Directions to the Utility of the Future!

Ed McCormick
President, Water Environment Federation
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The Visitor’s Guide to Michigan
WEF’s Mission

As a global water sector leader, our mission is to:

• Connect water professionals
• Enrich the expertise of water professionals
• Increase the awareness of the value and impact of water
• Provide a platform for water sector innovation
Spartans!
Wolverines!
Hornets!
Ty Warner
Gibson Guitars, Kalamazoo!
Huskies!

Michigan Tech
Historical Roles for Wastewater Utilities

- Protector of public health
- Protector of the environment
Resource Recovery
Our World View is Changing!

• "Wastewater treatment plants" are NOT waste disposal facilities

• They are "Water Resource Recovery" facilities that produce clean water, recover nutrients, and generate renewable energy
East Bay Municipal Utility District

• Regional public water and wastewater agency

• SF Bay Area

• 1.3m customers
East Bay Municipal Utility District
Oakland, California, United States

Reinventing the WWTP as a “Green Factory”

- An Emerging Role for WWTPs
  - Produce useful products for society

- Driving Forces
  - Environmental/Sustainability focus
  - Water Scarcity
  - Economic benefits
  - Changing Climate
Resource Recovery

NEW = Nutrients, Energy, Water
A CHANGE IN ATTITUDE
We Reduce Greenhouse Gas Emissions!
Traditional Renewable Energy

Courtesy of Peter Goldberg for Narragansett Bay Commission
Biogas Cogeneration

WASTE → BIOGAS → ELECTRICITY & HEAT
Co-digestion!

**Electrical power & heat**
- Municipal Solids
- High Strength Organic Material

**Clean gas & use as transportation fuel**
Kobe, Japan
Directions to the Water Resource Recovery Utility of the Future!
A WEF/WERF initiative accelerating innovation into practice
Water Resource Recovery
“Green Factory”
Utility of the Future

- Organic Wastes
- Food Waste
- Fats, Oils, and Grease
- Wastewater

Water Resource Recovery Facility

- Renewable Electricity & Heat
- CNG, Biodiesel
- Nutrient Recovery/Fertilizer
- Recycled Water
Effluent is recycled, not discharged!
Global Water
Water Use per Person
California – Severest Drought in 1200 years!
Water Reuse
Treatment plants become net energy producers...nutrient harvesters
Energy Use in Water Sector

Drinking water and wastewater consume:

• 3-4% of U.S. electricity\(^1\)

• 19% of California electricity\(^2\)
  ➢ Includes end use

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1. Electric Power Research Institute (Burton 1996)
2. Energy Down the Drain: The Hidden Costs of California’s Water Supply
Energy Content of Wastewater is 5x Energy Needed for Treatment!

Chemical: 20%
Thermal: 80%

WERF Project ENER1C12a (2014)
**WRRF Energy Use**

![Pie chart showing energy use categories](chart.png)

**Figure 5.2** Typical energy use for an activated sludge secondary facility (SAIC, 2006; WEF, 2009).
THE ENERGY ROADMAP

**Strategic Direction**

- SET GOALS

- Energy Use Over Time:
  - Time: 0, 1, 2, 3
  - Energy Use: 0, 100, 120
  - Legend:
    - Imported Energy
    - Renewable Energy
Organizational Culture

Themes

• Energy Vision
• Energy Team & Champion
• Staff Development and Alignment

“Culture eats strategy for breakfast”
My WEF Board “Mentor”
The Team that connects us
Water Resource Recovery


coming to Washington, DC

June 7-10, 2015
Strass Plant in Austria
Strass Plant Superintendant – Martin Hell
EBMUD’s Green Products

- Renewable Electricity, Heat
- Biodiesel
- Fertilizer
- Recycled Water
WEFTEC – Largest Annual Water Event in the World!
Chicago – September 26-30, 2015
Stormwater Leadership

- WEFTEC Stormwater Congress
- Stormwater Pavilion
- World Water: Stormwater Management
Water Resource Recovery

“Green Factory”
Strategic Partnership
Thank You!

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