



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!

# Welcome

The webinar will begin at 2:00 PM Eastern



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Moderator



### **Anneliese McClurg**

Coordinator, Research & Technical Assistance  
Council of Development Finance Agencies  
Columbus, OH

**Thank  
you**  
for joining the  
conversation today.  
Send us your questions  
and comments!

See all of CDFA's resources online at [www.cdfa.net/resources](http://www.cdfa.net/resources)



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Legal Disclaimer

CDFA is not herein engaged in rendering legal, accounting, financial or other advisory services, nor does CDFA intend that the material included herein be relied upon to the exclusion of outside counsel or a municipal advisor. This publication, report or presentation is intended to provide accurate and authoritative general information and does not constitute advising on any municipal security or municipal financial product. CDFA is not a registered municipal advisor and does not provide advice, guidance or recommendations on the issuance of municipal securities or municipal financial products. Those seeking to conduct complex financial transactions using the best practices mentioned in this publication, report or presentation are encouraged to seek the advice of a skilled legal, financial and/or registered municipal advisor. Questions concerning this publication, report or presentation should be directed to [info@cdfa.net](mailto:info@cdfa.net).

Updated: 2020

**Thank  
you**  
for joining the  
conversation today.  
Send us your questions  
and comments!



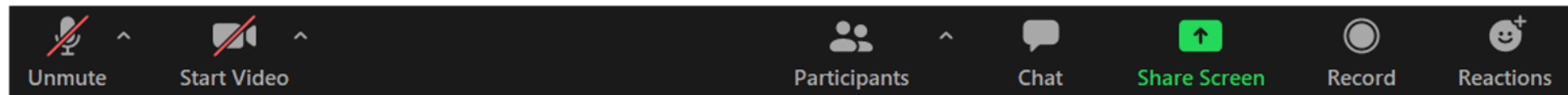
## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Join the Conversation

**Submit your questions by using the chat function!**



**Thank you**  
for joining the conversation today.  
Send us your questions and comments!





## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Defining the Food System Asset Class

For the past several years, CDFA has been researching how development finance agencies can become more engaged in developing localized food systems through traditional finance approaches. The premise of this project is to suggest and then prove that, if organized and defined properly, the food system can become a defined asset class worthy of traditional investment. Through this work, CDFA aims to advance opportunities and leverage capital to scale local food systems, increase access to better food, and create new living wage jobs in communities across the country.

**Thank  
you**

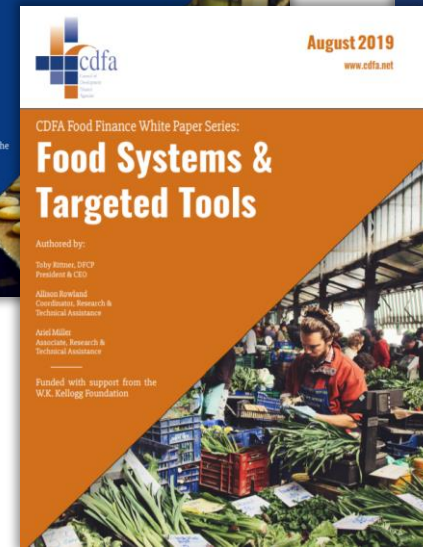
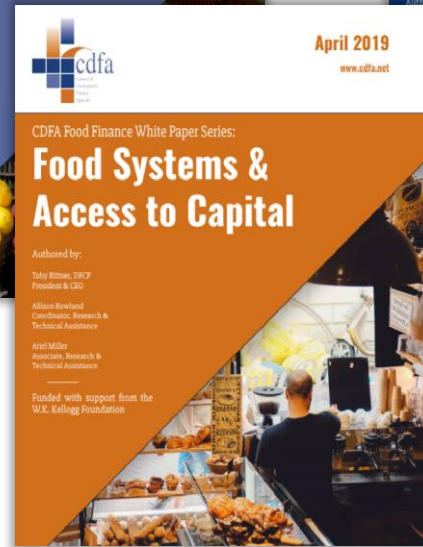
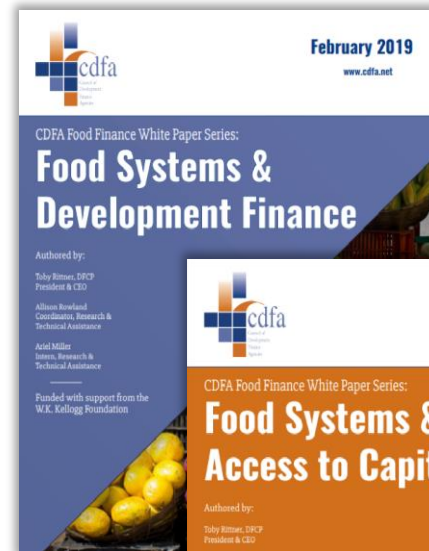
for joining the  
conversation today.  
Send us your questions  
and comments!





# Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

## CDFA Food Finance White Paper Series



**Thank you**  
for joining the conversation today.  
Send us your questions and comments!





# Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

## Panelists



**Caroline Vance**

Director of Capital, Innovation, and Engagement  
ReFED



**Kyle O'Keefe**

Director of Innovation and Programs  
SWACO



**Rodney Wendt**

Executive Director  
Washington Economic Development Finance Authority

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Panelist



#### **Caroline Vance**

Director of Capital, Innovation, and Engagement  
ReFED

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!





# Solving the Problem of Food Waste

(And What You Can Do About It)

PRESENTED BY  
Caroline Vance

---

October 11, 2022





## Who We Are

ReFED is a **U.S.-based nonprofit** working to **stop food loss and waste across the food system** by advancing **data-driven solutions** to the problem.

## Our Vision

A **sustainable, resilient, and inclusive food system** that optimizes environmental resources, minimizes climate impacts, and makes the best use of the food we grow.



### DATA & INSIGHTS

Leveraging data and insights that highlight supply chain inefficiencies and economic opportunities **to inform and motivate progress**



### CAPITAL & INNOVATION

Catalyzing capital **to spur innovation and scale high-impact initiatives**



### STAKEHOLDER ENGAGEMENT

Mobilizing and connecting supporters across the food system **to take targeted action**

# The Food Waste Challenge



## Feeding more people with fewer resources

50%

The United Nations predicts we'll need to increase global food supply by this amount to feed the population in 2050...

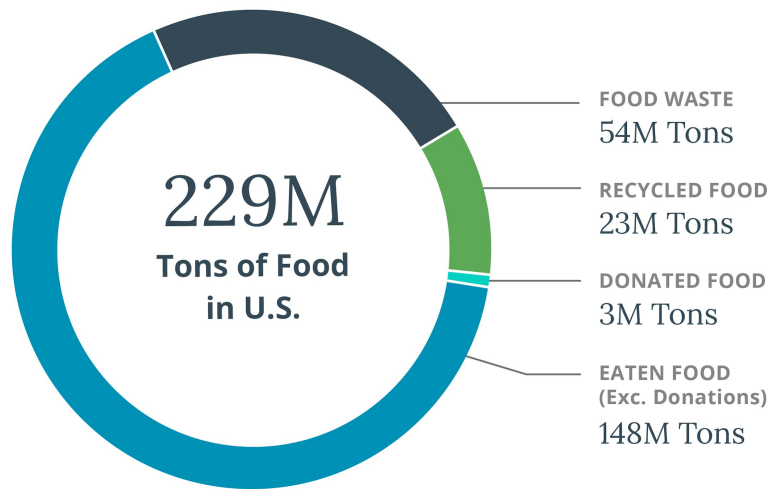
Yet a new study is showing that agricultural productivity has decreased by this amount due to the impacts of climate change:

21%

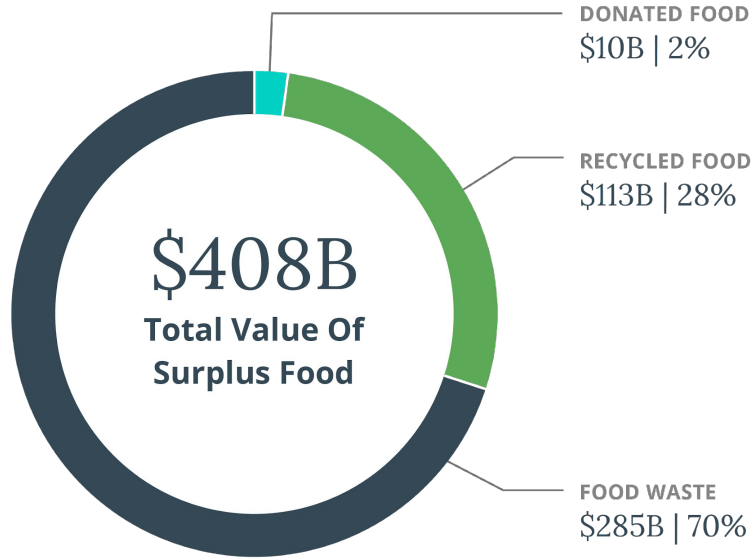
## GHG emissions by country



Source: CAIT, 2015, FAO 2015 Food wastage footprint & climate change. Rome: FAO



35% of all food  
went unsold or  
uneaten in 2019...



That surplus food was valued at \$408 billion – nearly 2% of U.S. GDP.

# Impacts of uneaten food: Hunger and Food Insecurity





## Impacts of uneaten food: Environmental



4%  
of U.S. GHG  
Emissions



14%  
of all  
Fresh Water Use



18%  
of all  
Cropland Use



24%  
of Landfill Inputs  
**#1 material** (EPA Estimate)

## A key opportunity to mitigate GHG emissions

Food waste ranked **#1 of 76** solutions for reversing climate change globally by Project Drawdown.<sup>1</sup>

**GHGs** come from growing, processing, and transporting food and **methane** is released as food rots in landfills.

**The emissions** caused by wasted food in the US is equivalent to **more than 58 million cars**.<sup>2</sup>

If food waste were its own country, it would rank as the **third largest GHG emitter**, behind only China and the United States.



# 50%

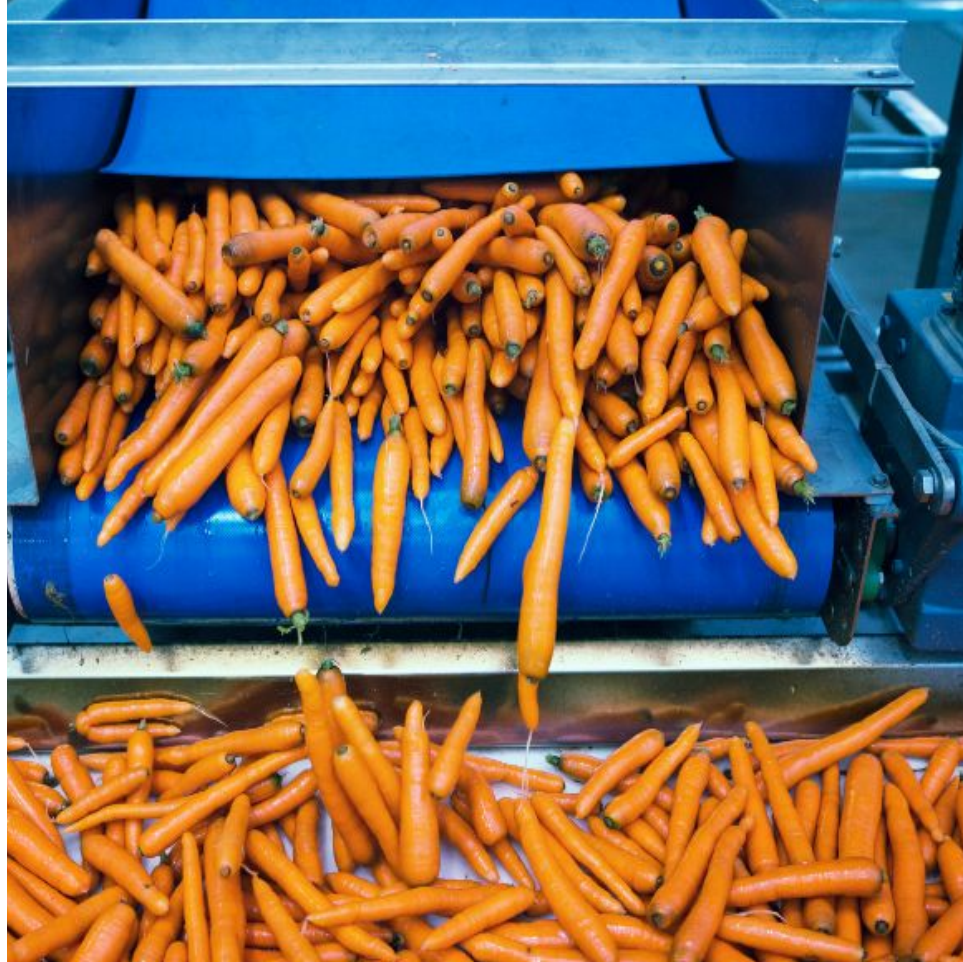
National and international goal  
for the amount of food waste that  
must be reduced by the year 2030

TARGET 12-3

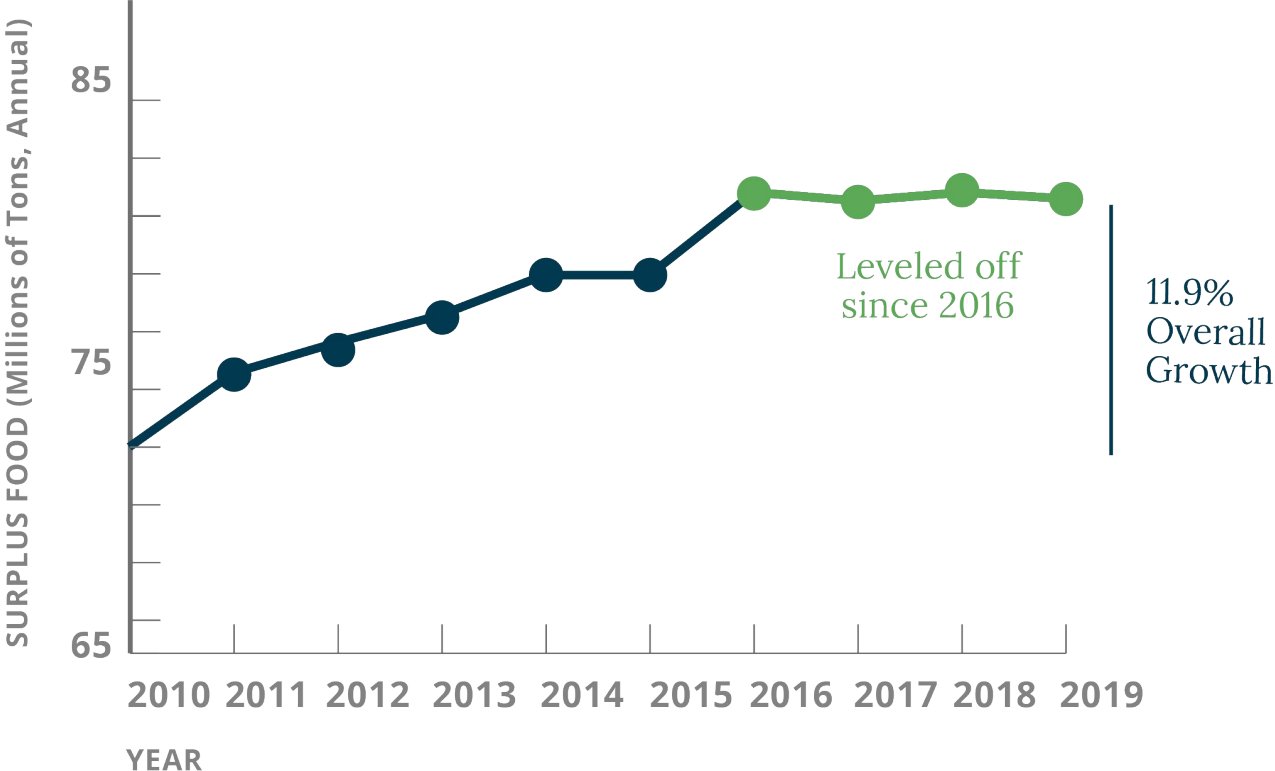


HALVE GLOBAL PER CAPITA FOOD WASTE

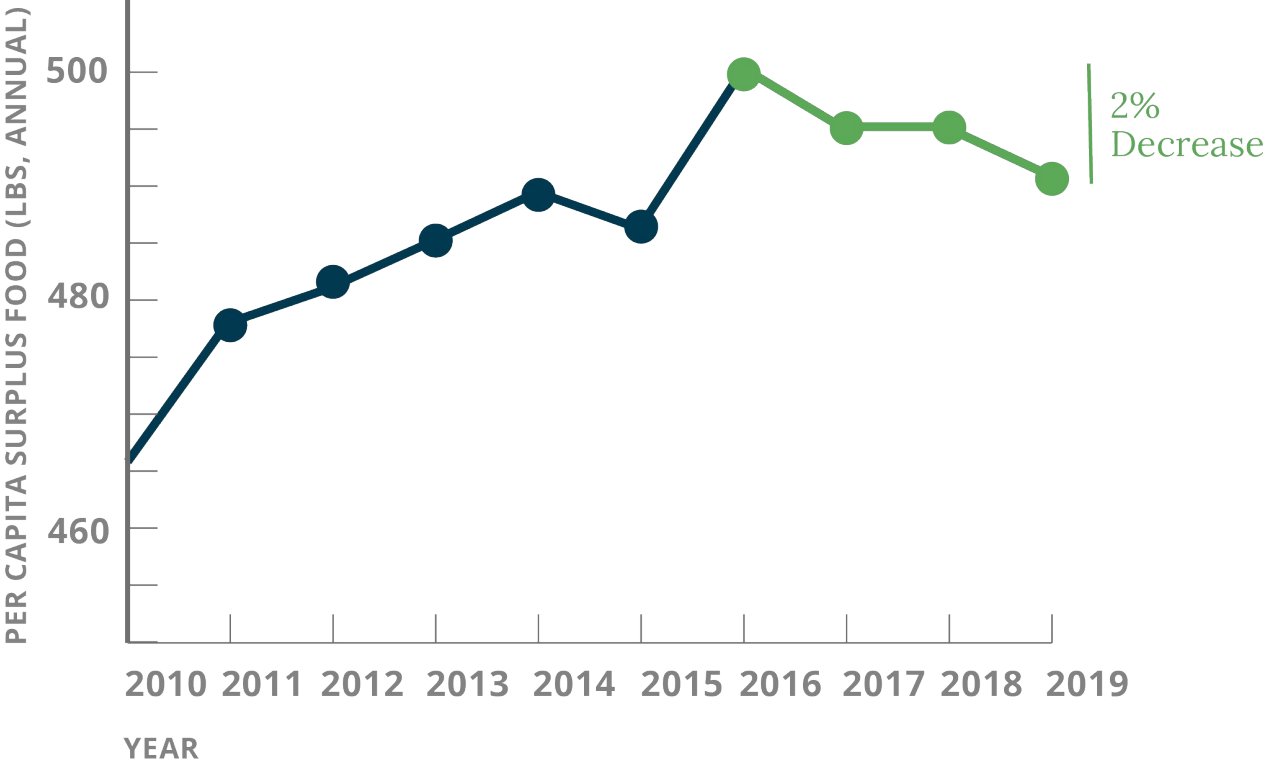
12 RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



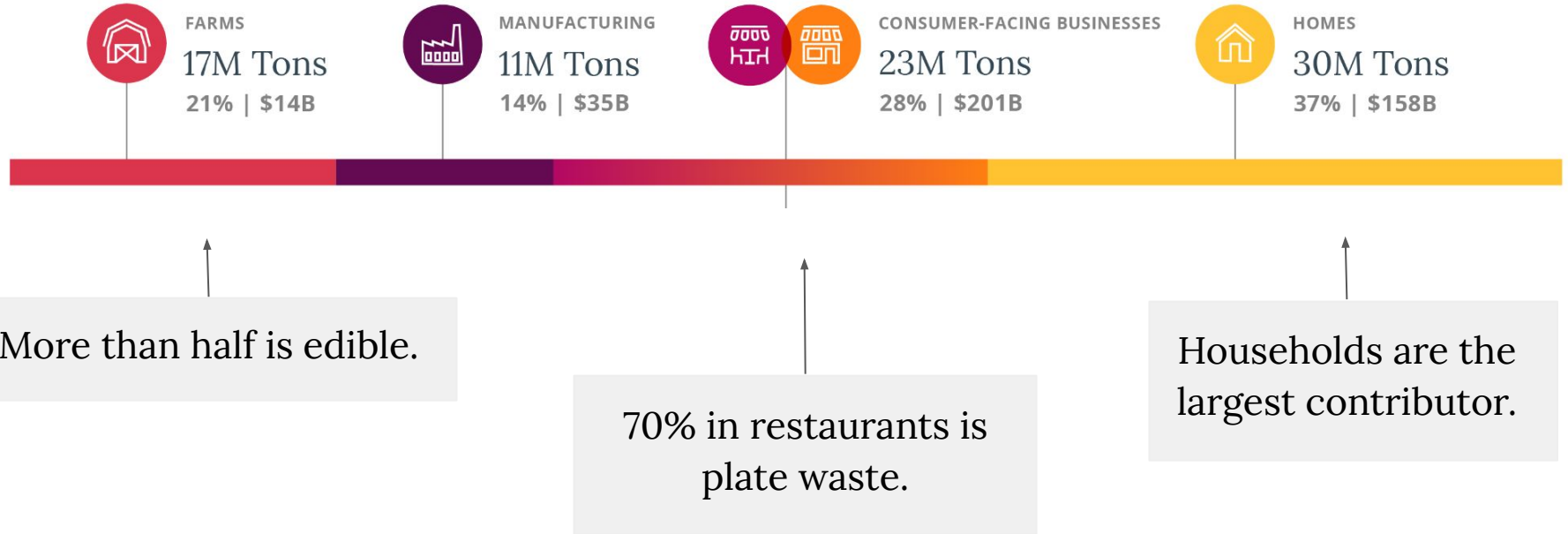
# Surplus food has leveled off since 2016...



And *per capita* surplus food has actually declined to 2014 levels



# ReFED mapped the problem: surplus food occurs across the supply chain



# A Blueprint for action

The *Roadmap to 2030* looks at the entire food system and provides a framework to focus waste reduction efforts. Powered by the Insights Engine, the *Roadmap to 2030* is an indispensable resource for reaching our 2030 goal.

7

ReFED outlined seven key action areas for the food system to focus its efforts over the next ten years to *prevent*, *rescue*, and *recycle* food at risk of going to waste.

## PREVENTION

## RESCUE

## RECYCLING



Optimize  
The  
Harvest



Enhance  
Product  
Distribution



Refine  
Product  
Management



Maximize  
Product  
Utilization



Reshape  
Consumer  
Environments

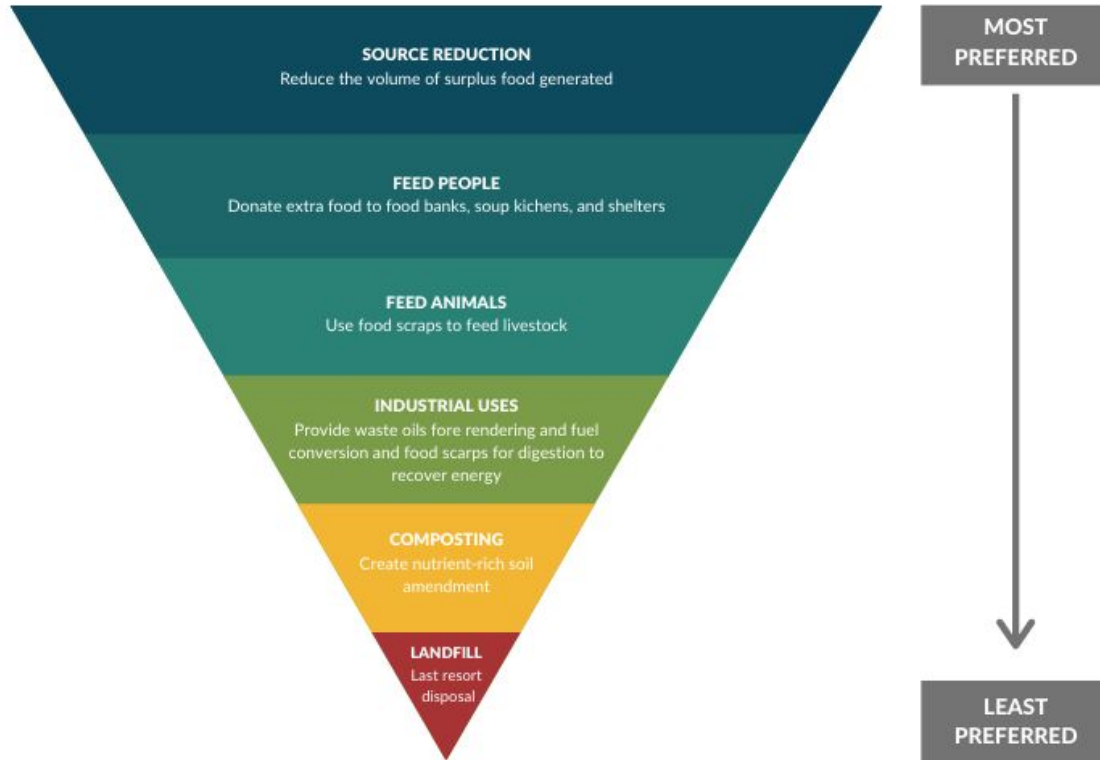


Strengthen  
Food  
Rescue



Recycle  
Anything  
Remaining

# Reduce, Reuse, Recycle





Action Areas



OPTIMIZE THE HARVEST

Avoid over-production, then harvest as much as possible. For wild caught products, source only what is needed.



ENHANCE PRODUCT DISTRIBUTION

Leverage technology to create smart systems that help efficiently move products to maximize freshness and selling time.



REFINE PRODUCT MANAGEMENT

Align purchases with sales as closely as possible and find secondary outlets for surplus. Build out systems and processes for optimal on-site handling.



MAXIMIZE PRODUCT UTILIZATION

Design facilities, operations, and menus to use as much of each product as possible. Upcycle surplus and byproducts into food products.



RESHAPE CONSUMER ENVIRONMENTS

Drive consumers towards better food management and less waste by creating shopping, cooking, and eating environments that promote those behaviors. Shift culture to place more value on food and reduce waste.



STRENGTHEN FOOD RESCUE

Further the rescue of high-quality, nutritious food by increasing capacity, addressing bottlenecks, and improving communication flow.



RECYCLE ANYTHING REMAINING

Find the highest and best use for any remaining food or food scraps in order to capture nutrients, energy, or other residual value.

| OPTIMIZE THE HARVEST                          | ENHANCE PRODUCT DISTRIBUTION                                       | REFINE PRODUCT MANAGEMENT              | MAXIMIZE PRODUCT UTILIZATION                    | RESHAPE CONSUMER ENVIRONMENTS  | STRENGTHEN FOOD RESCUE                    | RECYCLE ANYTHING REMAINING                                 |
|---|--|--|---|--|---|--|
| Buyer Spec Expansion                          | Decreased Transit Time   | Assisted Distressed Sales              | Active & Intelligent Packaging                  | Meal Kits  | Donation Coordination & Matching          | Centralized Anaerobic Digestion                            |
| Gleaning                                      | First Expired First Out  | Decreased Minimum Order Quantity       | Manufacturing Byproduct Utilization (Upcycling) | Buffet Signage   | Donation Education                        | Community Composting                                       |
| Imperfect & Surplus Produce Channels          | Intelligent Routing  | Dynamic Pricing                        | Manufacturing Line Optimization                 | Consumer Education Campaigns   | Donation Storage Handling & Capacity      | Centralized Composting                                     |
| Partial Order Acceptance                      | Temperature Monitoring (Pallet Transport)                          | Enhanced Demand Planning               | Edible Coatings                                 | K-12 Lunch Improvements  | Donation Transportation                   | Co-digestion at Wastewater Treatment Plants                |
| Field Cooling Units                           | Reduced Warehouse Handling   | Increased Delivery Frequency           | Improved Recipe Planning                        | Package Design   | Donation Value-Added Processing           | Home Composting  |
| In-Field Sanitation Monitoring                | Advanced Shipment Notifications                                    | Markdown Alert Applications            | In-House Repurposing                            | Portion Sizes  | Blast Chilling to Enable Donations        | Livestock Feed   |
| Innovative Grower Contracts                   | Early Spoilage Detection (Hyperspectral Imaging)                   | Minimized On-Hand Inventory            | Precision Food Safety                           | Small Plates   | Donation Reverse Logistics                | Waste-Derived Agricultural Inputs                          |
| Labor Matching                                | Inventory Traceability   | Temperature Monitoring (Foodservice)   | Discount Meal Plates                            | Standardized Date Labels   | High-Frequency Reliable Pickups           | Insect Farming   |
| Smaller Harvest Lots                          | Modified Atmosphere Packaging System                               | Waste Tracking (Foodservice)           | Employee Meals                                  | K-12 Education Campaigns   | Established Relationships with Businesses | Rendering  |
| Improved Communication for Planting Schedules | Vibration & Drops Tracking   | Low Waste Event Contracts              | Larger Quantities for Take Home                 | Trayless   | Culling SOPs                              | Waste-Derived Processed Animal Feed                        |
| Sanitation Practices & Monitoring             | Optimized Truck Packing, Loading & Unloading (e.g., Cross-Docking) | Direct to Consumer Channels            | Small and Versatile Menus                       | Home Shelf-life Extension Technologies                                     |   | Waste-Derived Bioplastics                                  |
| Optimized Harvesting Schedules                | Enforcing Cold Chain SOPs  | Online Marketplace Platform            | Sous-Vide Cooking                               | Smart Home Devices   |   | Waste-Derived Biomaterials                                 |
| On-Farm / Near-Farm Processing                | Regular Maintenance on Refrigerated Trucks                         | Online, Advanced Grocery Sales         |   | Waste Conscious Promotions   |   | Enabling Technologies (e.g. depackaging and pre-treatment) |
| Local Food Systems                            | Cross-Docking  | Precision Event Attendance             |   | Frozen Value-Added Processing of Fresh Produce                             |   | Separation & Measurement                                   |
| Clear Product Ownership                       |  | Repackaging Partially Damaged Products |   | Customizable Menus/Options   |   | Relationships with Waste Haulers                           |
|   |  | Retail Automated Order Fulfillment     |   | To-Go Offerings  |   | Waste Audits by Waste Haulers                              |
|   |  | SKU Rationalization                    |   | Free Items Offered Upon Request (e.g., bread, chips)                       |   |  |
|   |  | Markdowns                              |   | Storytelling (e.g. product impact, source, upcycled ingredient components) |   |  |
|   |  | Optimal Storage                        |   |  |   |  |
|   |  | Reduced Displays                       |   |  |   |  |
|   |  | Optimized Walk-In Layouts              |   |  |   |  |

Modeled Solutions

Unmodeled Solutions

Best Practices

## WHAT'S NEEDED

40+  
SOLUTIONS

\$14B  
INVESTMENT ANNUALLY

POLICY CHANGES

INNOVATION

ENGAGEMENT

## WASTE REDUCTION

45M  
ANNUAL FOOD WASTE  
DIVERSION (TONS)

## IMPACT PER YEAR

 \$73B NET FINANCIAL BENEFIT

 4T GALLONS IN WATER SAVINGS

 75M TONS GHG EMISSION REDUCTION  
POTENTIAL (MT CO<sub>2</sub>e)

 4B MEALS FOR PEOPLE IN NEED

 51K JOBS CREATED THROUGH SOLUTION  
IMPLEMENTATION OVER 10 YEARS

## Mobilizing capital is essential



### Project Finance (Gov't.)

\$714M / 5%

### Tax Incentives (Gov't.)

\$97M / 1%

### Grants (Gov't.)

\$1,024M / 7%

### Grants (Non-Gov't.)

\$1,217M / 9%

### Impact-First Investments

\$909M / 6%

### Venture Capital

\$1,421M / 10%

### Private Equity

\$1,085M / 8%

### Corporate Finance & Spending

\$7,124M / 50%

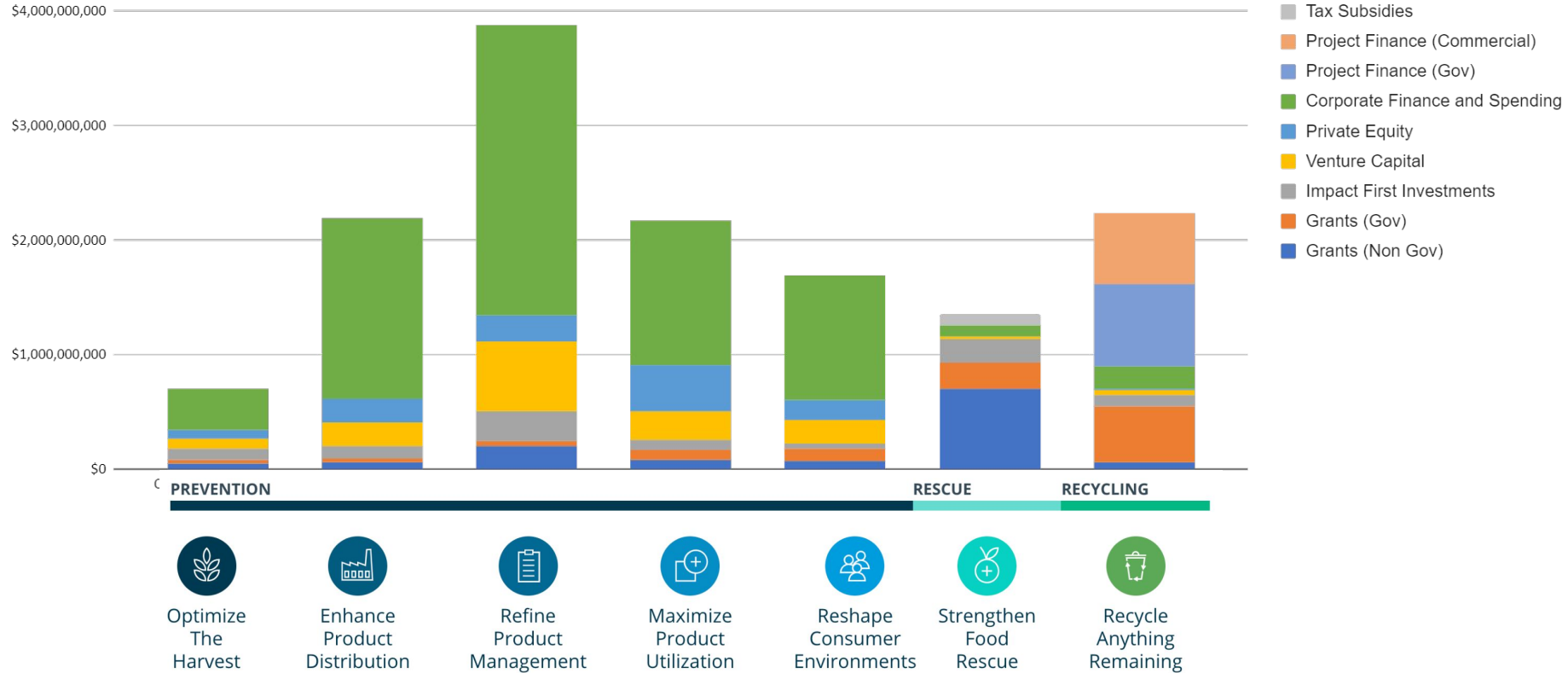
### Project Finance (Commercial)

\$617M / 4%

Each type of capital plays a role:

- **Catalytic Capital** to de-risk or fund programs lacking a market return
- **Private Investment and Corporate Finance & Spending** to fund innovation and adoption
- **Government & Public Funding** to support infrastructure development and ongoing programs

# Capital of all types is required across the value chain



# Why We are Optimistic



# Increase in attention and commitments



10x20x30



2030 Champions (U.S.)



**12**  
COMPANIES

**200+**  
COMPANIES

**44+**  
COMPANIES

**16**  
CITIES

# Specific companies showing reductions



(SINCE 2020)



(SINCE 2017)



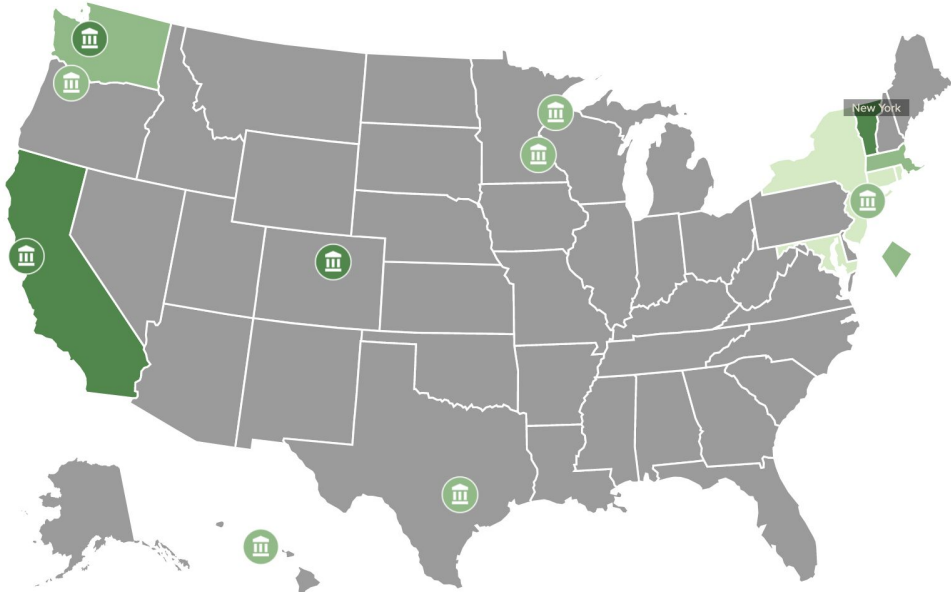
(SINCE 2020,  
Healthcare sector)

# The power of state policy



**99** Bills introduced

**28** Bills passed





More attention in the media

# THE WALL STREET JOURNAL.



## Food-Waste Startups Attract Funding as Grocers, Others Go Green

Venture-capital firms are investing in startups offering tech-savvy ways to make sure more food is eaten, not thrown away

**Food waste apps are battling to sell your leftovers**

## Bloomberg

Green | Climate Adaptation

**The Global Food Waste Crisis Is Even Bigger Than We Thought**

## The Washington Post

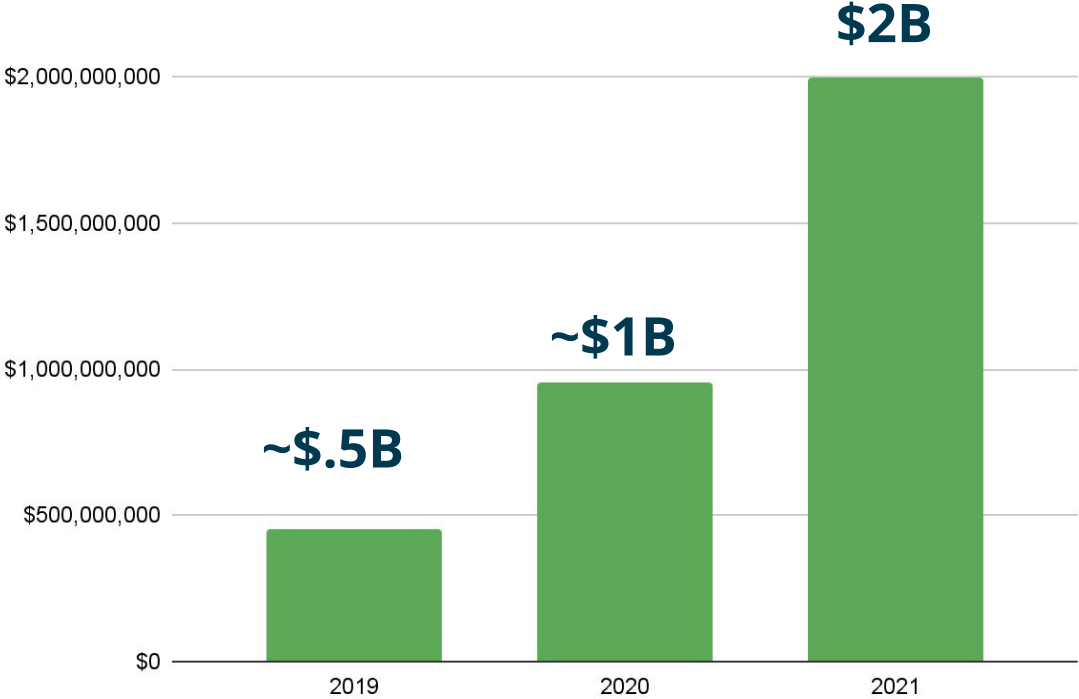
CLIMATE CURIOUS

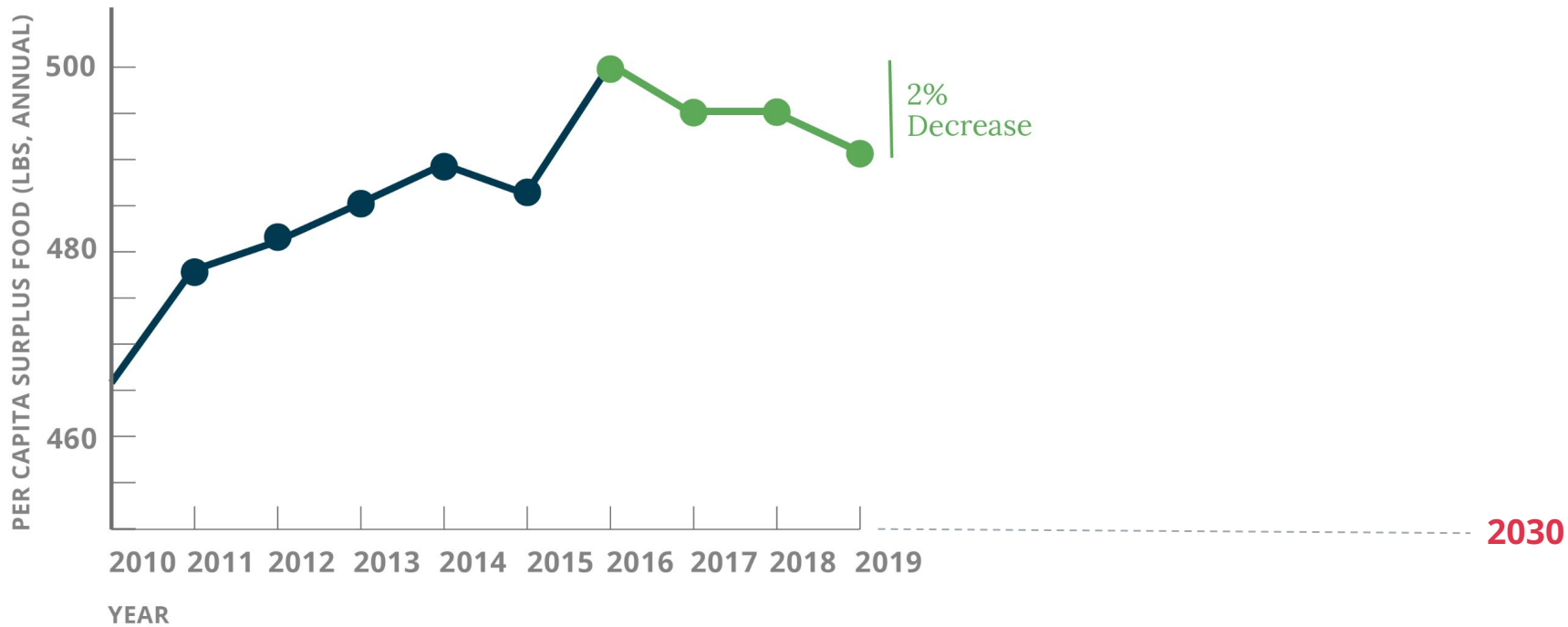
**A third of all food in the U.S. gets wasted. Fixing that could help fight climate change.**

## The New York Times

**One Thing Your City Can Do: Reduce Food Waste**

# Notable uptick in private capital





Source: ReFED

**2 DOWN**

**48 TO GO**

A vertical collage of fresh produce. From top to bottom: sliced beets on a wooden cutting board, a whole yellow lemon, a whole peach, a piece of broccoli, and a slice of citrus fruit in a white bowl. The background is a mix of these colors and textures.

**No Time – or Food! –  
To Waste**



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Panelist



**Kyle O'Keefe**

Director of Innovation and Programs  
SWACO

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!



# Creative Financing for Addressing Food Waste

Kyle O'Keefe  
Director of Innovation & Programs

# Solid Waste Authority of Central Ohio (SWACO)

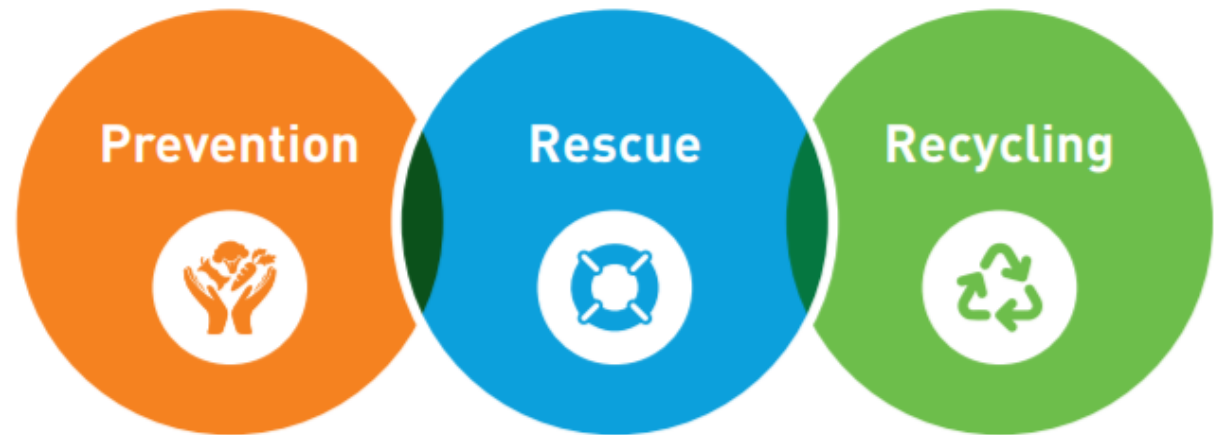
- Public Agency; Nine-member Board
- Franklin County jurisdiction / population 1.3mm
- Statutory purpose: reduce reliance on landfilling
- \$5 generation (landfill) fee on every ton of waste landfilled
- Annual program budget: \$6mm





## Central Ohio Food Waste Action Plan:

- Collective Impact Plan
- Over 100 local partners involved
- 50% food waste reduction by 2030
- 20 Solutions spanning three solution areas:





# Collective Financing for Composting Infrastructure

- Competitive process to evaluate public-private partnership currently underway
- SWACO to fund a portion of facility tipping fee for residentially generated food waste/organics: \$15-\$30 per ton
- SWACO to lease land for facility at little or no cost
- Regional communities commit yard waste and future food waste/organics to the facility
- Communities pay the remainder of the tipping fee cost

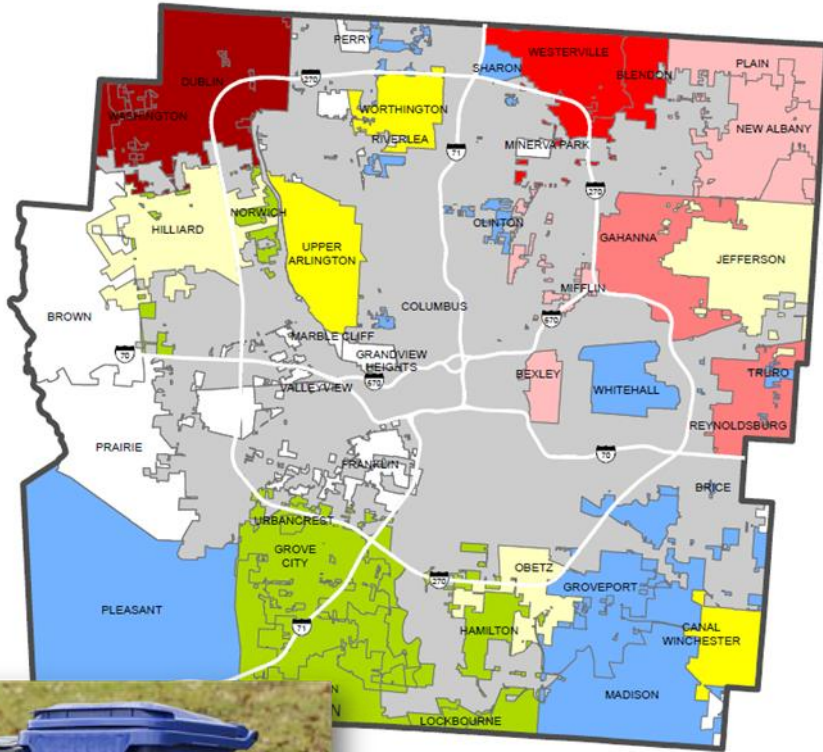


# Collective Financing of Recycling Collection Carts

- SWACO funds 50% of cart purchase costs
- SWACO negotiates a regional grant from The Recycling Partnership to cover 15-30% of cart costs
- SWACO finances the remainder(20-35%) with communities reimbursing SWACO over three years



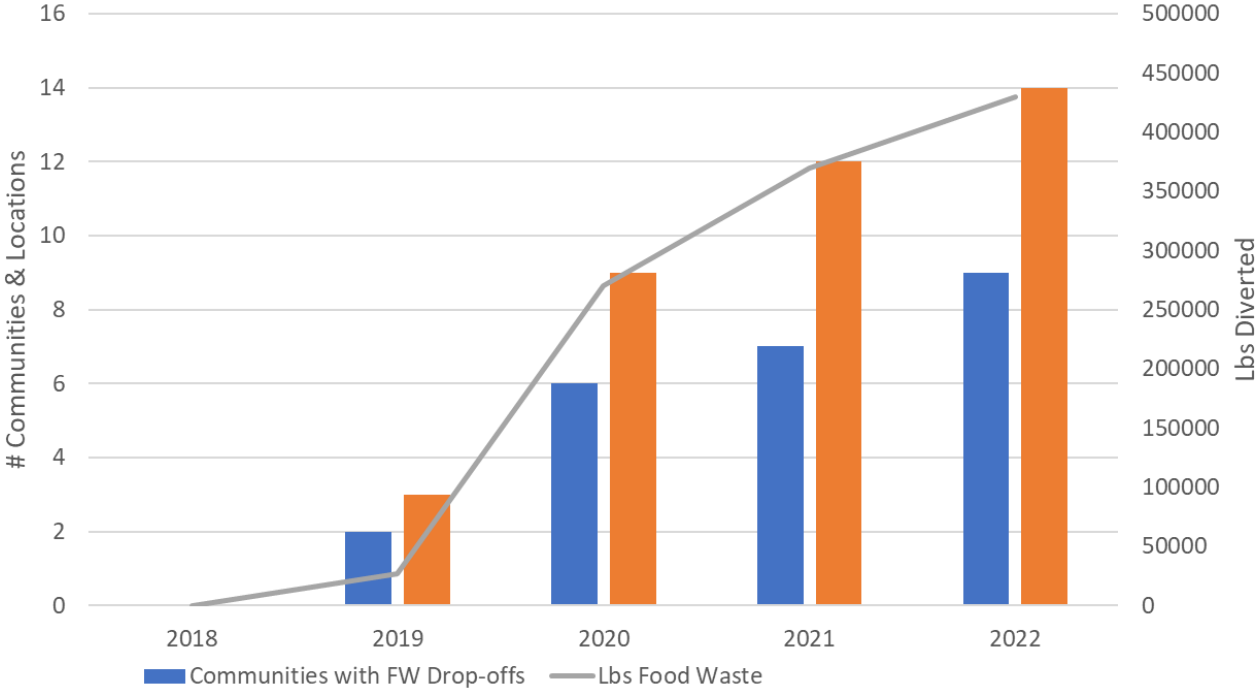
# Consortiums for Collection and Processing



- Competitive bidding and aggregation of regional collection services for recycling, yard waste, and trash
- SWACO manages bid process and development of terms and conditions
- Increase competitive bidding and reduce costs for communities



# Community Food Waste Drop-off Funding



# Incentives for Businesses and Institutions



Thank you!

Kyle O'Keefe

Director of Innovation and Programs

[Kyle.okeefe@swaco.org](mailto:Kyle.okeefe@swaco.org)



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

### Panelists



**Rodney Wendt**

Executive Director

Washington Economic Development Finance Authority

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!

# Addressing Food-Related Waste Through Conduit Bonds

Washington Economic  
Development Finance  
Authority

Rodney Wendt, Executive Director





WEDFA  
Washington  
Economic  
Development  
Finance  
Authority

- ▶ State agency created in 1989 by the legislature to act as a financial conduit to businesses through the issuance of nonrecourse revenue bonds
- ▶ Has the authority to issue these bonds in support of qualifying projects, including manufacturing, processing, airport and waste disposal facilities
- ▶ Over \$308,000,000 issued in bonds towards agricultural and food-related projects



# Tax-Exempt Bond Financing

- History of government-issued tax-exempt bonds for privately owned projects
- Tax-exempt bond financing contributes positively to the financial performance of projects
- The interest component of bond debt service payments is exempt from federal (and sometimes state and local) income taxes for the bond holder
- The interest rate will be lower than for a taxable bond
- Estimated savings using bank purchased tax-exempt bonds is a 15-20% reduction from conventional financing
- Estimated savings using bond fund-purchased tax-exempt bonds is a 20-40% reduction from equivalent conventional corporate or project finance debt
- Private Activity Bond categories include: Exempt Facility Bonds, including certain housing bonds; Qualified Small Issue Bonds (Manufacturing); Qualified 501(c)(3) Bonds

# Exempt Facility Bonds

- Issued to finance certain types of facilities without including:
  - Solid Waste Disposal Facilities
  - Sewage Treatment Facilities
- Often limited by available state “Volume Cap”





## Food Waste in Washington

- Food makes up 14% of Washington State's total waste stream at over 700,000 tons
  - The commercial sector generates 60% of this amount
- As food decomposes in bins, transit, compost facilities and landfills, it creates methane, a powerful greenhouse gas



## Food Waste in Washington: State plans, laws and rules

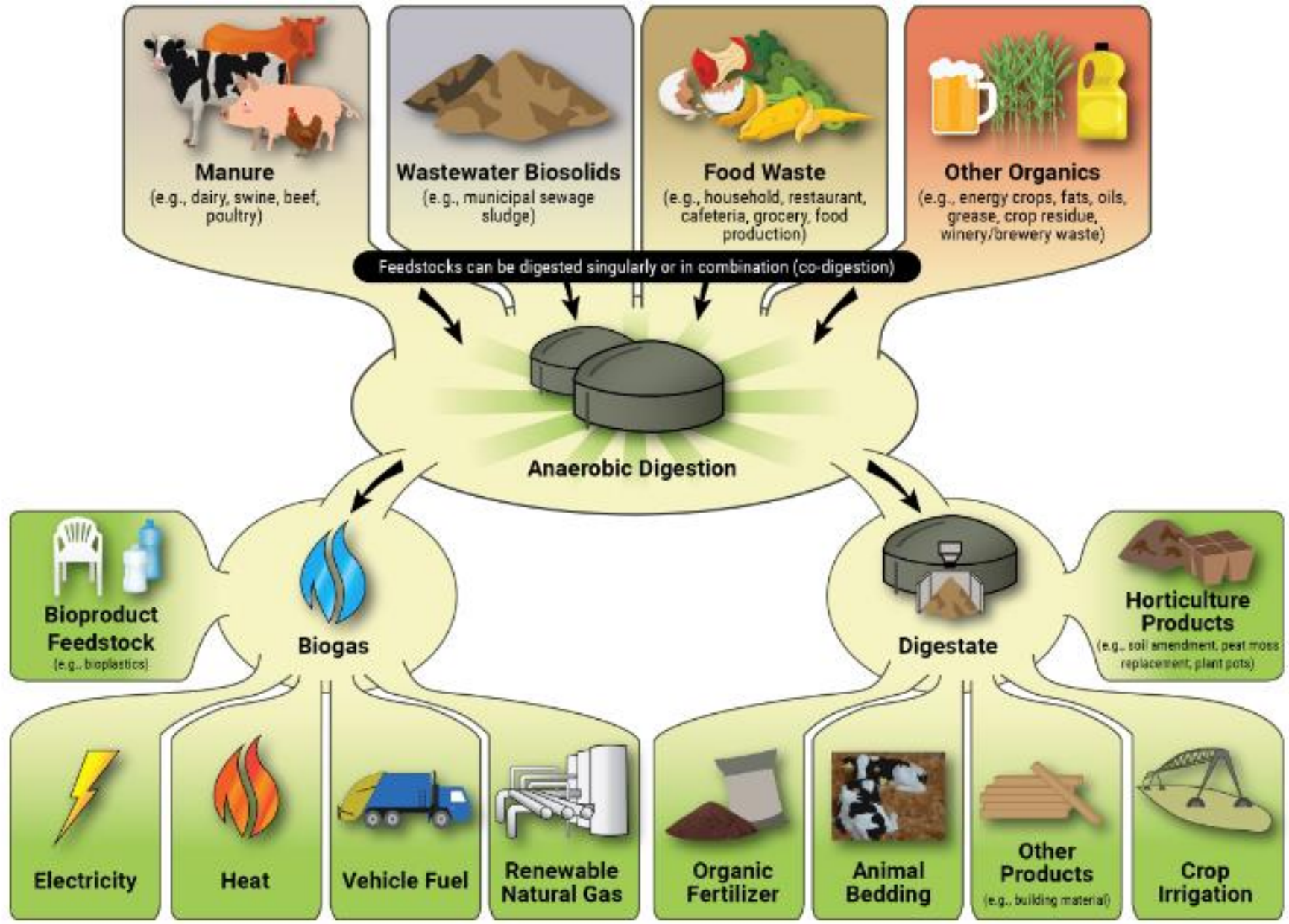
- In 2019, the Washington Legislature unanimously passed HB 1114, the Food Waste Reduction Act
- HB 1799, signed into law in 2022, sets a 2030 target to reduce the organic materials disposed of in Washington landfills by 75% by incentivizing food donation, composting and anaerobic digestion
- The Use Food Well Washington Plan is Washington's roadmap to reduce food waste by 50% by 2030



# Anaerobic Digestion

- Anaerobic digestion is a process through which bacteria break down organic matter—such as animal manure, wastewater biosolids, and food wastes—in the absence of oxygen

Flow of feedstocks through the Anaerobic Digestion system to produce biogas and digestate





# Divert, Inc.

---

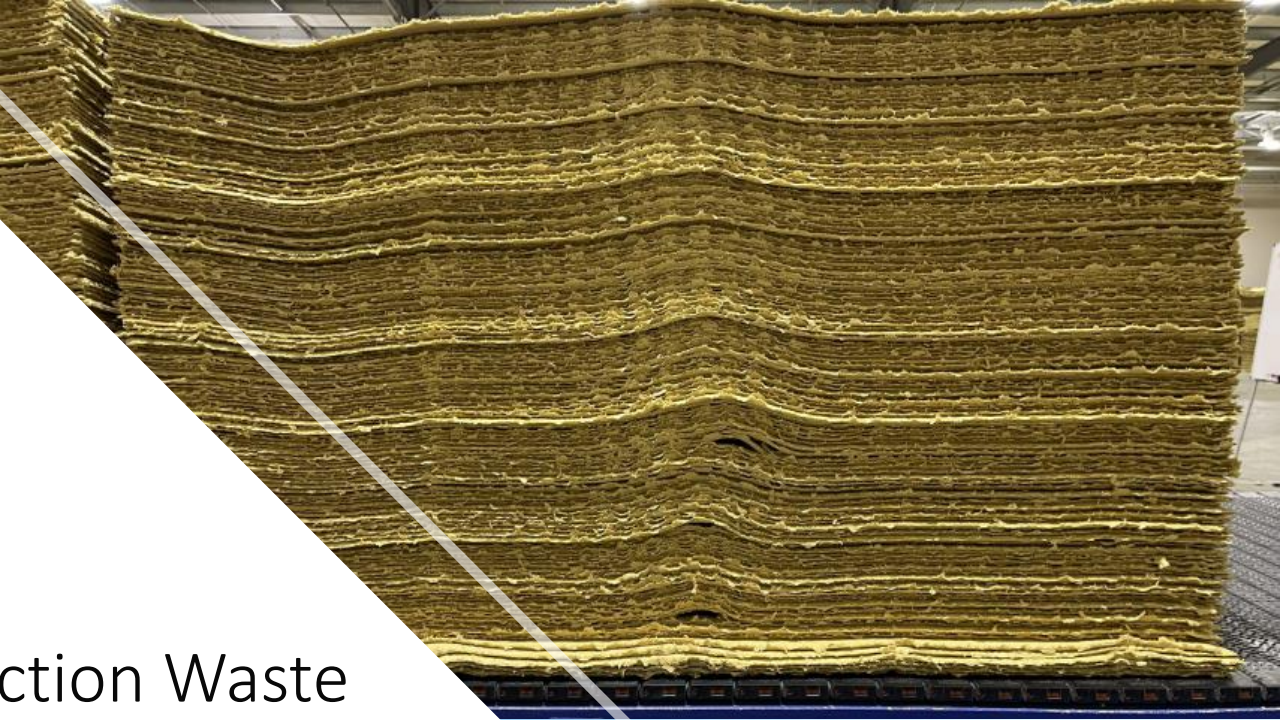
- \$76,164,000 project: \$51,075,367 in tax-exempt bonds
- Food waste recycling / renewable natural gas (RNG) generation facility in Longview, WA (Cowlitz County)
- The bond issuance is part of a larger, tri-part financing strategy that also includes projects in Pennsylvania (\$80,000,000) and California (\$52,000,000)
- All three series of bonds are designated as “Green Bonds,” a term used to provide investors the opportunity to invest directly in debt securities whose net proceeds are specifically allocated to support environmentally beneficial projects





# Divert's Process

- Food waste is analyzed for grocery store clients using proprietary technology to help the stores adjust purchasing to prevent excess waste
- Unsold and undonated organics are placed on a return trailer to the distribution center/anaerobic digester
- The digester will produce renewable energy for the plant
- The company plans for the renewable natural gas to be connected to nearby pipelines and sold to gas companies



Food Production Waste  
in Washington





- Pasco Wastewater Anaerobic Digestion Project, 2022
  - Will receive wastewater from new and existing food processing facility
  - \$138,600,000 project, with a portion financed as tax-exempt and taxable bonds
- 

- Mesa Dairy Project
  - 6,800 milking cows
  - About 35% financed with tax-exempt solid waste disposal bonds
- 

- Columbia County wheat straw project, 2017-2021
- Recycle straw pulp into packaging
- Majority of capital costs financed with tax exempt bonds

# WEDFA

Washington  
Economic  
Development  
Finance  
Authority

[www.wedfa.org](http://www.wedfa.org)



Rodney Wendt, Executive Director

Email: [wedfa@wshfc.org](mailto:wedfa@wshfc.org)

Phone: (206) 587-5634



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!

**Questions?**



Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

## Upcoming Events

### **CDFA National Development Finance Summit**

November, 2-4, 2022  
Denver, CO

### **CDFA // BNY Mellon Development Finance Webcast Series: Financing Tools to Invest in Clean Energy**

Tuesday, October 18 @ 2:00 - 3:00 PM Eastern

### **CDFA Federal Financing Webinar Series: Tools for Rural Communities from USDA**

Tuesday, October 25 @ 2:00 – 3:30 PM Eastern

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!

Register online at [www.cdfa.net](http://www.cdfa.net)



## Food Systems Finance Webinar Series: Don't Throw Away Opportunity! Creative Financing for Addressing Food-Related Waste

**Thank  
you**

for joining the  
conversation today.  
Send us your questions  
and comments!



**Anneliese McClurg**  
Coordinator, Research &  
Technical Assistance  
(614) 705-1315  
[amcclurg@cdfa.net](mailto:amcclurg@cdfa.net)

This webcast is designed to provide accurate and authoritative information in regard to the subject matter covered. It is available with the understanding that CDFA and the panelists are not engaged in rendering legal, accounting, or other professional services. If legal advice or other expert assistance is required, the services of a competent professional should be sought.