From Collection to Best Use of Food Waste

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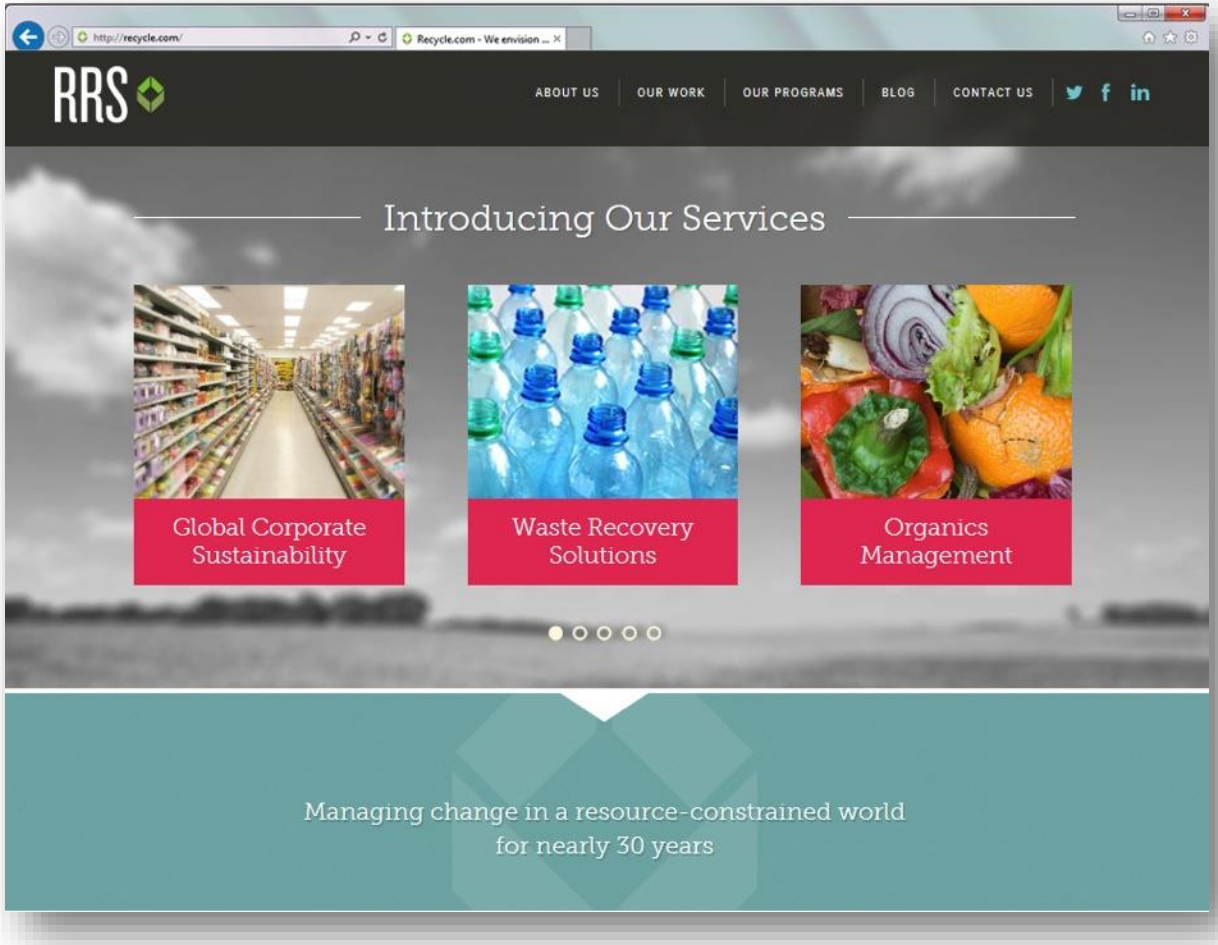
Managing Change in a Resource-Constrained World.

Providing solutions to meet the resource management and waste recovery goals of clients and their supply chains



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The soil is the great connector of lives, the source and destination of all.

It is the healer and restorer and resurrector, by which
disease passes into health,
age into youth,
death into life.
Without proper care for it we can have no community,
because without proper care for it
we can have no life.

Wendell Berry

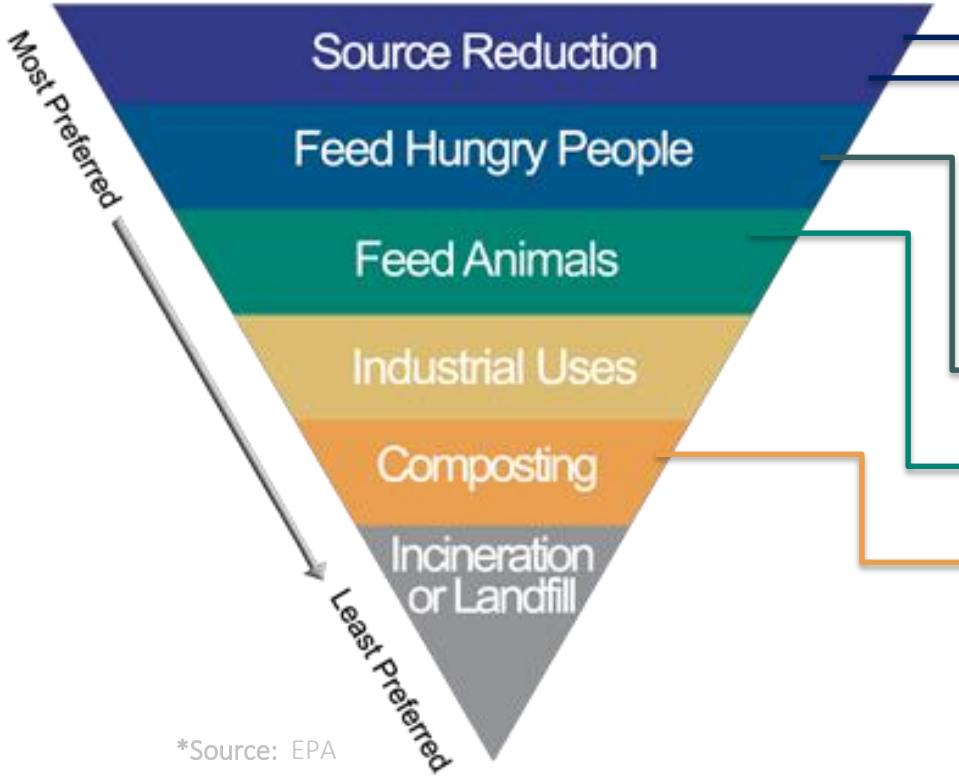
The Unsettling of America: Culture and Agriculture

Overview

- Why Focus on Food Waste
- Policy Supporting Food Waste Reduction and Composting
- Planning and Considerations
- Collection and Processing Options
- Hospital Case Study

What Can Be Done?

How to Reduce Food Waste?
What can be done with Leftover Food Waste?



Reduce purchasing volumes and packaging

Educate on food preservation / expiration dates

Donate to a food bank

Send residuals to a hog farm

Compost or anaerobic digestion

And remember to recycle the packaging!

Benefits of Managing Food Waste

Source: Waste360

Source: Wall Street Journal

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The Numbers Behind Your Food Waste

Food waste represents **25%** of US methane emissions

1 ton Methane = 12 tons CO_2 Equivalent

Sustainable waste management, reduction, and disposal practices are a valuable piece of the supply chain.

1/3 of MSW

is food-related waste

5 lbs

per day, per person

FOOD WASTE PILES UP THROUGHOUT THE CHAIN, BUT WE THE MOST AT THE CONSUMERS STAGE

43%

Equivalent of **$165 Billion** Per Year

10% of institutional food purchases become waste

another **4%-10%** become waste before ever reaching the customer

In cafeterias, each meal tray generates **½ lb** of food waste.*

A closed system is a good place to start a zero waste campaign

Source: Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill; Author Dana Gunders, Natural Resources Defense Council

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Planning and Considerations

Material

- Policies & Regulations
- Volumes and Sources

Logistics

- Partnerships & Collaborators
- Collection & Hauling
- Staffing
- Contamination
- Location & Space
- Available Technologies

Financial

- Capital Costs
- Operating Costs
- End Use / Markets

Education

- Training
- Leadership & Staff Buy-In
- Reduction & Diversion

Material

Policies Drive Progress

Policies can encourage composting and zero waste programs

Guidelines/Incentive System

- Requirements for take-out containers (reusable, compostable, recyclable)
- Green Purchasing / Product Bans
- Local Purchasing
- Healthy Food and Beverages
- Purchasing Cooperatives

Composting Infrastructure

- Year-round compostables collection
- Local composting facilities
- Collaboration with farms

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Zero Waste Collaboration

- Sports events
- Municipal events
- Public space composting
- Waste-free school lunches

Public Education

- Food waste prevention campaign
- Home / Onsite composting
- Food Donation
- Farm to Table
- Healthy Food in Healthcare

Case Study

Beaumont Hospital – Royal Oak

Options Analysis + Goals

- Kitchen / cafeteria
- Prep / post consumer waste
- Conversion to compostable dishware and use of more durable dishware
- Keep dining operations ‘service oriented’
- Odors minimized

Opportunities for Composting Food Waste Locally

Cost Analysis and Environmental Benefits

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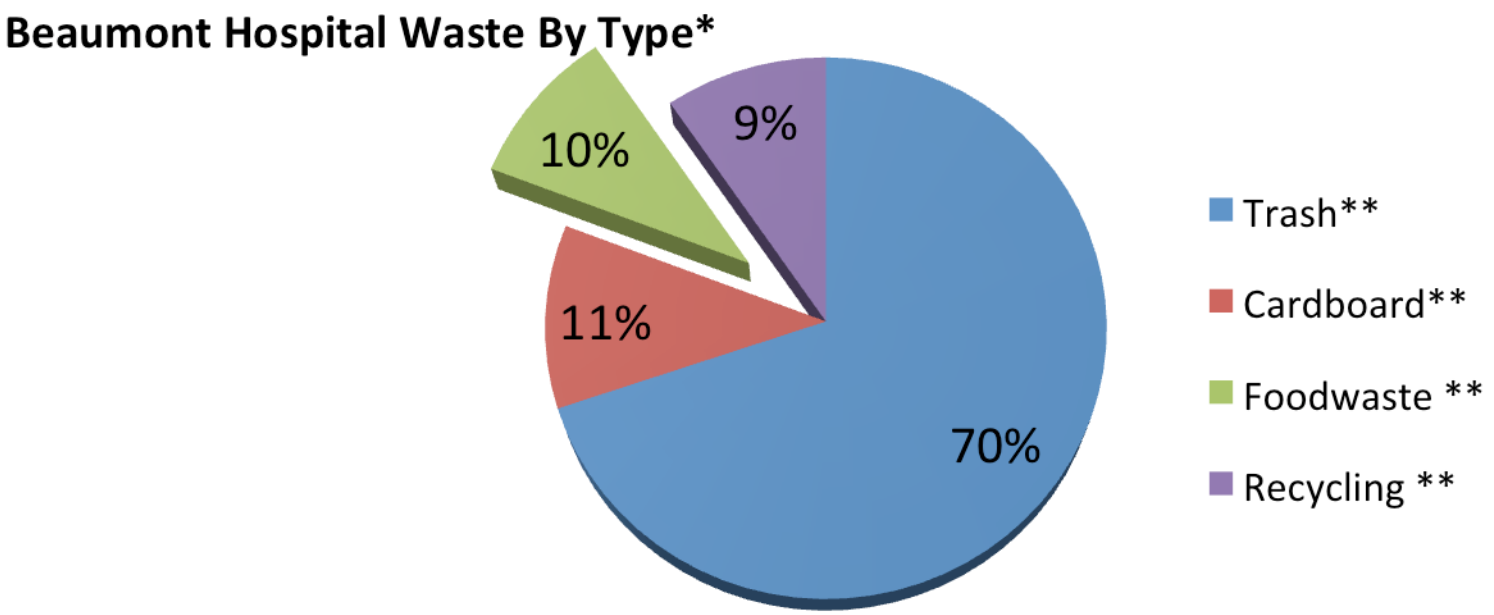
Waste Characterization



* Does not include regulated waste streams
** Reported by Kristine Browning, Environmental Services, Foodwaste estimated by RRS

Food Waste Sources

Facility – 1,070 beds

Meals – 14,658/day

Location	# of Meals Served per Day
Patient Meals/Room Service/Tray Line	4,691
Mackinac Room – South Tower Café	5,681
Concourse Café and Baker's Deli	3,688
Doctor's Dining Room	598

Program Phase 1

Only Focus On ……

- Kitchens
- Patient meals
- Tray return line

Assume

- Mostly uncontaminated waste and prep waste
- Disposable products on patient trays eliminated
- China/silverware used or compostable materials

Program Phase 2

Add Food From ……

- Cafeteria and Staff Lounges

Assume

- Disposable product line → durable dishware
- Discount to customers for selecting durable dishware
- Compostable 'to-go' materials on request
- Single serve condiments → bulk dispensers
- Pre-made sandwiches/salads wrapped in compostable products
- Convert trash bins to compostable bin

Program Phase 3

Expand Program To …..

- Concourse Café and Deli
- Other “grab and go” stores stands

Locations

- Switch ‘to-go’ containers to compostable materials
- Convert trash bins to compostable bins

Future Addition

Add the Following Materials to Program

- Soiled paper from bathrooms
- Soiled cardboard
- Other sources of paper

Adding Dry Paper Sources Would Help By …..

- Reducing odor issues
- Absorb moisture
- Allow more air to circulate

Projected Volumes

PROPOSED PHASING			
Phase	Total Compostables (tons/year)	Average (Tons per day)	Overall Diversion Rate (recycling+ composting)
Current	0	0.0	25%
Phase 1 Light (no patient meal trays)	80	0.22 or 0.85 cy/day	
Phase 1	303	0.83	
Phase 2	128	0.35	
Phase 3	50	0.14	
Total	481	1.32	35%

Assumes ~0.3 lbs per meal average (over all locations)

Assumes only 50-60% participation to start

Partnerships/Collaborators

Education and Enforcement

- Funding for education, oversight
- Development and maintenance of resources

Foodservice Vendors

- Foodservice providers (internal/external)
- Recyclables versus compostables

Policies and Regulations

- EPP and zero waste policies for reusables, compostables and recyclables
- Planning/Zoning
- Health department rules for reusable containers
- Use of food waste as animal feed (USDA)

Infrastructure / Space

- Space for new waste streams and containers
- Compost sites accepting food waste
- Transportation/Haulers
- Compost markets

Food Waste Sources

- Restaurants (pre- and/or post-consumer)
- Take-out cafés
- Research lab animal bedding
- Other institutions
- Special events

In-Building Collection and Infrastructure Impacts

- Pre-Consumer / Food Prep Waste
  - From prep station directly into container, lined or unlined
  - Can run through pulper
- Bins for Post-Consumer Food Waste
- Purchasing costs of compostable products
- Tray and Dishwashers
- Signage
- Staffing/Dining Operations

Source: Beaumont Hospital, MI

Source: Resource Recycling Systems Inc. Bronson Hospital, MI

Source: Cornell University

Dock Collection and Upgrades

- Dock Modifications
  - Dumpsters
  - Compactors
  - Electrical
  - Dock / Railings
- Cart-swap program
- Emptied into compactor, compacting truck or dumpster lined with cardboard

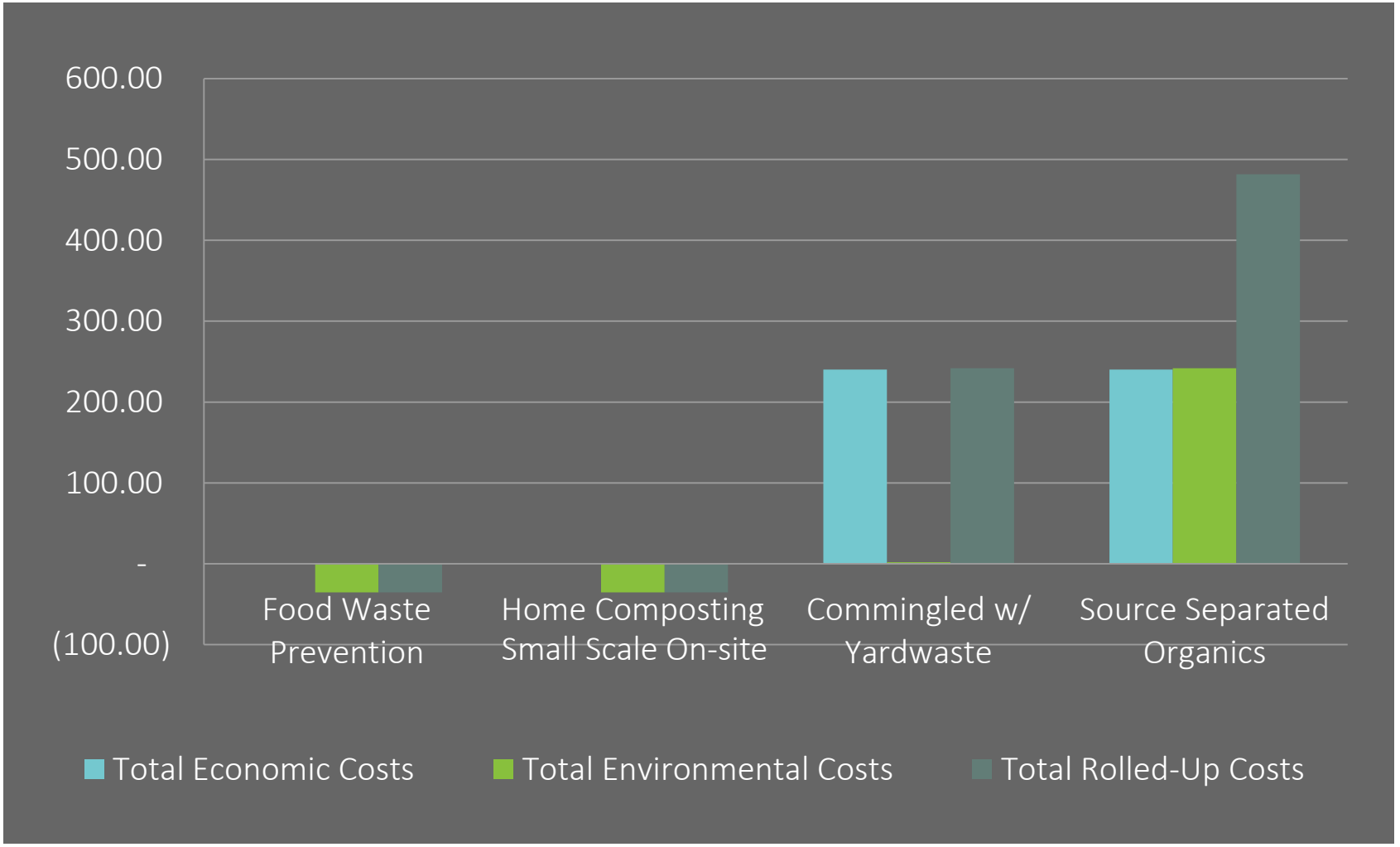
Source: Beaumont Hospital, MI

Source: RRS @ Metro Health Hospital, MI

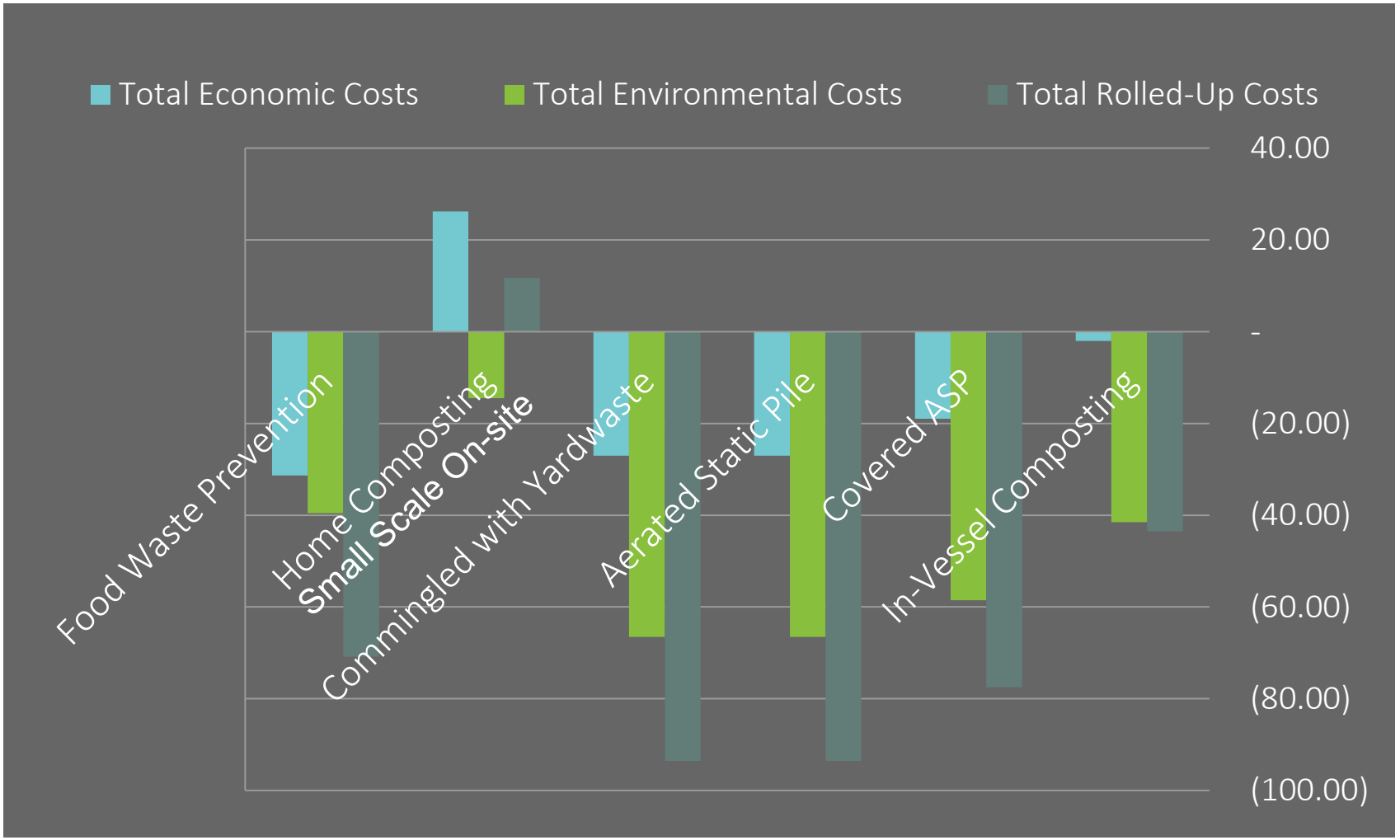
Processing and Siting Options

- Off-site Compost Site
  - 38 miles from facility
  - Aerated pile composting system
- On-site Composting with Yard Wastes in Landscape Yard (not enough space)
- Hog Farms (issue with compostable products)
- Space constraints are the primary factor dictating in-building and dock containers, and composting method
- Collaborate with other food waste generators, haulers, farmers, processors

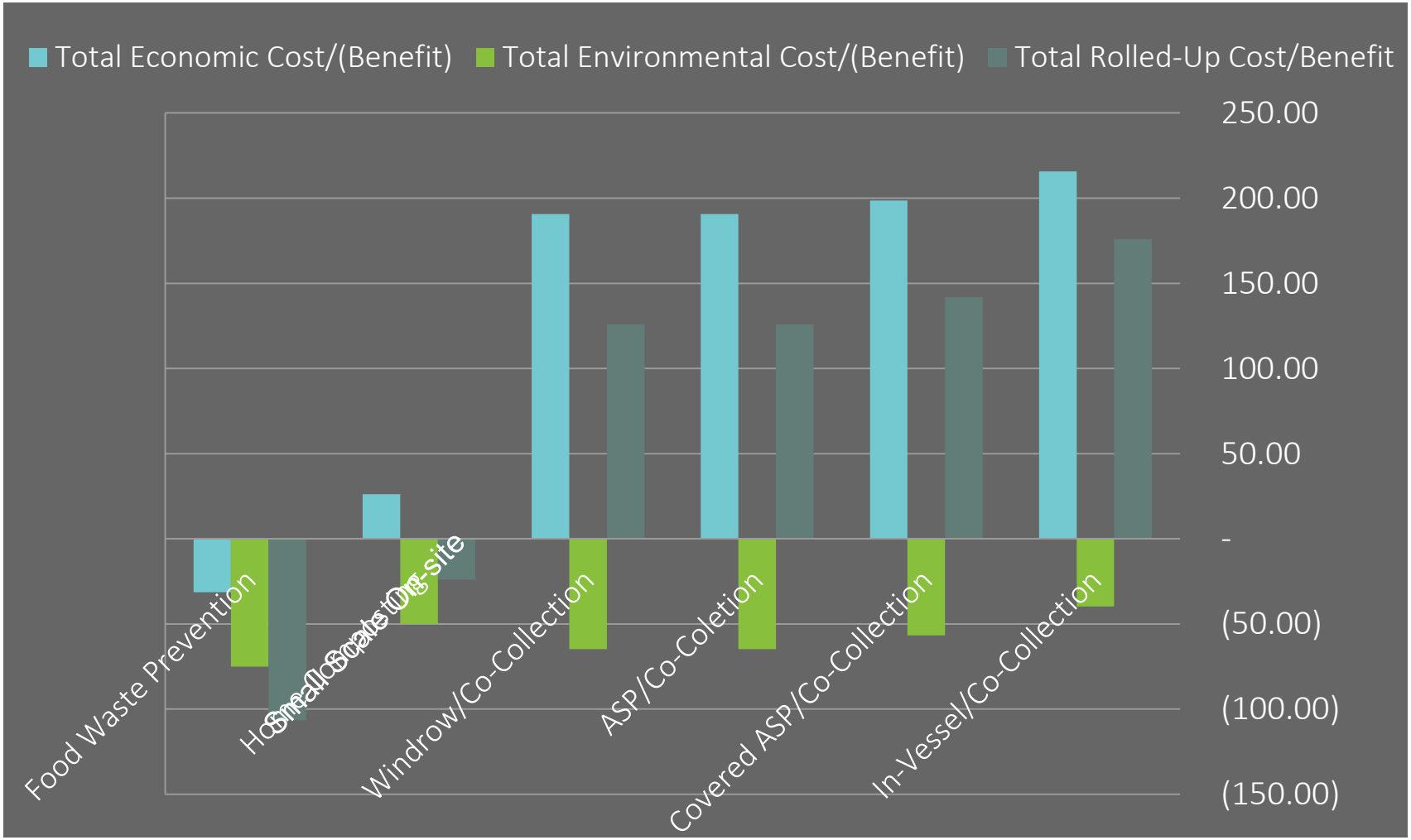
Collection Performance



Processing Performance



Overall System Performance



Create a Business Case

- Develop a business case analysis to consider all options, including compost markets
- Review capital and operating costs specific to your location and staffing
- Make the case for leadership and employee buy-in
  - Financials / pay-back
  - Sustainability /diversion goals

Summary of costs (at full roll-out)*

Summary of Costs of Hospital Wide Food Waste Composting Program	
Total Start-Up Costs* (includes first 3 months of service)	$11,400
Total Annual Ongoing Costs (includes foodservice ware)	$597,475
Total Annual Avoided Cost (includes foodservice ware)	($510,077)
Overall Annualized Costs (additional costs over sending to landfill)	$87,674 (~$180/ton)

* Preliminary costs only, based on all-phase roll out:
  1.32 tons/day or 481 tons/year
  and dedicated food waste collection to off-site compost site
* Currently Phase 1 Light ~80 tons/year

Environmental benefits

Total Environmental Benefits of Food Waste Collection (when all phases implemented)		
	**Waste Diverted From Landfill**	**481 tons**
	or the equivalent of	13 large compactor loads
	Avoided CO2 Emissions	**387 metric tons CO2 Equivalent**
	or the equivalent of taking	76.9 cars off the road for 1 year
	Total Change in Energy Use	**97 million BTUs**
	or the equivalent of	780 gallons of gasoline

Develop a Local Market and Community Awareness

- Use compost to grow local, healthy food
- Use as mulch in facility's landscaping
- Provide to employees to take home

Decentralized, local systems
support local farmers,
create local jobs and
promote community awareness

Training and Outreach

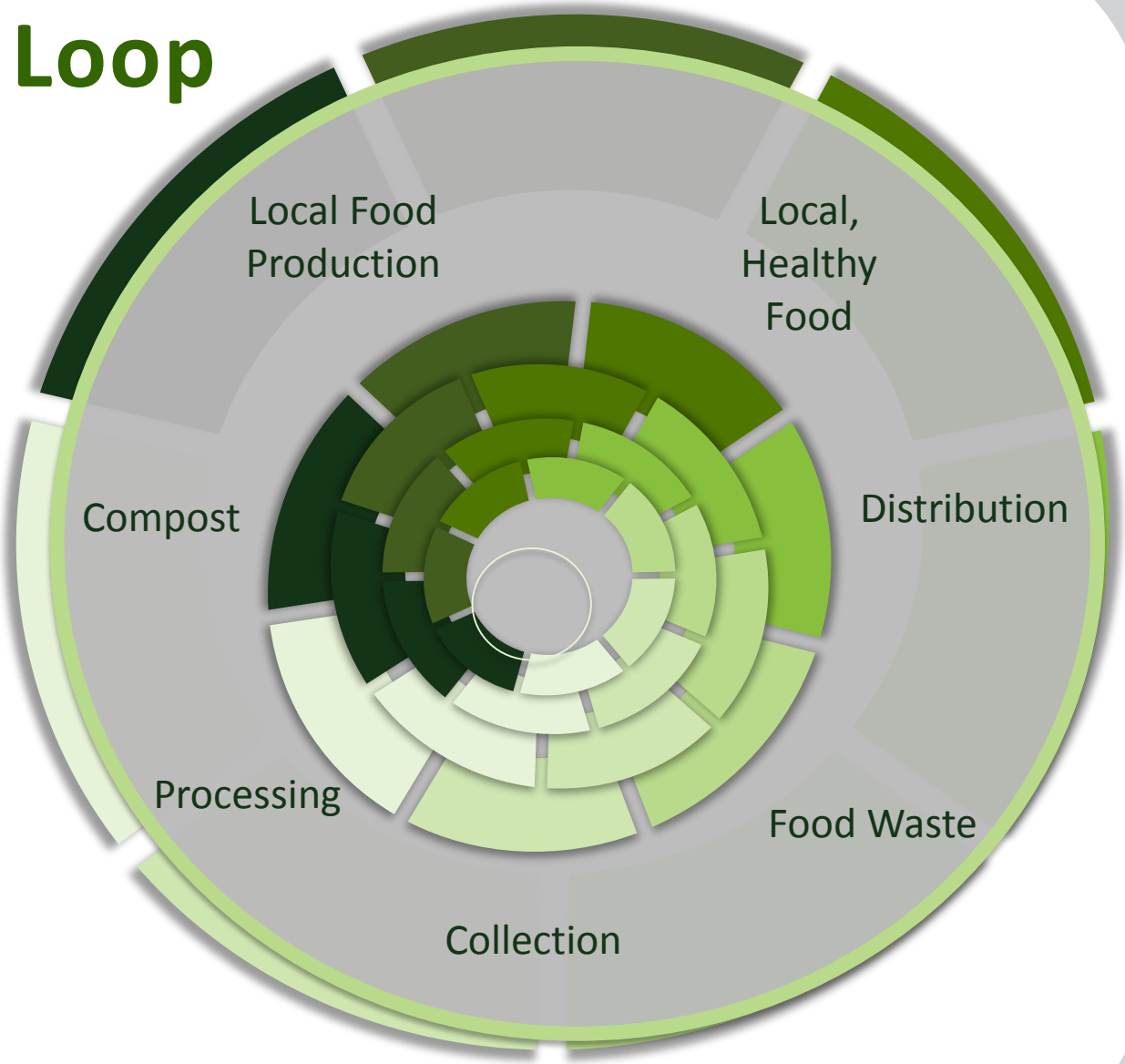
- Cafeteria users / customers
- Kitchen staff and practices
- Operations / housekeeping staff
- Lined vs. unlined carts
- Compostable ‘to-go’ containers
- Equipment (disposals, pulpers)
- Transportation / Dock operations
- Minimizing odors
- Alignment with Sustainability Goals

Source: Beaumont Hospital, MI

Source: Metro Health Hospital, MI

Closing the Loop

Be a leader in and support the growing trend of zero waste, sustainability and local, healthy food



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Thank you!

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