2014 National Pretreatment and Pollution Prevention Workshop

Are We Treating Wastewater or Recovering Resources?

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Utility of the Future: Major Paradigm Shift

PAST: collect wastewater, move it quickly downstream, treat it to acceptable standards, and dispose of waste without harming the environment.

FUTURE: manage resources to generate value for the utility and its customers, improve environmental quality at least cost to the community, and contribute to the local economy
Early 1800s – Water Supply Community  
**Need:** Provide reliable water supply  
**Function:** Supply Hydraulics

Late 1800s – Sewered Community  
**Need:** Protect Human Health  
**Function:** Separate Sewerage Schemes

Mid 1900s – Drained Community  
**Need:** Increase Usable Land for Agriculture & Development through increased Flood Protection  
**Function:** Dams, Drainage Systems, Channelization

1970s – Waterways Community  
**Need:** Protection for Environment - Regulation  
**Function:** Point & NP Source Pollution Mgmt

1990s – Water Cycle Community  
**Need:** Address Natural Resource Limitations  
**Function:** Diverse, Fit for Use Supplies, Conservation & Waterways Protection (MFLs)

Future – One Water Community  
**Need:** Integrated Management for Resilient, Sustainable, Engaged Communities
Sustainable Integrated Water Management

**Need:** Reliable, Secure, Diversified Supply where Quality is based upon Use
**Function:** Providing the Right Water for the Right Use

**Need:** Optimize built environment infrastructure
**Function:** Integrate Green Infrastructure and water harvesting into development

**Need:** Recognize agriculture as partner in water management systems.
**Function:** Partner for Co-Generation and Agricultural Reuse Opportunities

**Need:** Protect Human Health and Recover Valuable Resources
**Function:** Use highly treated resource to recover Nutrients, Energy & Water

**Need:** Flexibility in rules & legislation to protect environment & encourage innovation
**Function:** Adaptive Regulatory Programs that recognize site specific needs

**Need:** Take integrated approach to community, economic & water systems.
**Function:** Improve quality of life and business outputs through integrated systems.
From Waste to Wealth – Moving to a Resource Recovery Paradigm

- FOG (Fats, Oils & Greases) → Biofuels, Digestion Enhancements (Energy)
- Phosphorus → Fertilizer
- Urine Separating Toilets → Fertilizer (Nitrogen)
- Dissolved Metals → Usable metals
- High quality water → Potable water offset
- Biosolids → Energy, fertilizer
FOG Lipids to Biofuels
Side Stream Nutrient Recovery Systems & High Quality Water Reclamation
On Site Water Systems including Stormwater & Graywater Harvesting & Urine Separating Toilets
Some other recovery options being discussed:

- Recycling toilet paper for cellulose
- Harvesting casing compounds from pharmaceutical waste for use in veterinary pharmaceuticals
- Recovery of metals using chitin or a biomimicry process using bugs that remove metals out of water systems
Can you imagine how our water system would change:

- If we had self-cleaning fabrics;
- If we used gray water and/or stormwater harvesting in our development process;
- If we were only sending blackwater and sink water to the water reclamation facilities;
- If we were generating energy from our available water reclamation sources;
- If we were able to reclaim our highly treated water for beneficial use;
- If there were no waste?

Would this benefit your community?
Welcome to the “Utility of the Future”

**PAST**

**Motivation:** Collect, Remove, Treat, Dispose Safely

**Activity**
- Water Reuse
- Materials Recovery
- Materials Conversion
- Biosolids Reuse
- Energy Generation

**Innovation**
- Industrial Cooling, Recharge, Landscape, Golf Course Irrigation
- NH₄, P Compounds, N Compounds, Metals
- Bioplastics, Pyrolysis Fuel Oil, Algal Biomass, Solid Fuels, Fertilizers
- Liquid Fertilizer
- Photovoltaics, Wind Turbines

**FUTURE**

**Reduce Cost**

**Activity**
- Energy Efficiency
- Energy Recovery
- Operating Efficiency

**Innovation**
- Energy Efficient Equipment & Networks
- Methane & Hydrogen Recovery, Heat Recovery
- Automation and Smart Operations, Asset Management, Sourcing

**Support Community & Economy**

**Activity**
- Growth Planning
- Green Infrastructure
- Community Partnering

**Innovation**
- Sectoral Expansion, Targeted Upgrades, Managed Package Plants
- NPS Controls, Biowaste Conversion To Methane, Green Infrastructure
Wastewater management roadmap towards 2030

Industrial area

Source: Netherlands 2030 Vision Brochure
Do you agree?

- As our economy changes, different elements of resource recovery will become important in your area.

- There is a chance to improve the economy and improve the environment by looking for opportunities to recover resources.

- Pretreatment departments will be on the front line of these changes/opportunities.
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