REC’s, RIN’s, & Environmental Credit from Biogas Production, Use & Sale

DOE – Sustainable Water Infrastructure of the Future
Sarah A. Deslauriers, PE, ENV SP

January 30, 2019
Federal initiatives & incentives are driving increased production & use of biogas

- DOE Secretary (Rick Perry) announced "grand challenge" in water-energy nexus space – competition seeking to double resources (nitrogen, phosphorus, energy & reuse water) – recovered from municipal wastewater by 2030

- Joint initiative “Winning on Reducing Food Waste” signed Oct 18th by USEPA, FDA, & USDA - acting EPA Administrator Andrew Wheeler stated, "Redirecting excess food to people, animals, or energy production has tremendous economic and social benefits."
States have already implemented waste bans/organics recycling mandates

- Connecticut
- Massachusetts
- Rhode Island
- Vermont
- California
- New Jersey (pending)
- New York City
- Other states and cities developing legislation or regulations
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California climate policy is driving change in biogas (& biosolids) management at WWTPs!

<table>
<thead>
<tr>
<th>Year</th>
<th>Goal/Action</th>
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<tbody>
<tr>
<td>2019</td>
<td>Today</td>
</tr>
<tr>
<td>2020</td>
<td>Statewide GHG reduction to 1990 levels (AB 32)</td>
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<tr>
<td>2025</td>
<td>75% diversion of organic waste from landfills, includes biosolids (SB 1383)</td>
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<tr>
<td>2030</td>
<td>Statewide GHG reduction 40% below 1990 levels (SB 32)</td>
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<tr>
<td>2045</td>
<td>Statewide Carbon Neutrality (Executive Order B-55-18)</td>
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<tr>
<td>2050</td>
<td>Statewide GHG reduction 80% below 1990 levels (State Goal)</td>
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Co-digesting additional organic feedstock increases biogas production
Incentives for production/use of biogas are increasing...

- Renewable Energy Credits
- Self Generation Incentive
- Waste Diversion
- Renewable Fuel Standard
- Low Carbon Fuel Standard
- Alternative and Renewable Fuel and Vehicle Technology
- Pipeline Injection

Onsite Energy

Compressed Natural Gas
Renewable Energy Generation for Tracking & Sale of Renewable Energy Credits (RECs)

Tom Mossinger, PE – Carollo Engineers

Department of Energy’s Sustainable Water Infrastructure of the Future (SWIFt)

January 30, 2019
What Are **Renewable Energy Credits**?

- RECs are a means to track & manage renewable energy generation.
Why Are RECs Important?

• Allows for compliance with renewable portfolio standards
• Supports regulatory compliance
• Substantiates renewable energy generation claims
Renewable Energy Credits (RECs)

- In western US RECs are typically “banked” by WREGIS – Western Renewable Energy Generation Information System
- RECs can be retired, reserved or exported to other tracking systems
- RECs are traded openly on various markets across US
- All renewable power is eligible for participation in the REC market
- Value depends on when, where, and how RECs are generated
- Only electrical energy generated from renewable sources is eligible
• **WREGIS** is an independent, renewable energy tracking system for the region covered by the Western Electricity Coordinating Council (WECC)

• WREGIS tracks renewable energy generation from units registered in the system using verifiable data and creates renewable energy certificates (RECs) for this generation

• WREGIS Certificates can be used to verify compliance with state and provincial regulatory requirements (Renewable Portfolio Standards, for example) and in voluntary market programs
WREGIS Account Set-up Procedure

• Register with [www.wregis.org](http://www.wregis.org)

• Complete and mail Account Registration Packet and application fee to WREGIS
  – $250 for less than 1 MW
  – $850 for 1 MW to 10 MW

• Receive confirmation email

• Register generation units

• Confirm/install gas and power meters meeting WREGIS requirements

• Send verification packet

• Receive final approval from WREGIS
North American REC Markets

Current Certificate Tracking Systems

Sources: Environmental Tracking Network of North America (September 2009)
REC Purchasers

- Power companies often purchase RECs to meet RPS requirements
- Third parties purchase RECs on the open market
- RECs are typically sold by brokers in bundles of 10,000 RECs or more
- Current value per recent discussions with brokers is between $1 and $35 per REC
How Are RECs Generated?

- 1 MWh of renewable power = 1 REC
- Includes environmental and renewable attributes
- Energy sources include:
  - Hydro (sometimes!)
  - Solar
  - Wind
  - Power generated using renewable fuels
    - Biomass (green wastes/trees/saw grass/etc.)
    - Biogas (digester and landfill)
How Do We Track Our RECs?

• Generate renewable power
  – Solar, wind, small hydro and/or digester/landfill gas
• Get “Eligible Renewable Facility” certification with California Energy Commission or equivalent in other states/regions
• Create online account with WREGIS or other regional grid manager
• Track and manage RECs
REC Accounts

- Accounts are set up within the local electricity grids
- Western Electricity Coordinating Council (WECC)
Once Generated and Deposited with WREGIS – Now What?

• Use to meet (mandatory) GHG emission reductions
  – “Retire” RECs to meet mandated GHG reductions
  – “Export” RECs to other compatible tracking systems
  – WTP & WWTP’s are currently not expected to be required to meet mandated reductions
Once Generated and Deposited with WREGIS – Now What?

- **Sell Them!**
  - “Transfer” to other WREGIS account holder
  - “Reserve” to transfer it to non-compatible tracking systems or users
Who is Tracking RECs?

- City of Gresham
  - Solar and engines at WWTP
- LACSD
  - Engines and turbines at landfills and WWTPs
- Monterey Regional Water Pollution Control Agency
  - Solar and engines at WWTP
- Eastern Municipal Water District
  - Solar and fuel cells at WWTP
- Many Others across the US!
How are RECs Sold

• Most purchases are for large blocks (10,000 RECs or more)
• Solicit purchase (RFP)
• Sales typically through brokers
## Frequently Asked Questions on RECs

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>If I sell my RECs does it conflict with GHG reduction credit?</td>
<td>No</td>
</tr>
<tr>
<td>Is there risk to the owner (District, Agency, City)?</td>
<td>Yes and No</td>
</tr>
<tr>
<td>Are other agencies doing this?</td>
<td>Yes</td>
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Questions?
DOE SWIFT UPDATE - JANUARY 30, 2019

LCFS & RFS RINS Update

Greg Kester
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Opportunities Offered by the Wastewater Sector Contributing to State Mandates/Goals

- **Use of existing infrastructure** to accept at least 75% of food waste currently landfilled for anaerobic digestion

- **Increase biogas production** to generate renewable energy, low carbon transportation fuel, and pipeline grade RNG, in turn decreasing fossil fuel based greenhouse gas emissions

- Build healthy soils, sequester carbon, and reduce fossil fuel based inorganic fertilizer use through **land application of biosolids**

- **Develop collaborative partnerships** with private sector
California Low Carbon Fuel Standard (LCFS)

- California Air Resources Board charged with reducing Carbon Intensity (CI) of transportation fuel by 20% by 2030 as part of Global Warming Solutions Act update of 2018

- Developed LCFS as essential cap and trade program in 2010

- Entities unable to meet requirement must purchase credits from those who do meet it

- Sold >5 Million credits in 2016 at average price of $101/MT CO$_2$e, but biomethane from all sources were <7% of them
California Low Carbon Fuel Standard (LCFS)

- 2 pathways were developed by ARB for mesophilic anaerobic digestion at wastewater treatment plants in 2014

- CI of 30 g CO$_2$e/MJ for WWTP treating less than 20 MGD

- CI of 7.9 CO$_2$e/MJ for WWTP treating more than 20 MGD

- Gasoline and Diesel CI are both ~ 96 CO$_2$e/MJ

- Site specific pathways could also be developed and utilized

- Problem due to price uncertainty and volatility, among other issues – pathways remained unused until early 2018
California Low Carbon Fuel Standard (LCFS)

- Regulatory revisions (2018) amended CI reduction levels

- Reduced CI 1.25% annually from a 5% reduction from 2010 levels in 2018 to achieve a 20% reduction by 2030

- This means only a 7.25% reduction required by 2020

- But a more ambitious target of 20% by 2030 (opposed to original proposal of 18%)

- Eliminated pathways for WWTPs and replaced with Simplified Calculator
California Low Carbon Fuel Standard (LCFS)

- Still working to understand calculator and determine CI values

- ARB Staff have been good to work with and are dedicated to wastewater sector participation

- Four CA WWTPs either currently producing transportation fuel or in construction/planning to do so

- At least 10 more plan to do so by 2019

- Currently only proposals in front of ARB are San Antonio, TX and San Mateo, CA
Co-digestion Accelerates Diversion of Organics from Landfills

Opportunity:
- ~150 WWTPs already utilize anaerobic digestion and have excess capacity
  - WWTPs are often located in urban areas near waste generation → shorter haul

Challenges/Needs:
- Must build partnerships with solid waste sector to maximize effective diversion
- Cleanliness of organic waste stream must be assured (whether for co-digestion, digestion, or compost)
- Markets must be assured for both biogas and biosolids
Renewable Fuel Standard - USEPA

- USEPA Revised regulation for RFS in July 2014
- Determined that biogas from sewage sludge digestion is *cellulosic* and thus awarded highest credit value (D3)
- Determined that biogas from landfills and Municipal Solid Waste digester is also cellulosic (D3)
- But WWTPs who co-digest food waste or Fats, Oils, and Grease (FOG) are devalued to advanced biomass fuel (D5) at roughly 1/10\textsuperscript{th} the value
Renewable Fuel Standard - USEPA

- CASA formed a national coalition (CASA, NACWA, WERF, WRF, WEF, & CASA members) which met with EPA in July 2017

- Unable to secure re-interpretation of RINs

- Advanced alternative whereby POTWs would determine volume of biogas produced from sludge only digestion (per loading rate) & receive D3 credit for that volume

- Assume all additional biogas the result of added organic waste & receive D5 credit for that volume
Renewable Fuel Standard - USEPA

- Attempted to formalize the alternative approach in mid-2018

- Informed that EPA had been issued new set of priorities for the next 12-24 months from White House & Administration

- Priorities do not allow consideration of alternatives to apportion different RIN values for biogas

- Therefore, if WWTPs co-digest and produce transportation fuel, the RIN value is for a D5 fuel
Renewable Fuel Standard - USEPA

- EPA recently introduced two initiatives which promote organics diversion from landfills
  
  • Winning with Food Waste
  
  • Joint EPA/DOE Challenge for WWTPs to produce more renewable resources
  
- Also New Source Performance Standards for landfills also encourages diversion of food waste

- Hopeful this will reset priorities and open discussions!
Questions?

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