EBC Connecticut Program:
Connecticut Solid Waste Management Update
Welcome

Dana Huff

Chair, EBC Connecticut Chapter

Vice President, Tighe & Bond
Program Purpose – What You Will Learn

Jeff Martirano

Program Chair and Moderator

Project Manager
HDR Engineering, Inc.

Environmental Business Council of New England
Energy Environment Economy
Legislative Developments Impacting Solid Waste Management

Christopher P. McCormack

Member

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Environmental Business Council of New England
Energy Environment Economy
Significant Environmental Legislative Developments

- **PA 19-75: Transfer Act Amendments**
- **Resiliency/Climate Change/Green Power**
  - PA 19-35: “Green Economy” (mostly renewable power and related)
  - PA 19-71: Offshore wind procurement
  - PA 19-77: Municipal climate change and coastal resiliency reserves
- **State Water Plan**
  - Adopted by Joint Resolution 171
Significant Environmental Non-Legislative Developments

- **Proposed Site Remediation Regulations**
  - Remediation Standard Regulations: "Wave 2" amendments
  - Environmental Use Restriction: new regulations

- **PFAS Task Force**
  - Draft PFAS Action Plan (October 1, 2019)
  - DEEP testing near MIRA landfills
Solid Waste Proposed Bills

- **Nuisance Waste Proposals Nos. 1 to ∞**
  - Single-use plastic bags (ban; tax)
  - Nip bottles (ban; add to bottle bill)
  - Wine and sports drink bottles (add to bottle bill)
  - Styrofoam containers and trays (ban; passed Senate)
  - Plastic straws and stirrers (ban)
  - Helium balloons (ban)

- **SB 229 (ban styrofoam trays in schools):** passed Senate

- **And the winner is …**
Solid Waste Proposed Bills

- **PA 19-117 (budget bill) §355: Plastic Bags – Tax, then Ban**
  - “Nonreusable” = < 4 mils
  - As of 8/1/19: 10¢ fee remitted to State
  - As of 7/1/21: banned
  - Guidance: Department of Revenue Services
  - Individual municipalities can regulate
Solid Waste Proposed Bills

- **SB 234: Pilot program for curbside collection of food waste to go to anaerobic digesters**
  - Three municipalities
  - Within 20 miles of permitted/operational anaerobic digester
  - Favorably reported out of Environment

- **HB 5584: Investigate “Failure of Hartford Regional Trash-To-Energy Facility”**
  - No action in Environment

- **HB 5402: “Pay As You Throw”**
  - Prohibit DEEP from encouraging municipalities to adopt
  - No action in Environment
**Fracking Waste: PA 19-112**

- “Hydraulic Fracturing” = pumping fluid into subsurface for exploration, development, production or recovery of gas and oil or other subsurface hydrocarbons
- Natural gas and oil extraction activities
- Natural gas and oil waste defined separately
- “Gas waste” includes waste generated in conjunction with underground storage, LPG well storage
Solid Waste Passed Bills

**Fracking Waste: PA 19-112**

- *Existing ban: provisional*, pending adoption of regulations
- *This act: permanently bans* acquiring, storing, treating, transferring, disposing (etc.) natural gas waste, oil waste, waste from hydraulic fracturing, *as well as* introducing natural gas waste or oil waste into any Connecticut solid waste management facility
- Limited authority to approve requests to treat wastes for research purposes
Farm-Based Anaerobic Digesters: PA 19-35, Sections 15-17

- Colocated with animal feeding operation on land used for farming
- Feed stock
  - at least 50% farm-generated organic waste from animal feeding
  - not more than 5% food scraps/processing residuals, unrecyclable paper
- No 22a-208a permit required – annual report to DEEP
- Renewable energy procurement from same
PA 19-82: “An Act Prohibiting the Use of Certain Contracts for the Sale or Lease of Cats and Dogs”
- Sale contingent on paying over time after transfer of possession
- “Rent to own” (lease with option to purchase)
- Victim gets refund and keeps Fluffy
- But not
  - Purebred dog rented for breeding
  - Animals in spectator events, movies, rodeos, racing, polo, etc.
  - Working animals (guide, security, law enforcement, assistance)
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Update on Recycling Markets in Connecticut and New England

Steve Changaris
Manager, Northeast Region
National Waste & Recycling Association

Environmental Business Council of New England
Energy Environment Economy
Fall 2019 Update

Steve Changaris, Northeast Region VP
National Waste and Recycling Association

CT Chapter, Environmental Business Council
Middletown, CT
Size of CT Recycling and Waste Industry

- 6,000 direct jobs
- 19,000 jobs - *cumulative with our industry and related industrial/commercial activity*
- $1.8 billion direct economic impact
- $3.4 billion economic impact - *cumulative with our industry and related industrial/commercial activity*
• CT is consistently rated a top tier – top ten environmentally friendly state

• CT has an excellent solid waste statutory and regulatory framework for recycling with very active public and private industry partners

• CT’s collection and processing system produces quality recyclables for markets

• The costs for recycling services in CT are reasonable and competitive.

• CT should focus on recycling behavior of all generators -- improve education and enforcement
CT IPCs/Material Recovery Facilities

Connecticut
CTs system has produced a 35% diversion rate; with only 17% of designated recyclables in trash

CT should revisit its 60% diversion of MSW from disposal goal

Big City Blues – CTs largest cities are underperforming with diversion and recycling programs
Source: CT DEEP MSW Characterization Report 2015
FOCUS POINT REGARDING RECYCLING TODAY IN CT
“The reports of my death are greatly exaggerated”. Mark Twain

- Recycling is alive and well in recycling CT today
- Disposal of recyclables in CT is prohibited
- Recycling = great environmental benefits
- CT recycling preserves/offsets demand for 1 million tons of disposal; capacity that CT does not have
Markets, Markets, Markets

- China Overview – environmental politics and trade tensions
- Search for New International Markets Continue
- Domestic Markets Respond – relief is coming
- Glass – CT should expand bottle bill; include wine and spirit bottles
- Minimum Content Legislation – CT should consider
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Update on Quantum Biopower
Anaerobic Digestor Facility

Brian Paganini
Vice President & Managing Director
Quantum Biopower
Synonymous with organics diversion, biogas, and integrated solutions for our partners.

Built top domestic team who is leading the way in digester training and performance.

Well sought after team in creating change in New England; laws, programs, mandates, and projects.
COMMERCIAL SCALE FOOD RECYCLING

SOUTHINGTON, CT

Digester Facts
- Anaerobic digester – D/B/O by Quantum Biopower
- Built in 2016; 3 years to develop
- Blend of domestic/European technology
- Carbon negative plant
- Fully closed loop, nothing goes to waste

40,000 Tons
Yearly food waste processing capacity.

10,700 MWh
Annual energy output.

5,080 Tons
Yearly offset of CO2 emissions.

8,000 Tons
Compost and soil amendments.

Operation
- 24/7 – fully automated
- Highly skilled operations team
- Deep academic roots; R&D, testing/verification, and operations
FOOD WASTE DIVERSION

FOOD WASTE WE PROCESS

PRE/POST CONSUMER

PACKAGED WASTE

FATS/OILS/GREASES

DAIRY

BEVERAGE
DIGESTION PROCESS

1. Receiving/Pre-Treatment
2. Anaerobic Digestion
   - Lack of oxygen 128°F
   - Continuous mixing
3. Biogas to CHP
   - 1.2MW & 1MM BTU’s
4. Solid & Liquid Organic Fertilizer
Partners' Sustainability Metrics
Incremental GHG Emissions Reduction

66 MTCE/month
Metric Tons of Carbon Equivalent (MTCE)

22 Tons/Month of Soil Amendments
N/P/K Balance: 5-2.5-1
Every time Quantum recycles a beverage bottle we are generating .0033 kW’s every hour

Sustainability Metrics
Incremental GH Emissions Reduction by recycling CCNNE Materials:

66 MTCE/month
Metric Tons of Carbon Equivalent (MTCE)

22 Tons/Month of Soil Amendments
N/P/K Balance: 5-2.5-1
**Organic Soils**

**Organic Ingredients**
N/P/K, digestate, L&Y Waste, char, soils, etc

**Research & Development**
- Southern CT
- Agronomy lab
- Establish product blends
- Measure nutrients
- Design quality control

**Production Creation**
- Pelletization
- Nutrient quality
- Grow ability / Agronomics

**Sales/Marketing**
- Sales to Fertilizer company’s who put their brand on the bag
- Sales to end users who need specialty fertilizer blends
FUTURE OF AD IN NEW ENGLAND

249
Existing biogas Systems in North America

~8,000
Potential biogas systems in North America

THE FUTURE

• Greenfield – areas of high population density
• Collaborations – with existing WtE firms
• The P3 – Responding to the needs of States/Counties
• Renewable Natural Gas
• Fertilizer
Any establishment that generates more than two tons of food waste per week must separate material for donation and arrange for inedible scraps to be taken to an organics recycler within 25 miles.

April 1, 2019

New York passes statewide organics mandate, plastic bag ban
New York City makes 650,000 tons of food waste/year…

... of which a minimal amount is being recycled
THE GAS PROBLEM

Inability to get new gas pipeline in Westchester

Con-Ed said “no more gas” until 2023

Digester gas is being sought by Con-Ed as a recycled form of gas, created from local waste recycling

Eliminates new pipelines being built from Shale/fracking to the County and City.

Con Edison imposes gas moratorium in Westchester County
NY HAS THE INFRASTRUCTURE – WWTP’s

Wastewater Plants

- There are 13 wastewater plans in NYC
- Only one of them creates methane from biosolids and food waste; this methane is upgraded into natural gas and put in the pipeline – Newtown Creek in Brooklyn.
**Circular Economy**

- >500 digesters
- Some of the world's largest and most sophisticated systems
- Concentrated in the North
- Recovering close to 90% of food waste

**Biogas Injection**

- New mandates incentivizing gas from digesters being pumped into the Italian gas grid
- Decarbonized fuel – not produced from fracking or other means
- Renewable Natural Gas – Gas created from recycling
CONNECTICUT is the most dependent State on EfW out of the major EfW state utilizers in the Northeast.

IT'S TIME TO GIVE THE STATE A SOLUTION IT CAN SUPPORT
CONNECTICUT’S STORY

**In the 1980’s**
Connecticut began to scale back landfilling in favor of incineration of waste.

The program was successful and CT has closed all but one landfill in the State.

**Incineration**

**Present Day**
2.5MM tons of garbage/year & 2.5MM tons of incineration capacity.

**Old Infrastructure**
80% of the incinerators in the State are greater than 30 years old – the system is fragile and outdated.
CONVERGENCE OF MATERIALS AND RENEWABLES

THE ECO PARK FUTURE

Tailored Solution
- Project team approach
- A simple message and vision
- Achieves sustainable energy and materials management goals.
- A hub for community, academic, industry engagement for the advancement of recycling and energy processes and technologies

Academia
- Yale School of Forestry
- Uconn School of Engineering
- SCSU Chemistry

State & Local Benefits
- Business positive – pro innovation and development
- Experienced program team solving a generational problem in our surrounding states
- Cross-functional support among legislators, stakeholders, regulators, and the general public

Community
- Redevelopment aspects
- Gateway for growth
- Opportunity for redevelopment of the mill towns and urban areas that have wonderful old building structures.

NUTMEG
RECYCLING AND ENERGY PARK
FUTURE PROJECTS

EFW AND/OR TRANSFER STATION CO-LOCATION

- RESIDENTIAL/DEPACK/OR OTHER

ORGANICS PROCESSING

POST RECYCLED MSW

EFW

POWER CONTRACTS FROM STATES TO REFLECT SIMILAR RECYCLING FACILITY RATES

- ELECTRICITY
- STEAM
- RENEWABLE NATURAL GAS
- HEAT
- PEAK SHAVING/STORAGE

TONNAGE

ORGANICS

MICROGRID

OTHER RENEWABLES AND STORAGE
PROJECT DIRECTION - BIOSOLIDS

BIOSOLIDS & HIGH STRENGTH WASTE
CO-LOCATED AT WWTP or GREENFIELD PROJECTS

- BIOSOLIDS
  - Converted FOG’s (Glycerin & FFA’s)
  - High strength waste – 600,000 mg/dl+ COD

- ORGANICS
  - Pelletized fertilizer products

- CENTRATE
  - Centrate treated at WWTP

- RESIDUALS
  - Pelletized fertilizer products

CO-DIGESTION

RENEWABLE ELECTRICITY

HEAT RECOVERY

RENEWABLE NATURAL GAS
58% - 62% CH4

MICROGRID

ENERGY CONTRACTS FROM PARTNERS TO REFLECT DECARBONIZED METHANE GENERATION
PROJECT DIRECTION – NEW DIGESTERS

NEW MERCHANT PROJECTS

RELIANCE ON PARTNERSHIP PARTICIPATION FOR FOOD WASTE

FOOD WASTE – PROCURED BY STRATEGIC PARTNERS

ORGANICS

DEPACK
RECYCLING
WASTE PURIFICATION
PROCESSES
OTHER MATERIALS RECOVERY

DECARBONIZED METHANE GENERATION

RENEWABLE NATURAL GAS
58% - 62% CH4

RESIDUALS
Food Scraps are Resources, Not Waste

Alexander Williams

Owner & Directors of Operations

Blue Earth Composts, Inc.
Food Scrap Hauling in Connecticut

By Alex Williams, Owner Operator

EBC Conference - October 2019
Who We Are

- Residential, commercial, and event food scrap collection company
- Started with 20 residential customers
- 600+ residential, 100+ commercial, 50+ events/year
- 6.5 million pounds diverted
- 6 employees
Blue Earth Compost

- **Location:**
  - Hartford
- **Services:**
  - Residential
  - Commercial
- **Territory:**
  - Most of CT
- **Disposal facility:**
  - Quantum Biopower, Harvest New England
Peels & Wheels

- **Location:**
  - New Haven

- **Services:**
  - Residential, small-scale commercial, collects everything by bike

- **Territory:**
  - New Haven

- **Disposal facility:**
  - Operates compost site in NH
Curbside Compost

- **Location:**
  - Ridgefield

- **Services:**
  - Residential, commercial

- **Territory:**
  - Western and southern CT

- **Disposal facility:**
  - New England Compost
Secchiaroli Farm

- Location:
  - Waterford
- Services:
  - Commercial
- Territory:
  - Southeastern CT
- Disposal facility:
  - Pig farm
<table>
<thead>
<tr>
<th>Organix</th>
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<tbody>
<tr>
<td><strong>Location:</strong></td>
</tr>
<tr>
<td>○ Illinois</td>
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<tr>
<td><strong>Services:</strong></td>
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<tr>
<td>○ Commercial, primarily from grocery stores</td>
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<tr>
<td><strong>Territory:</strong></td>
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<tr>
<td>○ All of CT</td>
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<tr>
<td><strong>Disposal facility:</strong></td>
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<tr>
<td>○ Pig farms</td>
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Traditional Haulers

- **Location:**
  - Statewide
- **Services:**
  - Commercial
- **Territory:**
  - All of CT
- **Disposal facility:**
  - Pig farms, compost facilities, and Quantum
Residential
Who and How?

- Private companies filling void
- Here’s how programs work:
  - Small bucket
  - Exchange or tip on site
  - Some clean, some don’t
  - Return finished compost to customer
- Responsible, easy to use
- Added cost
Municipal Programs

- **Pros:**
  - Density
  - Impact
  - Lower tip fees
  - Lower MSW volumes

- **Cons:**
  - Another truck on the road
  - Resident buy-in
  - Contamination

- **No municipal programs**
  - Some towns have tested the idea
  - Drop off locations

- Some towns have tested the idea
- Drop off locations
Commercial
Who and How?

- Pre and Post-Consumer
  - Rolling carts
  - Dumpsters
  - Compactors
- Packaged
  - IBC totes
  - Palletized
- Convenient, cost-effective, clean

- Who’s participating:
  - Grocery stores
  - Colleges & Universities
  - Corporate kitchens
  - Retirement facilities
  - Food distributors

- Untapped markets:
  - Restaurants
Challenge

- Processing facilities
  - Only 4 in CT
- Education/Inertia
  - Public awareness
- Cost
  - Initial barrier
- Regulations
  - More stringent
- Municipal programs
  - Untapped resource
Benefits

- Massive environmental benefit
- Needed to meet recycling goals
- Lower cost because of rising tip fees
- Removes stress from aging infrastructure
- Local, tangible way to recycle material
Moving Forward

- More facilities
- Curbside collection a must
- More stringent regulation
Panel Discussion

Moderator: Jeff Martirano, HDR Engineering

Panelists:
- Steve Changaris, NWRA
- Gabrielle Frigon, Connecticut DEEP
- Robert Isner, Connecticut DEEP
- Brian Paganini, Quantum Biopower
- Alexander Williams, Blue Earth Composts