LIFT Scholarship Exchange Experience for Innovation & Technology (SEE IT)
Sponsored by: WRF, WEF, and NACWA

TRIP REPORT

SCHOLARSHIP UTILITIES: Cities of Mesa, Phoenix, and Tempe, Arizona

SCHOLARSHIP UTILITY CONTACT: David McNeil, Environmental Services Manager, City of Tempe, david_mcneil@tempe.gov

ATTENDEES (scholarship):

David McNeil, Environmental Services Manager (Tempe)
Cassandra Mac, Management Assistant (Tempe)
Dennis Porter, Assistant Director, Wastewater (Phoenix)
Patty Kennedy, Deputy Director of Wastewater Engineering (Phoenix)
Tom Sheber, Energy Conservation Coordinator (Mesa)

Additionally, the travel of a number of other Arizona utility professionals was supported directly and solely by their agencies:

Niel Curley, City of Mesa
Scott Bouchie, City of Mesa
Roy Van Leeuwen, City of Mesa
Jesus Mendez, City of Mesa
Steve King, Pima County Wastewater

James Bier of Ameresco, Project Manager for attending Arizona utilities' biogas recovery project at the regional 91st Avenue WWTP, also attended from Portland, OR. In addition to host utility (EBMUD) attendees, Manon Fisher and Autumn Cleave from local utility SFPUC attended the first day workshop.

TRIP DATES: June 17 – June 20, 2018

UTILITIES/SITES VISITED: East Bay Municipal Utilities District (EBMUD), workshop and resource recovery plant/operations; Central Marin Sanitation Agency (CMSA) resource recovery facility; Marin Sanitary Service (MSS) Food 2 Energy processing site; South San Francisco Scavenger site (food waste depackaging & dry AD facility)

TECHNOLOGIES/INNOVATIONS SEEN:

East Bay MUD High Strength Waste (HSW) and organics long-term feedstock security agreements and contracts, codigestion feedstock mixing/blending processes, receiving logistics, pretreatment, feedstock testing, storage, tracking software processes, new (2014) organics receiving area, odor control facilities and equipment, and related challenges and lessons learned; CMSA organic waste receiving facility, presentation on contracts, economics and ROI, biogas production and utilization, partnership agreement with MSS; MSS recycling facility, Food 2 Energy (F2E) organics recovery operation; South San Francisco Scavenger facility - food waste depackaging/slurry production process using in Scott Turbo depackaging equipment, dry AD energy recovery process.

TRIP BACKGROUND and RATIONALE (250 WORDS): *What technology did you select to visit? What is the problem you are trying to address? How did you envision the LIFT SEE IT scholarship trip helping your utility?*

Arizona recipients are assessing practices and technologies for energy recovery by codigestion both at regional and local facilities. Questions remain about feedstock quality, mixing/blending processes, receiving logistics, depackaging technology, testing, storage, tracking software processes, odor control, operational challenges, and economics. Unfavorable energy markets and operational concerns have inhibited codigestion in Arizona. The San Francisco Bay area hosts a number of facilities and technologies, with EBMUD at the core, that provided Arizona travelers with an opportunity to observe and understand a number of pioneering programs and advancements within one accessible geographic area. Additionally, recipients from City of Tempe operate the *Tempe Grease Cooperative*, an innovative FOG recovery cooperative in which host EBMUD expressed interest in understanding as an emerging model for securing codigestion feedstock.

During planning, organizers identified priority site visits within the region. CMSA operates a resource recovery program for codigestion of FOG along with source-separated organics in partnership with MSS. In South San Francisco, Scott Turbo depackaging technology supports recovery and dry anaerobic digestion of organics from local restaurants. EBMUD offers two decades of codigestion experience and lessons learned. Travelers envisioned carrying back lessons and technological advances to best inform codigestion efforts going forward. In particular, attendees are considering organics codigestion at the regional WWTP and the City of Mesa is planning for a food/FOG processing facility and transfer of blended feedstocks to its reclamation facilities for codigestion. Pima County Wastewater (Tucson) also attended, with interest in applying lessons to codigestion at their Tres Rios WRF.

TRIP SUMMARY (1 page max. Please include 10 photos and a 1-2 minute video montage from the trip. The video does not need to be professional, however if you have the means to create a professional video feel free to do so): *Why did you select the specific utility and technology for the visit? Based on your visit, do you think this technology/approach works for your utility? How useful was the trip in your decision making process? What were some of the trip highlights and takeaways?*

EBMUD was selected because they have a long history of organics recovery and codigestion. Additionally, EBMUD was a very accommodating and involved host, because they had interest in the cooperative model of FOG management implemented in Tempe. Once EBMUD was established as the host utility, attendees were also directed to CMSA, which operates a program with similar goals to EBMUD, but with a slightly different structure. The partnership between CMSA and MSS, and the close proximity of their facilities, allowed attendees to observe the entire back end of the food recovery supply chain. The South San Francisco Scavenger facility was visited because it utilizes innovative technology for food waste depackaging and pretreatment, and a unique dry AD process for biogas recovery.

EBMUD provided valuable information that would translate to impacts of regional codigestion in the Phoenix area, including information on program costs, risk, cogeneration through turbines, challenges with feedstock variability, food waste collection and outreach, market challenges associated with food waste security, and cost accounting and analysis. CMSA shared similar information, but their partnership with MSS also provided insight into potential alliances with solid waste agencies, and contamination management at the source through effective outreach. Experiences at both CMSA and EBMUD underscored the challenges of FOG receiving, and the value of risk-reduction through programs like Tempe's FOG cooperative. Technologies and processes observed will help with AZ attendees with the design of facilities that produce low-contaminant feedstocks. Food waste de-packaging equipment produces a pumpable digester feedstock slurry cost-effectively, but pulverized glass and other unwanted debris remains a challenge and may require additional removal technologies. For EBMUD, the co-operative approach to FOG management may have application in the EBMUD service area, and further, may have application to other waste streams such as food waste slurry.

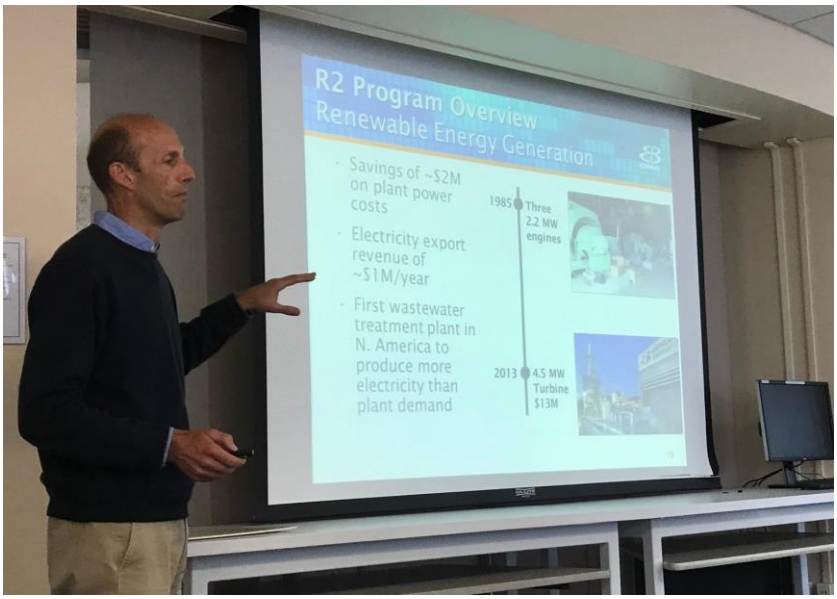
It was helpful to future efforts in AZ to hear successes and challenges directly from facility operators and engineers, and to better understand biogas treatment processes and technologies for various uses. The trip reinforced attendee strategies and decisions to proceed with codigestion of food waste and possibly commingled food and FOG, at local plants and possibly the regional plant. EBMUD experience with REC markets was useful in considering project economics for different end uses. The Tempe FOG co-operative presentations stimulated a lot of thought among the EBMUD staff and they are exploring the possibility of using a similar approach.

Highlights included: 1) the importance of community culture to creating stakeholder buy-in for resource recovery, particularly when R2 can't be justifies with economics alone; 2) that

partnerships and outreach throughout the organics supply chain can make huge differences to the consistency, quality and cleanliness of organics; 3) Cogeneration supports on-site utilization at WWTPs, but energy markets in Arizona and RIN values more likely support on-site CNG, or RNG production and sale; 4) for EBMUD, the FOG co-op structure allows use of the hauler as a quasi-inspector and helps to maintain feedstock quality.

For all participants, there was great value in the contacts made to facilitate inter-utility and inter-region discussion and support as participants evolve their resource recovery programs.

Arizona team @ EBMUD facility



EBMUD R2 Program Manager John Hake shares R2 overview

EBMUD feeds FOG and other organics to digesters

EBMUD tour w/ generator and digester bladder in background

Marin Sanitary Service (MSS) Outreach Coordinator Kim Scheibly answers Attendee Questions

MSS processes clean food waste from area restaurants daily

Seven tons of slurried food waste is delievered from MSS to CMSA
and blended with 10,000 gallons of FOG daily

CMSA Treatment Plant Manager Chris Finton explains codigestion process

Scott Turbo Separator Effectively Separates Organic Slurry from Packaging

Clean biogas from dry AD process provides CNG for South San Francisco Scavenger fleet