Water/Energy Nexus: Program Opportunities and Policy Challenges for Wastewater Facilities

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Sanitation Agencies are key partners in meeting state policy goals

- Protecting and enhancing the quality of state waters
- Helping to meet organics diversion goals through co-digestion
- Increasing water recycling & re-use (associated energy load)
- Producing distributed renewable energy
Energy Efficiency and Demand Response

- Wastewater/Sanitation agencies receive incentives from Investor Owned Utilities for EE projects
- “Custom Projects” or Savings by Design
- Improve plant efficiency and lower operating costs
- Increase ability to participate in Demand Response programs (big payback)
Integrated Demand Side Management

- Energy Efficiency, Demand Response and Distributed Generation
- Continuous Energy Improvement and Integrated Demand Side Management
- Understanding energy use = $$$
- Demand Response participation is tied to on-site power generation
- WWTPs can participate more in DR because of ability to self-power
Why Water/ Sanitation Districts for IDSM?

- Large aggregate demand
  - Multiple sites
- Opportunities for diverse efficiency measures
- Good DR performers
- DG and Storage
- Key: SCADA systems
- Conclusion: water districts are “naturals” for integrated DSM solutions

--SoCalEdison
Demand Response Illustrative Example

Pumping load delayed
# Types of Demand Response

<table>
<thead>
<tr>
<th>Utility Type</th>
<th>3rd Party Type</th>
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<tbody>
<tr>
<td><strong>Interruptible</strong></td>
<td><strong>Flexible Solutions</strong></td>
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<tr>
<td>(short notice)</td>
<td><strong>Several Choices</strong></td>
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<tr>
<td>Base Interruptible Program</td>
<td><strong>Participation Based</strong></td>
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<tr>
<td>AP-I (pumping controls)</td>
<td><strong>Payments</strong></td>
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<tr>
<td>(incentives)</td>
<td><strong>Technology Solutions</strong></td>
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<tr>
<td><strong>Price Based</strong></td>
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<tr>
<td>(day ahead)</td>
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<tr>
<td>SAI (Critical Peak Pricing)</td>
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<tr>
<td>Demand Bidding</td>
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<tr>
<td>Real Time Pricing</td>
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<td>(variable rates or credits)</td>
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Northern CA: solid: EBMUD as exemplary facility

Central and Southern CA: Uncertain due to decreased limits on criteria air pollutants from Biogas Powered Engines

Interagency Wastewater Biogas Working Group summit last February
SB 1122 implementation: create a mechanism to sell excess power from wastewater biogas to IOUs

- Creates a 110MW RE-MAT set-aside for power from anaerobic digestion (either wastewater, municipal organics or co-digestion)

RES-BCT: Allows for local govt to self-generate and “wheel” to multiple points of use without penalty.
- Size limit: 5MW of generation capacity per location (not system-wide)
Possible Loss of On-site Generation?

Possible outcome from SCAQMD Rule 1110.2 compliance:

- loss of on-site power = need for power purchase from grid = power constraints during peak periods
- possible rate increases for wastewater customers
- AND potential need for grid improvements to serve large loads at WWTPs
Opportunities for new technologies

- “Clean Burn” engines using H2
- Switch engines to turbines or micro-turbines
- Will these technologies be proven and cost effective in time?

- Switch to producing CNG/LNG for Transportation Fuel: incentive under Low Carbon Fuel Standard
- Certainty?
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