Organics Management and Carroll County

Carroll County Environmental Advisory Council (EAC)

Presented:

Regina Cagle Irr, P.E.
15 June 2022

Presented by:

EA Engineering, Science, and Technology, Inc., PBC

AGENDA

A | EA Profile and Background

B | Organics Opportunities in Carroll County

C | Organics Management Examples

- Residential
- Community
- Rural
- County-wide Processing
- CASE STUDY: Howard County Compost Facility

D | Organics Project Development Process

A | EA PROFILE

- Founded in 1973 to provide environmental solutions in support of evolving regulatory frameworks
- Headquartered in Hunt Valley, MD
- 26 offices nationwide
- Over 550 employee-owners
- 100% employee-owned
- Public Benefit Corporation (PBC)

A | OUR EXPERTS

Regina Cagle Irr, P.E.

Environmental Engineer and Project Manager

- 14 years of experience, 12 with EA
- Professional Engineer, Maryland
- Expertise includes environmental engineering and compliance services focusing on solid waste, organics and, zero waste projects.

Mark Gutberlet, P.E., BCEE

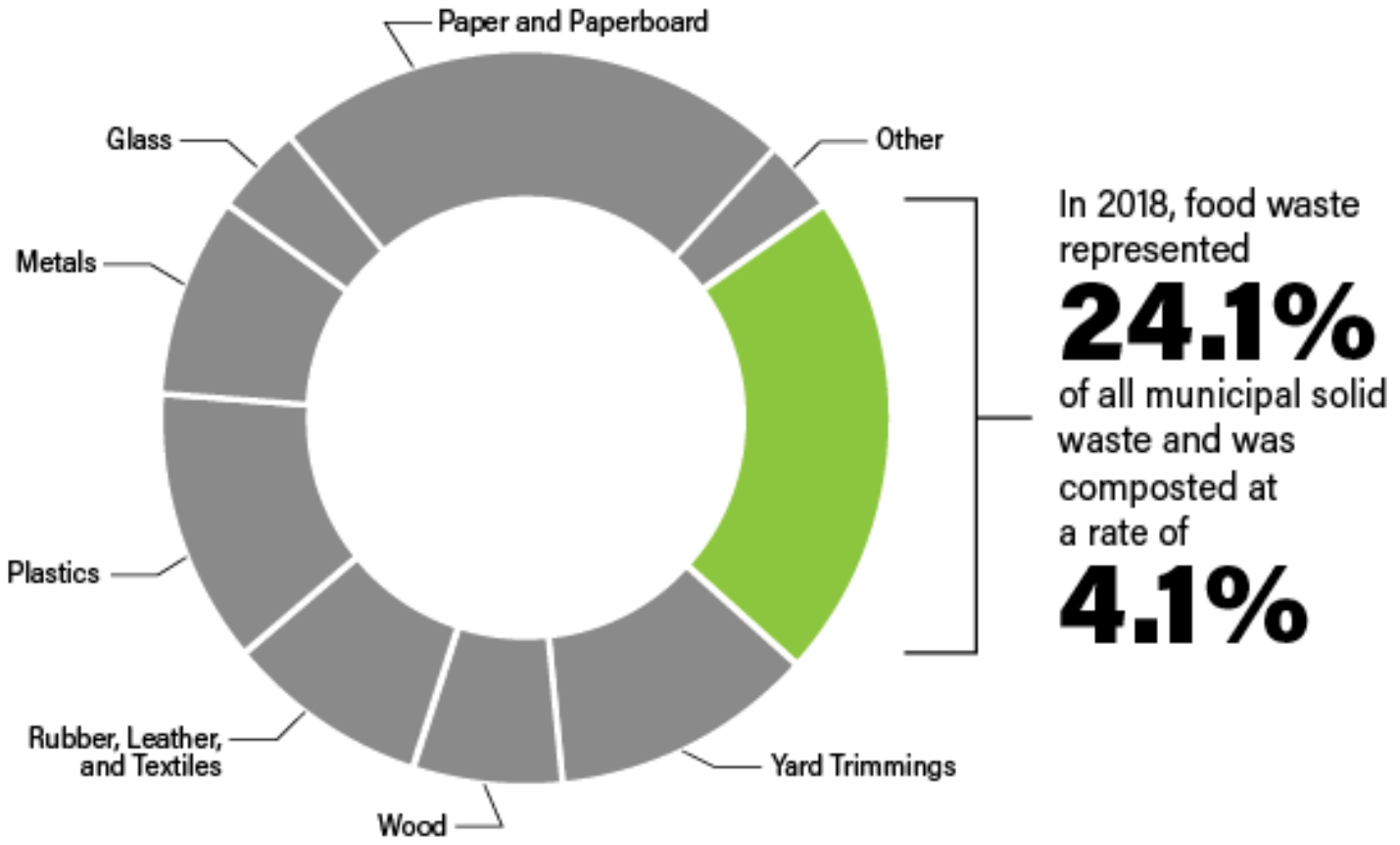
Mid-Atlantic Engineering Practice Leader

- 27 years of experience, all with EA
- Professional Engineer, Maryland
- Leads multi-disciplinary teams in solid waste management, stormwater management, site design, and remediation.

A | EA WORK IN CARROLL COUNTY

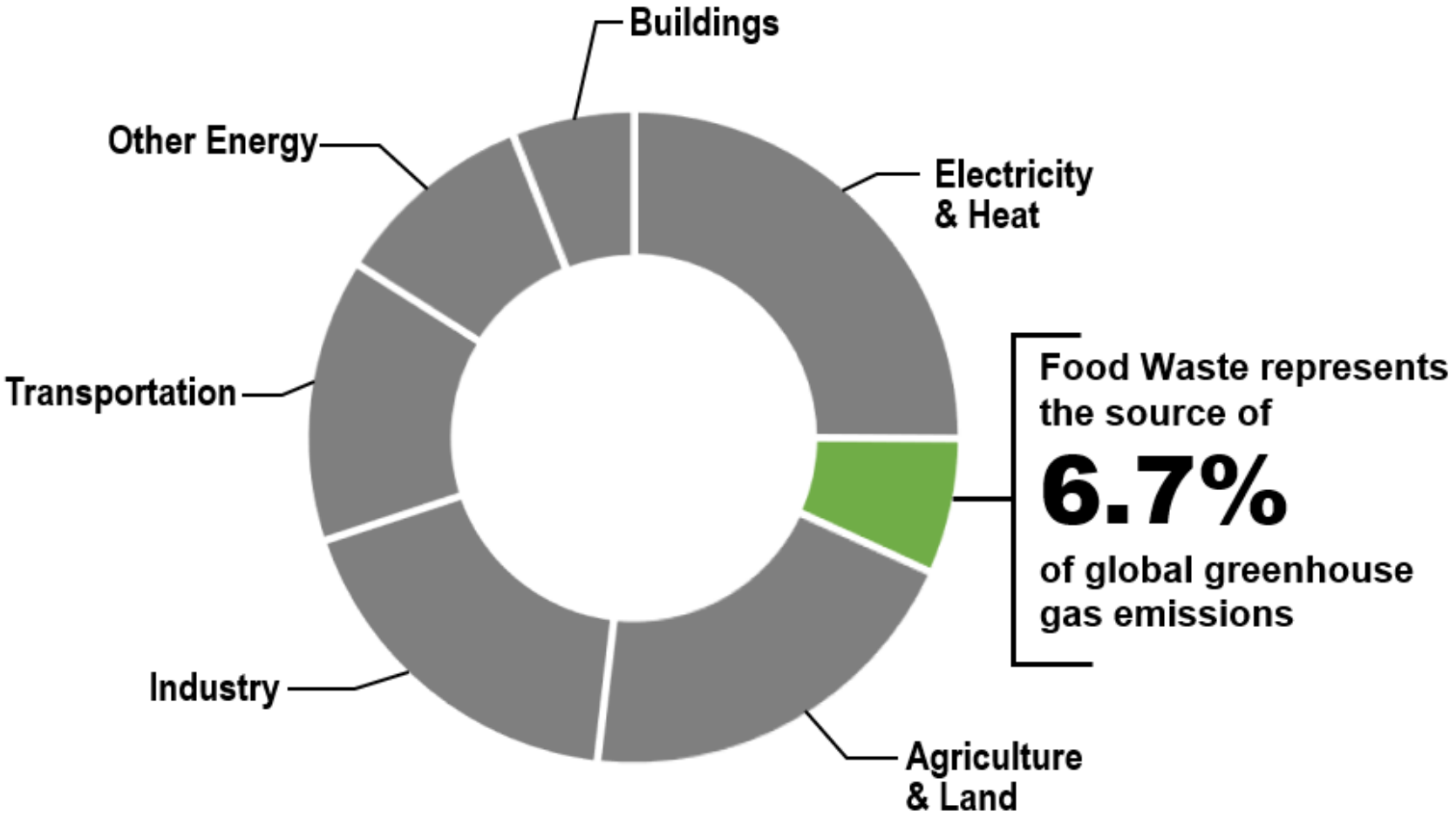
- Northern LFG design and monitoring support
- Bark Hill LF closure design
- Snowden Run pump station upgrade design
- Hampstead WWTP master planning
- Stormwater management facility retrofits
- Asset Management System (AMS) for W/WW systems

B | WHY DO ORGANICS MATTER?



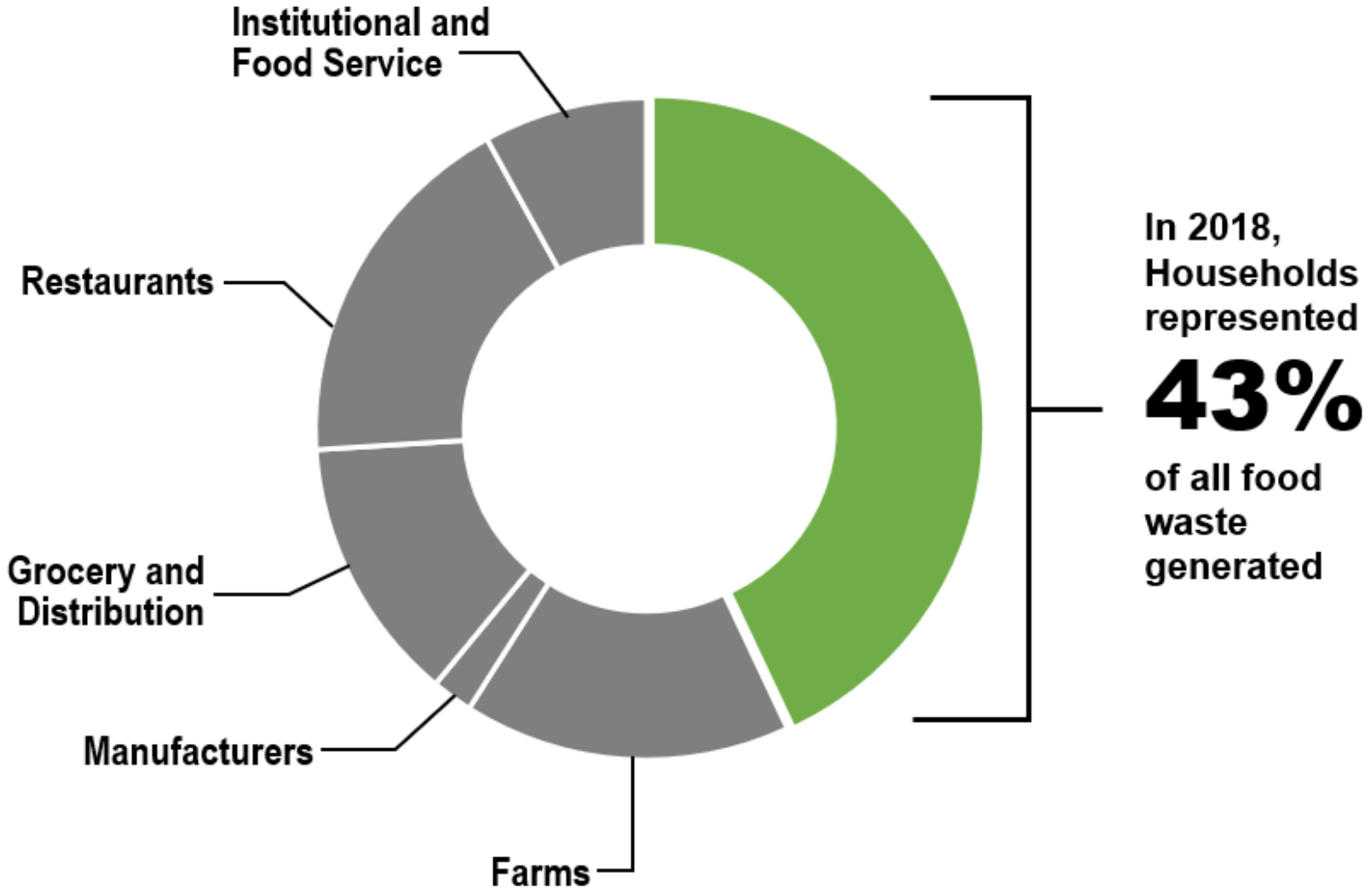
Source: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management

B | ORGANICS AND GHG EMISSIONS



Source: https://www.fao.org/3/i3347e/i3347e.pdf

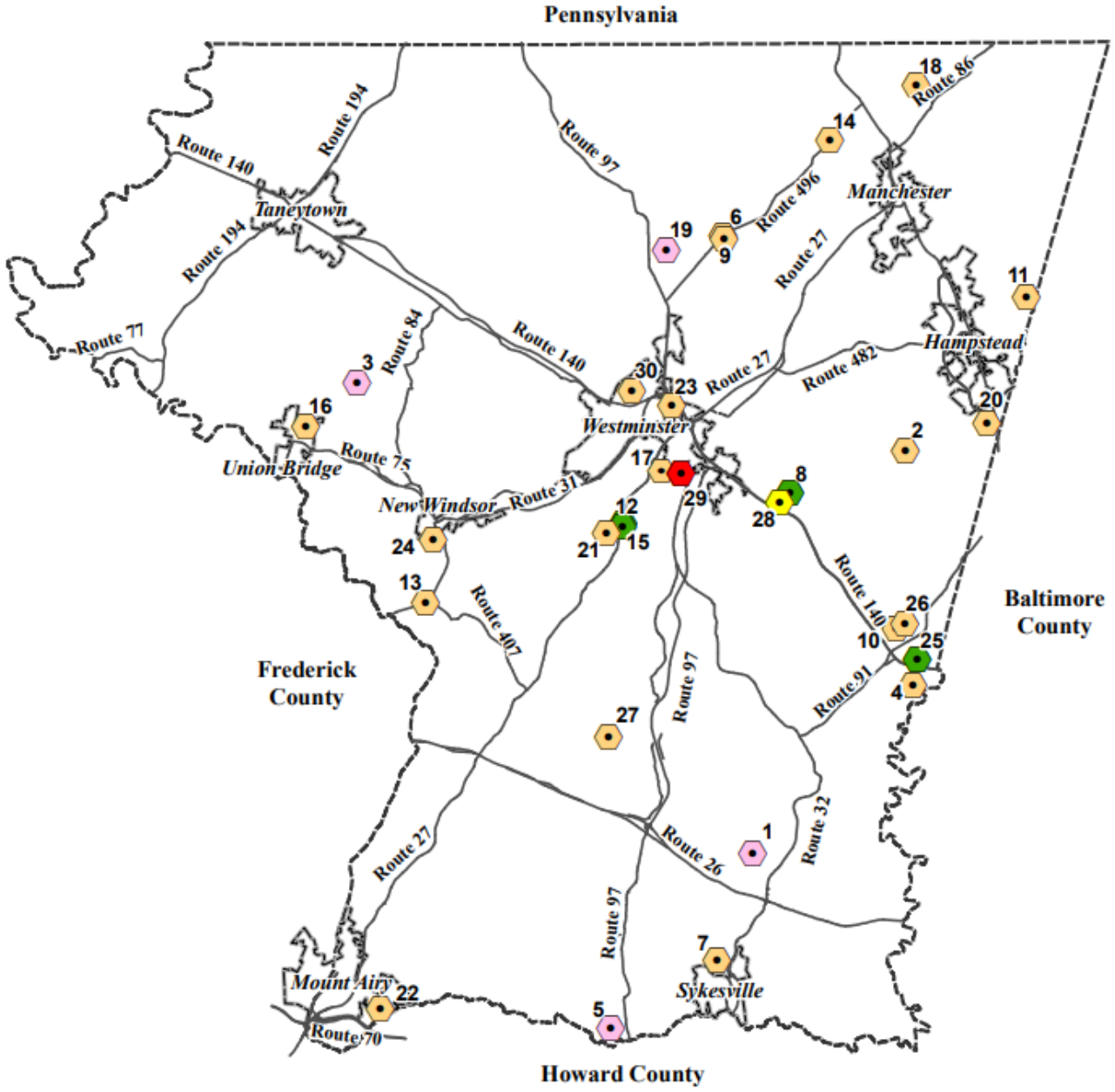
B | WHERE DOES FOOD WASTE COME FROM?



Source: https://refed.org/food-waste/the-challenge#

B | COUNTY ORGANICS OPPORTUNITIES

- County generates ~85k tons annually of residential MSW
- Estimated 20k tons annually food waste
- Over $1M annually in food waste disposal costs
- Increased organics diversion from landfill could:
  - Reduces disposal cost
  - Extends landfill life
  - Reduces GHG emissions
  - Return nutrients to soil
  - Improve soil moisture retention
  - Revenue stream to offset costs



C | ORGANICS MANAGEMENT EXAMPLES

- Residential
- Community
- Decentralized
- Regional, Small
- Regional, Large

C | RESIDENTIAL

- Backyard composting
  - Leaf Pile
  - Grasscycle
  - Compost Bin
- Indoor Composting
  - Vermicompost
- Reduce Food Waste
- **<u>Create a culture of composting know how</u>**
- ***Cost: $10-100***

C | COMMUNITY

- Greenbelt, MD 100-unit housing development
- Bin centrally located at local park
- Rodent proof bin constructed by local resident
- Cooperatively managed by local community
- Participation by local grocery store
- Pilot testing before rollout in multiple locations
- ***Cost: <$1,000***

C | DECENTRALIZED

- Drop-off organics collection
- Food Recovery
- ***Cost: <$1,000***

C | REGIONAL, SMALL

- Curb side pickup of 35 gallon bins from 8,800 homes in pilot program
- Six covered piles on 0.67 ac facility utilizing aerated static pile processing equipment
- Facility pilot to prove concept for equipment, odor, contact water
- Air permitting for large grinders and Surface Water Use
- 75 days for processing and curing
- Processing of 4k tons annually
- ***Cost: $1M***

C | REGIONAL, LARGE

- Bi-weekly residential collection of food scraps at >14,500 households
- 1,300 tons food waste, 1,300 tons manure diverted annually
- Aerated Static Pile compost in concrete bunkers
- MDE General Compost Facility Permit
- Processing of 60k tons annually
- In 2021, $375k revenue from finished compost
- ***Cost: $13M***

D | FACILITY DEVELOPMENT PROCESS

STEP 1
Assessment and Planning

- **Understand your local organic waste resources**
  - Gauge community interest and engagement for organics diversion
  - Identify organic waste sources (residential, commercial, industrial, other)
  - Identify organic waste types (food waste, agricultural waste, industrial food production waste, etc.)
  - Understand existing local organics processing capability (e.g. composting, anaerobic digestion, etc.)
  - Determine regulatory requirements and exemptions
  - Identify potential education and outreach opportunities
- **Assess demand for finished products**
  - Determine potential for use in local farms or agriculture
  - Determine potential for use in municipal projects or operations
- **Conduct waste audit**
- **Set waste diversion goals**

STEP 2
Implementation

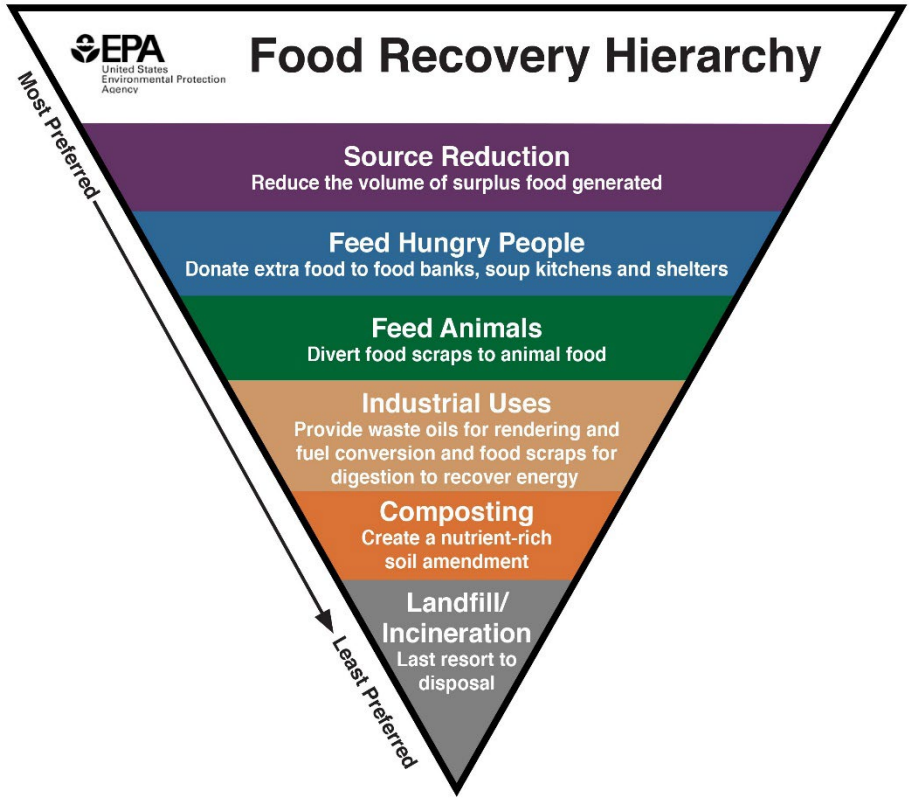
- **Small-scale**
  - Community and backyard composting
  - Distribute food scrap collection buckets to test residential response
  - Provide waste diversion resources and education
  - Incentivize office place composting programs
- **Medium-scale**
  - Pilot-scale programs – Establish community drop off points in coordination with composting companies and/or local farmers
  - Develop food donation programs to keep edible food out of the waste stream
- **Large-scale**
  - Develop municipal or regional organics processing facilities
  - Capital planning, agency coordination, permitting, site design, asset management
  - Engage in waste disposal agreements with local organics processing facilities

STEP 3
Monitoring

- **Develop benchmarks for sustainable waste collection**
  - Organics processing facility troubleshooting
  - Data validation
- **On-going education and training**
- **Review and revise local policies**
- **Resources and Certifications**
  - Institute for Local Self Reliance
  - SWEEP Standard
  - TRUE Zero Waste

D | PROGRAM PLANNING

- Assess Local Food Waste Resources
  - Gauge Community interest and engagement
  - Identify food waste sources and types
  - Existing local processing capability
- Assess Demand for finished product
  - Use in local or municipal projects
  - Retail and wholesale sales
- Conduct Waste Audit



D | PROCESS PLANNING

Collection

- By Municipalities
- Private Hauler County-wide
- Homeowner Drop-off

Processing

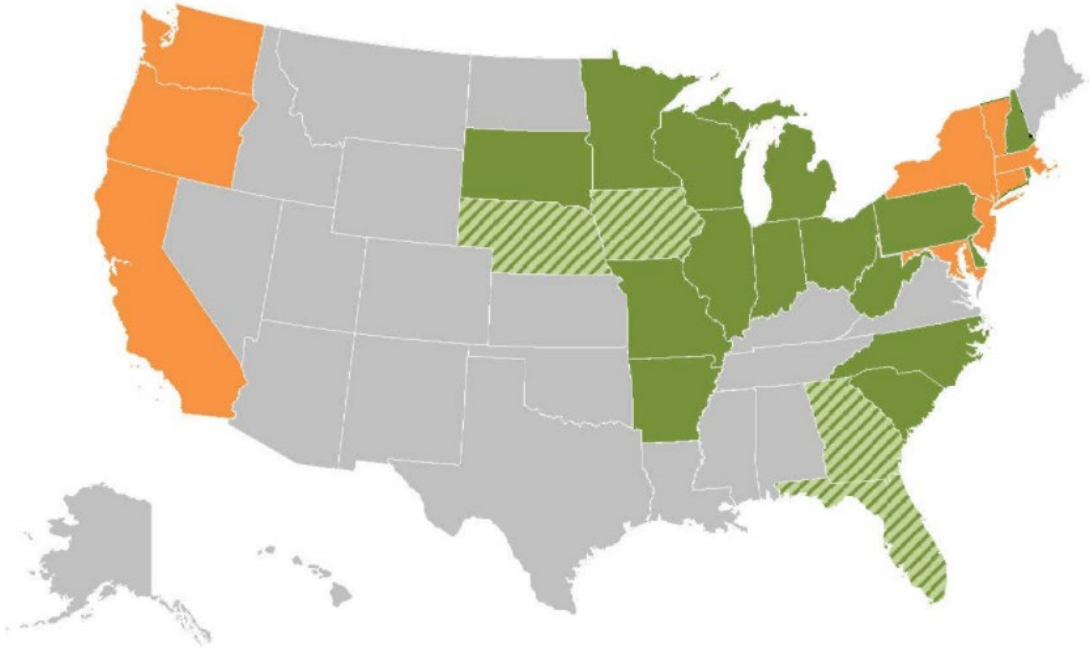
- County operated
- Vendor operated

Finished Product

- Laboratory Testing
- Certifications
- End Market

D | REGULATORY ENVIRONMENT

- The COMPOST Act (HR4443) introduced in the House last summer
- State-wide Food Waste Bans
  - Commercial food waste bans being developed state-wide in CA, CT, MD, MA, NJ, NY, RI
  - Overall food waste bans in VT, OR, WA
- Waste Diversion goals in cities pursuing elimination of food waste and zero waste goals



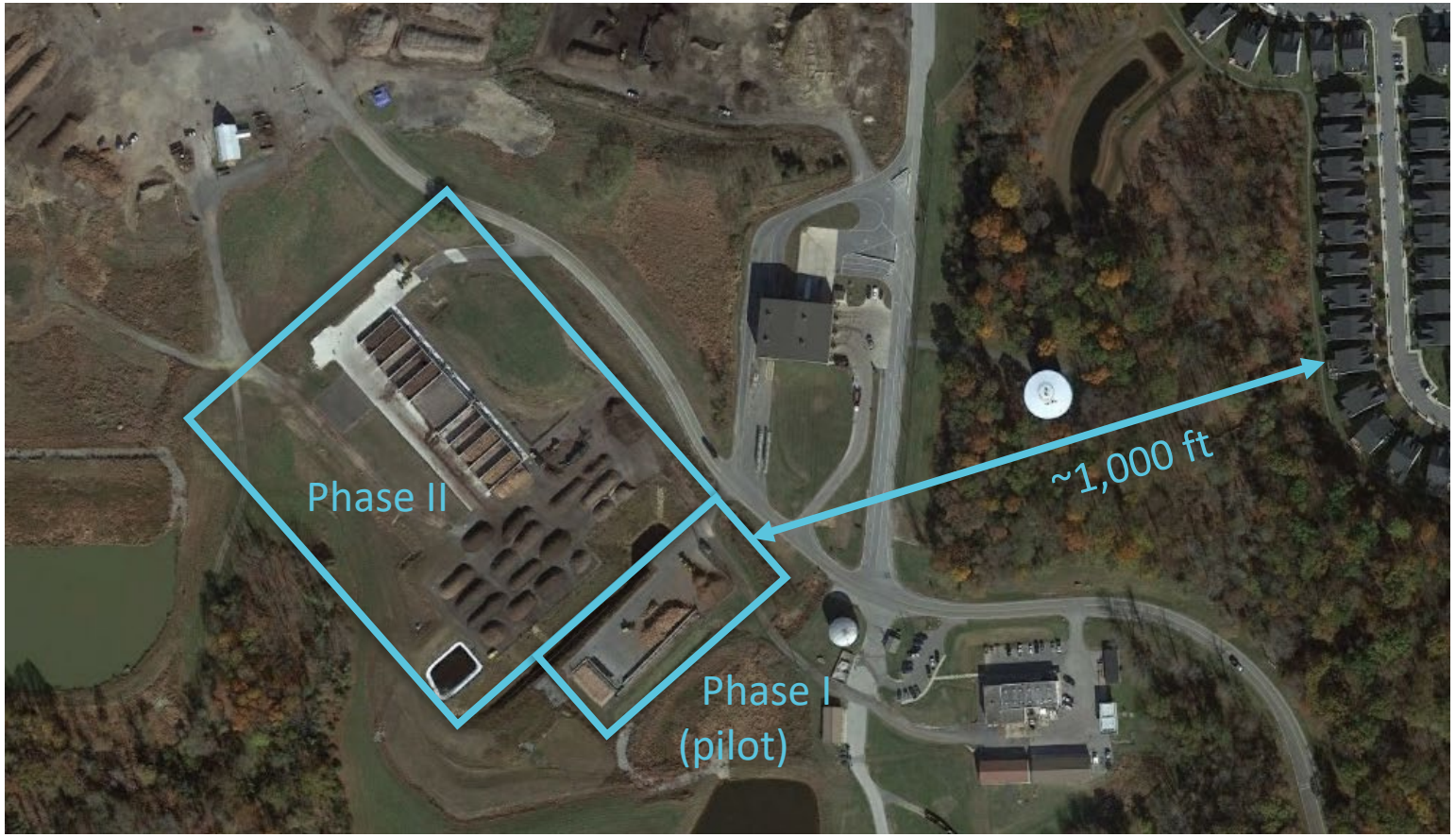
Yard debris bans: Arkansas, Delaware, Illinois, Indiana, Michigan, Minnesota, Missouri, New Hampshire, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, West Virginia, Wisconsin

Yard debris bans with exemptions for landfills with gas collection systems: Florida, Georgia, Iowa, Nebraska

Food scrap collection mandates or aggressive legislation for keeping out of landfills: California, Connecticut, Maryland, Massachusetts, New Jersey, New York, Oregon, Vermont, Washington

D | FACILITY PLANNING

- Facility Siting
  - County-owned
  - Equipment
  - Operations
  - Utility access
  - Site access
  - Odor/Noise
  - Permit Requirements
- Facility Sizing
  - Technology
  - Pilot Scale to Full Scale



D | TECHNOLOGY REVIEW

Compost Technology	Operational Requirements	Energy Requirements	Feedstock Capability	Impacts to Neighbors	Space Requirements	Scalability	Cost	Processing Time
Open windrows	Turning equipment, monitor temperature and moisture	Fuel for turning equipment	Large volumes of yard waste	Odor	High	Low cost and difficulty to add more windrows	Lower (turning equipment, manual labor)	3–12 months
Sheltered/covered windrows	Turning equipment, monitor temperature and moisture	Fuel for turning equipment	Large volumes of yard waste	Odor	High	Low cost and difficulty to add more windrows, cost of additional shelter	Low-moderate (turning equipment, manual labor, cover/enclosure)	3–12 months or less
Open ASPs	Monitor and deliver oxygen, monitor temperature and moisture, bulking agent for aeration	Energy requirement for air blowers	Large volumes of food and yard waste	Odor (best controlled using negative aeration)	Moderate (large piles require less land than windrows)	Low difficulty to add pile or increase pile size, but require cost of additional aeration equipment	Moderate (blowers, fans, pipes, sensors, bulking agent)	3–6 months
Covered ASPs	Monitor and deliver oxygen, monitor temperature and moisture, bulking agent for aeration	Energy requirement for air blowers	Large volumes of food and yard waste	Odor (best controlled using negative aeration)	Moderate (large piles require less land than windrows)	Low difficulty to add another pile, but require cost of additional aeration equipment and new cover	Moderate-high (blowers, fans, pipes, sensors, bulking agent, cover/enclosure)	3–6 months or less
In-vessel composting	Turning/mixing equipment, monitor temperature, moisture, oxygen (electronically), technical expertise but less manual labor	Energy requirement for electronic monitoring and turning/mixing	Food and yard waste	Very little odor produced	Low-moderate (allow higher stacking, better use of space)	High cost to add vessel, could size vessel larger than necessary	Moderate-high (rotating drum, silo, concrete trench, agitated bed, turning/mixing equipment)	2–4 months
Anaerobic digestion	Likely require separation of yard and food waste and separate compost for yard trimmings, often requires composting after anaerobic digestion for final stabilization	May require heating but energy usage offset by biogas (electricity use typically 10–20% of biogas energy output)	Best suited for food waste and biosolids, yard waste can be resistant to digestion and have low biogas yield	Little odor, but potential biogas leakage and flare malfunction	Moderate (additional compost area may be required, less volume reduction than conventional compost)	High cost to add vessel, could size vessel larger than necessary	Moderate-high cost (vessel, biogas collection system and flares, liquid effluent handling) but potential energy savings with use of biogas	3–4 months

D | FACILITY ECONOMICS

Facility Costs
- Phase I (Pilot) Capital Cost – $1M
- Phase II (Full Scale) Capital Cost – $13M
- Cost of processing food scraps – $33/ton

Avoided Costs
- Avoided landfill tipping fee – $45/ton
- Avoided yard waste tipping fee – $43/ton

Sales Strategy
- Retail Sales (shown)
- Wholesale Pricing for large purchasers

HoCoGro

Made locally

Spread Locally

Certified® Compost

STA Seal of Testing Assurance

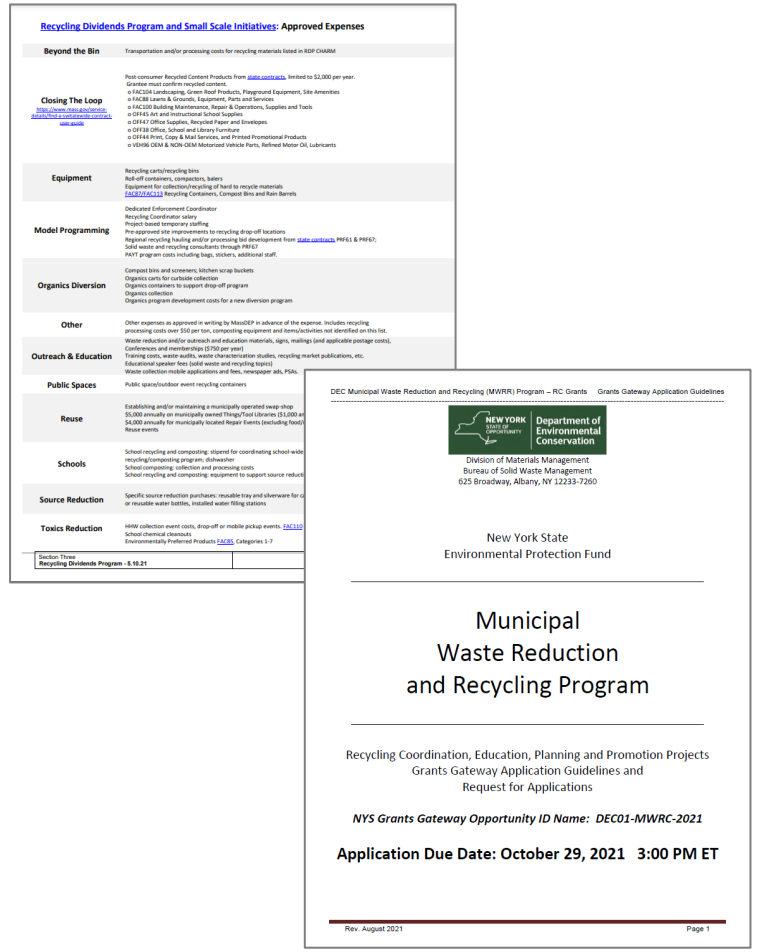
US Composting Council®

HoCoGro Compost	HoCoGro Mulch	HoCoGro Topsoil
$23/yd³	$21/yd³	$25/yd³

Made Locally Spread Locally

D | RESOURCES

- Funding
  - EPA – Supporting Anaerobic Digestion in Communities
  - USDA – Community Compost and Food Waste Reduction Pilot Project
- Technical
  - US Composting Council
  - Solid Waste Association of North America
  - Maryland Recycling Network
  - Northeast Recycling Council



Recycling Dividends Program and Small Scale Initiatives: Approved Expenses

Beyond the Bin	Transportation and/or processing costs for recycling materials listed in RDP CHARM
Closing The Loop	Post-consumer Recycled Content Products from state contracts, limited to $2,000 per year. Grantee must confirm recycled content. o FAC104 Landscaping, Green Roof Products, Playground Equipment, Site Amenities o FAC88 Lawns & Grounds, Equipment, Parts and Services o FAC100 Building Maintenance, Repair & Operations, Supplies and Tools o OFF45 Art and Instructional School Supplies o OFF47 Office Supplies, Recycled Paper and Envelopes o OFF38 Office, School and Library Furniture o OFF44 Print, Copy & Mail Services, and Printed Promotional Products o VEH96 OEM & NON-OEM Motorized Vehicle Parts, Refined Motor Oil, Lubricants
Equipment	Recycling carts/recycling bins Roll-off containers, compactors, balers Equipment for collection/recycling of hard to recycle materials FAC87/FAC113 Recycling Containers, Compost Bins and Rain Barrels
Model Programming	Dedicated Enforcement Coordinator Recycling Coordinator salary Project-based temporary staffing Pre-approved site improvements to recycling drop-off locations Regional recycling hauling and/or processing bid development from state contracts PRF61 & PRF67; Solid waste and recycling consultants through PRF67 PAYT program costs including bags, stickers, additional staff.
Organics Diversion	Compost bins and screeners; kitchen scrap buckets Organics carts for curbside collection Organics containers to support drop-off program Organics collection Organics program development costs for a new diversion program
Other	Other expenses as approved in writing by MassDEP in advance of the expense. Includes recycling processing costs over $50 per ton, composting equipment and items/activities not identified on this list.
Outreach & Education	Waste reduction and/or outreach and education materials, signs, mailings (and applicable postage costs), Conferences and memberships ($750 per year) Training costs, waste audits, waste characterization studies, recycling market publications, etc. Educational speaker fees (solid waste and recycling topics) Waste collection mobile applications and fees, newspaper ads, PSAs.
Public Spaces	Public space/outdoor event recycling containers
Reuse	Establishing and/or maintaining a municipally operated swap-shop $5,000 annually on municipally owned Things/Tool Libraries ($1,000 a $4,000 annually for municipally located Repair Events (excluding food/ Reuse events
Schools	School recycling and composting: stipend for coordinating school-wide recycling/composting program; dishwasher School composting: collection and processing costs School recycling and composting: equipment to support source reducti
Source Reduction	Specific source reduction purchases: reusable tray and silverware for c or reusable water bottles, installed water filling stations
Toxics Reduction	HHW collection event costs, drop-off or mobile pickup events. FAC110 School chemical cleanouts Environmentally Preferred Products FAC85, Categories 1-7

Section Three
Recycling Dividends Program - 5.10.21

DEC Municipal Waste Reduction and Recycling (MWRR) Program – RC Grants Grants Gateway Application Guidelines

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Division of Materials Management
Bureau of Solid Waste Management
625 Broadway, Albany, NY 12233-7260

New York State
Environmental Protection Fund

Municipal
Waste Reduction
and Recycling Program

Recycling Coordination, Education, Planning and Promotion Projects
Grants Gateway Application Guidelines and
Request for Applications

NYS Grants Gateway Opportunity ID Name: DEC01-MWRC-2021

Application Due Date: October 29, 2021 3:00 PM ET

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CONCLUSION

- What are your goals to reduce organics to landfill?
- What scale or processing is right for you?
- What first steps can you take?
  - Identify budgetary costs and funding sources
  - Conduct a Waste Audit
  - Review Organics Processing Technologies
- Northern Landfill Resource Recovery Park
  - Review white papers from solicitations
  - Master planning

CONTACT US

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