Organics Recycling Summit Day 2

WELCOME!

King County
Department of
Natural Resources and Parks
Solid Waste Division

Organics Recycling Work Group Purpose

1. Gather stakeholder input that helps identify and prioritize actions to expand and enhance organics recycling and ensure a sustainable organics recycling system for the future.
2. Set the stage for participating organizations to work together in the future on the solutions identified.

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Organics Recycling Summit #2

AGENDA	
9:30am-10:15am	Welcome & Summit #1 Recap
10:15am-11:30am	Context Update
11:30am-12:00pm	Creating a Shared Vision
12:00pm-12:30pm	Lunch Break
12:30pm-1:15pm	Break-out Session: Unlocking Solutions
1:15pm-1:45pm	Break-out Session: Report Back
1:45pm-2:30pm	Mapping our Path Forward
2:30pm-2:45pm	Wrap Up & Adjourn

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Recap of Action Items & Information Gaps

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Wasted Resources

Information Gaps	Action Items
• Analysis of effectiveness and diversion rates of different organics systems including those that are food-only versus those that accept packaging (mid priority)	• Need a clear, consistent region-wide vision for organics recycling (high priority)
	• Standardize organics recycling protocols and contracts across multiple jurisdictions (mid priority)
• Research on best practices for communication around purchase dates and use-by dates to help reduce food waste (low priority)	• Back legislation that supports a sustainable organics recycling system in the region (mid priority)
	• Increase food rescue efforts to decrease wasted food in the organics recycling stream (mid priority)
	• Focus on using durables to reduce food packaging entering the organics recycling stream (mid priority)

Contamination

Information Gaps
• Determine what makes up the contamination in organics recycling stream (if possible also material types and brands) and make a recommendation regarding contaminant focus including considerations of which contaminants processors are already removing from the stream (high priority)
• Determine why contamination is getting in organic recycling carts – what consumer behaviors are leading to contamination? (high priority)
• Clarify compostable versus non-compostable packaging across jurisdictions (mid priority)

Contamination

Action Items
• Need for regional organics contamination committee (e.g., Recycle Right / Responsible Recycling Task Force) (high priority)
• Create a consistent messaging approach including naming, terminology and lists of compostable and non-compostable items to reduce consumer confusion. Include transcreated messaging in this effort. (mid priority)
• Determine and communicate most effective ways to deal with greenwashing claims that confuse consumer about the compost-ability of packaging products (low priority)
• Create a regional media campaign to reduce contamination (high priority)
• Expand enforcement tactics including cart tagging and violator household/business specific enforcement steps (high priority)
• Jurisdictions, haulers and processors collaborate to share information and resources, including code and compliance information (mid priority)
• Increase use of new technologies to reduce contamination in organics stream (mid priority)
• Grants focused on reducing contamination (low priority)

Processing Capacity

Information Gaps	Action Items
• Research existing organics recycling systems with greater regional coordination (e.g., CA) (high priority)	• Increase processing capacity including taking full advantage of existing capacity (high priority), investigating decentralized processing facilities, and improving siting and permitting processing while also taking odor issues and impacts on communities into consideration
• Compile data and research on the costs of processing organics into compost, including potential methods of reducing costs and billing transparency (e.g., itemizing organics recycling costs on utility bills) (high priority)	• Revive effort to encourage at-home composting for residents including backyard composting and worm bins
	• Increase coordination between policymakers and organics recycling stakeholders, including tax benefits and green incentives (mid priority)
• Understand current and upcoming chemical challenges impacting compost quality	• Improve processing facility communications with neighbors and public (mid priority)

End Markets

Information Gaps	Action Items
• Increase research on the value, costs and benefits of compost use versus alternatives, particularly for agriculture (high priority)	• Evidence the value, costs and benefits of compost use versus alternatives, particularly for agriculture (high priority)
• Identify research growth trends in compost markets, including new technologies (high priority)	
• Identify motivators and barriers for different audiences to buy more compost (or start buying compost) (mid priority)	• Understand and streamline how specifiers, purchasers and enforcers approach compost use in public projects
• Gather data on transportation costs and logistics for getting compost to eastern WA (e.g. for agricultural markets) (mid priority)	
• Understand the current process and enforcement methods from King County soil inspectors (mid priority)	• Increase education about benefits of compost (e.g. value engineering, green economics) consistent with the growth trends and new opportunities for compost use (high priority)
• Understand current compost demand/trends through procurement audits (low priority)	

Context Update

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Presenters & Information Gaps

Topic	Presenter(s)	Info Gap
True Costs of Processing	Jay Blazey, Cedar Grove	Compile data and research on the costs of processing organics into compost and potential ways to reduce costs and increase billing transparency
New Technologies, Compost Market Costs and Trends	Andrew Tomes, WISErg Srirup Kumar, Impact Bioenergy	Identify research growth trends in compost markets, including new technologies
Value of Compost in Agricultural Uses	Dr. Sally Brown, UW	Gather data on transportation costs and logistics for getting compost to eastern WA and to agricultural markets
Market Assessment Update	Andy Smith, King County Andrea Lai, Cascadia	Understand compost demand and procurement trends, current enforcement and motivators/barriers

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“True Cost and Transparency” Commercial Composter Perspective

Jay Blazey
General Counsel
Cedar Grove Composting

Overview

- To many residents and customers, composting is “FREE!”
- Basic model: Cedar Grove covers costs (and hopefully turns some profit) through tip fees and product sales

Some Variables to Consider

Unique variables:

- Outdoors
- Different facilities/technology
- Putrescible waste processing
- Seasonality
- Moving and processing large volumes
- Jurisdictional differences

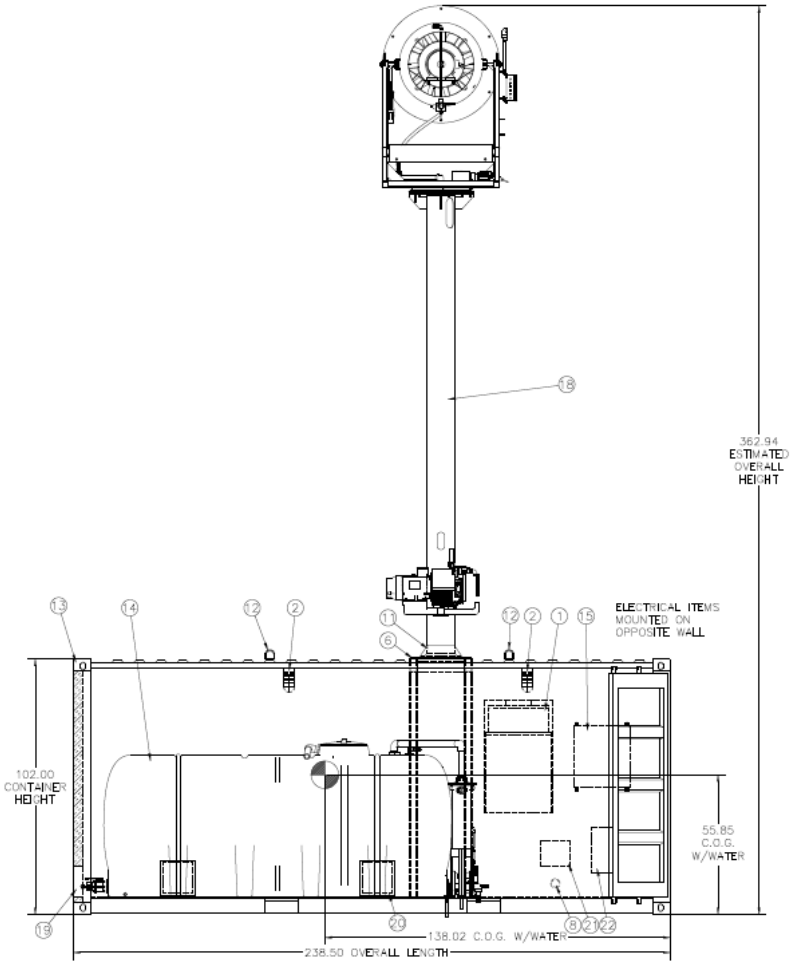
Hard Costs for Local Composting

Here is what you are actually paying for….

- Initial costs: land, engineering, permitting, construction
- Truck, driver, hauler costs
- Our valued employees
- Processing equipment/infrastructure
- Vehicles and fuel plus R&M

Hidden Costs

- Research and innovation
- Education and outreach
- Odor mitigation and environmental costs
- Odor complaints – legal costs
- Contamination and residuals costs



What is changing over time?

- Technology is developing and advancing
- Population growth = more material and more contamination
- Desire to meet zero waste goals and subsequent policy changes

Huge benefits from composting

- Green, local manufacturing jobs
- GHG reduction
- Carbon sequestration
- Green infrastructure: bioretention, stormwater filtration
- Agricultural uses and restoration

Questions

Emerging Technologies in End Uses of Recyclable Organic Waste Products

Andrew Tomes
WISErg Corporation

Agenda: End Uses

- Action Items
- Reasons to consider end uses as a goal
- Trends in current end use products
- New/Emerging end use products

Action Items – Improving End Uses

- New technology = greater efficiency = lower costs = faster adoption
  - Identifying successful solutions is crucial
- Regulatory apparatus must account for positive externalities
- Relative weights of feasibility, affordability, efficiency, and level of environmental benefit need to be determined

FROM THE MAY 2003 ISSUE

Anything Into Oil

Technological savvy could turn 600 million tons of turkey guts and other waste into 4 billion barrels of light Texas crude each year.

By Brad Lemley, Tony Law | Thursday, May (

RELATED TAGS: ALTERNATIVE ENERGY

FROM THE APRIL 2006 ISSUE

Anything Into Oil

Turkey guts, junked car parts, and even raw sewage go in one end of this plant, and black gold comes out the other end.

By Brad Lemley | Sunday, April 02, 2006

RELATED TAGS: ALTERNATIVE ENERGY, GADGETS

AddThis

(See DISCOVER's earlier coverage of "Anything Into Oil" here and here. See the follow-up article here.)

The smell is a mélange of midsummer corpse with fried-liver overtones and a distinct fecal note. It comes from the worst stuff in the world—turkey slaughterhouse waste. Rotting heads, gnarled feet, slimy intestines, and lungs swollen with putrid gases have been trucked here from a local Butterball packager and dumped into an 80-foot-

Go Green This Thanksgiving: Turn Turkey Guts Into Oil

A Missouri plant successfully turns practically anything into black gold. But profitability is another matter.

By Peter Fairley | Tuesday, November 25, 2008

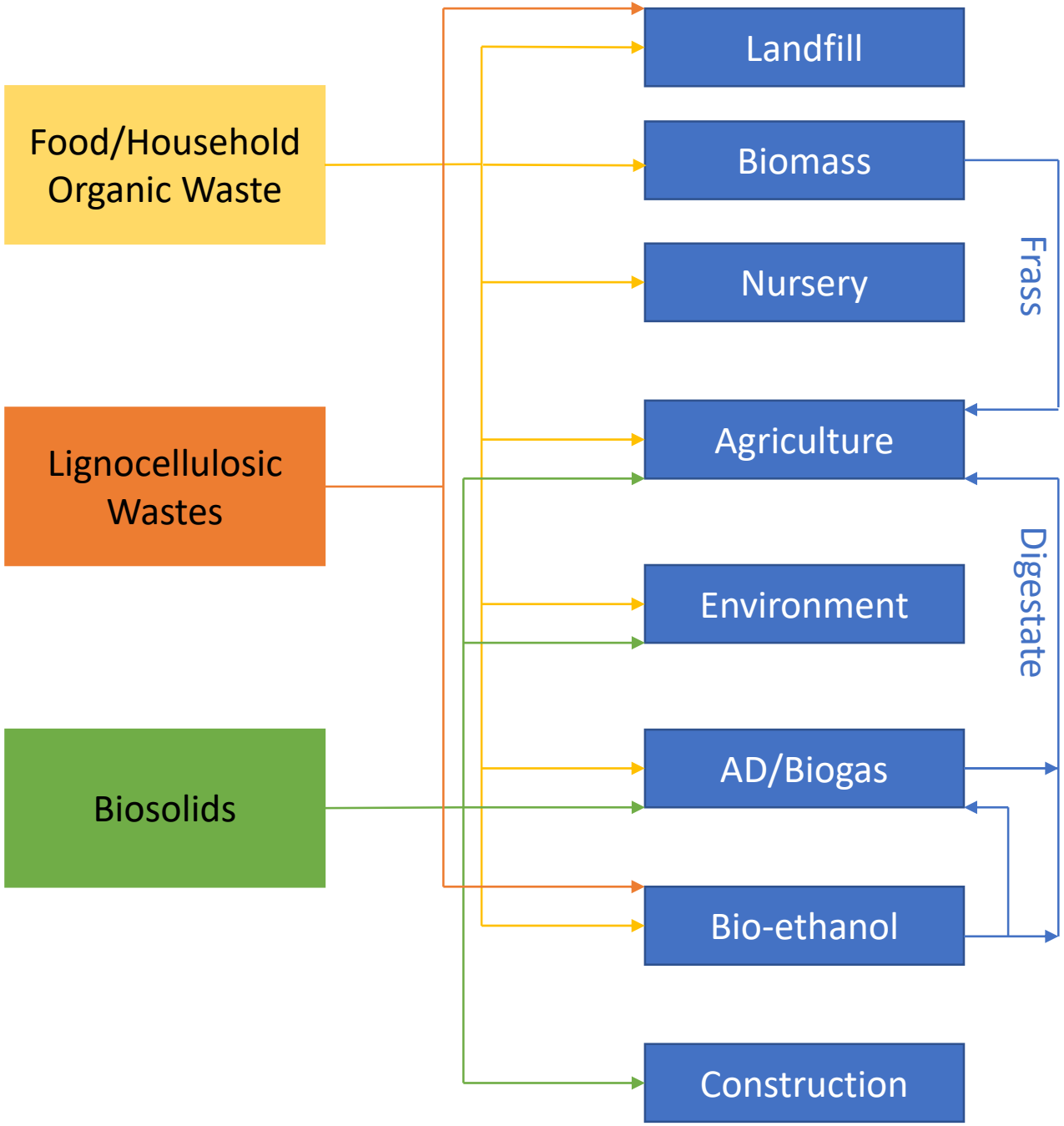
Developing an understanding cost/benefit of diversion

Reducing environmental impact

Maximizing the economic value

Streamlining the collection and processing

Crafting effective policy incentives

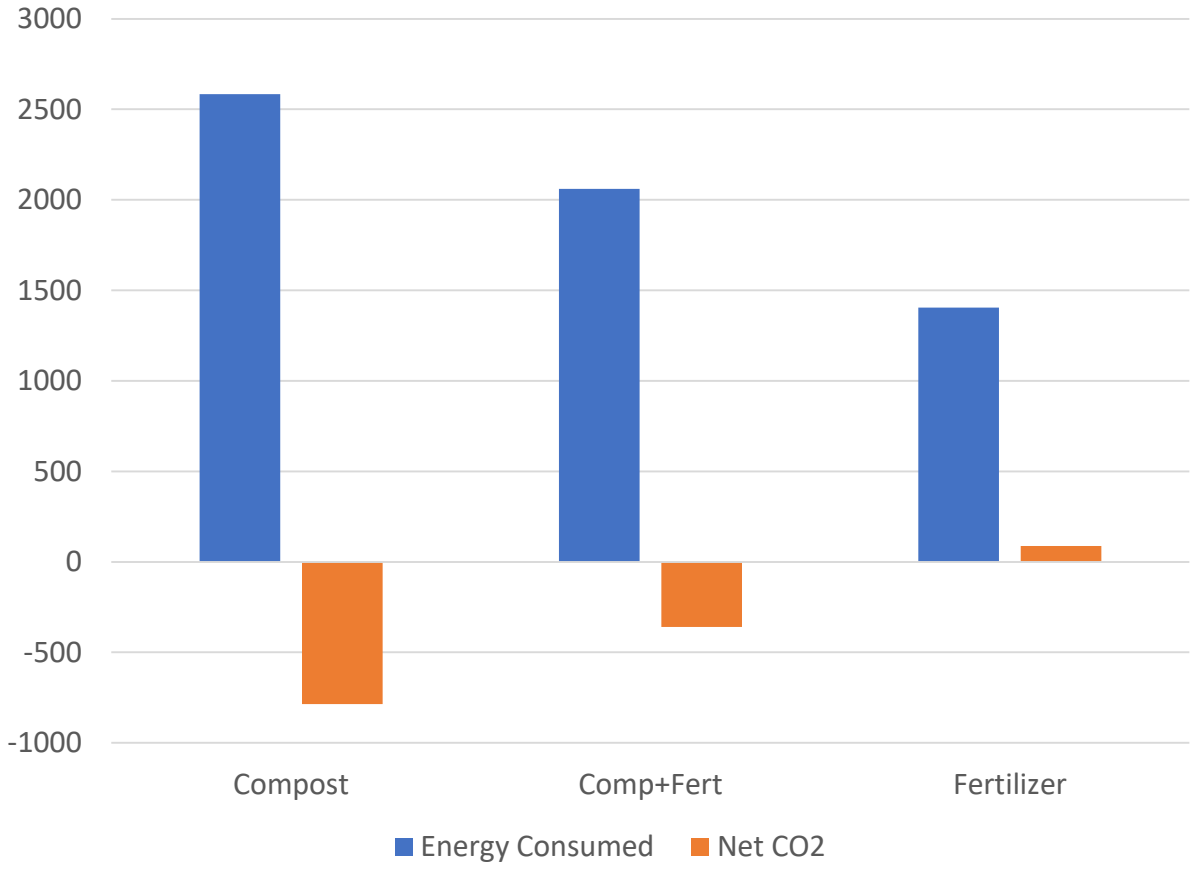


Value Axes

- Cost/Profit potential
- Relative Demand
- Carbon sequestration
- GHG emissions offset
- Benefits to soil/groundwater
- Efficiency vs other processing methods

Compost

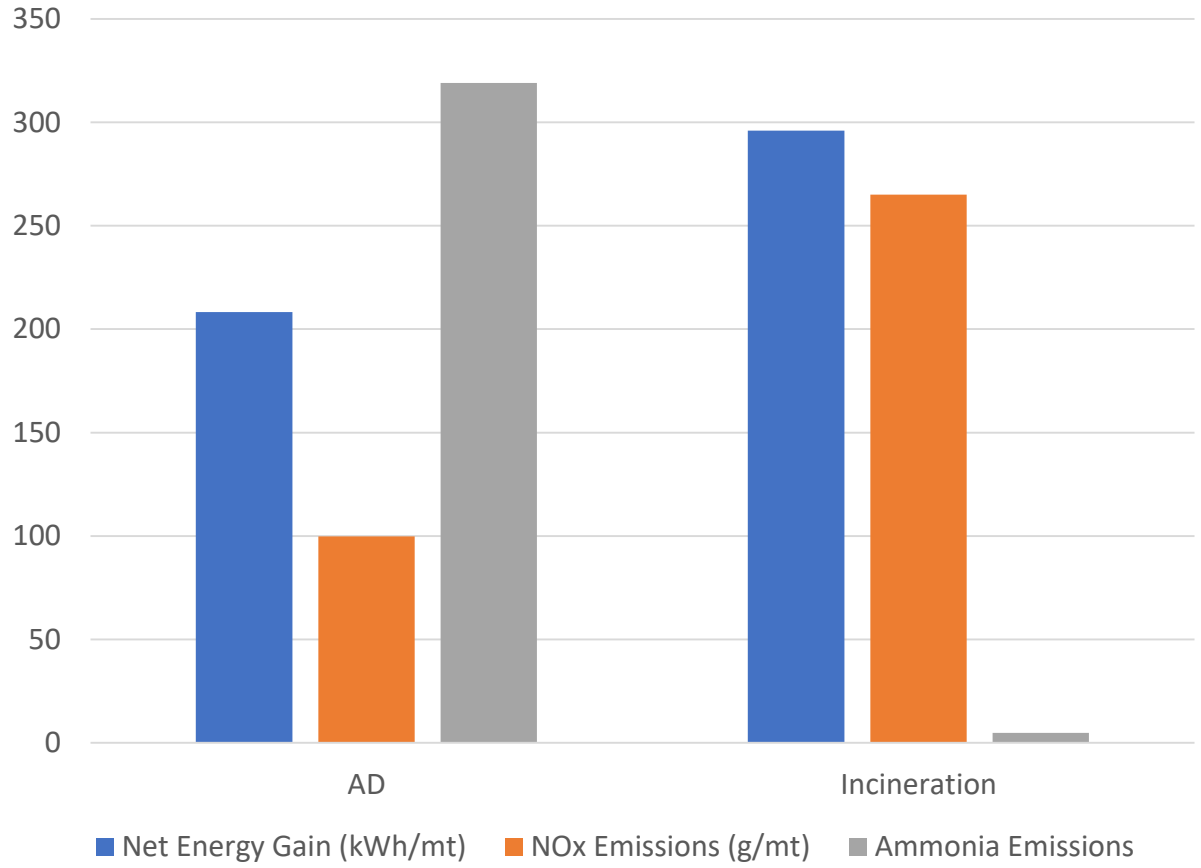
Significant carbon sequestration capability, but energy-intensive



Treatment	Compost	Compost+Fertilizer	Fertilizer only
Energy Consumption (MJ per mt tomatoes produced)	2584	2060	1404
Net Carbon Emissions (kg CO2 per mt tomatoes)	-786	-360	88

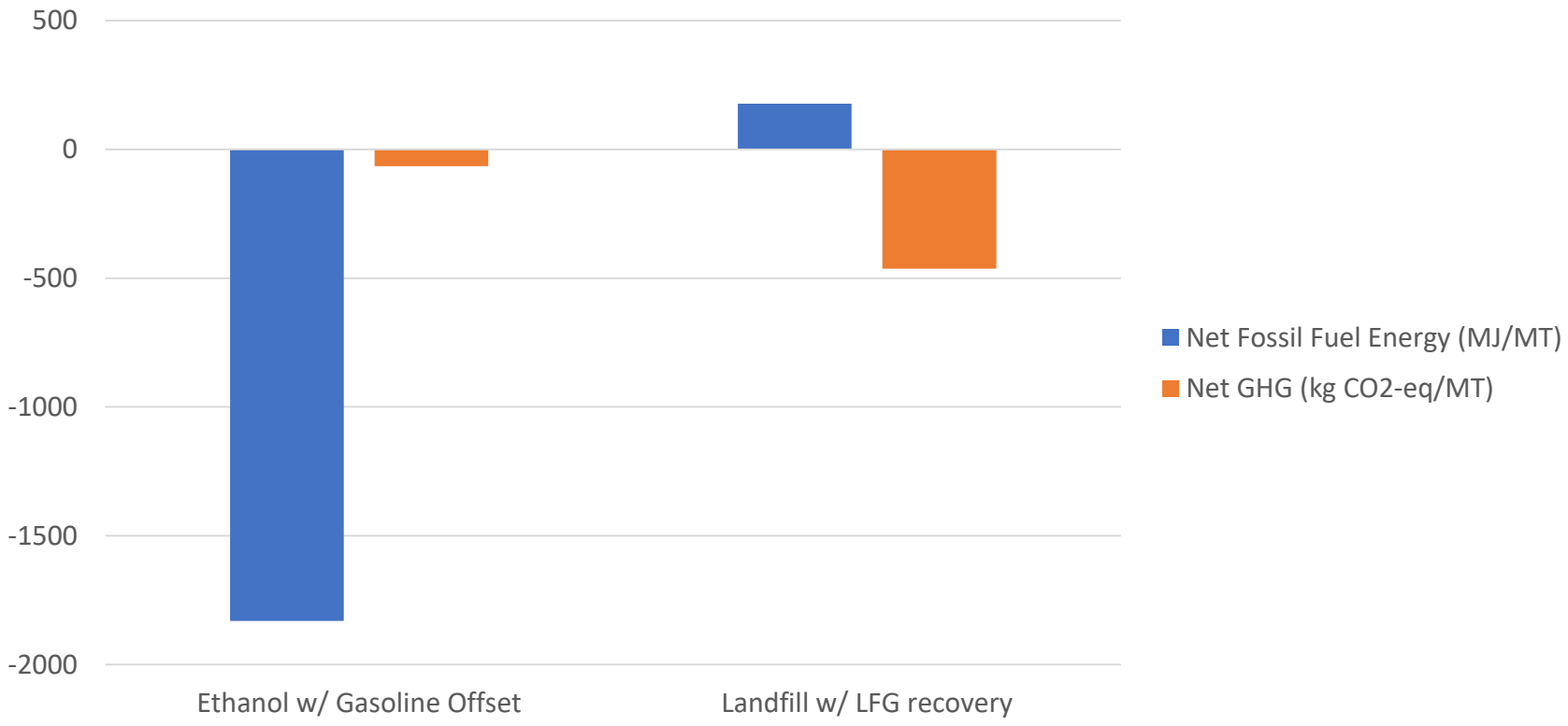
Anaerobic Digestion/Biogas

- Overall capacity for outlets is high (8% of King City's natural gas needs can be met by complete use of organic waste in AD)
- Compared to incineration, less energy is produced with less NOx (economic gain/environmental loss)
- Ammonia capture technology will be important



Bioethanol Production

Significant energy offset, but low carbon sequestration



New Processing Outlets in the Pacific NW

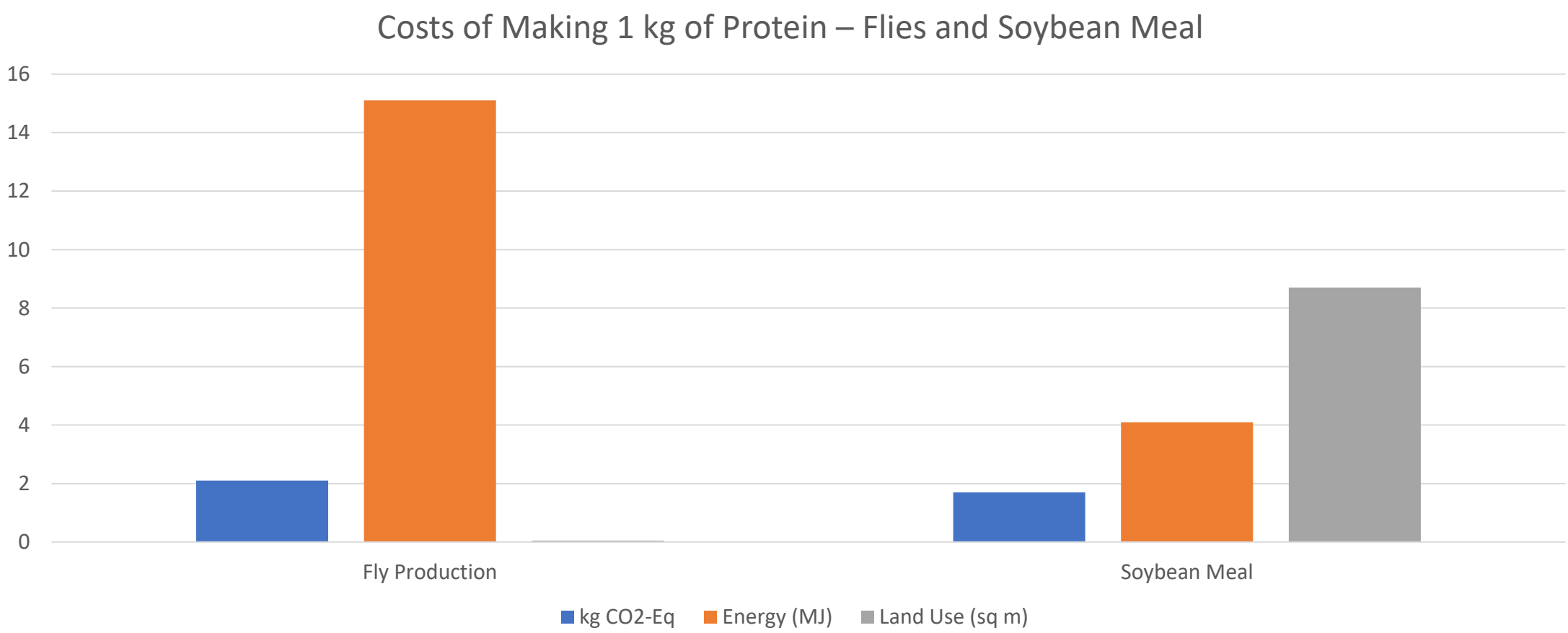
Onsite Stabilization and Recovery - WISErg

- Potential for high nutrient recapture and lower GHG emissions
- Cleaner/more hygienic than open bins
- Requires employee training and high purity waste stream

Insect Biomass – Beta Hatch

- Mealworms as a decontamination strategy for messy streams
  - Capable of breaking down mycotoxins and polystyrene
- Can piggyback on/contribute to other recycling programs
- More energy use, but lower land footprint than other methods

Black Soldier Fly Larvae – Life Cycle Analysis

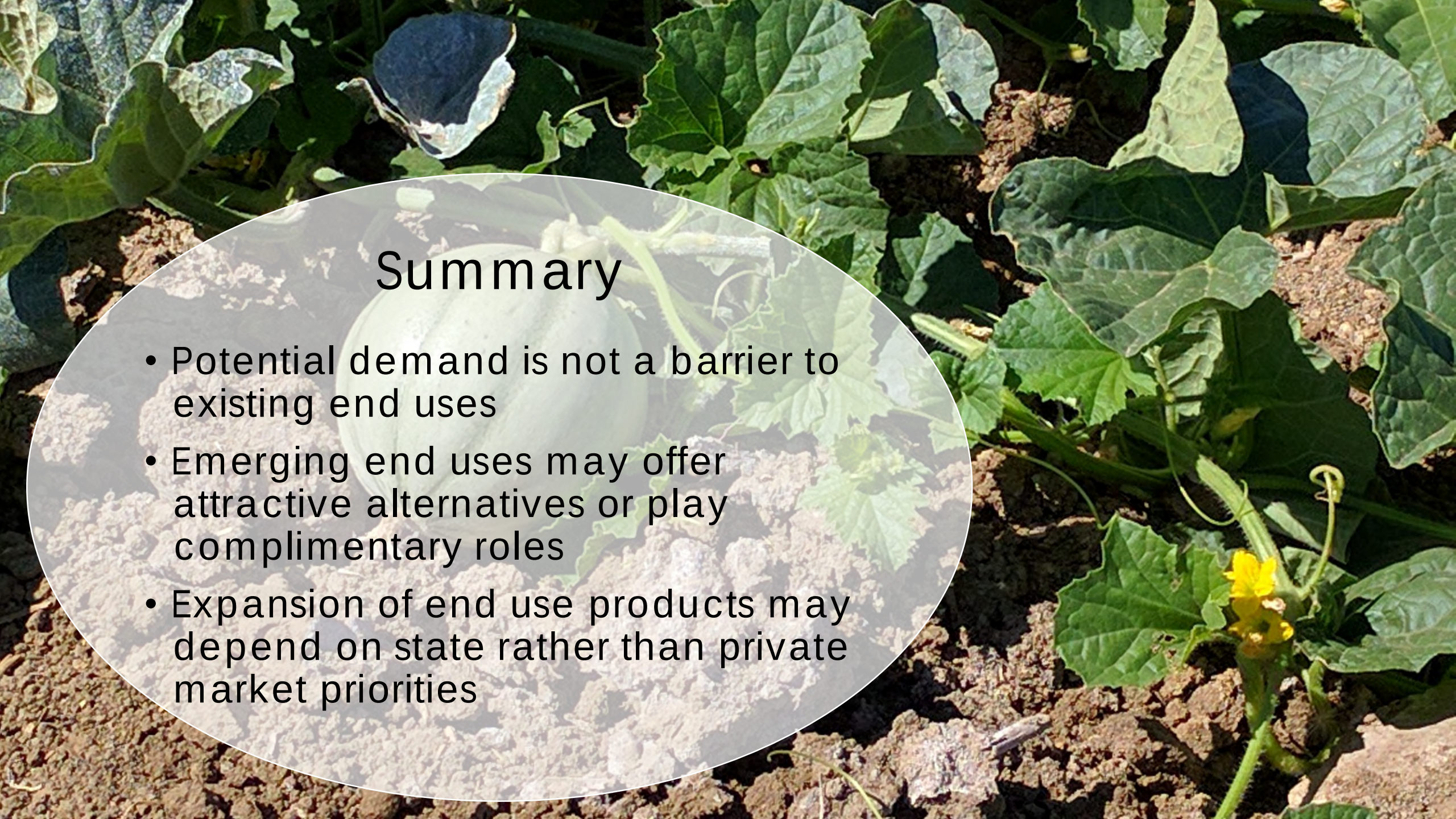


Complete Catabolic Processing – Micron Waste

Complete breakdown of organic products, no end uses but no need for hauling

Barriers to End Use Expansion

- Land footprint (processing takes up space; siting facilities near feedstocks takes up commercial space)
- Budget footprint (most forms of processing need government support to get started or maintain operations)
- Lack of profitability (energy content per ton is lower than fossil fuels; hauling can be expensive)
- Health concerns (biosolids not allowed for use in organic ag)



Summary

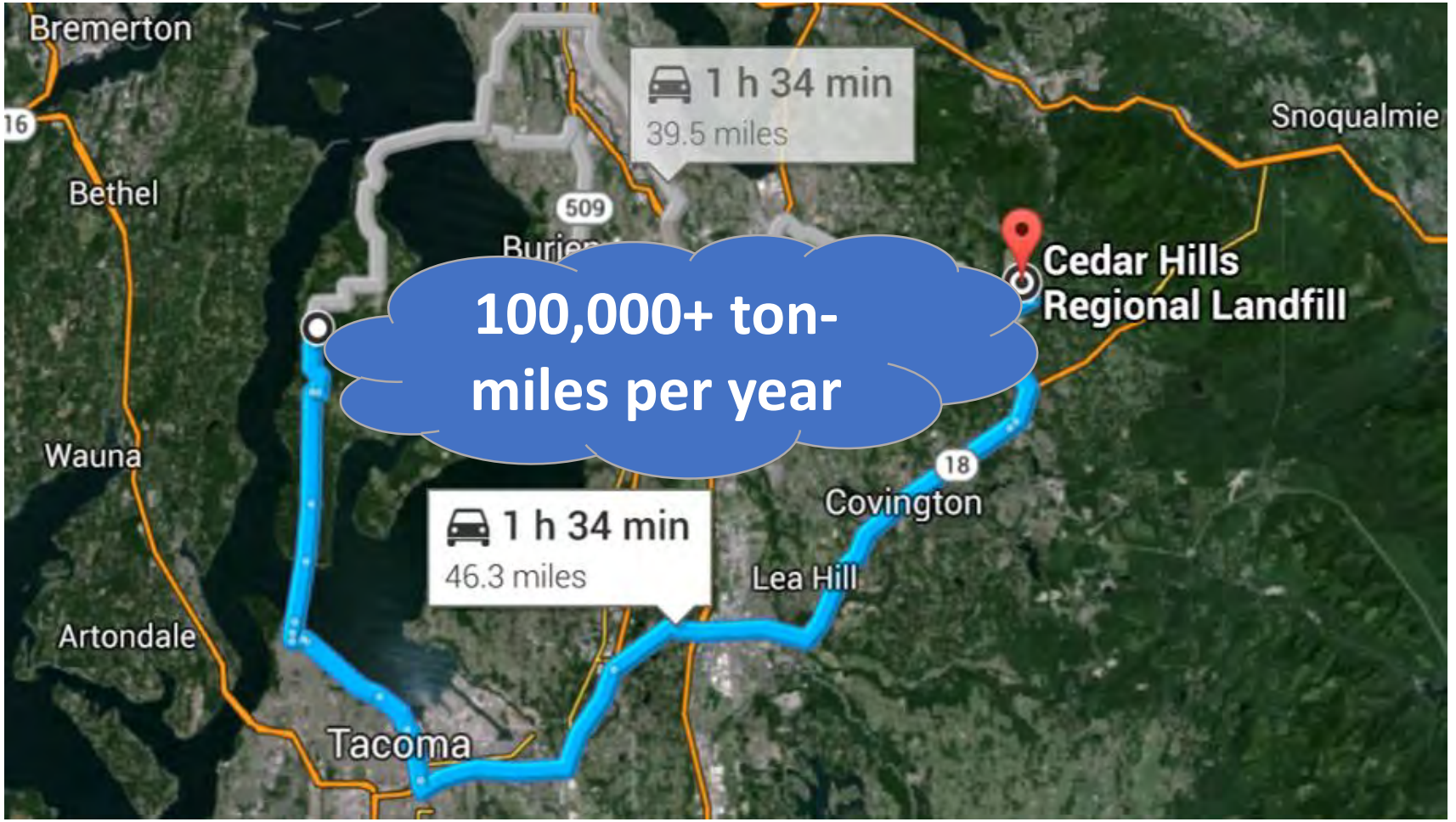
- Potential demand is not a barrier to existing end uses
- Emerging end uses may offer attractive alternatives or play complimentary roles
- Expansion of end use products may depend on state rather than private market priorities

Questions

Decentralized Anaerobic Digestion

Srirup Kumar
Impact Bioenergy

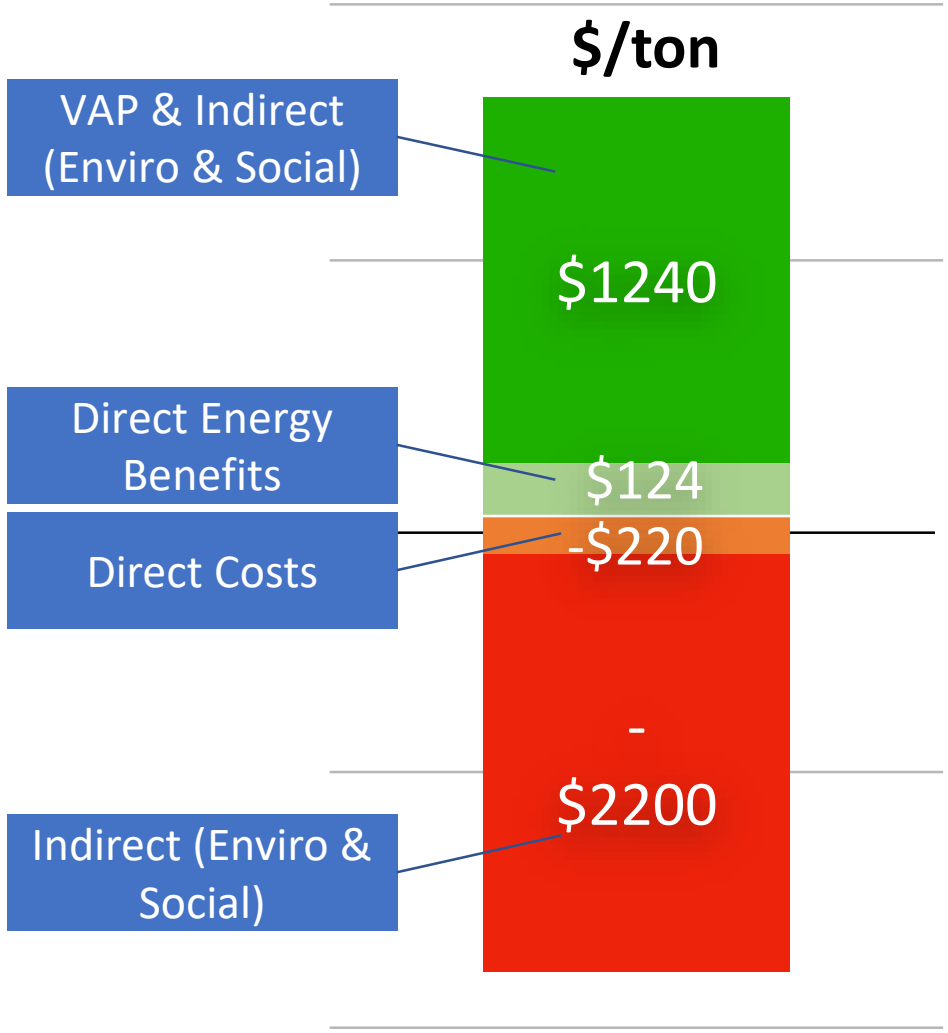
Vashon Island pre-2014



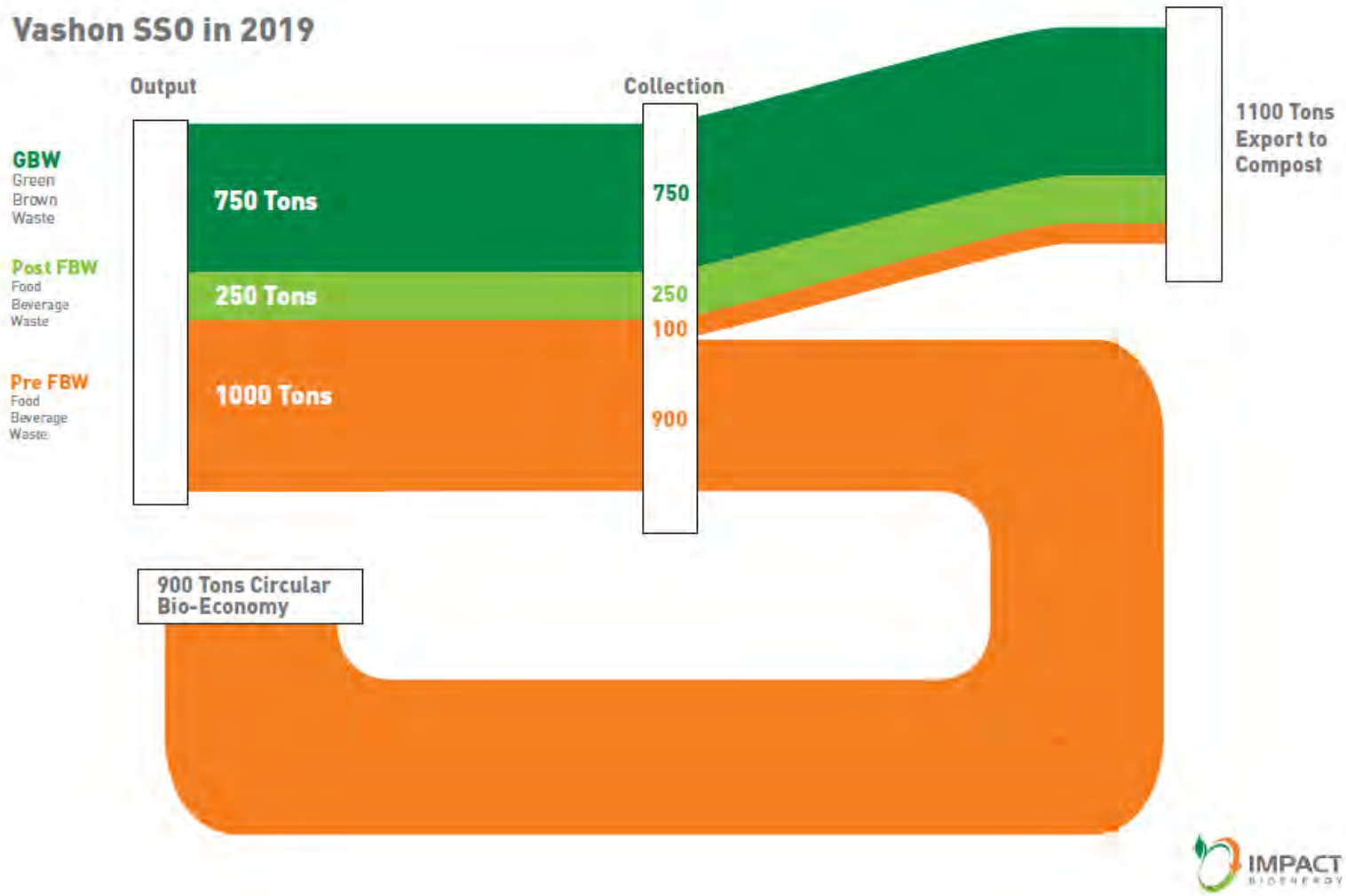
Direct Costs Per Ton

	VRTS			
	tons	trips	total monthly cost	$/ton
Jan	82.71	14	$ 12,724.81	$ 153.85
Feb	57.70	16	$ 12,222.62	$ 211.83
Mar	98.88	26	$ 20,184.16	$ 204.13
Apr	70.73	18	$ 14,116.95	$ 199.59
May	78.42	24	$ 17,821.74	$ 227.26
Jun	70.97	22	$ 16,278.95	$ 229.38
Jul	77.02	28	$ 19,880.42	$ 258.12
Aug	63.09	24	$ 16,855.95	$ 267.17
Sep	68.46	26	$ 18,267.70	$ 266.84
Oct	61.47	18	$ 13,533.57	$ 220.17
Nov	68.59	17	$ 13,445.41	$ 196.03
Dec	0	0	$ -	$ -
totals	798.04	233	$ 175,332.28	$ 219.70
costs	$ per trip		$ 536.72	
	tip/ton		$ 63.00	
	actual cost per ton		**$ 219.70**	

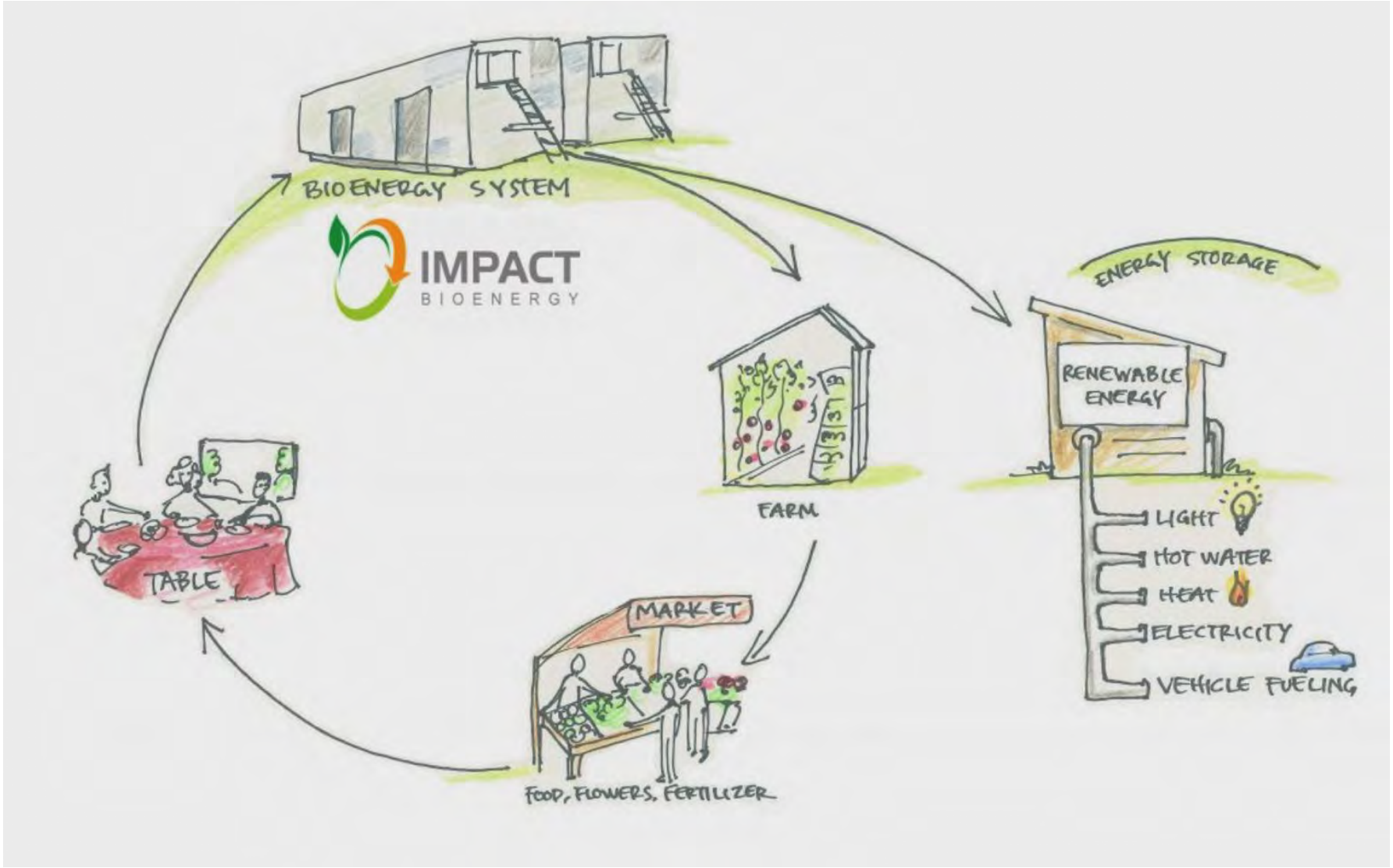
True Costs



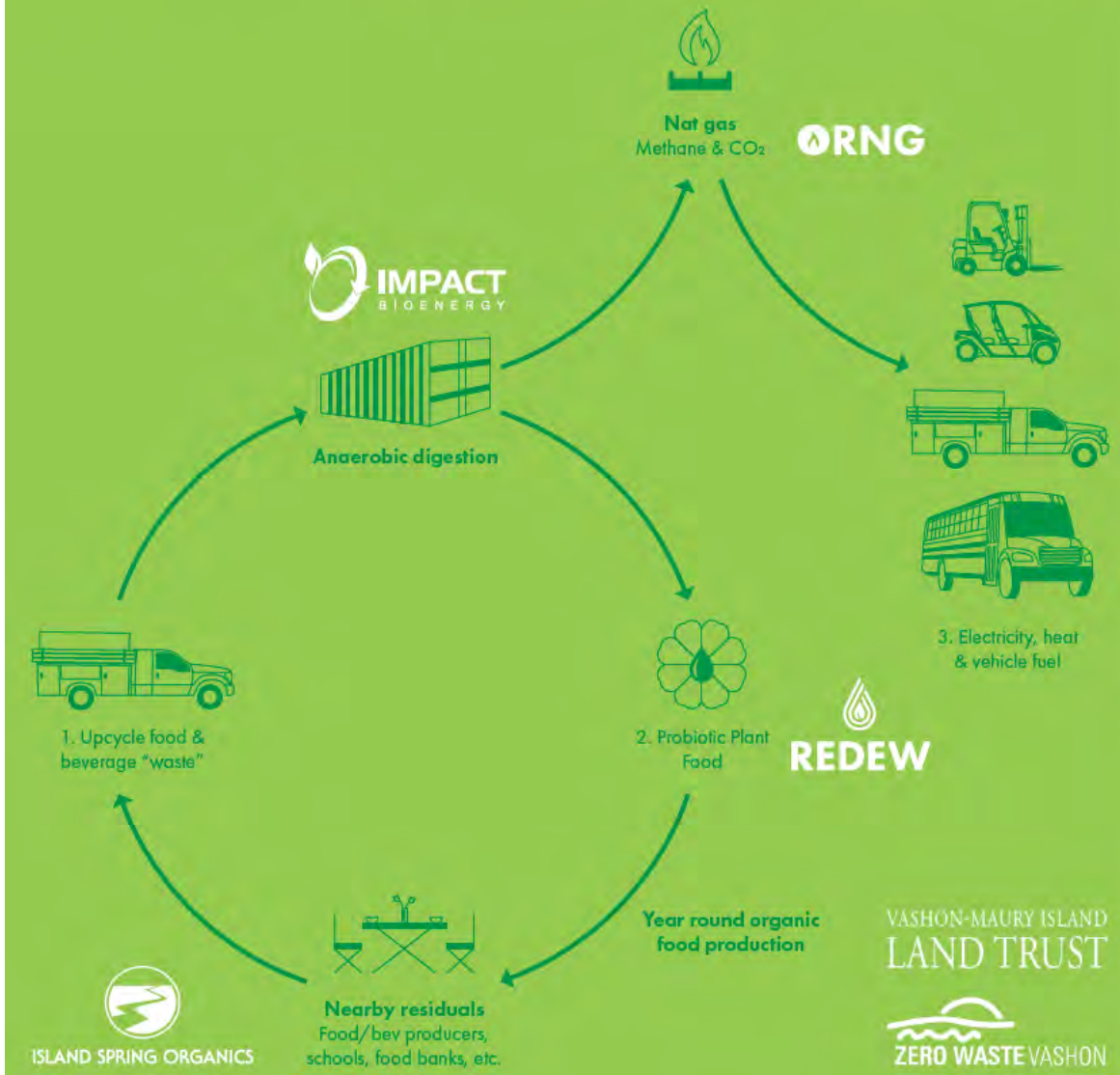
Vashon Island 2019



True Circularity



Converting **Community Food "Waste"** to **Community Resources** *with zero-waste*



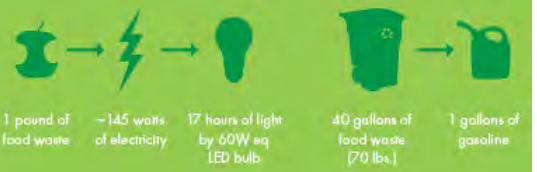
Who can use a bioenergy system?

Impact's modular bioenergy systems, the HORSE (25 to 175 tons/year) and NAUTILUS (185 to 1,500 tons/year), are sized to match the available food and beverage "waste" at or near the host, minimizing the capital cost, transportation, and footprint of anaerobic digestion.

What do they generate?

Renewable Energy

The bioenergy systems offer distributed, base-load energy and heat production, providing energy independence and resiliency. The energy can be stored to balance intermittent renewables such as solar and wind, to reduce power demand charges, and to address disaster preparedness.



Organic Soil Amendments

The NAUTILUS reclaims the nutrients and water, creating a rich probiotic plant food that promotes the healthy growth of your and your community's own food, flowers, and landscapes. It replaces chemically-based fertilizers with locally produced probiotic plant food soil amendments.

Vashon Island 2019

Thank you!

Questions

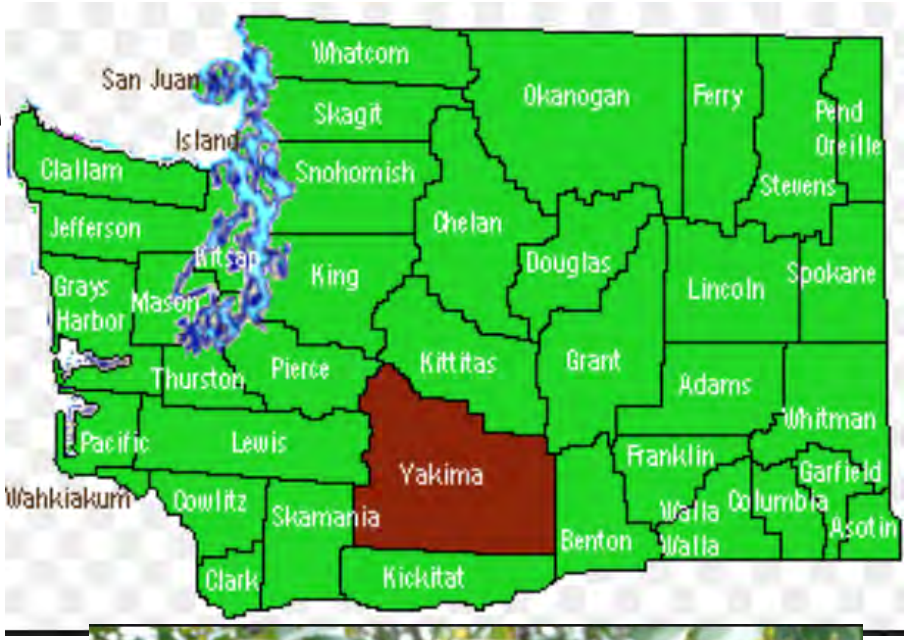
There's No Place Like Home

Dr. Sally Brown
University of Washington

Local versus long distance markets for compost

- Often a perception that 'east of the mountains' is the 'Oz' for organics
  - Primarily agricultural
  - Recognition in the literature of the benefits of organics for soils
  - Should lead to an easy market for 'Westside' composts

Yakima County for example



- #1 County in WA for agriculture
- Top producer of tree fruit including apples, cherries and pears
- Also major grower of vegetables
- And lest we forget
  - Grapes and hops

They also have their own organics
(WA DOE Biomass and Bioenergy inventory, 2005)

- Field residue – 130,107
- Animal waste – 212,087
- Forestry – 464,120
- Food packaging – 18,837
- Municipal – 162,160

And their own compost

Loop versus compost

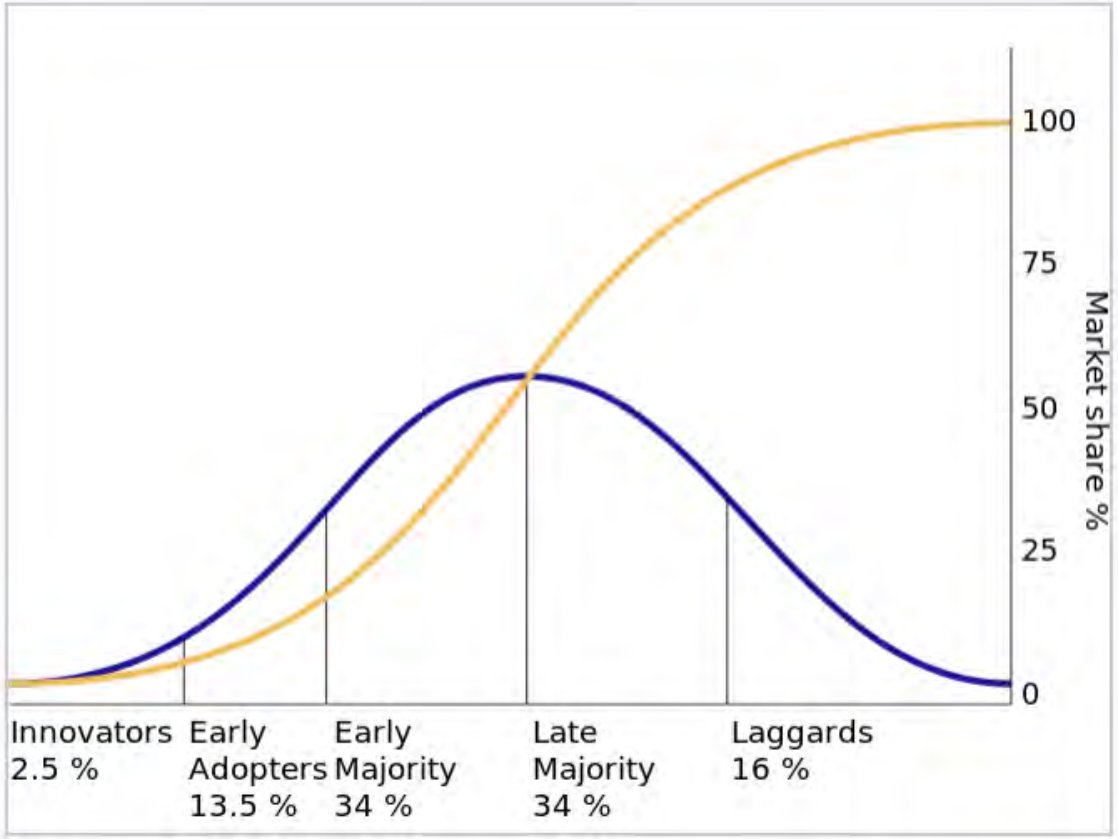
- Loop as Class B is not suitable for most uses in King County (forestry is the exception)
- Loop's cost structure is built to include transport and application
- Loop is a very consistent product with high nutrient value
  - It can be used as a direct substitute for synthetic fertilizers

- Loop made a very deliberate decision to target highly respected leaders in the community to be first users and spokespeople for their product
  - Standard model for diffusion of information

Loop versus compost - contaminants

- No one wants their toilet or sink to overflow
- The WWTP has grit screens that screen out the majority of contaminants in the product
- These limit contaminants in Loop

Loop goes to Yakima



The diffusion of innovations according to Rogers. With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level. The blue curve is broken into sections of adopters.

Feedstocks to Natural Selection

- Likely a high tip fee
- NSF- equipment to remove contaminants
- Would be able to blend to get a consistent product
- Is this really the best or even a viable alternative?

Compost for farmers

- Is valuable over the long-term and with high cumulative applications
  - Builds organic matter, adds tilth, water holding capacity, source of micronutrients, can improve product yield and quality
- No current subsidies available for compost use
- Very expensive for limited short-term benefits
- Is King County willing to subsidize?

Compare Yakima to King County
(WA DOE Biomass and Bioenergy inventory, 2005)

- Field residue – 0
- Animal waste – 56,360
- Forestry – 132,393
- Food packaging – 0
- Municipal – 1,177,000

Compost versus Loop

- Compost is suitable for all uses in King County
- Compost's cost structure is based on a tip fee to the compost facility
  - That is itself partially based on revenues from sale of the product
- Compost (food/ yard) is not a very consistent product and has low nutrient value
  - Total fertilizer value will vary seasonally and be based on the ratio of green to brown
- Compost has not made decisions on how to encourage large-scale adoption of its product
  - Standard model for diffusion of information

Compost versus Loop - contaminants

- Trash cans don't overflow
- Compostable packaging can help limit
- The best way to limit contaminants is public awareness/ownership

BioCycle.net

BIOCYCLE

THE ORGANICS RECYCLING AUTHORITY.

Search over 2,500 articles on composting, renewable energy and organics recycling.

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Contaminant Removal Strategies

Separation of materials requires identifying the appropriate characteristic by which sorting can be done, and optimized. Key separation characteristics are size, weight, density, hardness, magnetism, electrical conductivity and light refraction.

Craig Coker
BioCycle June 2014, Vol. 55, No. 5, p. 46

Troubles with your product will follow wherever you go

Where did they find what they were looking for?

- (Brain) – Lower contaminant levels
- (Heart)- High and consistent product quality
- (Courage)- Local, dedicated market

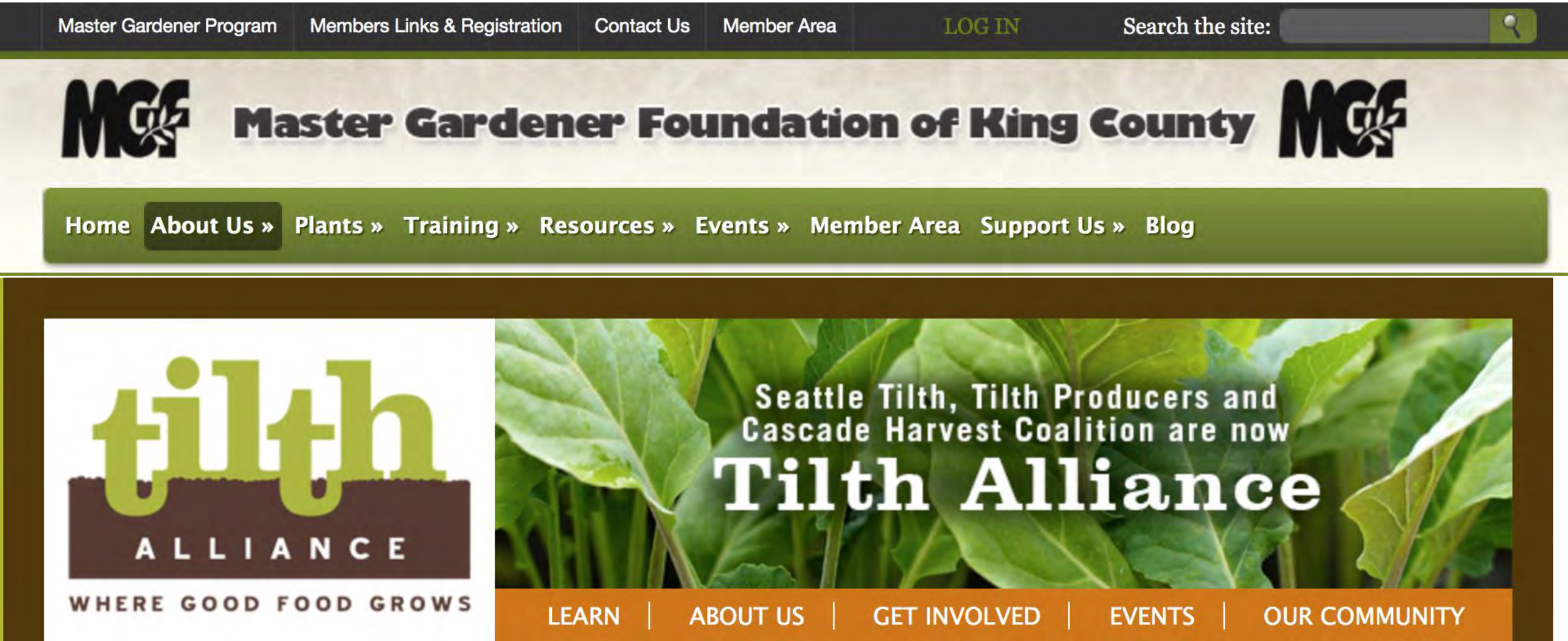
If you look internally- high market potential
Make compost use the SOP

Major highways

- Interstate 5
- Interstate 90
- Interstate 405
- U.S. Route 2
- State Route 18
- State Route 99
- State Route 167
- State Route 520
- State Route 522

About King County Parks

You also have local innovators



Increasing local use and awareness

- Will also give you a better product
- People will know what happens to the stuff in the bin
- They will care about product quality
- They may even start taking the stickers off of the vegetables

So repeat after me…..

While you can click your heels - your time would be much better spent in developing local markets while simultaneously working on product quality.

Questions

Market Assessment Update

Andy Smith, King County Solid Waste Division
Andrea Lai, Cascadia Consulting Group

King County
Department of
Natural Resources and Parks
Solid Waste Division

King County Linkup Program

Current organics focus

- What is the Generation, Disposal, Capture, and processing Capacity in our region?
- What is being disposed inappropriately in organics carts? How much and why?
- What does current compost product look like after processing?
- What can we reasonably expect Food Waste Generation to look like in the near future?
- What is the current market for organics materials – both local and national opportunities?

King County

King County Compost Commitment

We will work to expand and enhance the regional market for compost from the county's organics stream.

- Stakeholder input
- King County compost review
- Organics assessment
- Market assessment

King County

King County Compost Review

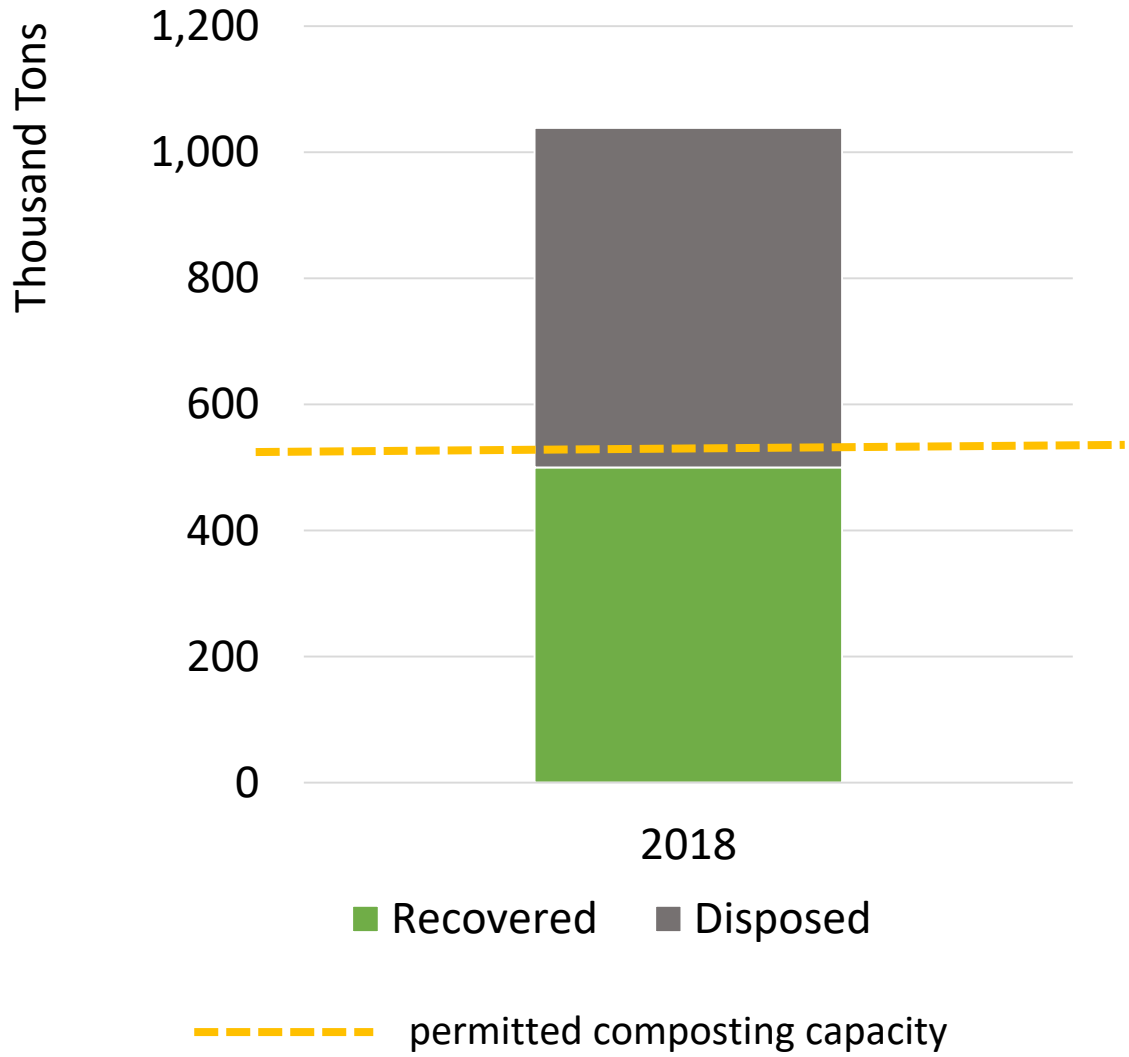
Working with King County Divisions and Agencies to support them:

- Identify current approaches
- Understand current usage
- Consider the carbon benefits
- Develop new opportunities

King County

We are near permitted capacity, with more organics available to recover

Approximately 500,000 tons of organics were collected for recovery in 2018—but still slightly less than half of what we generated.



Estimated 2018 organics generation, King County, Snohomish County, and Seattle.

End Markets for Finished Compost

Stormwater Control

(soil amendment per local code)

Erosion Control

Landscaping/ Nursery

Agriculture

Barriers and Opportunities for Compost Use

Barriers

Broadly:

- Cost
- Product quality
- Knowledge

Variability of demand—in some markets, tied to construction and development

Opportunities

- Shared responsibility for product quality
- Investment in research and pilot demonstrations
- Ongoing engagement and training—not only for waste generators, but also for end users of product.

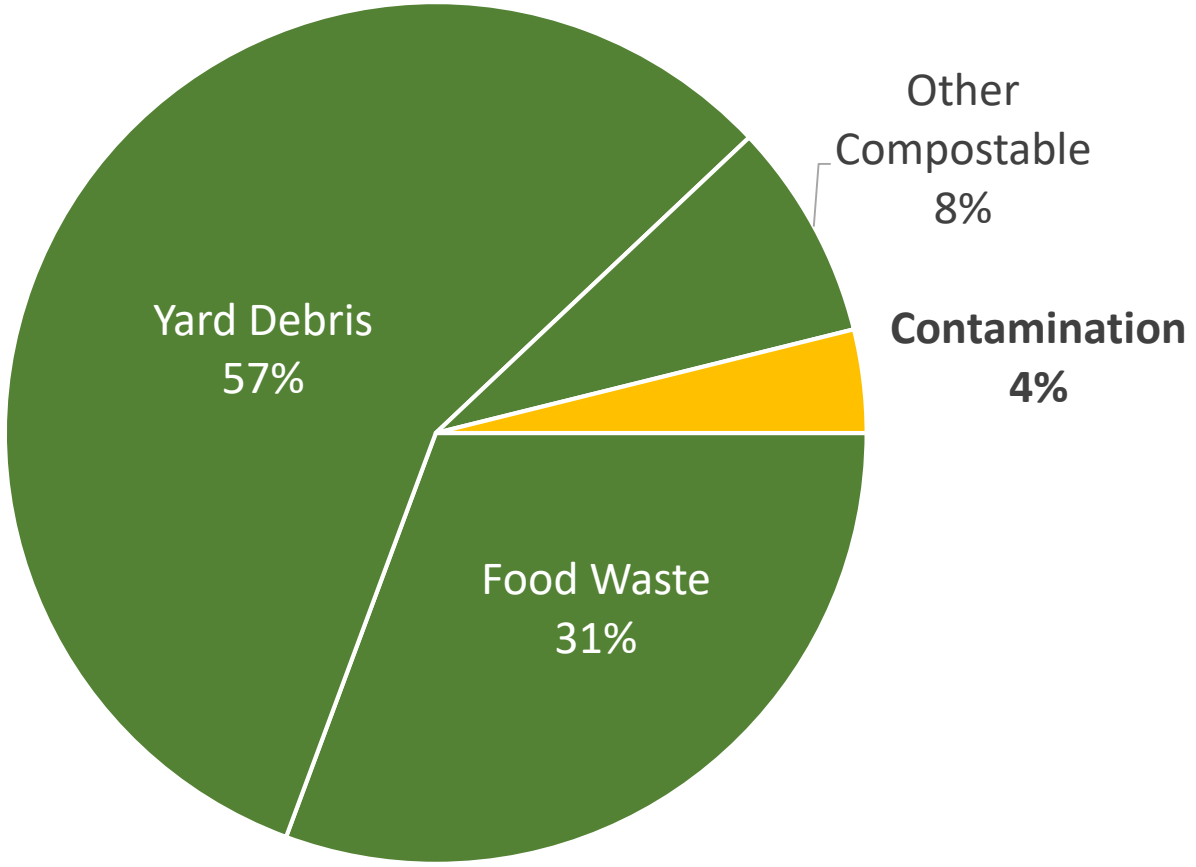
Known data gaps

- Level of compliance and enforcement on existing policies
- Understanding barriers for specific user types and audiences

Summit #1
Information gap:
Contamination

Two in-progress studies:

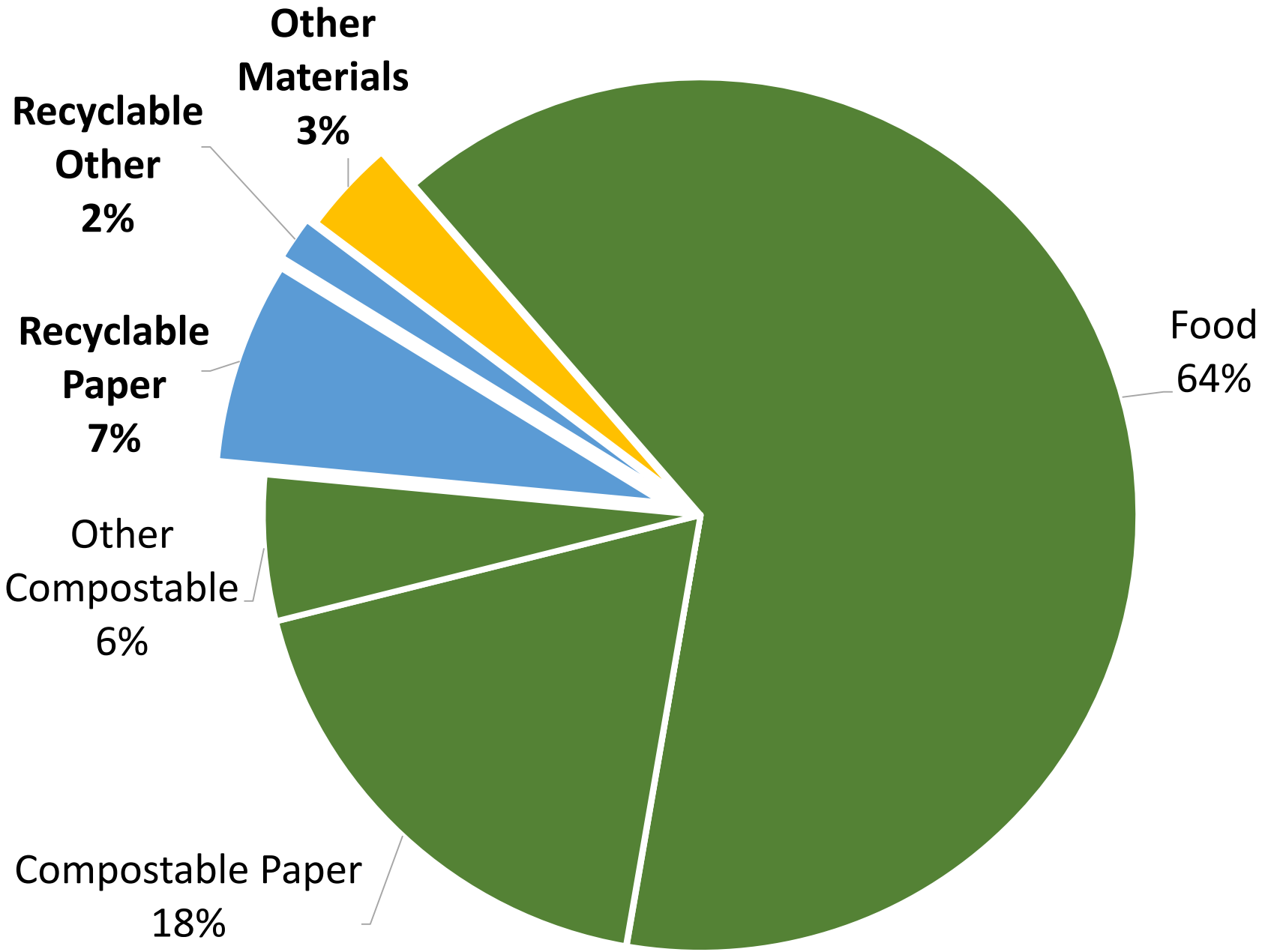
- Inbound commercial organics
- Finished product study



Composition of 2018 organics stream (in percentages by weight), King County and Seattle, all generating sectors

King County Commercial Curbside Organics

March 2019
preliminary
study data



King County Commercial Curbside Organics

March 2019 preliminary study data

Material	% Ratio	+/-
Compostable Items	**87.9%**	**3.6%**
Fruits and Vegetables, Edible	11.2%	4.3%
Fruits and Vegetables, Non-edible	13.7%	2.6%
Homegrown Fruits and Vegetables	0.0%	0.0%
Meat, Edible	3.1%	1.2%
Meat, Non-edible	2.6%	1.8%
Mixed/Other Food Waste, Edible	19.1%	3.0%
Mixed/Other Food Waste, Non-edible	14.4%	3.9%
Single-use Food Service Comp. Paper	7.3%	1.9%
Other Compostable Paper	11.1%	1.9%
Compostable Plastic Bags and Film	2.5%	0.4%
Compostable Plastic Food Packaging	0.8%	0.3%
Yard Debris	0.0%	0.0%
Compostable Plastic Utensils/Straws	1.4%	0.3%
Other Compostables	0.7%	0.8%

Material	% Ratio	+/-
Recyclable Items	**8.8%**	**3.1%**
Recyclable Paper	7.3%	3.0%
Recyclable Plastic	0.9%	0.2%
Recyclable Metal, Ferrous	0.1%	0.1%
Recyclable Metal, Non-Ferrous	0.2%	0.1%
Recyclable Glass	0.3%	0.2%
Other Materials	**3.4%**	**1.2%**
Other Plastic	1.9%	0.4%
Other Metal	0.1%	0.0%
Other Glass	0.1%	0.1%
Other Materials	1.3%	1.2%

Questions

Creating a Shared Vision

King County
Department of
Natural Resources and Parks
Solid Waste Division

Vision Statement

A vision statement is what we ultimately want to achieve.

What is the desired end state for organics materials management in our region?

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Option #1

All organic material is captured, processed and used locally.

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Option #2

Organic material is prevented, reduced, recycled and ultimately reused locally, creating a self-sustaining regional organics system.

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Option #3

The region's organics recycling system reduces waste, promotes healthier soils and protects the environment.

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Lunch Break

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Breakout Groups

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Breakout Groups

Contamination

Processing Capacity

End Markets

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Small Group Reports & Mapping our Path Forward

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Wrap-Up

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King County Solid Waste Work Plan

- Implement regional organics education and tagging campaign
- Identify opportunities for more compost use in government projects and provide technical assistance
- Identify opportunities for more compost use in agriculture
- Evaluate the feasibility of organics processing at Vashon Island Transfer Station
- Explore commercial food waste digestion at waste water treatment digesters
- Support review of potential zoning amendments for siting composting facilities
- Others - TBD

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Continued Stakeholder Engagement

1) Clean Cart Communication Work Group

Purpose: Develop and implement a regional education and cart tagging program designed to reduce "bad" behavior with the curbside organics cart.

2) Organics Management Bi-annual Meetings

Purpose: Keep organics issues at the forefront. Report on progress, successes and continued challenges.

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Summary of Next Steps

- Report sharing output from both summits send for input
- Finalize all data and research

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THANK YOU!

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