

WISCONSIN

ENERGY EFFICIENCY STARTS WITH YOU

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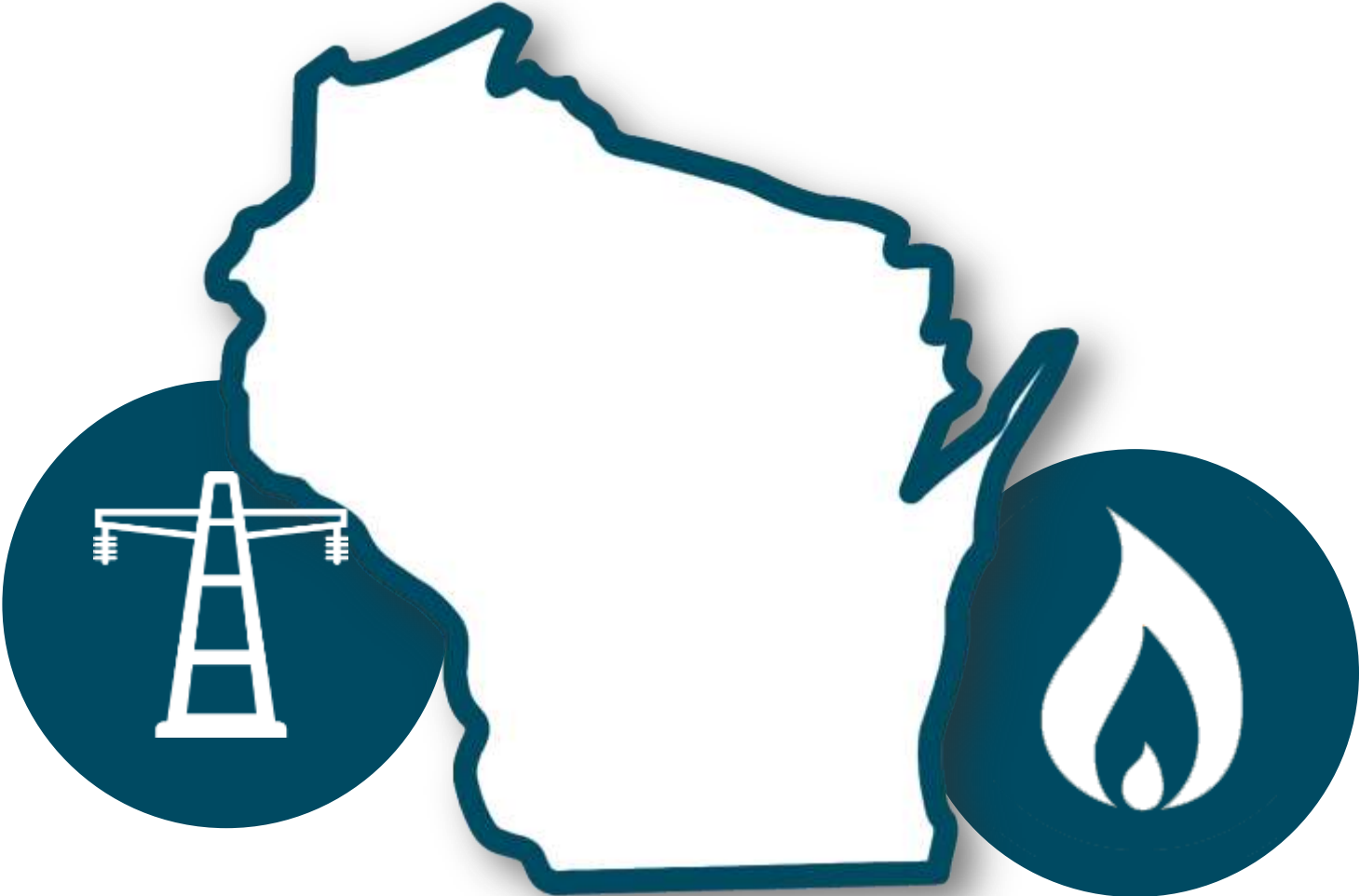
OCTOBER 9, 2019

Agenda

- Focus on Energy background
- City of Burlington Wastewater Treatment Facility:
 - Getting started
 - First energy survey 2002-2003
 - Aeration modification projects
 - Focus on Energy program transition
 - Developing an energy efficiency culture
 - Key takeaways
- Becoming energy efficient
- Focus on Energy assistance
- Questions




Focus on Energy background

What is Focus on Energy?



What does Focus on Energy do?



-  Assists Wisconsin residents and businesses in identifying and implementing energy efficiency projects
-  Offers unbiased information and technical assistance to participating utilities' electric and/or natural gas customers
-  Provides financial incentives for energy saving projects that would not otherwise occur

Focus by the numbers



- Focus on Energy has delivered more than \$1 billion in economic benefits over the past eight years
- Focus on Energy's positive net employment impacts supported more than 1,000 full-time equivalent jobs per year over the Quadrennium
- Served customers at more than 128,000 residences and more than 6,100 businesses in 2018
- When economic benefits are counted, cost-effectiveness findings calculated that Focus on Energy provided \$5.16 in benefits for every \$1.00 invested over the 2018 program year
- Energy saved last year would power more than 69,000 homes for one year

Visit focusonenergy.com/evaluation-reports to view the full report

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City of Burlington Wastewater Treatment Facility

Getting started

- Discussed the Focus on Energy Program with the City's Superintendent
- Expressed interest to reduce energy use
- Estimated level of potential incentive
- Discussed opportunities to assess
- Requested data and information prior to site visit
- Completed a site visit



First energy survey

- Surveyed site on April 5, 2002
- Identified the following energy efficiency opportunities:
 - Energy-efficient fluorescent lighting
 - Occupancy sensors
 - Premium efficient motors
 - Demand-side management
 - Utilize existing biogas
 - Redistribute aeration diffusers
 - Modify aeration controls
 - Evaluate need to downsize aeration blower



First project installed

- Installed a biogas conditioning system
- Treated hauled-in waste impacting biogas quality but provided quantity needed
- Started to utilize biogas being produced
- Reduced the need to purchase natural gas



Aeration modification projects

- Initial survey identified a complete array of aeration modifications:
 - Diffuser distribution
 - Blower size
 - Controls
- Continued contact and encouragement to modify the aeration system
- Delayed implementation

Aeration project installed

- Studied aeration system and confirmed forecasted savings and project cost
- Implemented aeration system modifications
- City of Burlington applied and received a Focus on Energy incentive to install identified energy-efficient modifications:
 - Blowers – New technology
 - Diffusers – Redistribution of diffusers increased density for improved oxygen transfer and mixing at lower air flow rates
 - Controls – Dissolved oxygen (DO) probe per basin SCADA monitors and controls blowers



Blowers



Diffusers



Control System

Focus on Energy Program transition



- Transitioned after the implementation offering and acceptance occurred prior to implementation
- Focus on Energy continued to support the City of Burlington during implementation of the aeration system modifications

New superintendent (foreman)

- During project implementation a transition in the management of the WWTF also occurred
- A new WWTF foreman came on board

Developing an energy efficiency culture

- Former superintendent conveyed the value of energy efficiency
- Present foreman continued to promote energy efficiency awareness including training staff on the subject
- Current staff are regularly challenged to identify energy efficiency opportunities
- Staff continue to maintain consistent discussions on energy efficiency and operations
- Staff encouraged to identify opportunities on either capital investment or in operations

Continued energy efficiency projects

- Updated VFDs on bio-filter feed pumps
- Paced bio-filter feed pumps off of influent flow rather than constant speed operation
- Delivered modifications to ventilation system to increase air flow rate but not increase energy used
- Converted all exterior lighting to LED lighting
- Upgraded administration building HVAC:
 - Installed new air handler with VFD
 - Upgraded to new VAV boxes
 - Replaced aging condensers with efficient two stage units

Continued energy efficiency projects



- Updated interior lighting
- Operated high demand equipment during off peak times
- Allowed SCADA system energy use monitoring at WWTF and pump stations

Burlington takeaway

- How was energy efficiency achieved?
 - Assistance from Focus on Energy
 - Staff persistence
 - Precise process and power monitoring
 - Consideration of projects or modifications of all sizes
- Change in KPI
 - 2001 – 2,063 kWh/MG
 - 2019 – 1,445 kWh/MG

Becoming energy efficient

How do I become energy efficient?

- Baseline your energy use
- Review the **Top 25 Low Cost – No Cost Saving Opportunities** handout
- Identify easy-to-implement energy-efficient opportunities
- Meet with your Energy Advisor to discuss opportunities
- Develop an energy efficiency plan
- Regularly update your energy efficiency plan as projects are implemented and new opportunities are identified

Baseline energy use

- Presently, most Wisconsin wastewater treatment facilities have this information in their CMAR document



Image courtesy enelx



FOCUS ON WASTEWATER

TOP 25 LOW COST - NO COST SAVING OPPORTUNITIES

- 1 Meet with your electric supplier to evaluate your current rate schedule and identify the most efficient rate for your facility.
- 2 Demand Management - Contact your electric supplier to review your energy rate schedule and identify on-peak hours.
 - Review your operations during on-peak hours to identify idle operation of non-essential equipment.
 - Determine if a portion of your treatment process(es) can be adjusted to operate during off-peak hours.

Examples Include:

 - Operate thickening or dewatering equipment during off-peak hours.
 - Shift recycling of supernatant to off-peak hours.
 - Load digesters during off-peak hours.
 - Operate mixers or aerators in aerobic digesters during off-peak hours.
 - Accept or treat hauled-in wastes during off-peak hours. Utilize storage, if applicable.
 - Shift filter backwash cycles to off-peak hours.
 - Bump diffusers to off-peak hours or not at all, if practical.
 - Test repaired equipment during off-peak hours.
 - Change lead-lag equipment operation during off-peak hours.
 - Do not mix solids holding tanks during on-peak hours.
- 3 Maintain pumps and blowers; inspect, lubricate, and replace seals and bearings; check belt tension and alignment and adjust for optimal operation per manufacturers recommendations.
- 4 Turn off aerobic digester blower periodically or operate intermittently (i.e. 2 hours on / 4 hours off; repeat).
- 5 Modify the dissolved oxygen (DO) level in the aeration tank(s).
- 6 Operate select aeration tanks as needed.
- 7 Change intake filters for aeration blowers regularly to provide minimum resistance for intake air.
- 8 Identify, assess and repair aeration system air main leaks.
- 9 Identify and repair compressed air leaks.
- 10 Identify equipment speeds and re-sheave blowers to gain efficiencies.

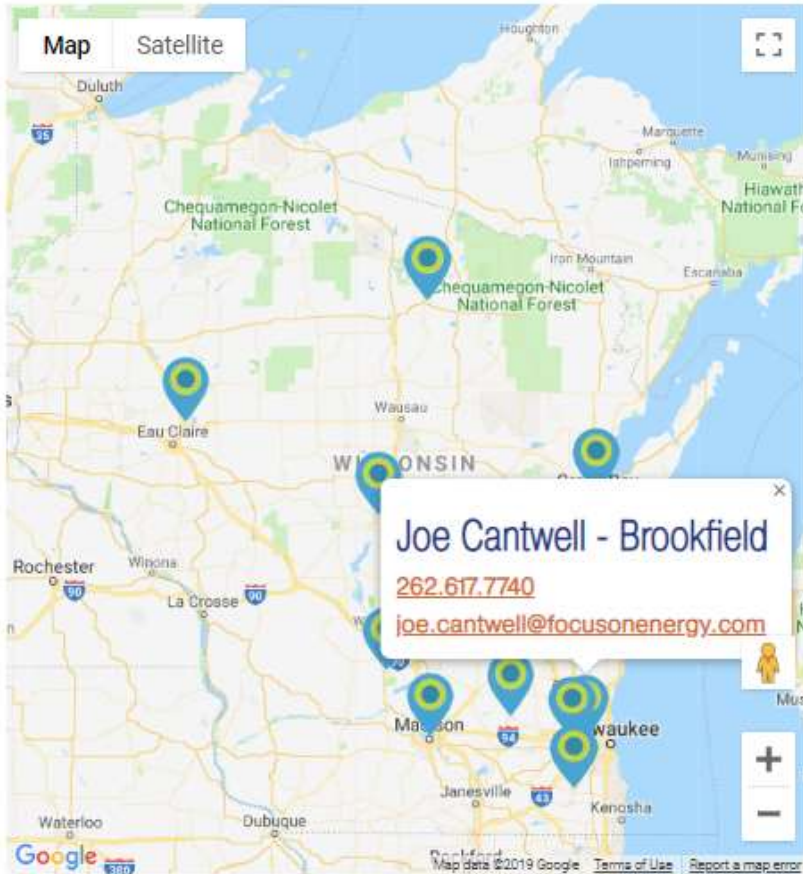
- 11 Turn off unnecessary lighting and install occupancy sensors.
- 12 Idle aeration basins or zones seasonally, if not needed.
- 13 Adjust system operations when there is a change in wastewater load.
- 14 Raise wet well levels to reduce static head in the pump system.
- 15 Lower aeration tank levels to reduce air header static pressure.
- 16 Shift nightly low flow periods or seasonal low flow periods to smaller HP pumps / blowers, if applicable.
- 17 Operate minimum number of UV lamps as possible while still meeting disinfection needs if applicable.
- 18 Regularly clean UV lamp sleeves to improve transfer efficiency.
- 19 Test and calibrate / replace DO sensors if needed.
- 20 Identify the best location to install DO probes in the aeration tanks.
- 21 Install programmable thermostats and utilize night set back / set up settings.
- 22 Assess the potential for organics removal prior to entering the secondary treatment system. Assess the capability for high organic dischargers to feed loadings directly to a digester.
- 23 Review your operations to identify if any pumps or blowers are being throttled. If throttled pumps and blowers are identified, review to determine if they can be unthrottled to operate more efficiently.
- 24 Idle any unnecessary equipment.
- 25 Review Focus on Energy's Water and Wastewater Energy Efficiency Best Practices Guide. This updated guide outlines the basic steps in building an energy management program, as well as providing detailed information on water, wastewater, building efficiency, and general best practices.

Review Low-Cost/No-Cost Saving Opportunities

Visit focusonenergy.com/wwfacilities to download a copy

Energy Advisor Map

Focus on Energy Advisors are here to help guide you through your next energy efficiency project. Not sure if your project qualifies, what paperwork you'll need or you have the right equipment? We can help. Select the program below first and then the area you are located to find your advisor. Not sure which program is right for you? [Provide us with some information](#) on who you are and we'll have the right advisor give you a call or email within two business days.



[Energy Advisor Options](#) ▼

- [Agriculture, Schools, and Government Program](#)
- [Small Business and Business Incentive Program Commercial Customer](#)
- [Small Business and Business Incentive Program Industrial Customer](#)
- [Small Business and Business Incentive Program Trade Ally](#)
- [Home Performance Heating & Cooling Improvements](#)
- [Home Performance Program Whole Home Improvements](#)
- [Large Energy Users](#)
- [Multifamily Energy Savings Program](#)
- [Design Assistance](#)
- [Renewable - Residential & Business](#)

Meet with your Energy Advisor

Visit focusonenergy.com/ea-map

Develop an energy efficiency plan

- Become aware of your energy use
- Provide education in energy efficiency
- Gather data
- Analyze data
- Interpret what the data telling is you
- Create a plan
- Implement the plan
- Identify a timetable to continually review and update the plan

Working with less energy



Focus on Energy assistance

Prescriptive incentives

- Specific dollar amounts for completing a qualifying energy efficiency measure
- Direct one-for-one replacement for commonly installed equipment
- Technology requirements and incentive amounts are found in the catalogs
- Visit focusonenergy.com/applications for most current incentive application
- Customer has 60 days after project installation to submit application and invoice(s)

Custom incentives

- Based on estimated first-year energy savings associated with a project/ technology
- Customers must receive pre-approval by working with a an Energy Advisor prior to purchasing equipment
- Customer signs project completion notice and provides invoices once the project is complete

2019 Custom Incentives

- Custom Incentives
 - \$0.04 per kWh saved
 - \$100 per peak kW reduced
 - \$0.80 per Therm saved (additional \$0.20 bonus for 2019)
 - Projects limited to a 1.5-10 year payback window based on energy savings
 - Incentive is limited to 50% of the estimated project cost



Maximize the Focus on the Energy Program

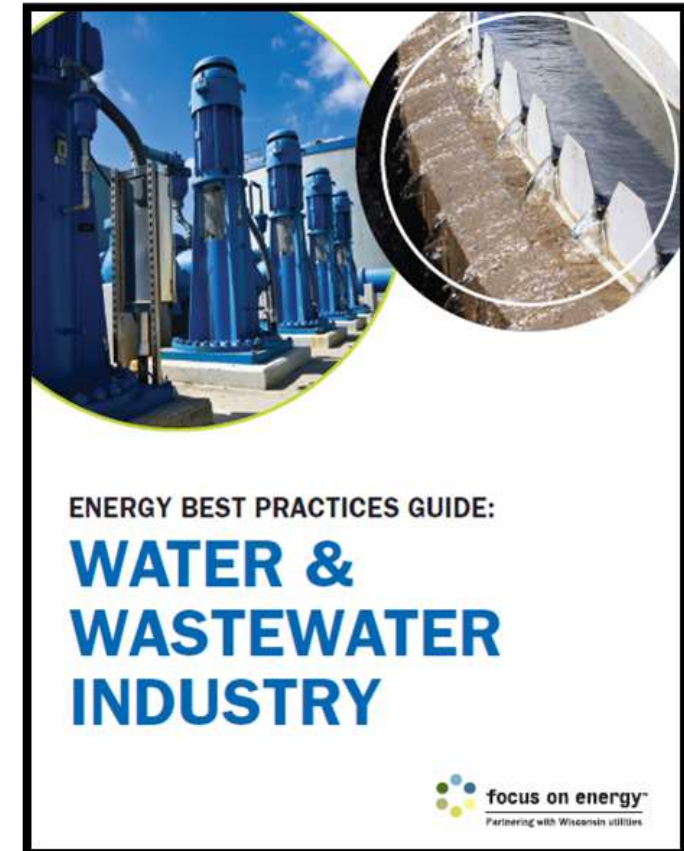


- Start talking with your Energy Advisor while in the planning phase of your project
- Invite your Energy Advisor to upcoming project planning meetings
- Include Focus on Energy language in your RFP to ensure your Trade Ally contractors use qualifying energy efficient equipment



Energy best practices guide

- Outlines the basic steps in building an energy management program
- Provides general best practices and recommendations
- Visit focusonenergy.com/guidebooks to download your FREE copy today!



Questions



Contact us



Call: 888.947.7828

Visit: www.focusonenergy.com/wwfacilities

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