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

Chair: Sudhir Murthy, DC WASA
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