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PANNONE LOPES DEVEREAUX & WEST LLC

counselors at law

Regulatory and Permitting Frameworks for Source Separated Organics to Energy Facilities

Teno A. West, Principal
Steven A. Torres, Partner

Definitions

- **Organic Waste-** organic material including food scraps, food processing residue, vegetative materials, soiled or unrecyclable paper.
- **Anaerobic Digestion (AD)** - a process by which bacteria break down organic materials in an oxygen-free environment, thereby producing certain gasses and solid digestate.

Other Technologies

- **Incineration-** Older means of converting waste into energy by burning.
- **Gasification-** Newer alternative of degrading waste in with a small amount of O2 to produce syngas (an energy source)
- **Pyrolysis-**Newer alternative of degrading waste in the absence of air to produce char, pyrolysis oil and syngas.
- **Thermal depolymerization-** Process of reducing organic material into crude oil
- **Fermentation** (wet and dry)- conversion of waste into Biogas

Around The Horn

Massachusetts Organic Material Ban

Massachusetts Organic Material Ban

- What are "organic materials?"
  - Food or vegetative materials, that can be processed into energy using new technologies
  - Includes:
    - Vegetables
    - Grains
    - Fish and animal products and byproducts
    - Plant material

Massachusetts Organic Material Ban

- Who is Covered?
  - Beginning in October 2014, commercial producers of 1 ton of food/vegetative waste per week.
  - Residential homes are excluded
  - Entities at or above the following sizes are likely subject to the ban:
    - College or University
      - Residential – 730 students
      - Non-residential – 2,750 students
    - Secondary School – 1,600 students
    - Hospital – 80 beds
    - Nursing Home – 160 beds
    - Restaurant – 35 or more full time employees
    - Resort/conference Property – 475 seats
    - Supermarket – 35 or more full time employees

Massachusetts Organic Material Ban

Alternate means of disposal :

1. Reduce the amount of organic waste produced.
   - This will eliminate the need to dispose of that waste altogether.
2. Donate or repurpose food items to:
   - Food banks,
   - Soup kitchens
   - Shelters
3. The remaining organic material must be processed by:
   - Composting,
   - Conversion into animal feed,
   - Anaerobic digestion (AD)

Connecticut Organics Ban

Connecticut Organics Ban

- What is banned?
  - Depositing "source separated organic materials" for regular disposal at landfill.
- What are "source separated organic materials?
  - "Organic material, including, but not limited to, food scraps, food processing residue and soiled or unrecyclable paper"

Connecticut Organics Ban

- To Whom does the ban apply?
  - Commercial producers of an average of 104 tons per year or more of organic waste, located within 20 miles of a composting facility including:
    - commercial food, wholesalers or distributors, industrial food manufacturers or processors, supermarkets, resorts or conference centers.
  - Beginning in 2020, this will apply to producers of an average of 52 tons per year or more.

Connecticut Organics Ban

- What is the goal of the legislation?
  - Divert organic waste away from landfills and instead process it at permitted composting facilities within the state.

Vermont Food Waste Ban

Vermont Food Waste Legislation

- What is required?
- 1) Beginning July 1, 2014, mandated recyclables must be separated separate from other solid waste and delivered to a facility maintained and operated for the management and recycling .
- (2) Beginning July 1, 2015, leaf and yard residuals must be separated from other solid waste and delivered a location that manages leaf and yard residuals.
- (3) Beginning July 1, 2017, food residuals must be separated from other solid waste and delivered to a location that manages food residuals.

Vermont Food Waste Legislation

- "Food residuals" include preconsumer and postconsumer food scraps.

- Excludes meat and meat-related products with respect to residuals are composted by a resident on site.

Vermont Food Waste Legislation

- To whom does the food waste ban apply?

Those within 20 miles of a facility that manages food residual and produce more than:

  - 104 tons per year beginning July 1, 2014
  - 52 tons per year beginning July 1, 2015
  - 26 tons per year beginning July 1, 2016,
  - 18 tons per year beginning July 1, 2017,
  - Any person who generates food residuals beginning July 1, 2020

Vermont Food Waste Legislation

- Goals of the legislation:
  - (1) Reduction of the amount generated at the source;
  - (2) Diversion for food consumption by humans;
  - (3) Diversion for agricultural use, including consumption by animals;
  - (4) Composting, land application, and digestion; and
  - (5) Energy recovery.

New York City

New York City

- In December, 2013 New York City passed an organics waste ban, that becomes effective on July 1, 2015.
  - The ban applies to a wide array of retail and commercial producers of food waste.
  - Those affected establishments must deliver organic waste to a composting or anaerobic digestion facility, or to a transfer station that will deliver to such a facility.

San Francisco and Seattle

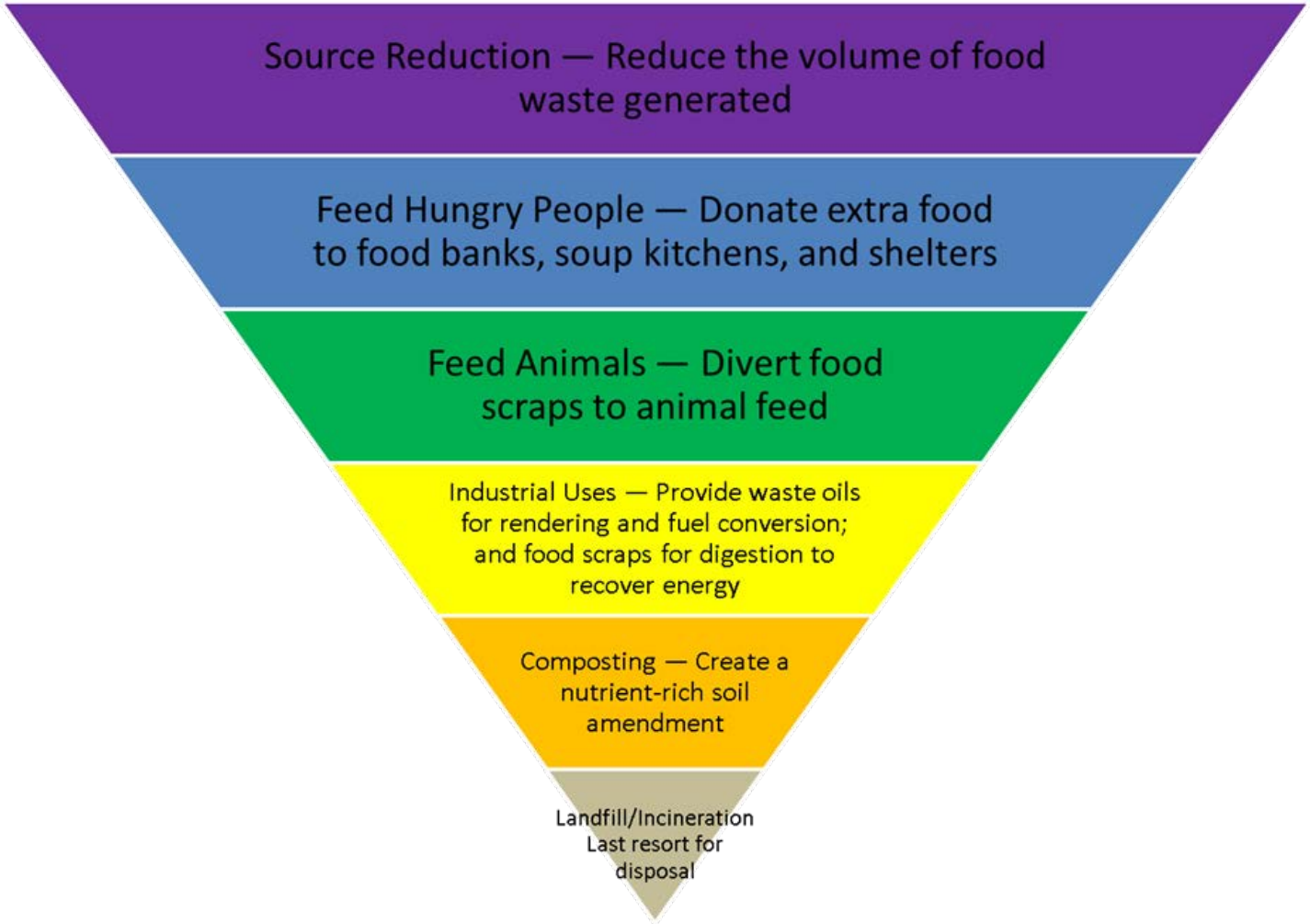
San Francisco and Seattle

- San Francisco is one of the leaders in recycling and food waste legislation.
- In 2009, the city implemented a complete ban on food waste disposal in landfills for all producers.
- The city performs collection of that waste separately from other waste.
- Seattle offers a similar service, although it is at an early stage of implementation.

Recent Projects

- **Alberta, Canada-** an AD facility was expanded and now processes 200 tons/day of municipal source separated organics, food processing wastes and biosolids, and may go as high as 385 tons/day.
- **San Jose, California-** Phase One of a three phase commercial dry fermentation, AD, and composting facility recently opened. Each phase will process 250/tons per day of solid waste, and are anticipated to produce renewable compressed natural gas to be used as vehicle fuel and 30,000 tons/year of finished compost.
- **Orlando, Florida-** Harvest Power "Central Florida Energy Garden." Will process more than 120,000 tons of organic materials annually while producing 5.4 megawatts of combined heat and power

Food Recovery Hierarchy



Siting, Permitting and Regulatory Compliance

Three areas of significant concern:

- Zoning
- Environmental and site assignment
- Emissions – Where applicable

Zoning

- Table of uses
- Definition or exemption for “solid waste processing facility”
  - How are we defined
  - Are we defined
- Zoning as of right
  - Variances (dimensional)
  - Use Variance
  - Special Permit
  - Site Plan Review

Siting, Permitting and Regulatory Compliance

Environmental and Site Assignment

- Wetland and conservation
- Site Assignment for Solid Waste handling Facilities
  - Fatal Flaw Analysis

Application of Site Assignment Criteria

Siting, Permitting and Regulatory Compliance, Air, Emissions and Interconnection

- US EPA air permits for electrical generation facilities (*Got Stacks*)
- Qualified facility or defined utility
- Electrical interconnection agreements
- Net metering or power purchase agreements
  - Public and Private cap
  - Utility pipelines and delays

Summary

- Organics to energy and fuels opportunities are increasing
- Emerging solid waste policies foster development of emerging technologies in waste categories
  - Source separation of separate waste categories
  - Producer responsibility
- Waste bans are on their way for organics
- Broad regulatory frameworks being developed to implement these bans
  - New frameworks for technology and source specific issues
  - Integration with existing federal and state laws regulating waste and emissions
- WHO WANTS TO BE THERE FIRST
- DON'T WORRY, THERE IS PLENTY OF OPPORTUNITY TO GO AROUND