

ARPA-E Energy from Wastewater

Breakout Group #2 - Clean Water and Energy from Wastewater: Utility, Federal/State/City Agency and Business Perspectives on Metrics and Requirements

Group 2: Barriers (Infrastructure, codes, permits, and requirements) and incentives needed

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What are some challenges **and solutions** with implementing new technologies into the current wastewater treatment infrastructure? 1 of 3

- Infrastructure
 - Use of water for waste conveyance (non-water methods to convey waste) – need to evaluate (true) life cycle cost
 - Need true LCC analysis, accommodate externalities
 - Moves toward decentralized approaches
 - Water/Power utility interconnection
 - Technology for small flow WWTPs (<1-2 mgd) production and capture of biogas
 - Technology for onsite systems heat recovery / biogas capture
 - Lack of integrated systems solutions (energy, water, infrastructure...)
 - Institutions to support new approaches
 - **INCENTIVIZE FUNDING OF INFRASTRUCTURE PROGRAM**
 - **IMPROVEMENTS TO WATER AND POWER INFRASTRUCTURE**
 - **FOCUS SHORT-TERM EFFORTS BASED ON ENERGY RATES**
 - **LINK DEVELOPMENT TO GREEN JOBS INITIATIVE**
- Legacy environmental regulations
 - EPA procurement models (“or equal” clause)
 - Need for drinking water quality for reuse
 - Punitive vs. incentive-based regulations (\$ per # of discharge)
 - Deployment of projects (local, state, etc. regulators/officials) within SRF framework
 - **ALTERNATE PROCUREMENT APPROACHES**
 - **INCENTIVE-BASED REGULATIONS**

What are some challenges **and solutions** with implementing new technologies into the current wastewater treatment infrastructure? 2 of 3

- Utility Management
 - Power / Water utilities – need to integrate planning & operations; interconnection
 - Risk aversion
 - Need to show true risk-benefit (reuse applications)
 - Political risk, utility manager
 - Engineers / designers
 - True value pricing of water
 - Performance contracts – disincentive to work with smaller utilities (need to aggregate?)
 - **RECRUITMENT OF STAFF WITH A STRATEGY MOTIVE (MORE THAN EXECUTION)**
- Technology and R&D funding
 - Need more federal funding
 - Universities – lack of funding / lack of applied research (U.S. issue)
 - Historical shift from government to private funding
 - Very little venture capital funding
 - **FEDERAL INNOVATION STRATEGY / APPROACH FOR WATER**
 - **FRAMEWORK DOCUMENT TO ADDRESS RESEARCH/TECHNOLOGY NEEDS AND FUNDING METRICS (E.G. 1% OF INVESTED \$)**
 - **INCENTIVIZE FUNDING OF INFRASTRUCTURE PROGRAM**
 - **DEMONSTRATION / PILOT PROGRAM WITH INTEGRATED PROGRAMMATIC APPROACH**

What are some challenges **and solutions** with implementing new technologies into the current wastewater treatment infrastructure? 3 of 3

- Education and communication
 - Perception
 - Wastewater “yuck factor” / public perception
 - Public officials
 - Agency personnel & Operators
 - Engineers / Students
 - It’s a resource, not a waste
 - **INTEGRATE UNIVERSITY-LEVEL / ACADEMICS INTO DESIGN PROCESS**

What are some challenges **and solutions** with implementing new technologies into the current wastewater treatment infrastructure?

- TO ENSURE SUCCESS OF TECHNOLOGIES, BREAKTHROUGH APPROACHES TO SYSTEMS / IMPLEMENTATION NEED TO BE EXPLORED
 - INSTITUTIONAL FRAMEWORK NEEDS TO BE DEVELOPED TO SUPPORT TECHNOLOGY

What codes/permits/requirements apply to the treatment of wastewater?

Could new codes/permits/requirements be written to accommodate new transformational technologies? Which cannot change under any circumstances? Where is the “gray area”?

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- Noted that this is a local issue with impact on local jobs