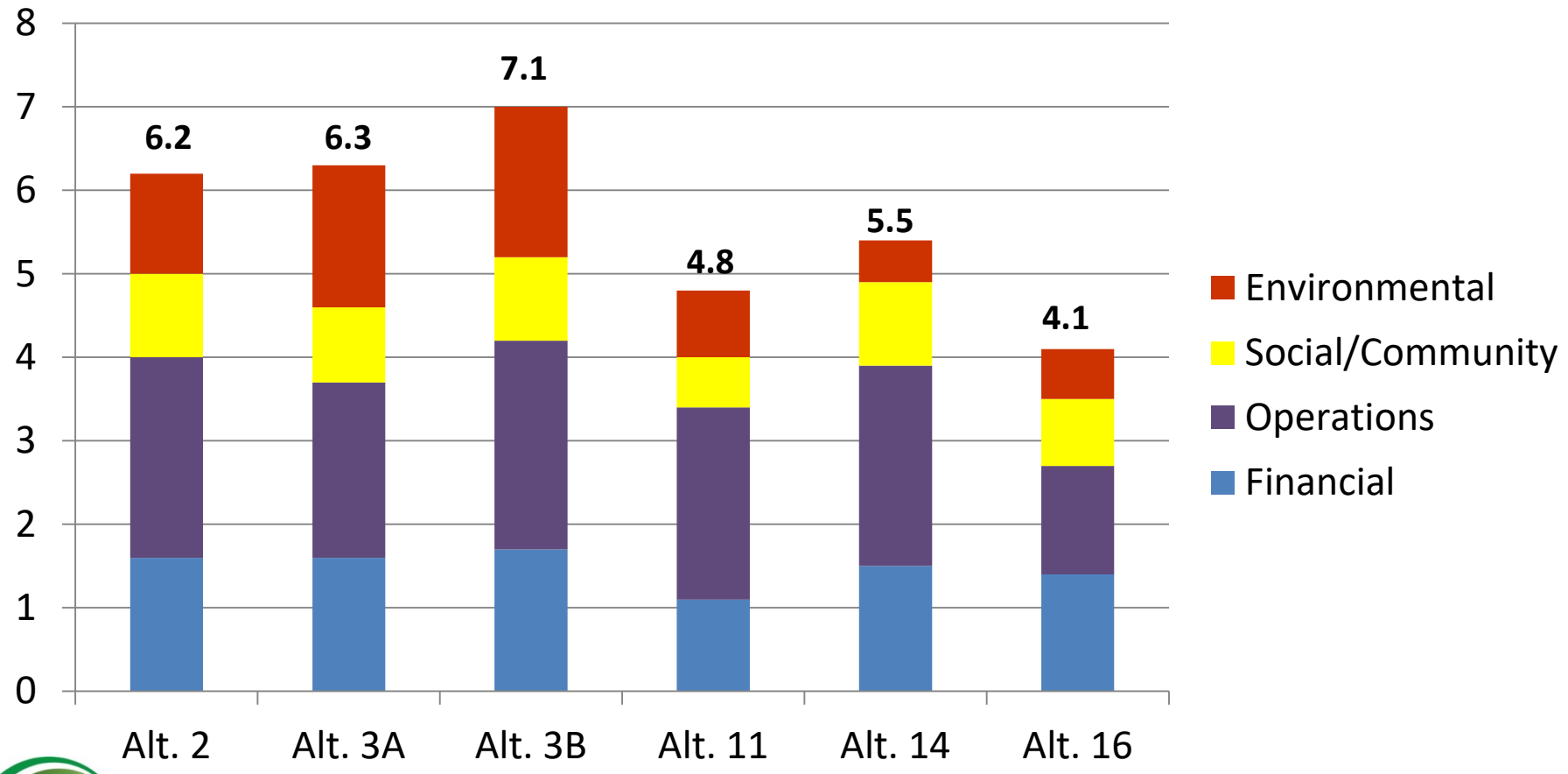
Alternative Analysis: Process and Criteria

- 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%)

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Alternative Scoring



R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Alternative Costs

	Alt. 2	Alt. 3A	Alt. 3B	Alt. 11	Alt. 14	Alt. 16
Capital Cost	$112.7 M	$154.9 M	$146.9 M	$80.6 M	$109.1 M	$88.4 M
Total Present Worth*	$121.5 M	$121.6 M	$112.6 M	$143.4 M	$123.5 M	$130.3 M

- Project capital cost: $147 million
  - 9% per year wholesale rate increase through 2016

R2E2 PROJECT

NEW Water
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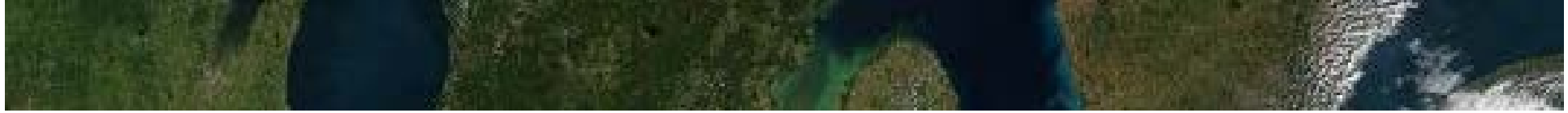
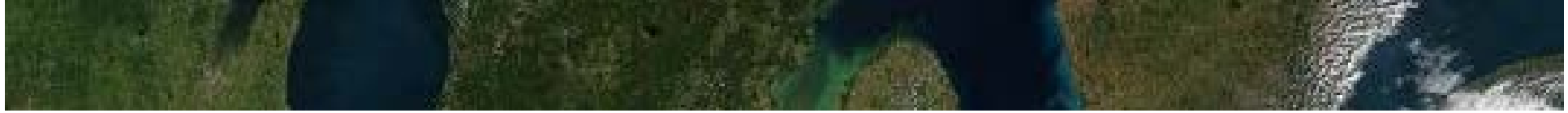


Public Information Meeting (PIM)

- 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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District



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

R2E2 PROJECT

NEW Water
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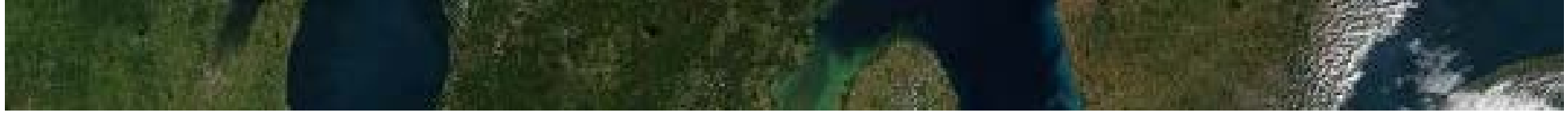

Project Support

- 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

R2E2 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Background Information

Three main drivers:

- Aging infrastructure
- Environmental regulations
- Increased capacity needs

R2E2 PROJECT

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The brand of the Green Bay Metropolitan Sewerage District

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 PROJECT

NEW Water
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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 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

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 PROJECT

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

R2E2 Costs

Project Phase	Approximate Costs
Engineering Services	$25,000,000
Fluidized Bed Incinerator Equipment	$21,200,000
Construction Project #1	$6,300,000
Construction Project #2	$114,000,000
Construction Project #3	$2,500,000
Total	$169,000,000

R2E2 PROJECT

$147M?

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

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

Des Moines Water Works

Water You Can Trust for Life

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

Des Moines Water Works
Water You Can Trust for Life

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

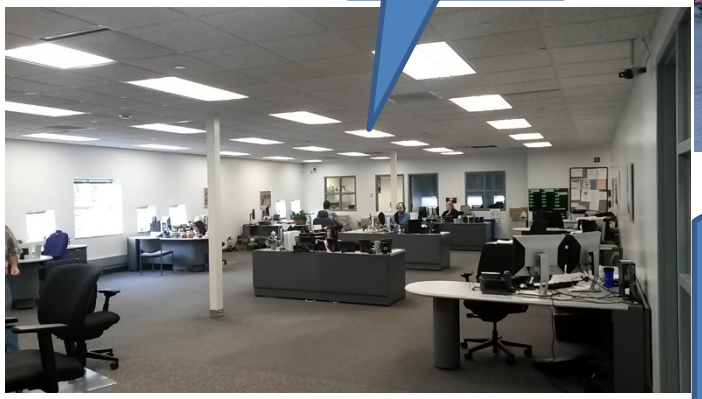
Why energy management

- 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.

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



Fleet consumes 10% of all our energy!

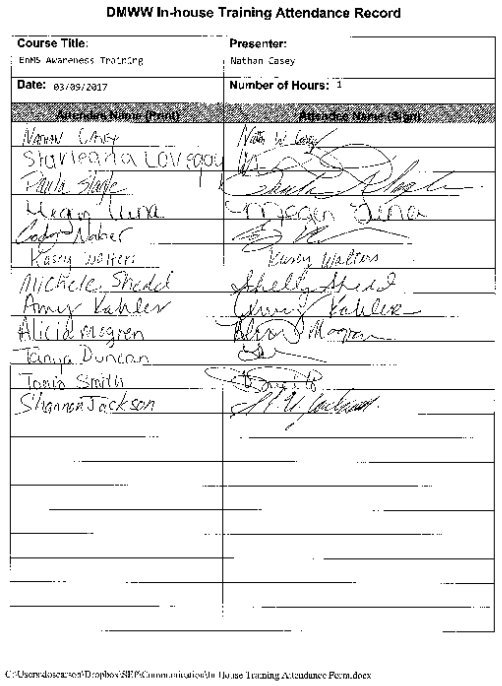
Air Conditioning

Heating & cooling – 10% of all energy consumed!

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



DMWW In-house Training Attendance Record

Course Title: EnMS Awareness Training	Presenter: Nathan Casey
Date: 03/09/2017	Number of Hours: 1
Attendee Name (Print)	Attendee Name (Sign)
Nathan Casey	Nathan W. Casey
Starleana Lovegoy	[illegible]
Paula Starke	[illegible]
Megan Luna	Megan Luna
Cody Naber	[illegible]
Kasey Walters	Kasey Walters
Michele Shedd	Shelly Shedd
Amy Kahler	Amy Kahler
Alicia Mogren	Alicia Mogren
Tanya Duncan	[illegible]
Tonia Smith	[illegible]
Shannon Jackson	[illegible]

C:\Users\dosearson\Dropbox\SEP\Communications\In House Training Attendance Form.docx

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.

Des Moines Water Works
Water You Can Trust for Life

Please complete the light blue shaded fields and click the submit button to send.

Date:

Suggestion or request:

Submitted by name:

Relationship to Des Moines Water Works (choose one):

Employee Contractor Supplier Customer General Public

Area or department affected:

Clicking the Submit button will forward your suggestion to the Core Energy Team who will provide feedback on your suggestion.

Submit

Continued communication and employee involvement

- Continued training for all employees
- Feed back 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

Certification

ISO 50001

Certification

Conferred Upon

DES MOINES WATER WORKS

2201 George Flagg Parkway, Des Moines IA 50321

SCOPE 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, Incorporated, the Certification Body, to be in conformance with all provisions of this standard, the Energy Management System of the organization is hereby certified to 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 Duties document.

Initial Certification:	11/01/2017	Current Certification:	11/01/2017	Re-certification Due:	11/01/2020

In witness whereof this Certification is granted and the Mark of Certification and our signatures are hereunto affixed.

Richard A. Ellis, Ph.D.
Chairman & Majority Principal

CERTIFICATION #: 00272

Advanced Waste Management Systems, Inc.
6430 Hixson Pike
Hixson, TN 37343
423-843-2206

Rev Date: 11/07/2017

SUPERIOR ENERGY PERFORMANCE

Certification

Conferred Upon

Des Moines Water Works

2201 George Flagg Parkway, Des Moines IA 50321

SCOPE 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, Incorporated, the Certification Body, to be in conformance with all provisions of this standard, the Energy Management System of the organization is hereby certified to 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 Duties document.

Superior Energy Performance Level:	Bronze	Current Certification:	11/01/2017	Re-certification Due:	11/01/2020

In witness whereof this Certification is granted and the Mark of Certification and our signatures are hereunto affixed.

SEP272

Superior Energy Performance
U.S. DEPARTMENT OF ENERGY

Richard A. Ellis, Ph.D.
Chairman & Majority Principal

Advanced Waste Management Systems, Inc.
6430 Hixson Pike
Hixson, TN 37343
423-843-2206

Revision Date: 11/06/2017

Des Moines Water Works

Water You Can Trust for Life

www.dmww.com | | dsmh2o.com

Customer Service: 283-8700 | 24/7 Emergency: 283-8772

City Wide Partnerships and Messaging Best Practices

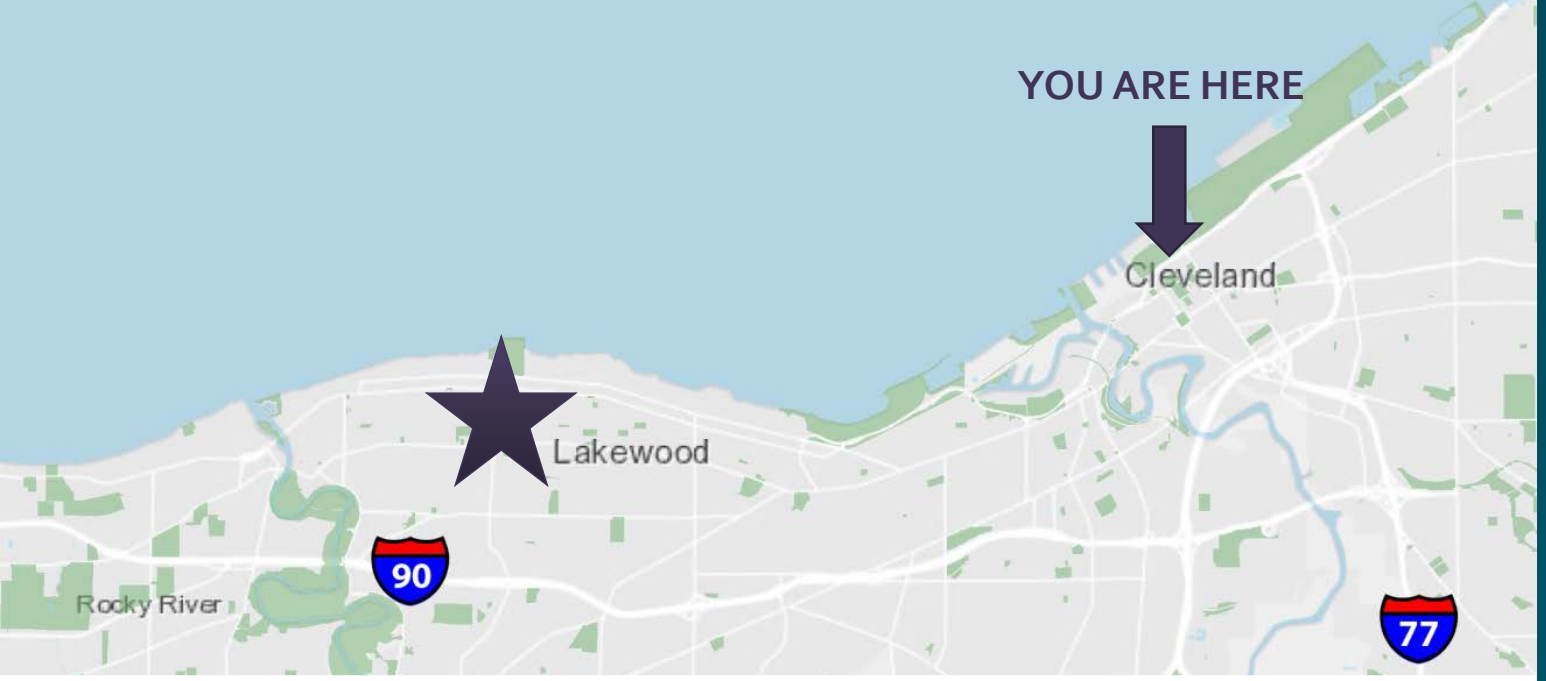
Mayor Summers, Lakewood, OH

Lakewood's Second Century

Leading Thinking Beyond Conventional Solutions

Mayor Michael P. Summers

August 23, 2018



Street Car on Detroit Avenue

Lakewood, Ohio

Established 1911

Lakewood Wastewater Treatment Plant
August 20, 1916

Lakewood Today

5.6 square miles	**50,866** residents	**17,000** structures	**4,300** employers
18 parks	**9,285** residents/square mile	**3,000** structures/square mile	**3.7%** unemployment
180 miles of sidewalks	**#125** national population density	**30,000** housing units	**14.4%** poverty rate
92 miles of roads	**10th** largest workforce in Ohio	**$152,000** median housing value	**55%** renters
160 miles of sewers	**31%** Millennials	**50%** houses built pre-1920	**$47,000** median household income

Lakewood's 21st Century Housing Initiative

Dowd Avenue House

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.

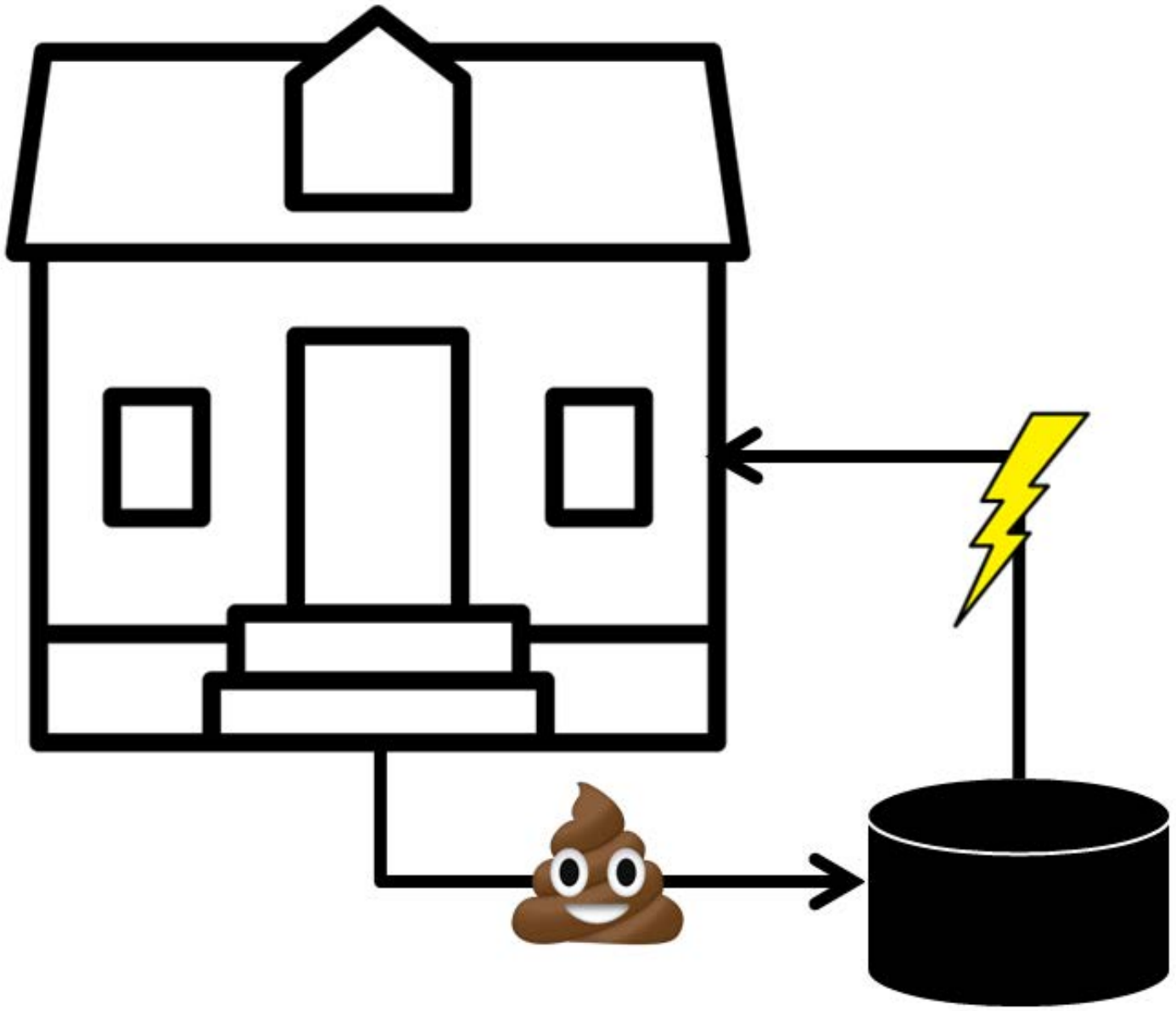
Utilize **LOCAL TALENT**

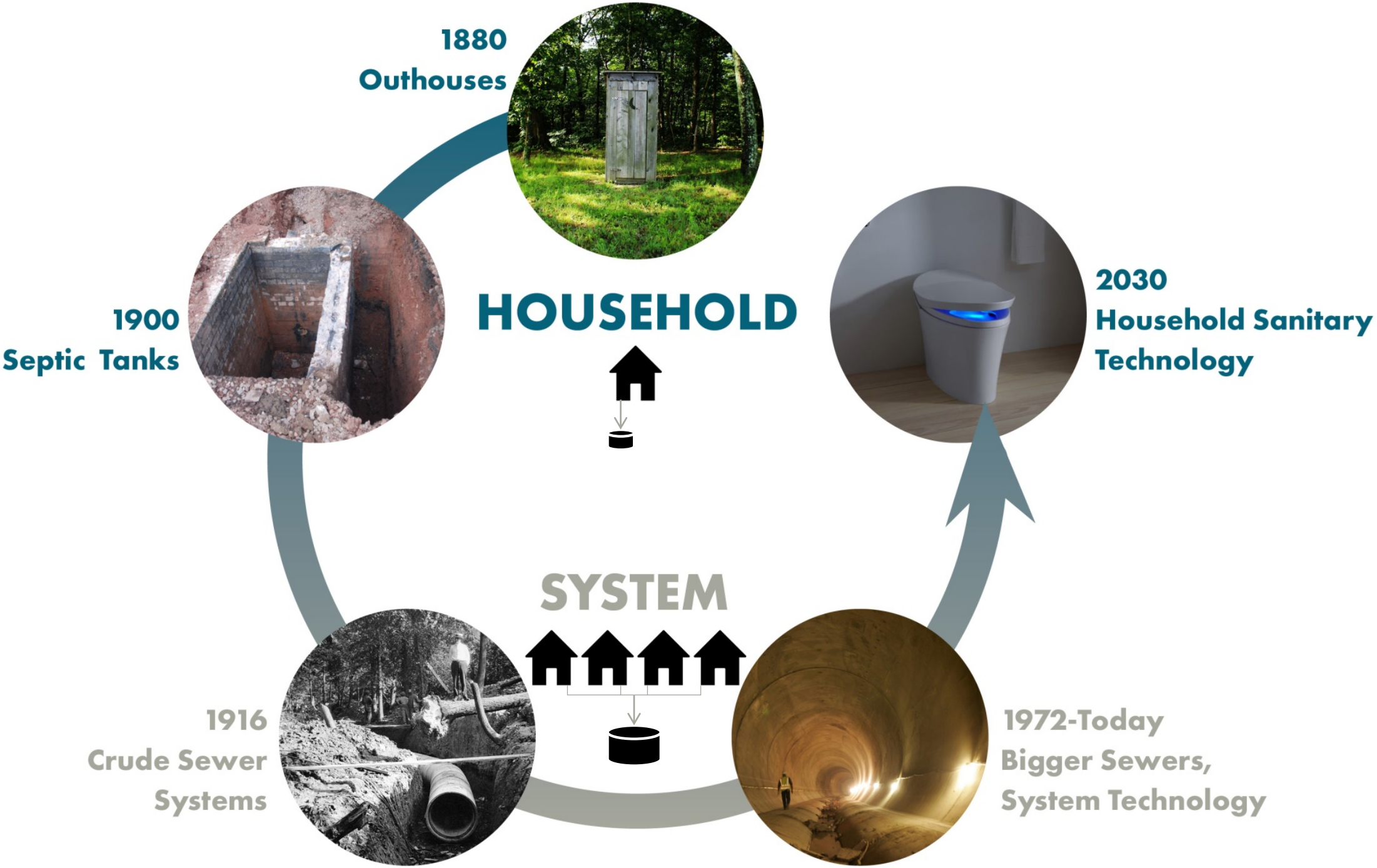
State &
Federal Government
prepared
healthcare
USEPA
smart grid technology
severe weather
RESILIENCY
block clubs
population
parks
Housing Forward
action
education
Downtown Development
innovation
economy
partnerships
sidewalk repair program
Community
Vision
Clean Water Lakewood
environmental
police cameras
market
social
Madison on the Move
alignment
energy reliability
forces
density
driverless cars
transportation
active living
big data pilot
public safety
engagement
Project SOAR
political
diversity
bike lanes

2.

DREAM BIG

Go beyond engineering best practices




1880
Outhouses
1900
Septic Tanks
HOUSEHOLD
2030
Household Sanitary
Technology
SYSTEM
1916
Crude Sewer
Systems
1972-Today
Bigger Sewers,
System Technology

The Bill & Melinda Gates Foundation Call For The Reinvention Of The Toilet, Offers $42 Million In Potty Grants

Matt Burns @mjburnsy / Jul 19, 2011

Com

3.

Residents Expect **<u>MORE</u> 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