



# Utility of the Future (UOTF): From Blueprint to Advocacy

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# UOTF...What Does it Look Like?

Treatment plants become energy self-sufficient or a net energy producer...



# UOTF...What Does it Look Like?

Cities are redesigned...from *below* ground up...to become extensions of the treatment and supply system





# UOTF...What Does it Look Like?

Watershed management is as important as the formal treatment system



# Welcome to the Water Resources Utility of the Future

Motivation	Activity	Innovation
Reduce Cost	Energy Efficiency	• Energy Efficient Equipment & Networks
	Energy Recovery	• Methane & Hydrogen Recovery, Heat Recovery
	Operating Efficiency	• Automation and Smart Operations, Asset Management, Sourcing
Increase Revenue	Water Reuse	• Industrial Cooling, Recharge, Landscape, Golf Course Irrigation
	Materials Recovery	• NH <sub>4</sub> , P Compounds, N Compounds, Metals
	Materials Conversion	• Bioplastics, Pyrolysis Fuel Oil, Algal Biomass, Solid Fuels, Fertilizers
	Biosolids Reuse	• Liquid Fertilizer
	Energy Generation	• Photovoltaics, Wind Turbines
Support Community & Economy	Growth Planning	• Sectoral Expansion, Targeted Upgrades, Managed Package Plants
	Community Partnering	• NPS Controls, Biowaste Conversion To Methane, Green Infrastructure

# UOTF a New Paradigm

Past	Future
Handlers of wastewater	Managers of sustainable resources
Seeking permit compliance	Watershed-scale environmental leaders seeking least-cost, highest return solutions
Engineers designing treatment plants	Regional planners of weather-resilient, green communities
Isolated public service units	Integrated members of economically thriving local communities

# UOTF Legislative Actions

- Fully support public and private enterprises as they make the transition to the UOTF
- Sanction watershed-based solutions to water quality challenges
- Encourage water reuse and conservation where feasible
- Enable full recovery of waste heat and energy

# UOTF Legislative Actions

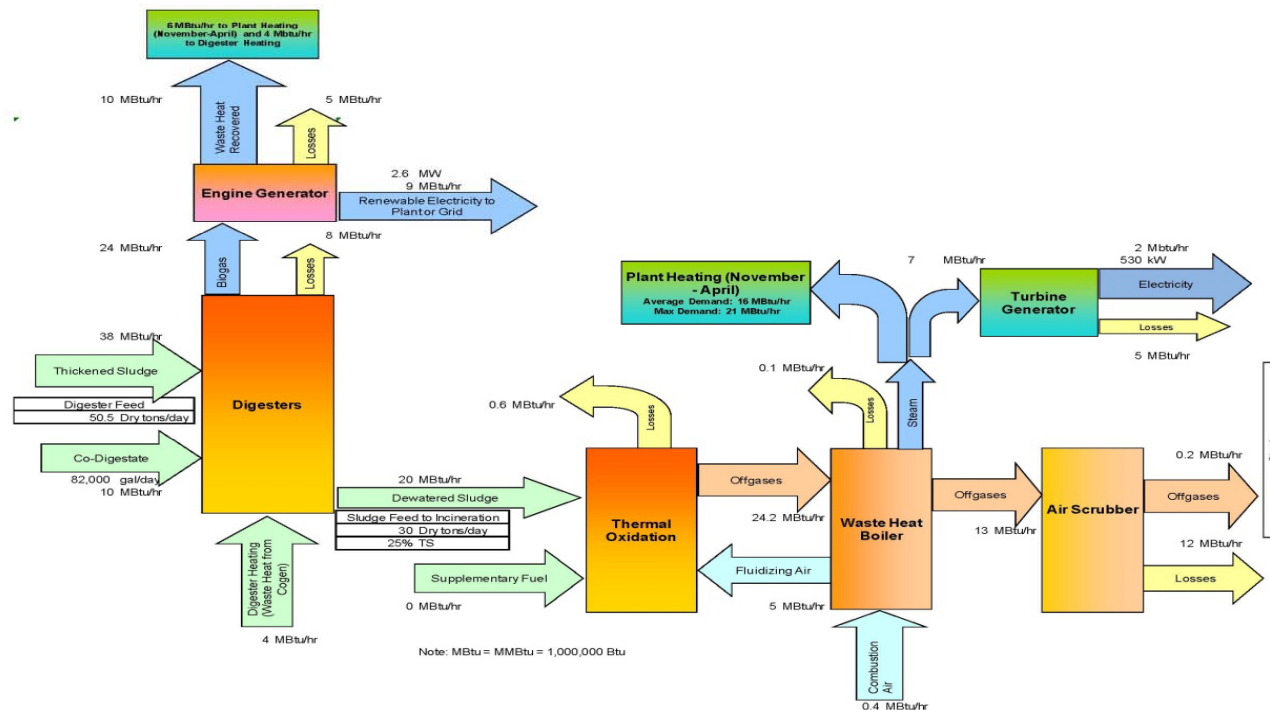
- Create a Congressional UOTF caucus to collaborate with industry and other subject experts
- Create a new national infrastructure resiliency funding program in response to extreme weather events



# UOTF Legislative Actions

- Craft a 21<sup>st</sup> Century Watershed Act that builds on 40 years of Clean Water Act achievements, but embraces UOTF initiatives more fully:
  - Redefine Publicly Owned Treatment Works in a manner that recognizes it as a resource provider
  - Extend permit terms or offer more flexibility for projects that employ resource recovery activities like water recycling
  - Make water reuse an eligible activity to receive federal financial aid

# UOTF are Resource Managers



Green Bay Metropolitan Sewerage District's Resource Recovery and Electrical Energy (R2E2) Project: Energy balance graphic depiction, year 2035 average

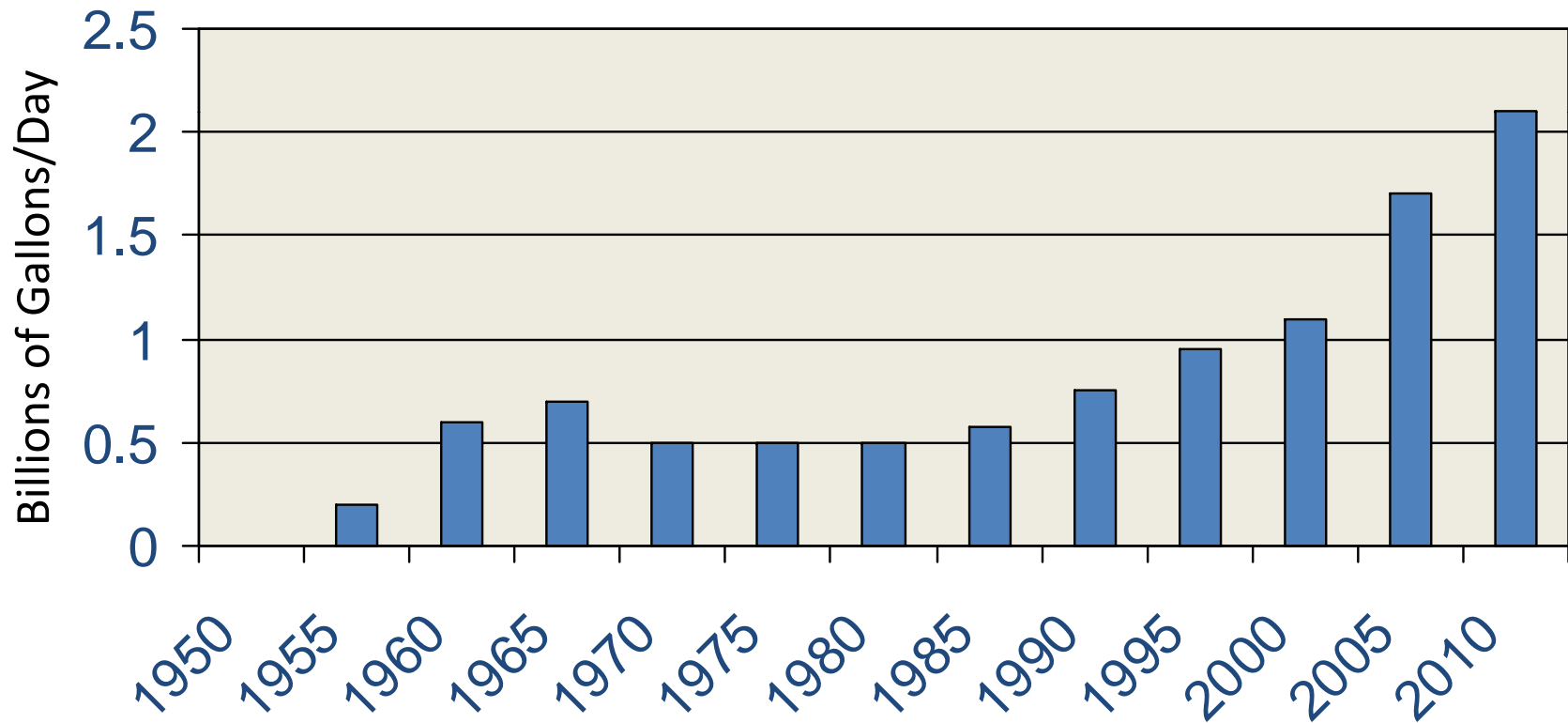
# UOTF Financial and Risk Allocation Actions

- Focus disparate federal programs on UOTF objectives
- Maximize efficient water use and reuse for new government buildings
- Stimulate the pace of technology innovation with a new advanced R&D program for clean water
- Implement pooled risk-sharing strategies and reciprocity for technology approval across all states

# Reuse as a Revenue Generator

*About 6% of total municipal wastewater effluent in the US is reclaimed for landscape irrigation and recharge. Four states -- CA, AZ, TX, and FL -- account for 90% of reclaimed wastewaters.*

## US Wastewater Reuse



*Source: USGS and other sources*

# UOTF Institutional or Programmatic Changes

- Stronger support for green infrastructure to frame a broader conversation about fundamental urban design
- Integrated watershed planning that engages the public, civic leadership, potable water utilities, and infrastructure professionals to make better decisions

# Why the Watershed Matters



*Photo credit: Steve Sello  
April 2011*



# How Bad It Can Get



# Plowing Through Waterways Allows Sediment and Nutrients to Leave Fields



# Desired Conditions



# Adaptive Management Facilitates Watershed Improvements

- Regulatory compliance strategy for point sources
- Partnerships formed in the watershed to balance load reductions by point and nonpoint sources
- Reduce pollutant discharges through the most cost-effective methods
- Point sources are afforded flexibility
- Requires demonstration of eventual compliance with ambient water quality criteria of receiving water

# UOTF Productivity Improvement

- Use process/decision support tools such as Lean, Six Sigma, and sustainability-driven environmental management systems
- Use social media and smart technology to interact with stakeholders and better deliver services
- Standardize operator certification to create a better trained and more mobile workforce

# UOTF Advocacy, R&D, Education, and Outreach

- Key roles for NACWA, WEF, WERF, and EPA
- Support focused, collaborative research
- Advocacy for legislative change
- Advisory services to regulators
- Enhance public information and participation
- Knowledge base platform to detail and update the latest UOTF technologies and practices



# The Industry of the Future

- Managers of valuable resources
- Maximize net benefits (environmental and community) in the form of reduced cost and increased revenue
- Driven by triple bottom line business case analysis
- Develop strong partnerships with external stakeholders and use those partnerships to achieve goals

# New Brand, New Attitude

- Reframe the conversation through branding



# UOTF as a Force for Change

- National in scope
- Subsidiaries everywhere
- Employ millions
- Assets in the trillions
- Invest \$100 billion annually
- Collaborative effort with NACWA, WEF, and WERF

# Bold, Transformative Thinking Required

- Realize most effective solutions often involve others outside the utility's direct control
- A 21<sup>st</sup> Century Watershed Act must be enacted to support these initiatives
- Clean Water Utilities become leaders in the watershed community seeking to deliver maximum environmental benefits at the least cost to society



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