



Advancing Data-Driven Solutions to Reduce U.S. Food Waste

PRESENTED BY
Katy Franklin

Maryland Food Recovery Summit

December 1, 2021



Who We Are

ReFED is a national nonprofit working to end 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 to highlight supply chain inefficiencies and economic opportunities



CAPITAL & INNOVATION

Catalyzing capital to spur innovation and scale high-impact initiatives

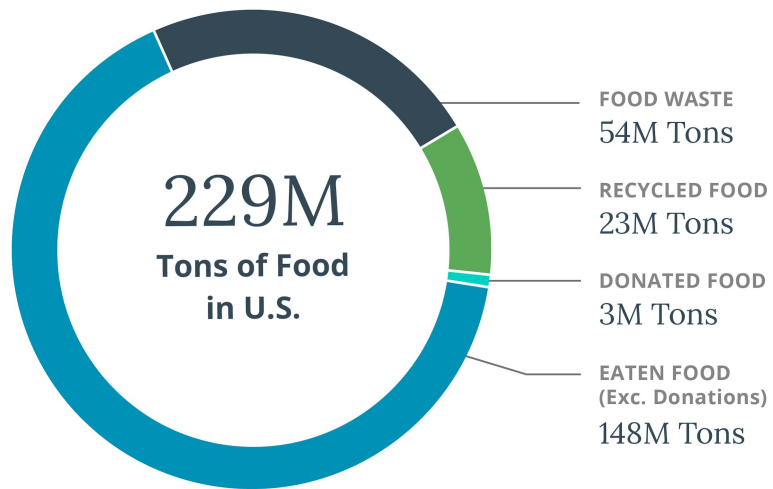


STAKEHOLDER ENGAGEMENT

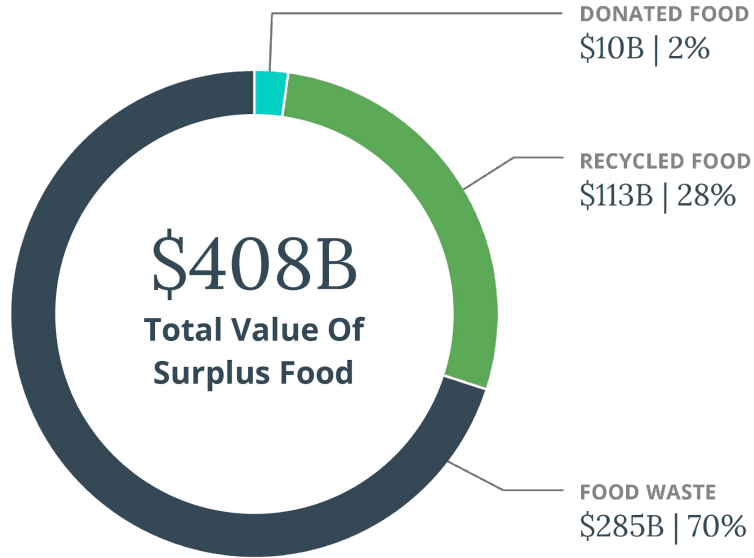
Mobilizing and connecting supporters to take targeted action

The Food Waste Challenge





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: Environmental



4%
of U.S. GHG
Emissions



14%
of all
Fresh Water Use



18%
of all
Cropland Use



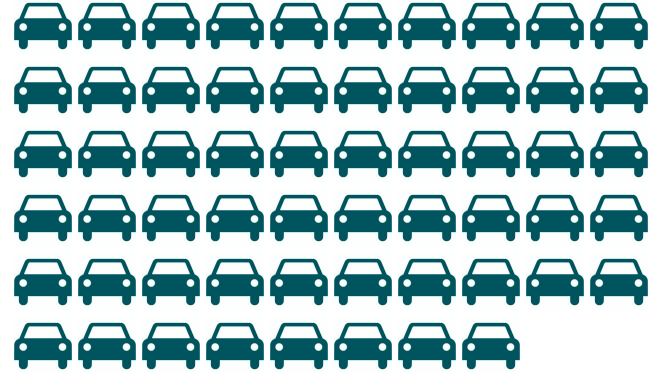
24%
of Landfill Inputs
#1 material (EPA Estimate)

Impacts of Uneaten Food: Environmental



4%

The footprint of uneaten food is equivalent to 4% of U.S. GHG emissions...



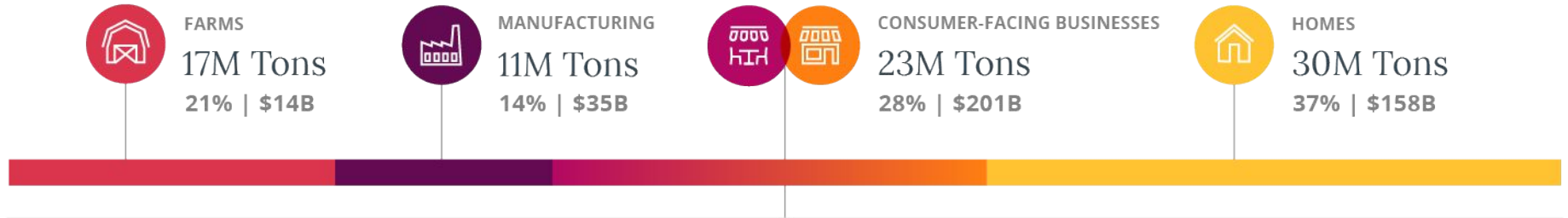
58 million

...which is the same amount emitted by 21% of the cars on the road.

Impacts of Uneaten Food: Hunger and Food Insecurity



Surplus food occurs across the supply chain.

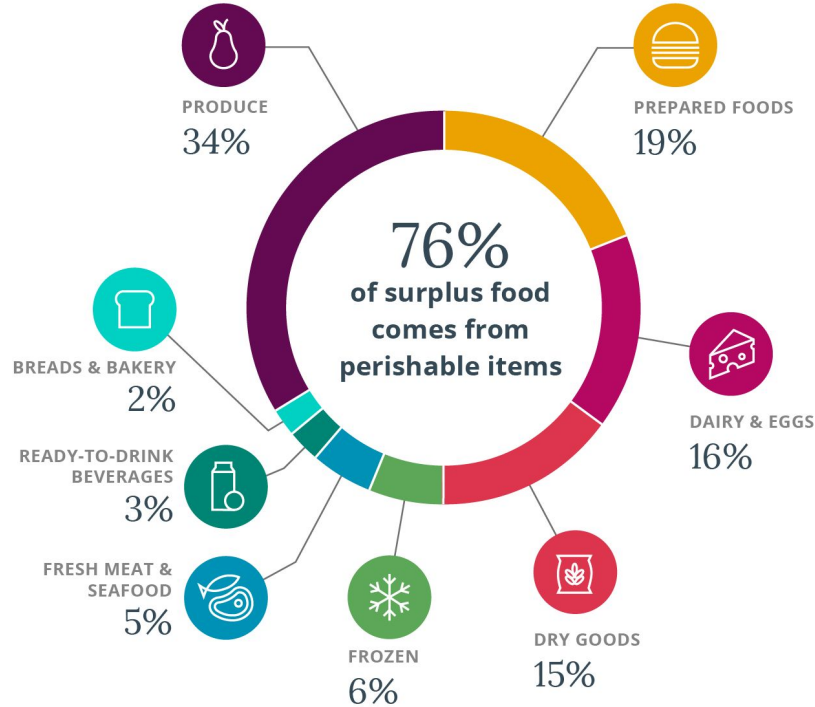


CONSUMER-FACING BUSINESSES INCLUDE:



*Other Foodservice Includes Healthcare, Assisted Living, Military, and Other

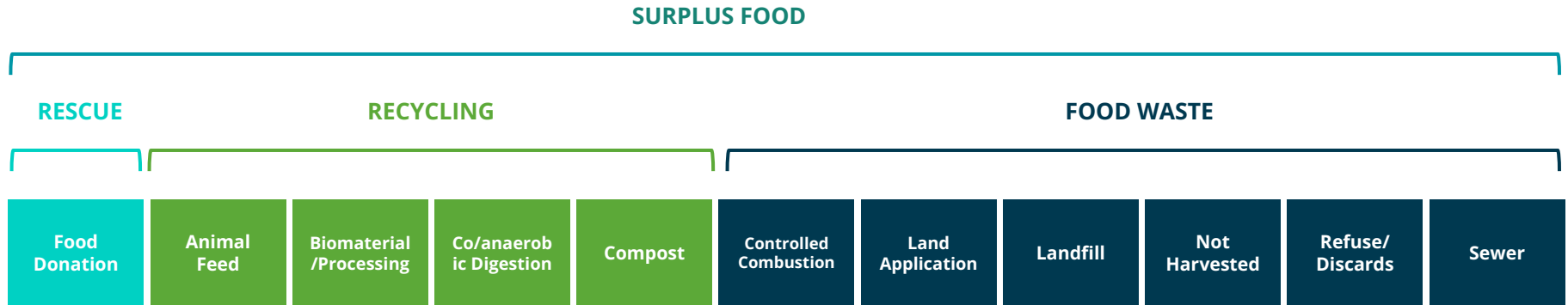
Fruits and vegetables constitute a third of total surplus food.



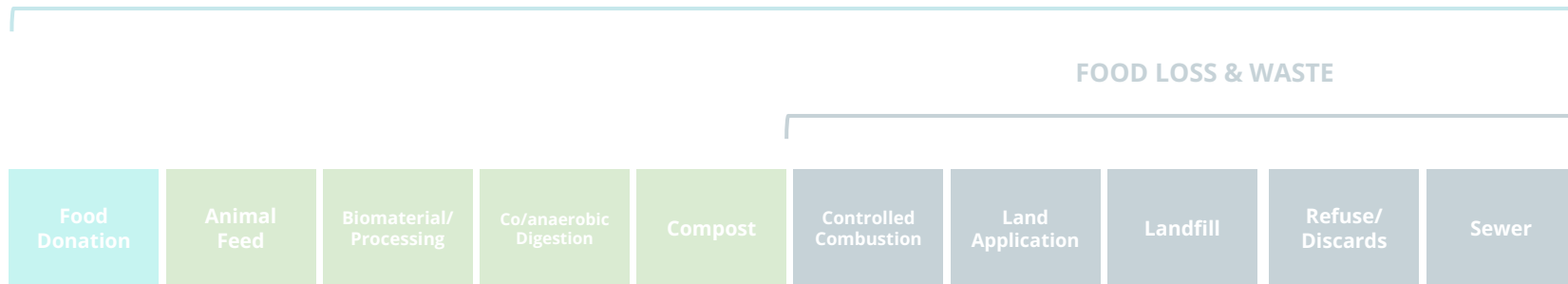
Source: ReFED

What is “Surplus Food”?

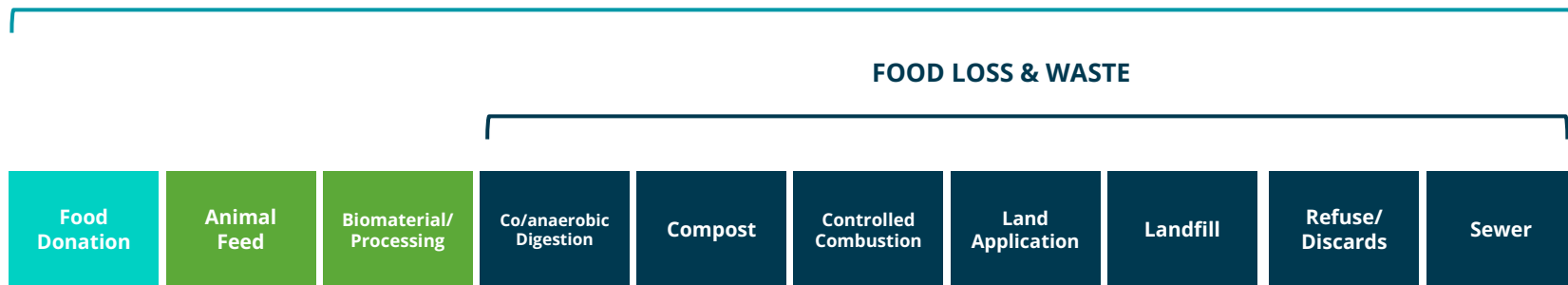
All food that goes *unsold* or *unused* by a business or that goes *uneaten* at home – including food and inedible parts (e.g., peels, pits, bones) that are fed to animals, repurposed to produce other products, composted, or anaerobically digested. It also includes food that is *donated*.



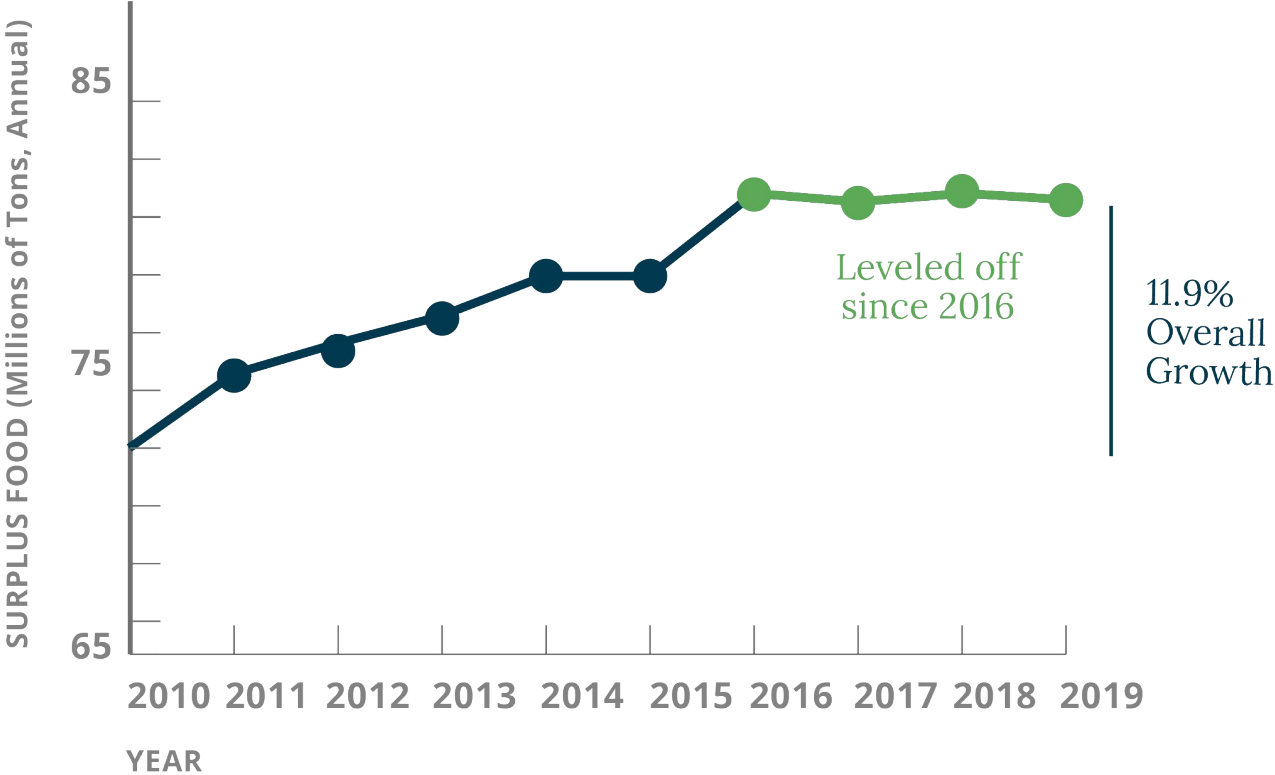
SURPLUS FOOD - ORIGINAL INTERPRETATION



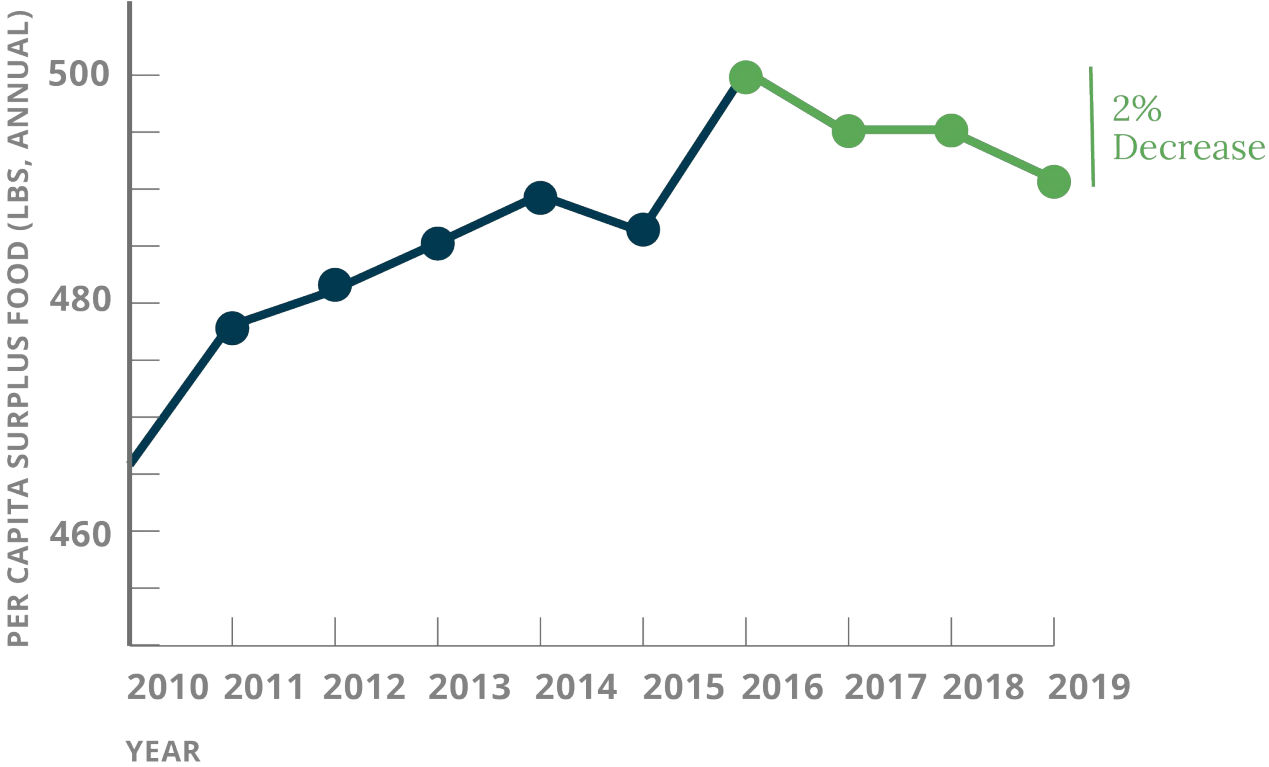
SURPLUS FOOD - REINTERPRETATION



Surplus food has leveled off since 2016...



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



Key Findings

Edible, unharvested produce left on farms:

More than 50% of the produce left behind on farms in 2019 was actually edible; That's enough fruits and vegetables to theoretically provide each food insecure American with 4 servings per day.

Food left on plates at restaurants:

70% of surplus in foodservice comes from customers not eating everything they're served. This is an issue we have not begun to tackle at all yet.

Food thrown out in home kitchens:

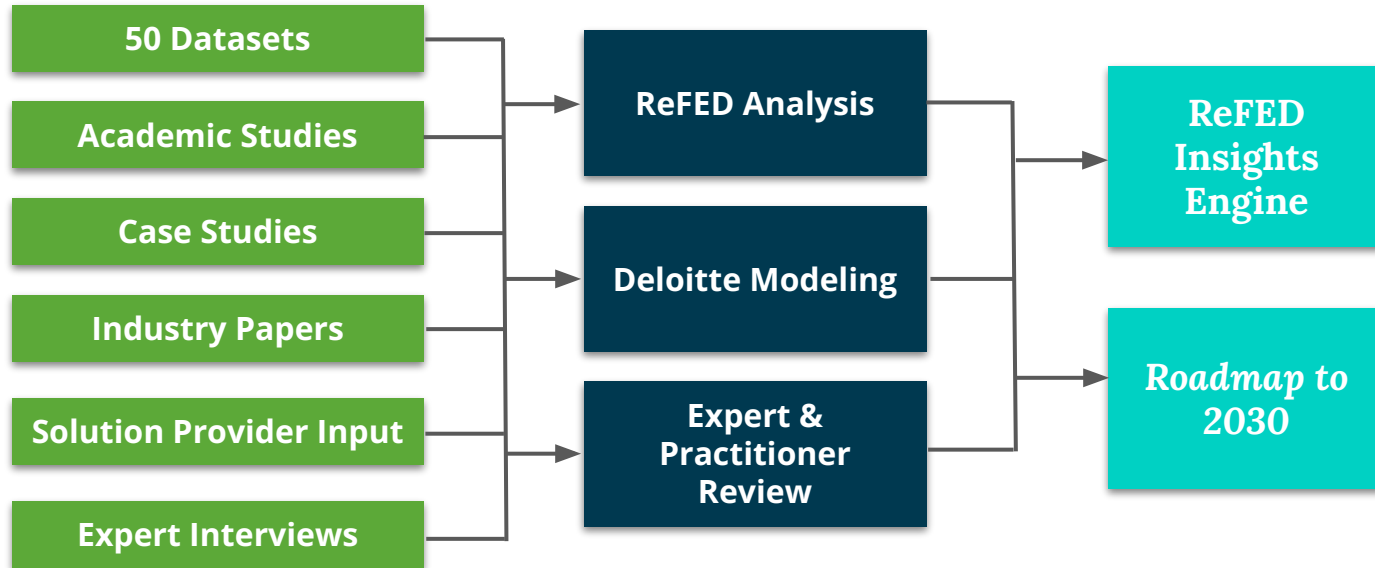
The residential sector is still the largest source of food waste overall and also has an even bigger greenhouse gas footprint given the added energy required to get food from farm to home.



Roadmap to 2030: Reducing U.S. Food Waste



What We Did...



The Tools

**ReFED
Insights
Engine**

Understand the Problem
Food Waste Monitor

Analyze & Prioritize Solutions
Solutions Database

Find Solution Providers
Solution Provider Directory

Calculate Impact
Impact Calculator

**Roadmap to
2030**

7 Key Action Areas

**40+ Modeled & Unmodeled
Solutions**

**Financing, Policy, Innovation, &
Engagement Recommendations**

User-Specific Guidance

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 CO₂e)

 4B MEALS FOR PEOPLE IN NEED

 51K JOBS CREATED THROUGH SOLUTION
IMPLEMENTATION OVER 10 YEARS

A Five-to-One Annual Return

\$14B



\$73B



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%

\$3B
**Catalytic
Capital**

- De-risks new innovation
- Unlocks bottlenecks
- Overcomes agency problems
- Stimulates marginal projects

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

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

PREVENTION

Optimize The Harvest

Enhance Product Distribution

Refine Product Management

Maximize Product Utilization

Reshape Consumer Environments

RESCUE

Strengthen Food Rescue

RECYCLING

Recycle Anything Remaining

IMPERFECT & SURPLUS CHANNELS

INTELLIGENT ROUTING & INVENTORY TRACEABILITY

ENHANCED DEMAND PLANNING & SECONDARY RESALE

UPCYCLING

MEAL KITS

DONATION COORDINATION, MATCHING & TRANSPORTATION

COMPOSTING & AD

GLEANNING

TEMPERATURE MONITORING & COLD CHAIN

DYNAMIC PRICING & MARKDOWN ALERTS

SHELF-LIFE EXTENSION

HOME SHELF-LIFE EXTENSION

COPIA, Farmlink, Forager, Seashare, Dreaming Out Loud, Spoonfuls, and Levin's

ANIMAL & PET FEED

IMPROVED PLANNING & LABOR MATCHING

EARLY SPOilage PREVENTION & DETECTION

WASTE TRACKING

ACTIVE & INTELLIGENT PACKAGING

CONSUMER & K-12 EDUCATION

Food Donation Connection, Spoonfuls, Levin's, and Doordash

WASTE-DERIVED AG INPUTS

RESEARCH, MEASUREMENT, CONVENING, POLICY & ADVOCACY

“Strengthening food rescue” means furthering the rescue of high-quality, nutritious food by increasing the capacity of food relief agencies, addressing distribution bottlenecks, overcoming donor hesitation, and improving communication flow – all in a way that emphasizes the health and dignity of end recipients struggling with food insecurity.

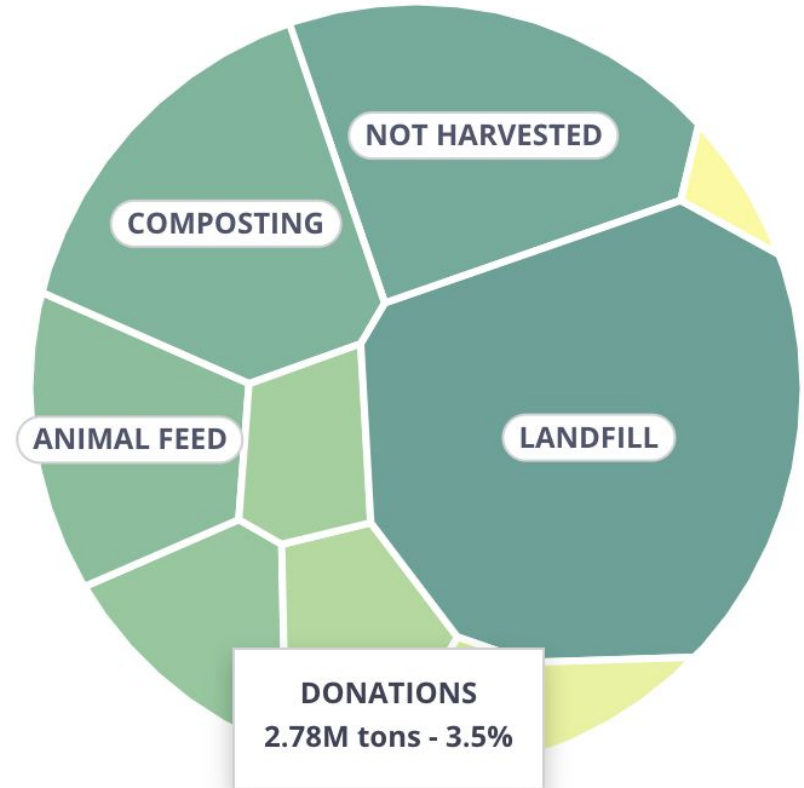




ACTION AREA #6

Strengthen Food Rescue

- **Landfill**
27.6M Tons - 34.2%
- **Not Harvested**
13.9M Tons - 17.2%
- **Composting**
12.9M Tons - 16%
- **Animal Feed**
7.66M Tons - 9.5%
- **Donations**
2.78M Tons - 3.5%





ACTION AREA #6

Strengthen Food Rescue

KEY INDICATORS (ANNUAL)

2.3M

FOOD WASTE TONS
DIVERTED

\$8.8B

NET FINANCIAL BENEFIT

\$1.4B

INVESTMENT NEEDED

2.7M

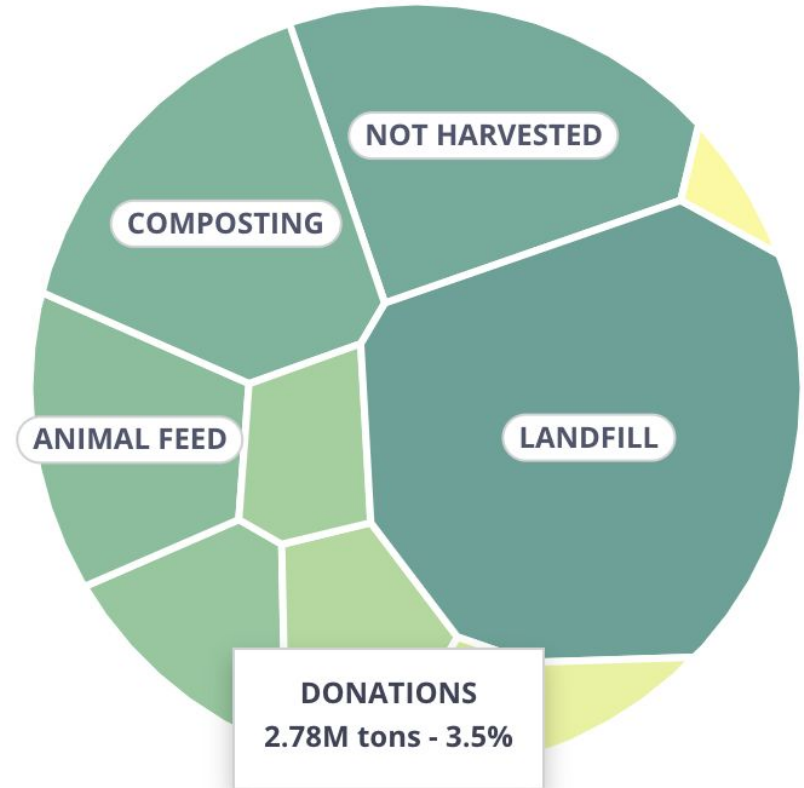
MT CO2E REDUCTION

298.7B

GALLONS WATER SAVED

3.9B

MEALS SAVED





ACTION AREA #6

Strengthen Food Rescue

Top Solutions

1/ Donation Education

1.1M Wasted Food Tons Diverted

1.84B Meals Recovered

2/ Donation Transportation

643K Wasted Food Tons Diverted

1.07B Meals Recovered

3/ Donation Storage Handling & Capacity

265K Wasted Food Tons Diverted

442M Meals Recovered

4/ Donation Value-Added Processing

191K Wasted Food Tons Diverted

318M Meals Recovered

5/ Donation Coordination & Matching

144K Wasted Food Tons Diverted

239M Meals Recovered

What You Can Do





Engagement

- **Co-Developed Training** - Food businesses and food recovery organizations should co-develop staff training on food recovery protocol, including proper culling, handling, and storage based on the needs (e.g., pick-up schedule, donatable foods, space limitations) of the operations.
- **Donation Tracking and Integration** - Food donors and recipients should collaborate to implement standardized data collection metrics that integrate with food rescue systems to address the current gaps in food recovery tracking and monitoring.
- **Change the Culture** - Food businesses should promote their engagement with food rescue and secondary resale organizations in order to destigmatize food recovery and encourage prevention among consumers.
- **Engaging Health Officials** - Health inspectors and others in regular contact with large swaths of the food industry should regularly educate and encourage food donation to expand adoption of waste prevention and food recovery solutions.



Innovation

- **Data-Sharing Technology** - Real- or near-time data sharing technology could enable time-sensitive rescue opportunities by informing food type, quantity, condition, and location of product nearing expiration.
- **Earned Revenue Models** - Earned revenue business models for food recovery organizations can drive scalability and sustainability of recovery activities, especially when they include a strong return on investment for food donors.
- **New Approaches to Labor** - Increased automation and new business models can reduce food recovery organization reliance on volunteers and ensure a consistent labor force, a critical need that has been highlighted by the coronavirus pandemic.
- **Sharing Platforms for Idle Assets** - While transportation and cold storage are a limiting factor for food donations, many sit idle in businesses. Coordinating platforms and technologies are needed to fully leverage these idle cold storage and transportation assets and allow them to be used to expand food donation infrastructure at minimal cost.



Policy

- **Expand Federal Food Donation Enhanced Tax Deduction or create State-Level Tax Incentive for Non-Profit Sales and Transportation Services-** [Federal, State; Legislative] Under current law, in order for a donor to claim the federal enhanced deduction for food donation, donations must go to a non-profit organization that does not charge the end recipient for the food, thus excluding tax deductions for social supermarkets that sell donated food at an extremely discounted price, or food recovery organizations that charges \$1 to recipients to help offset the costs of home delivery of donated foods. Expanding the federal enhanced tax deduction (or creating new state-level credits or deductions) to cover donations to the ultimate recipient at a deeply reduced price would help incentivize innovation in food recovery and donation. In addition, expanding the deduction (or creating new state-level credits or deductions) to cover transport services would help overcome one of the most expensive barriers to food recovery. These incentives could be provided at the federal or state level.
- **Clarify Guidance On Food Safety for Donations** - [Federal, State, Local; Legislative, Regulatory] U.S. federal food safety legislation and regulations developed by FDA and USDA generally do not mention the food safety practices that should be followed for food donations, leading to confusion and a matrix of varying rules in different states and localities. These laws could be updated to feature donation-specific chapters, on topics such as temperature, transportation, and labeling of donated foods. Additionally, FDA and USDA could expand guidance to states and localities on food safety for donated food, including an update to the FDA Food Code to improve state restaurant and retail food safety and ease the process for state regulators to identify how the Food Code and other food safety laws apply to donations. In addition or in the alternative, state and local governments could also provide guidance or regulations to clarify relevant, donation-specific food safety requirements.
- **Strengthen Liability Protections for Food Donation** - [Federal, State; Legislative] In order to encourage food donation, Congress or state legislatures could strengthen liability protections for food donation in a number of ways, including: 1) broadening protections to include food items sold at a low cost and donations transferred directly from donors to recipients; 2) granting administrative authority of Emerson Act regulations and guidance to USDA; and, 3) conducting an education campaign on donation liability protection for potential food donors and food recovery organizations.
- **Require Government Agencies and Their Contractors to Report Food Donations** - [Federal, State; Legislative] The existing Federal Food Donation Act requires federal agencies to encourage federal contractors to donate excess food, yet does not stipulate that agency food donation be tracked or monitored in any way. Congress could amend the Act to add a reporting requirement, in order to incentivize more food donation. Additionally, Congress could amend the Act to require covered contracts to include language mandating that agency contractors take steps to donate excess food by creating a written agreement with a food recovery organization.



TOTAL

\$1.4B

PUBLIC

■ Tax Incentives - \$97.2M

■ Government Grants - \$228.5M

PHILANTHROPIC

■ Non-Government Grants - \$697.2M

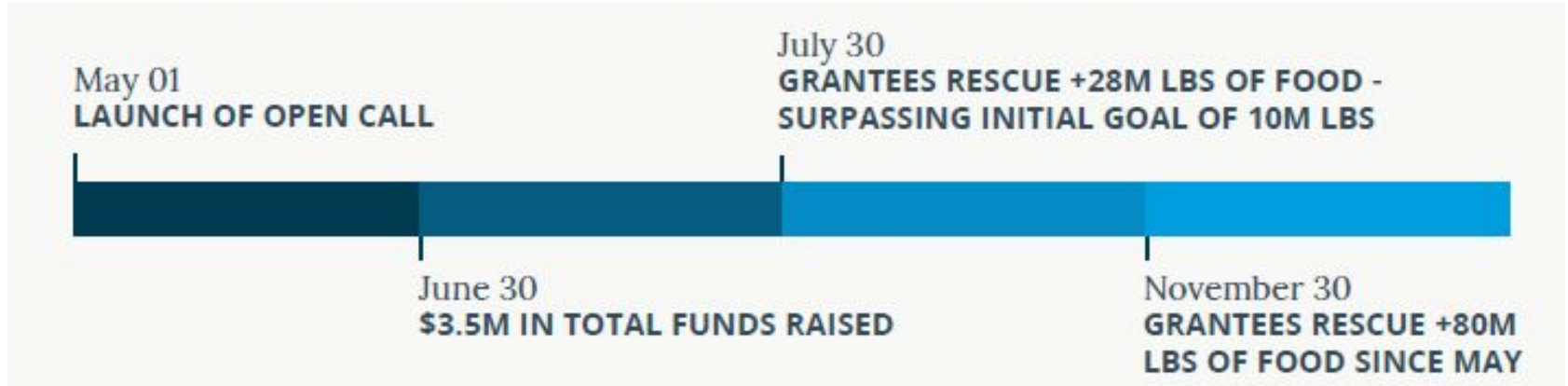
■ Impact-First Investments - \$206.0M

PRIVATE

■ Venture Capital - \$21.3M

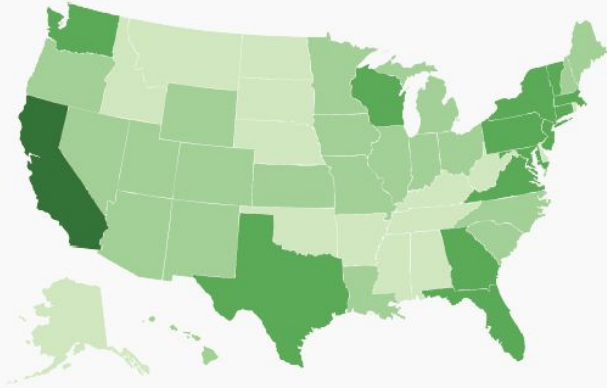
**■ Corporate Finance & Spending-
\$104.9M**

ReFED's COVID-19 Fund: A Case Study in Catalytic Funding

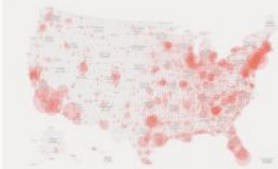


Geographical Reach of the 37 Grantees

ReFED leveraged its research and data to design a portfolio of organizations that is well-positioned to support the areas hardest hit by COVID-19



TOTAL COVID-19 CASES IN U.S.



Source: The New York Times

KEY BY STATE

- 8 Nationwide Organizations
- 9-10 Organizations
- 11-20 Organizations
- 20+ Organizations

Grantees

412 Food Rescue
Aloha Harvest
BlueCart
Boston Area Gleaners
Brighter Bites
Central Pennsylvania Food Bank
DC Central Kitchen
Dreaming Out Loud
FarmDrop
FarmLink
Food Connect
Food Forward
Food Rescue Alliance
Food Rescue US
Forager
Full Harvest
Goodr
Harvard Food Law & Policy Clinic
Harvest Against Hunger
L&M Companies
Lovin' Spoonfuls
Move for Hunger
Natural Upcycling
Oceanside Unified School District
Partnership for a Healthier America
Pintiful (City Harvest)
Replate
Seashare
Second Harverst Heartland
Second Servings of Houston
Table to Table
Take Care (Bitwise Industries)
Treasure8
United Against Poverty
Vermont Foodbank
The Wave Foundation
White Pony Express



91.6M
POUNDS OF FOOD RESCUED



8.1M
PEOPLE SERVED



92%
OF GRANTEES SERVING BLACK,
INDIGENOUS, AND PEOPLE OF
COLOR POPULATIONS



2.5K
JOBS CREATED OR RETAINED



95%
OF GRANTEES LED BY
DIVERSE TEAMS

Philanthropic Funding Adds Capacity, Leading to Greater Impact and Funding



ReFED Action Area: **Strengthen Food Rescue**

Solutions: [Donation Coordination & Matching](#), [Imperfect & Surplus Produce Channels](#)

- Dreaming Out Loud (DOL) operates a DC-based local food hub that connects small farms to Black-owned food enterprises and markets (60% are farmers of color and 70% are women)
- Faced with growing need during the COVID-19 pandemic, DOL received **\$100,000** in funding from the ReFED COVID Food Waste Fund in June of 2020
- With this no-strings-attached capital, DOL was able to add vital human capacity and infrastructure to meet the demand for supplemental and emergency food:
 - Retain 3 full-time employees and hiring 5 new employees
 - Rent a commercial kitchen and cover costs associated with transportation and deliveries
 - Win a proposal for an additional grant of \$200,000 from the Greater Washington Community Foundation
 - Connect and collaborate with other, larger organizations such as DC Central Kitchen and World Central Kitchen
 - Recover ~300,000 lbs of food between July to September 2020 through partnership with World Central Kitchen.

The grants distributed through the Fund enabled the majority of the portfolio to raise additional funding — more than 13x the average grant size.

You're invited to join the

ReFED Food Waste Action Network



Member Benefits:

- Networking
- Office Hours
- Lunch 'n Learns
- Innovation Demo Days
- Blogs & Case Studies

Join a growing list of industry leaders from organizations like:



POSNER
FOUNDATION
of Pittsburgh



FOOD LAW
and POLICY CLINIC
HARVARD LAW SCHOOL



Blue
Apron



DOORDASH



Spoiler Alert



Leanpath

bit.ly/JoinReFEDFWAN



Food Waste Fellowship

- Grad student fellows focused on designing and executing food waste reduction strategies that can significantly reduce GHG emissions.
- All the benefits of the Climate Corps® program with added support, resources, and tools from ReFED, the leading source on food waste reduction data and insights.
- Launches in Summer 2022. Contact Angel Veza at angel.veza@refed.org to learn more.



PACIFIC COAST

Food Waste
Commitment

- A public-private partnership between food businesses and local, state, and provincial governments – all working to prevent and reduce wasted food along the West Coast.
- Aligns with other global initiatives and commitments like UN SDG 12.3; Champions 2030; and the Courtauld Commitment.
- Signatories include Kroger, Albertsons, Sprouts, New Seasons Markets, and Bob's Red Mill.
- For more information, contact Jackie Suggitt at jackie.suggitt@refed.org.



Stay Connected



@refed

refed.org

[Insights.refed.org](https://insights.refed.org)

