



Department of
**Environment &
Conservation**

Energy-Water Nexus

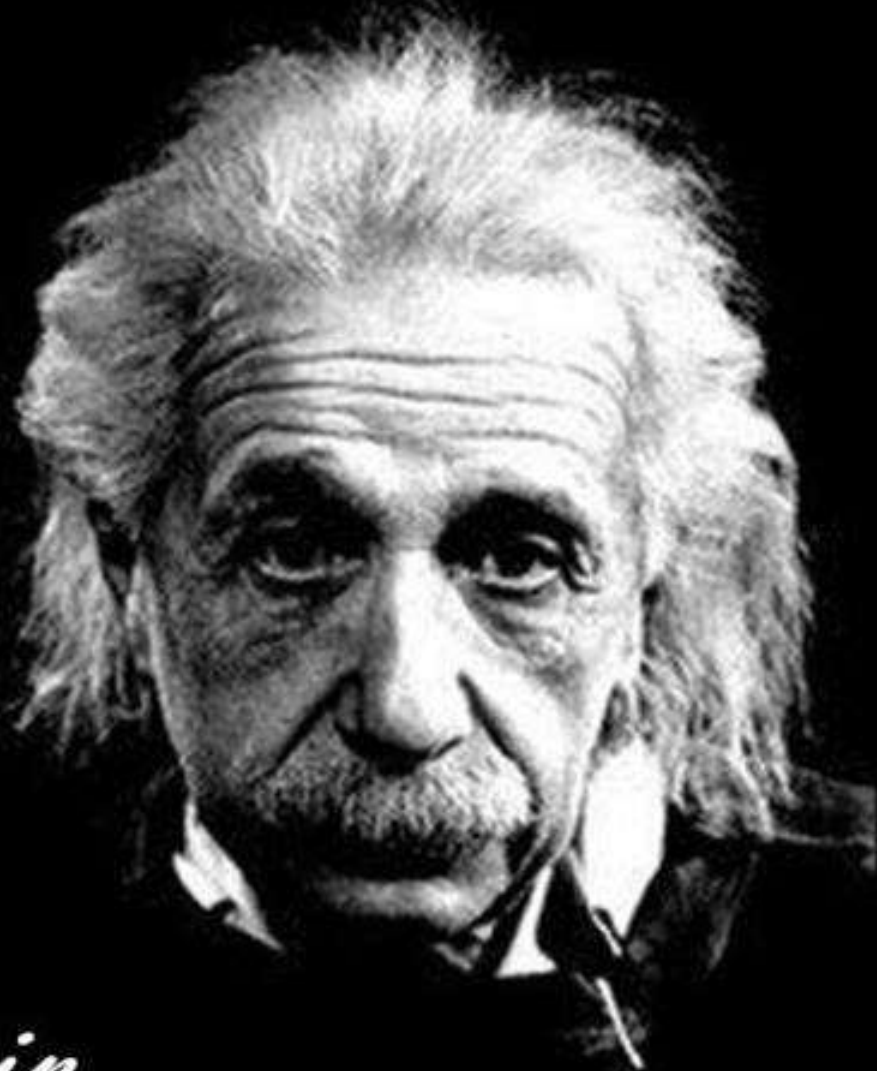
Ben Bolton, Energy Programs Administrator

September 2018



WE CANNOT SOLVE
OUR PROBLEMS WITH
THE SAME THINKING
WE USED WHEN
WE CREATED THEM

~ Albert Einstein



Energy Efficiency Partnership



Region 4



Process

- EPA Region 4 prioritizes wastewater systems based on submitted water quality data.
- Project team meets in person and creates list of candidates to invite to participate.
- Team checks with environmental field inspectors and Comptroller's Office for issues and referrals.
- Deputy Commissioner sends letter to inviting the Mayor and copies operators to participate.
- Team performs energy assessment site visits.
- 2 to 3 Technical Workshops with free CEUs
- Provide implementation and tracking support



TN Water & Wastewater Energy Efficiency

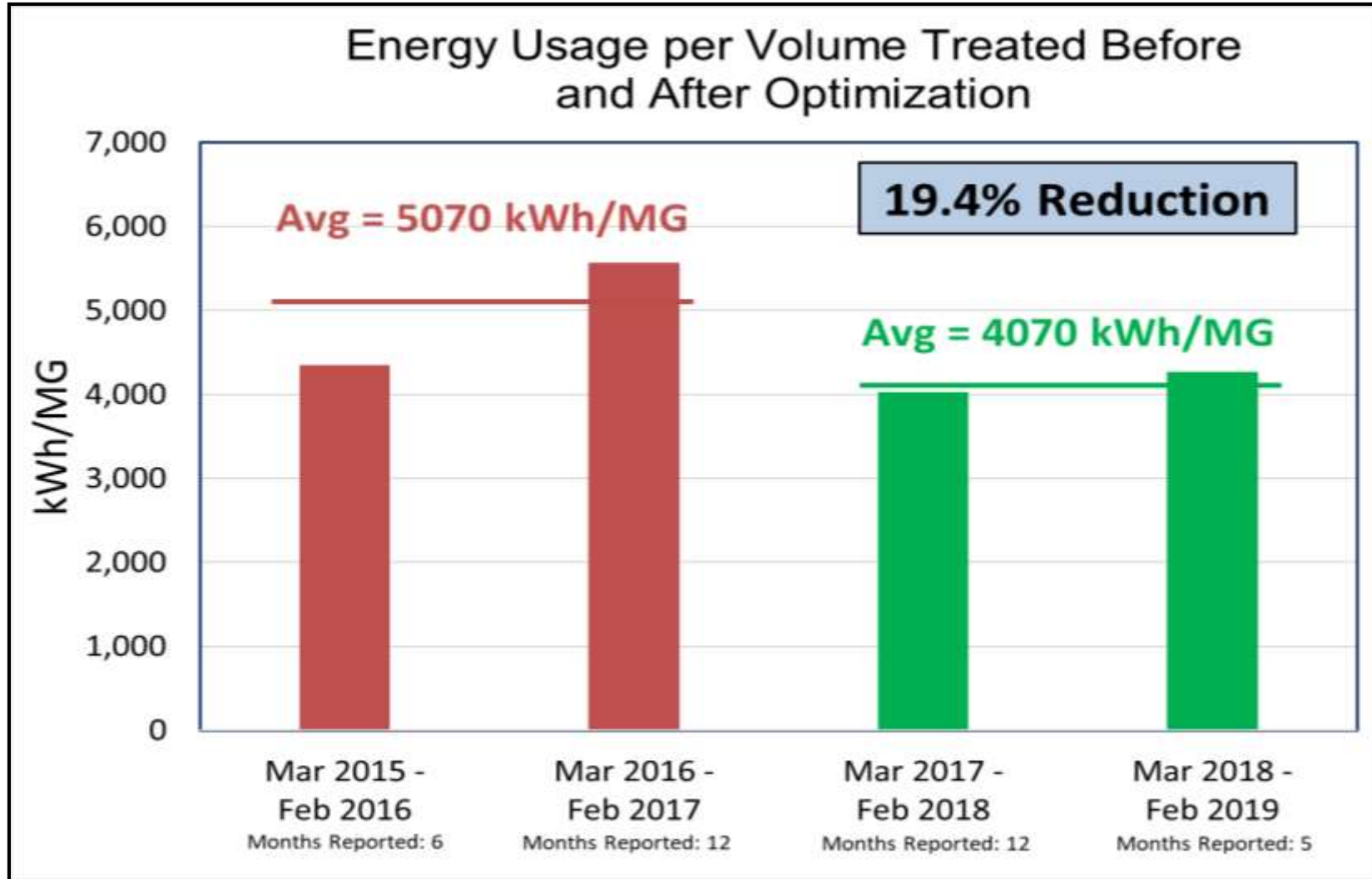
- 24 Water and Wastewater Facilities assessed in TN and AL in 2 years.
- For wastewater facilities implementing TDECs low-to-no-cost recommendations:
 - Average 19% reduction in annual energy costs
 - Average 40% reduction in average nutrient discharge
- *Identified* savings since 2016 (verification underway):
 - \$390,468 annual cost savings
 - 4,358,200 kWh/year savings
 - 95 tons per year nutrient reduction

Carthage Wastewater Treatment Plant



Carthage Wastewater Treatment Plant

Measured Energy Savings in Carthage



kWh/MG = kilowatt-hours per million gallons of water treated

Site Visits, Workshops, & Tweets



Dept. of Environment @TNEEnvironment 15 Dec 2016
Ben Bolton with the Office of Energy Programs spoke about Wastewater Systems Energy Efficiency Projects at the TREEDC Conference today!



← ↻ ❤️ 1 ⋮



Leveraged Resources – DOE IACs

- DOE Industrial Assessment Centers
 - Provide engineer professors as speakers
 - IAC Coordinator attended TN workshop
 - Can assess drinking water system pumps
 - Funded graduate student to Wastewater Engineering Professor for biokinetic model into [BioTiger model](#) and training video.
 - Spoke at DOE Better Buildings on initiative
 - <https://energy.gov/eere/amo/industrial-assessment-centers-iacs>



Best Practices

- Develop a partnership using state & federal resources
- Involve State Environmental Agency's Compliance and Enforcement Wastewater staff
- Gather information from:
 - Environmental water staff
 - Environmental field inspectors
 - U.S. EPA Regional Office
 - State Financial Municipal Audit Division
- Involve elected officials and management
- Offer free Continuing Education Units for Workshops



Lessons Learned

- Any size plant can find savings.
- Small investments produce big results.
- Using savings for upgrades motivates staff to find more opportunities
- City hall and treatment plants share responsibility for effective energy management.



Additional Resources Webpage

<https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/programs-projects/programs-and-projects/energy-doe-state-energy-program-competitive-awards/energy-doe-area-2-award-energy-efficiency-wastewater/energy-doe-area-2-additional-resources.html>

- Additional Case Studies

<https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/programs-projects/programs-and-projects/energy-doe-state-energy-program-competitive-awards/energy-doe-area-2-award-energy-efficiency-wastewater/energy-doe-area-2-case-studies.html>

“Next time you drive over a bridge and see clean water, thank a wastewater operator.”



Dr. Larry Moore, P.E.
Professor Emeritus, Civil Engineering
University of Memphis

TN Governor's Environmental Stewardship
Award, Lifetime Achievement, 2018



Questions?



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