

# Organics Recycling in its Teens Mindset, Methods & Money

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## Presentation to Northeast Recycling Council

CASELLA RESOURCE SOLUTIONS

recycling · collection · organics · energy · bio-fuels · landfills



# Casella Resource Solutions – Since 1973

- Casella Organics
  - Recycling mineral and organic residuals
  - For industrial & municipal customers
  - Using facilities, technologies & selling products &
  - Selling **earthlife**® Products
- CRS Offering Zero Sort traditional recycling &
- Collection, Transportation & Landfill Disposal w/ GTE



**earthlife**®



# Overview

1. Broadening the Concept of “Organics Recycling”
2. Methods & Technologies Emerge for Certain Organics
3. Financing AD & Economic Viability

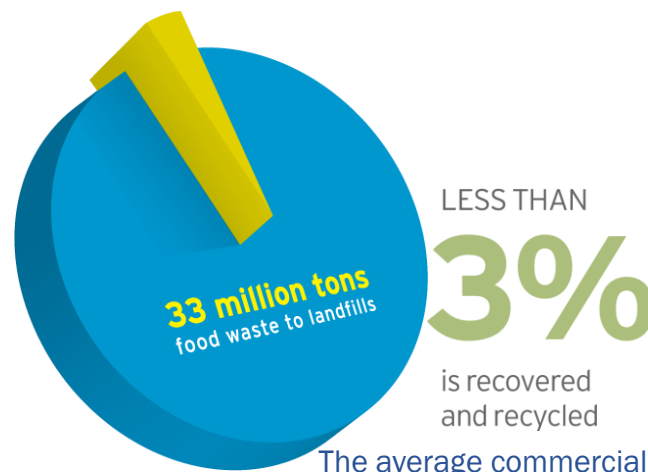
# Re-imagine “Organics Recycling”

Broaden Concept of “Organics Recycling” - Nutrient and Carbon Cycling

Organics is More than the Food Waste (FW) in MSW

Orders of Magnitude of “Organics” Resources Recovery Opportunity

- HUGE – Industrial/Manufacturing Residuals (71:1 - Upstream:MSW)
  - Wood ash, lime byproduct, pulp & paper mill Fiberclay, food processing+
- MODERATE – MSW
  - 15-25% Food Waste
  - 10% Other Organics
  - 40+% Trad. Recyclables
- MODERATE – Biosolids



Graphic by Insinkerator

The average commercial kitchen produces 4,000 lbs. or more of food waste a week. Most of it ends up in landfills.

# Non-Industrial “Organics”

## ESTIMATED ANNUAL TONS

Total Organics - All States  
19,727,736

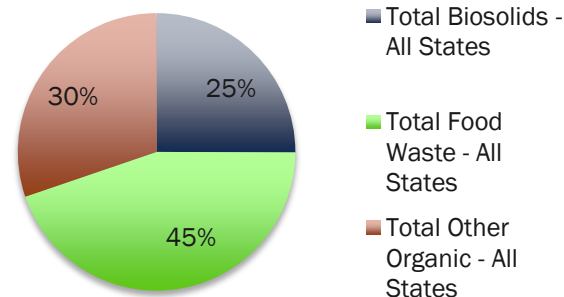
Total Biosolids - All States  
4,944,060

Total Food Waste - All States  
8,819,285

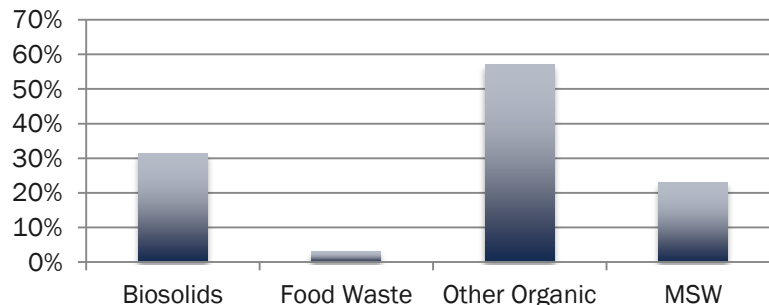
Total Other Organic - All States  
5,964,390

Total MSW - All States  
55,345,139

## New England, NY, & NJ % of Total Organics



## % of Category Recycled New England, NY, NJ



Draft provided by NEBRA

# FW Recycling Methods & Equipment



## Organics Conversion Methods

- Composting,
- Anaerobic Digestion,
- Dehydration
- Direct Farm Fertilization,
- Animal Feed
- Direct Farm Fertilization

## Supporting Technology & Equipment

- Collection
- Pulping
- Cleaning
- Screening
- ORFs & Transfer
- Landfills

# FW Conversion Facilities Proliferate



# Composting



- Hawk Ridge – GICOM
- Open Air Windrow
- ECS Covered Static Pile

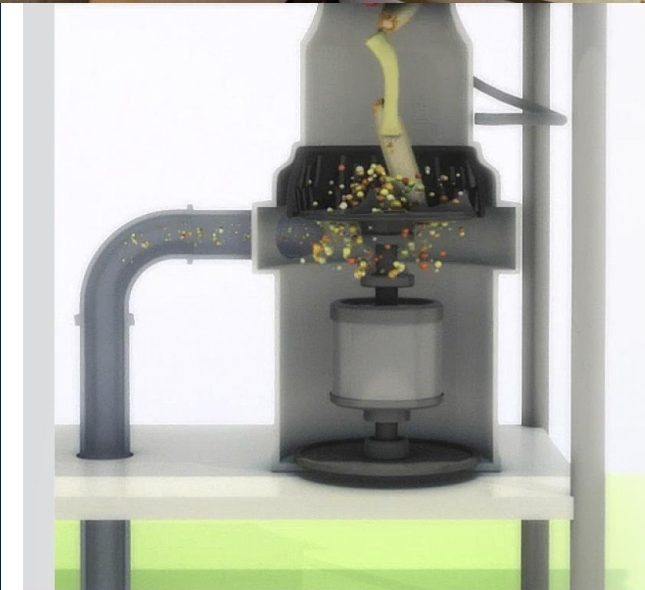
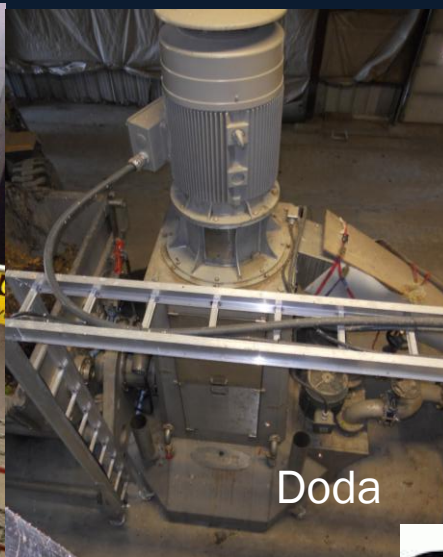




# Anaerobic Digestion



# FW Pulping & Cleaning



# FW On-Site Conversion



## Northeastern University Study

- Dehydration
- Composting
- Enzyme Treatment
- Liquefaction +++

# FW Separation & Collection



# The Role of Landfills

## Juniper Ridge Landfill



Daily & Intermediate Cover



Active Gas Collection



Landfill Liner System

For many organic streams, due to contamination and/or the current status of regional infrastructure, Low Emission Landfill with Gas-To-Energy remain the current highest and best use.

Landfills serve as a needed backup when recycling capacity is down for maintenance or inadequate capacity is on line.



Waste Compaction

# FW Economics - Many Questions

## Unproven Factors and Strategies Impact Economics

- Conversion Method - AD (Dry or Wet), Composting, Land application, Animal Feed...?
- Recipe - Manage alone or with biosolids and/or manure?
- Collection Method – Totes, Blue Bags, Vac Trucks, Bikes?
- Processing – At the Source, Centralized & Transfer, at the Conversion Facility, or none
- Energy Capture – CHP, Clean & Compressed Gas, Combustion, None
- Financing Uncertainties – Incentives, Banks and Investor

# 1 Example: Farm Based AD in MA

## Multiple Revenue Sources

- Net Metering = High Price / kWh >55%
- Feedstock Tip Fees >15%
- Sale of Fertilizer >5%
- RECs & AECs >15%

## Capital Sources

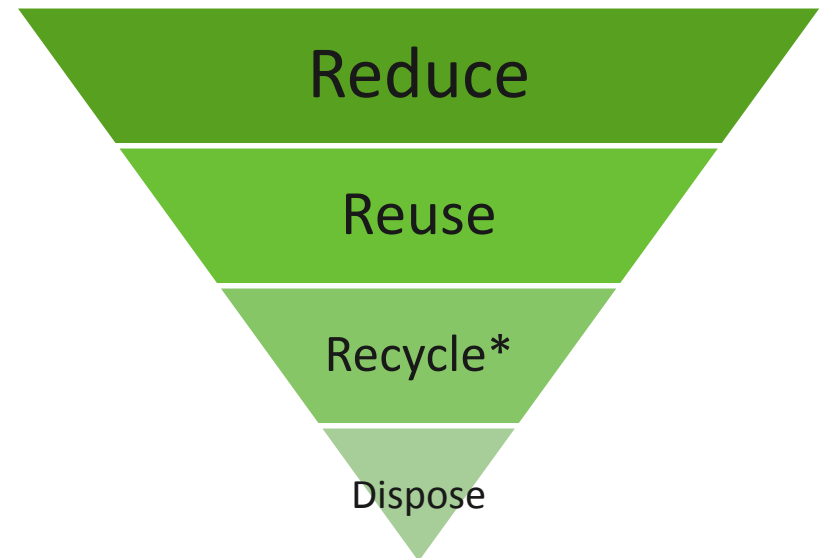
- Investment Tax Credit 25%
- Traditional Bank Loan 11%
- MA Low Interest AD Loan 28%
- MA CEC Grant 3%
- Equity (incl. USDA Grant) 26%
- Revolving Fund 7%

## Returns

- Unlevered 10 Yr IRR after Taxes = 10%; 20 year = 15%

# “Which way did he go?” – Stay the Course

*The field of Organics recycling is dynamic and rapidly changing. There are many developments regionally that point to greater opportunities to capture these materials from the waste stream and recover their value as resources. Let's work together to overcome the challenges and promote them.*



\*both “traditional” recycling and organics recycling





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