



**EESI**

Environmental and  
Energy Study Institute

**Materials will be available at:**

**[www.eesi.org/121021waste](http://www.eesi.org/121021waste)**

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# CONGRESSIONAL BRIEFING

**Reducing Emissions by Reducing Food Waste**

**Briefing Series: Reduce and Reuse**

**How to Cut Greenhouse Gas Emissions of Building  
Materials, Plastics, and Food**

Friday, December 10, 2021

# About EESI...



## **NON-PROFIT**

Founded in 1984 by a bipartisan Congressional caucus as an independent (i.e., not federally-funded) non-profit organization



## **NON-PARTISAN**

Source of non-partisan information on environmental, energy, and climate policies



## **DIRECT ASSISTANCE**

In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs



## **SUSTAINABLE SOCIETIES**

Focused on win-win solutions to make our energy, buildings, and transportation sectors sustainable, resilient, and more equitable

# Polycymaker Education

## Briefings and Webcasts



Live, in-person and online public briefings, archived webcasts, and written summaries

## Climate Change Solutions



Bi-weekly newsletter with everything policymakers and concerned citizens need to know, including a legislation and hearings tracker

## Fact Sheets and Issue Briefs



Timely, objective coverage of environmental, clean energy, and climate change topics

## Social Media (@EESIOnline)



Active engagement on Twitter, Facebook, LinkedIn, and YouTube



# “Reduce and Reuse” Briefing Series



4

-  **December 08**     **Building Materials: From Production to Reuse**
-  **December 09**     **The Climate Consequences of Plastics**
-  **December 10**     **Reducing Emissions by Reducing Food Waste**

*Sign up for the Full Series: <https://www.eesi.org/1221waste>*

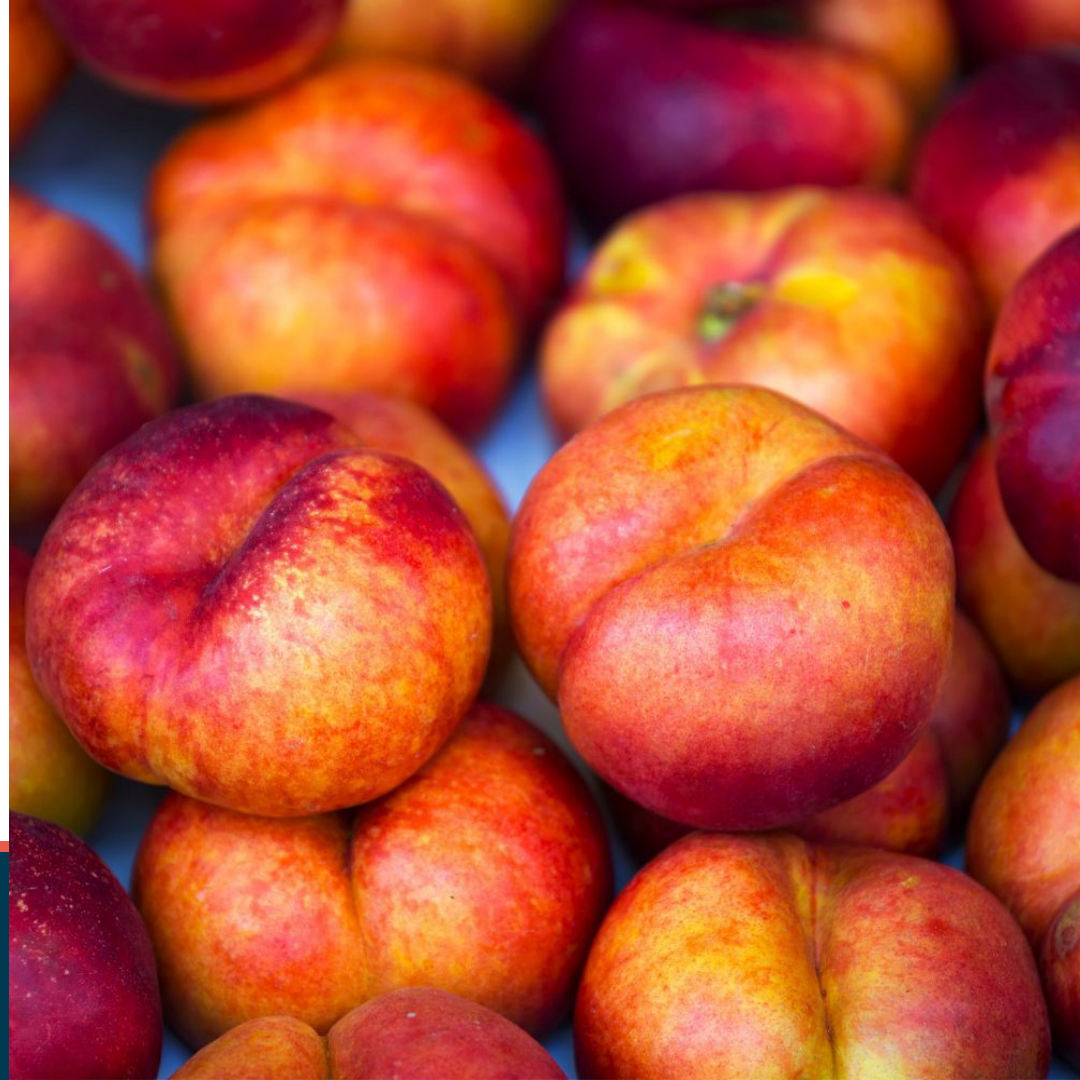




Advancing Data-Driven Solutions  
to Reduce Food Loss and Waste

## America's Food Waste Challenge

December 10, 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

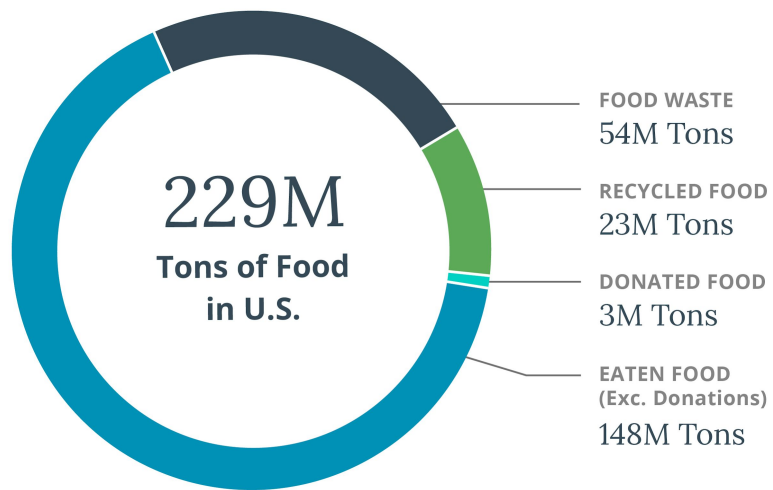


## STAKEHOLDER ENGAGEMENT

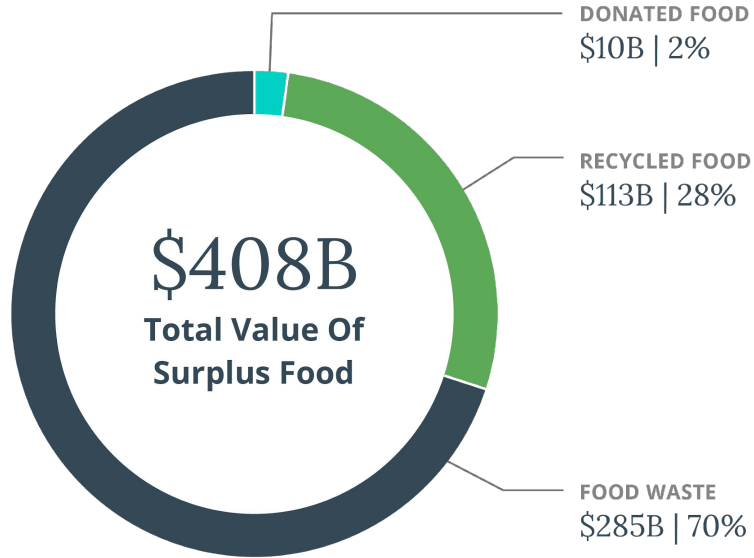
Mobilizing and connecting supporters to take targeted action

# 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)

# Farm-to-Kitchen Environmental Footprint of U.S. Food Loss and Waste

(excluding impacts of waste management,  
such as landfill methane emissions)



GHG emissions of  
**42 coal-fired power plants**



Enough water and energy to supply  
more than **50 million homes**



The amount of fertilizer used  
to grow **all plant-based foods**



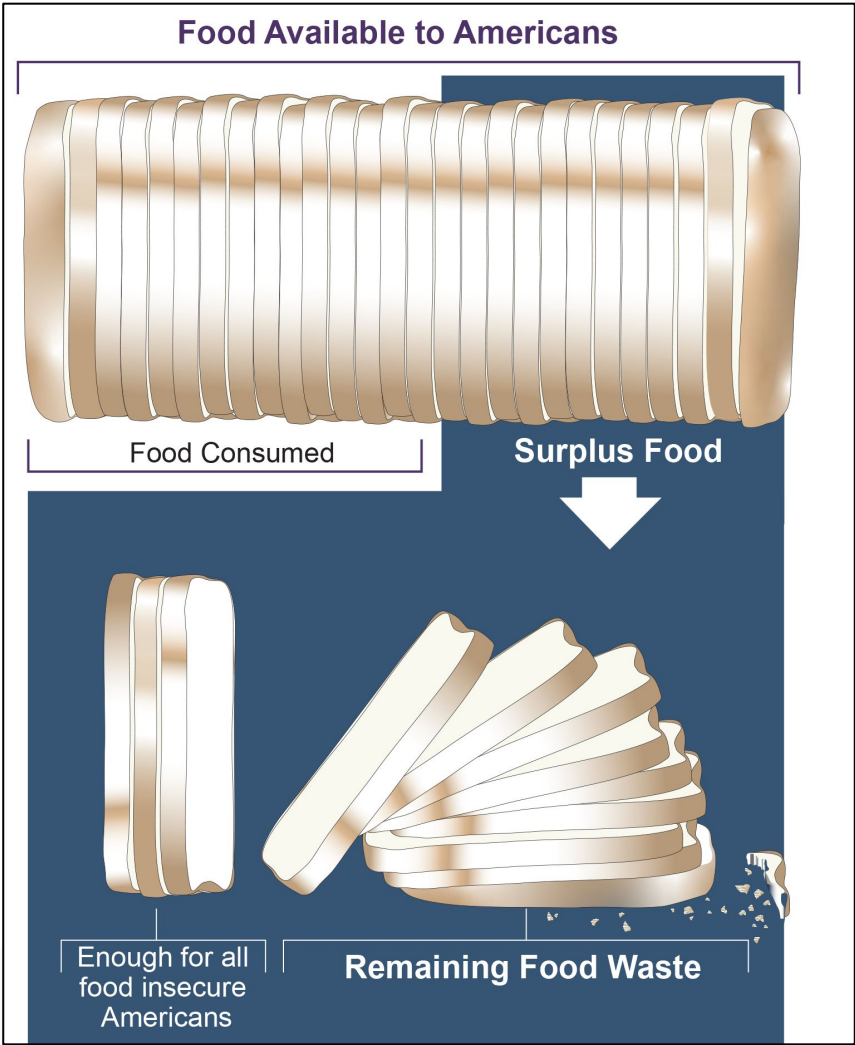
An area of agricultural land  
equal to **California and New York**

## Impacts of Uneaten Food: Hunger and Food Insecurity

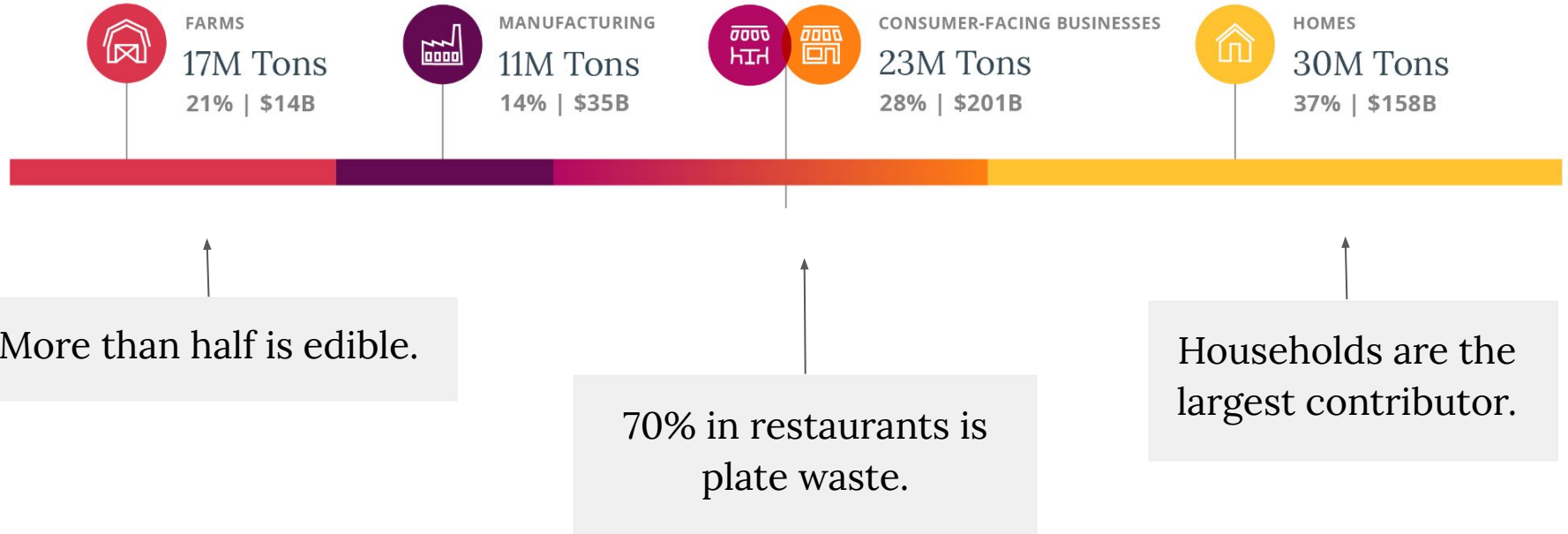


Source: Feeding America

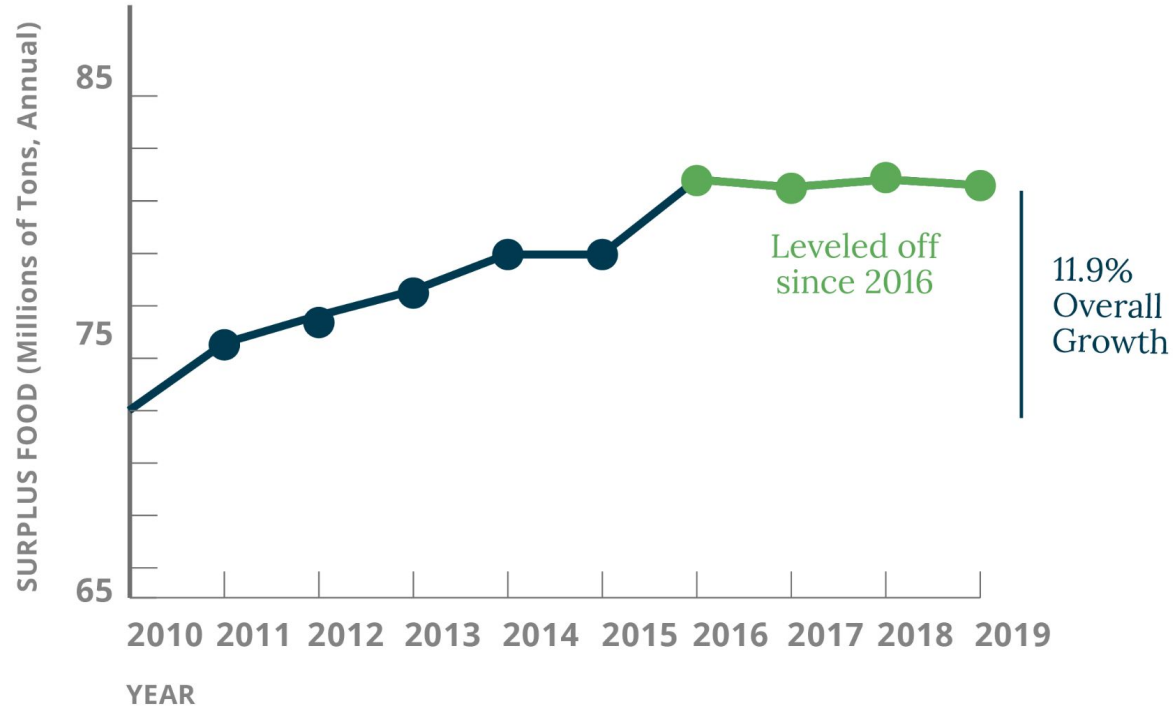




# Surplus food occurs across the supply chain.

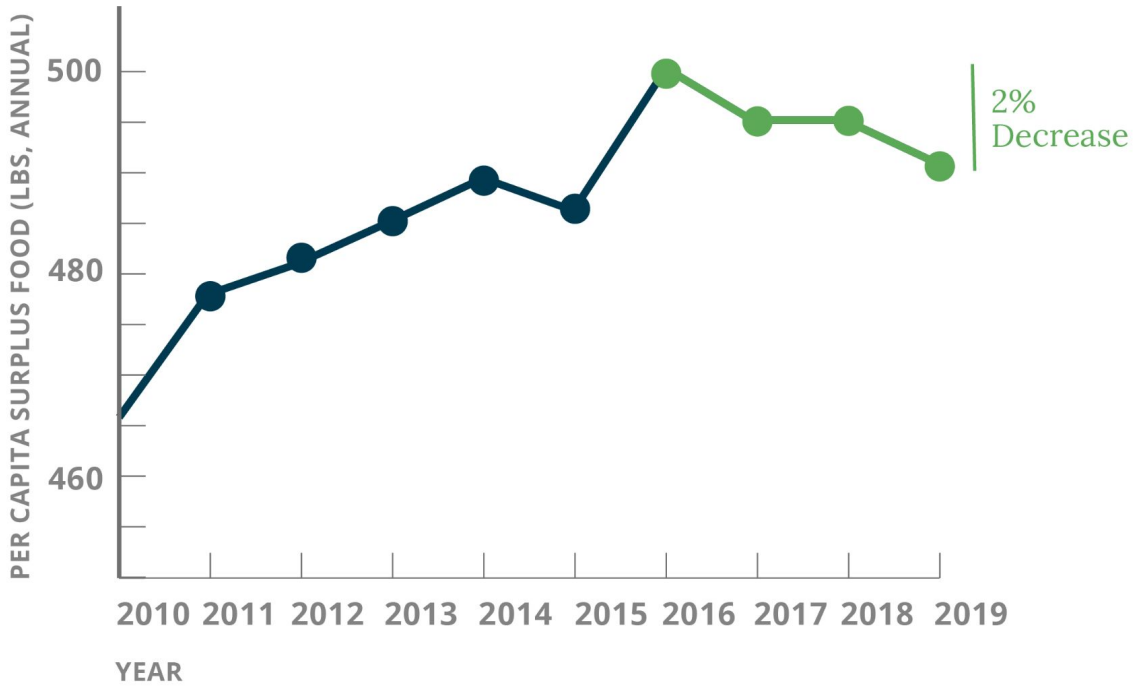


Surplus food has leveled off since 2016...



Source: ReFED

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



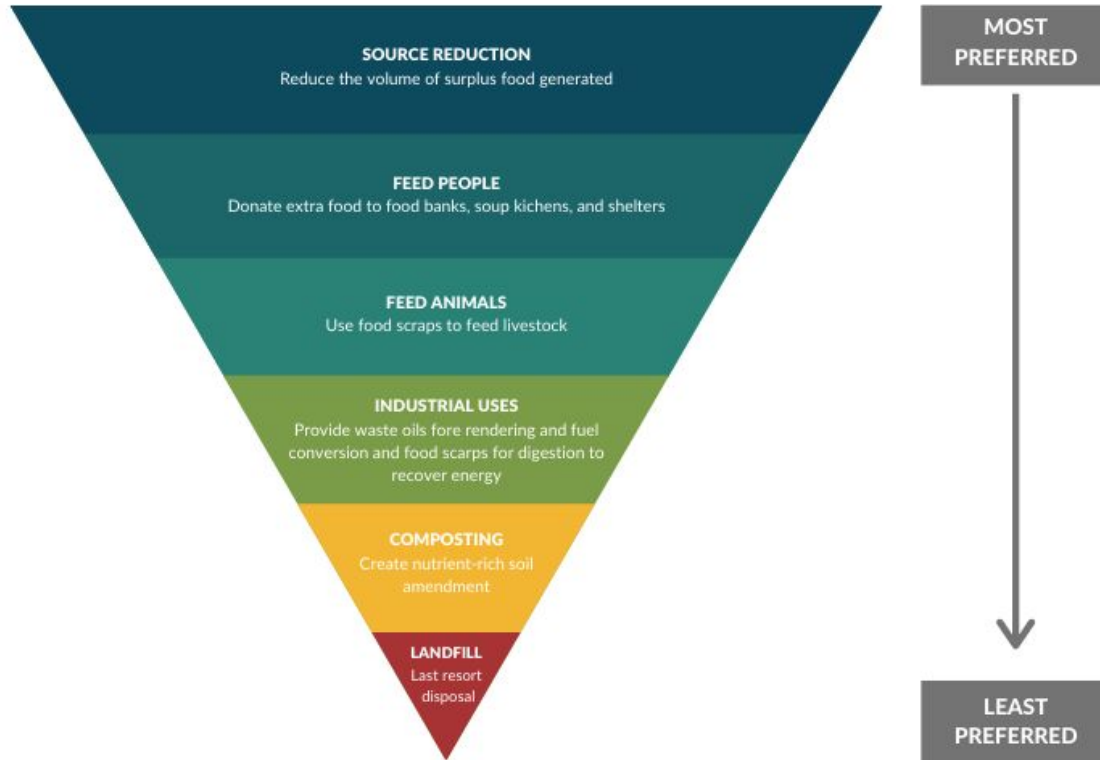
Source: ReFED

A photograph of a peach processing line. In the foreground, several ripe peaches with red and yellow skin are scattered across a series of parallel yellow rollers. To the left, a blue conveyor belt is visible, also carrying peaches. In the background, a white metal structure, possibly part of a sorting or packaging machine, is partially visible. A central semi-transparent dark grey rectangle contains white text.

50%

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

# EPA Food Recovery Hierarchy



# Reaching Our 2030 Goal



## 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



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
- Simulates 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**

**CLEANING**

**TEMPERATURE MONITORING & COLD CHAIN**

**DYNAMIC PRICING & MARKDOWN ALERTS**

**SHELF-LIFE EXTENSION**

**HOME SHELF-LIFE EXTENSION**

**ANIMAL & PET FEED**

**WASTE-DERIVED AG INPUTS**

**IMPROVED PLANNING & LABOR MATCHING**

**EARLY SPOilage PREVENTION & DETECTION**

**WASTE TRACKING**

**ACTIVE & INTELLIGENT PACKAGING**

**CONSUMER & K-12 EDUCATION**

**WASTE-RESOLVE**

**WASTE-DERIVED AG INPUTS**

## RESEARCH, MEASUREMENT, CONVENING, POLICY & ADVOCACY

# Growing Awareness and Investment in Food Waste Solutions

**FAST COMPANY**

## Katy Perry and Oprah Winfrey just invested in this startup to eliminate food waste, one avocado at a time

Apeel Sciences combats greenhouse gas emissions via its ingenious coating to preserve the shelf life of fruits and vegetables—and it's the ideal investment for a sustainability-minded celebrity.



**THE WALL STREET JOURNAL.**

English Edition | Print Edition | Video | Podcasts | Latest Headlines

## 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



**yahoo/finance**  
Misfits Market Announces \$200M Series C; Achieves Unicorn Status As It Creates New Food Supply Chain For Online Groceries, Delivering Value & Accessibility



**The Washington Post**

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

**LOS ANGELES BUSINESS JOURNAL**  
THE COMMUNITY OF BUSINESS™

## Wonderful Co. Sets Up \$1 Million Waste Challenge

By Melissa DiMartino

Monday, October 5, 2020

Like | Share | Print | Email



# ReFED Insights Engine

An interactive knowledge hub for food loss and waste launched in 2021, the Insights Engine lets users:

1. Understand the Problem

2. Explore the Solutions

3. Find Solution Providers

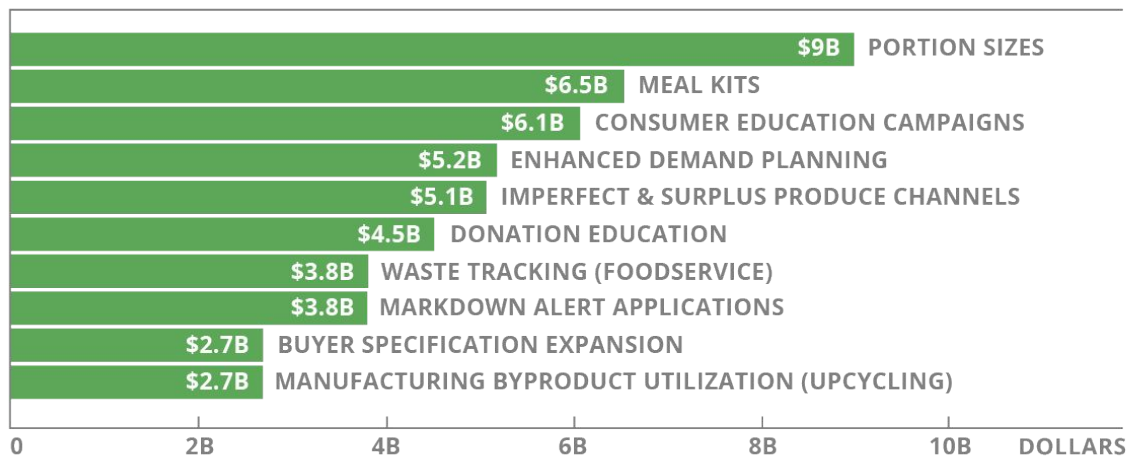
4. Calculate Impact

Launch the Insights Engine





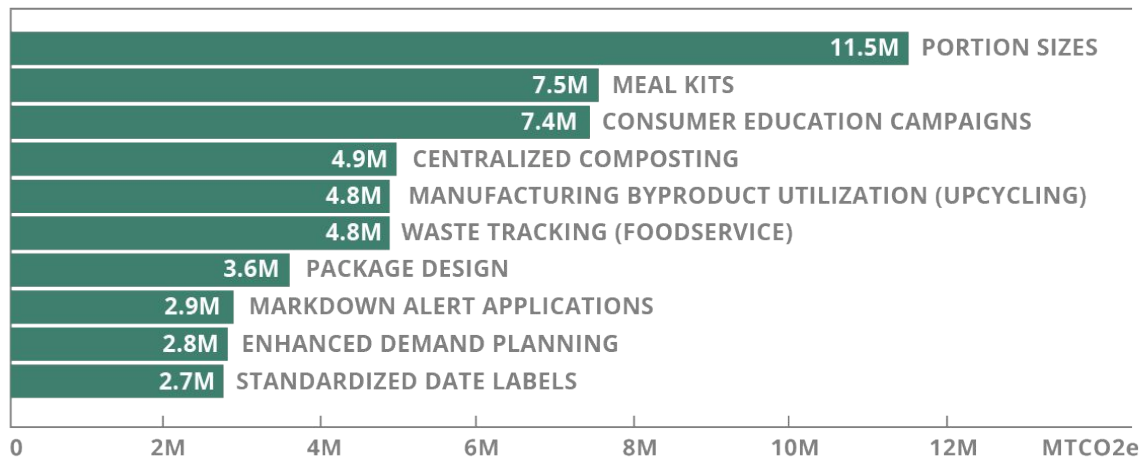
## Top Ten Solutions | **NET FINANCIAL BENEFIT**





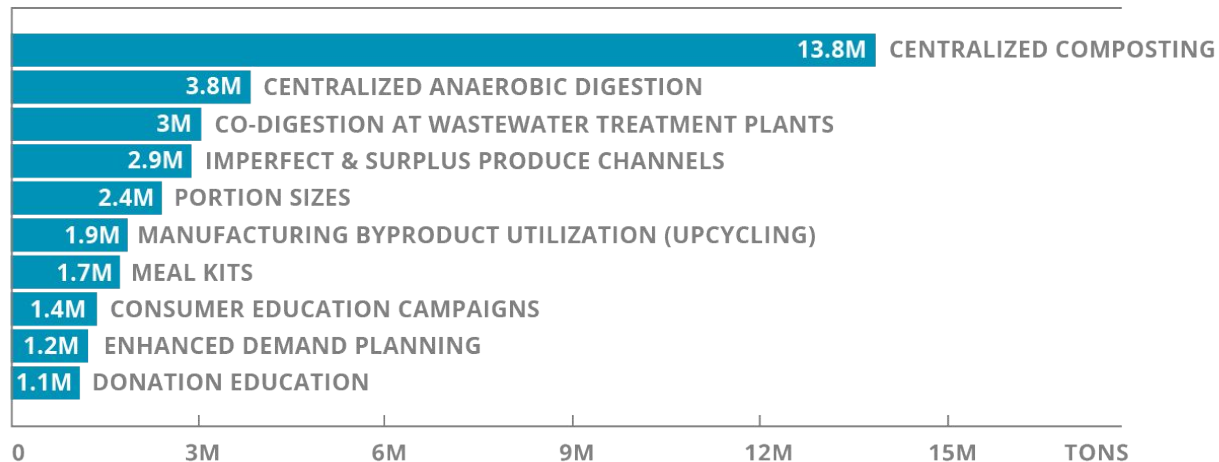


## Top Ten Solutions | GHG EMISSIONS AVOIDED IN MTCO<sub>2</sub>e

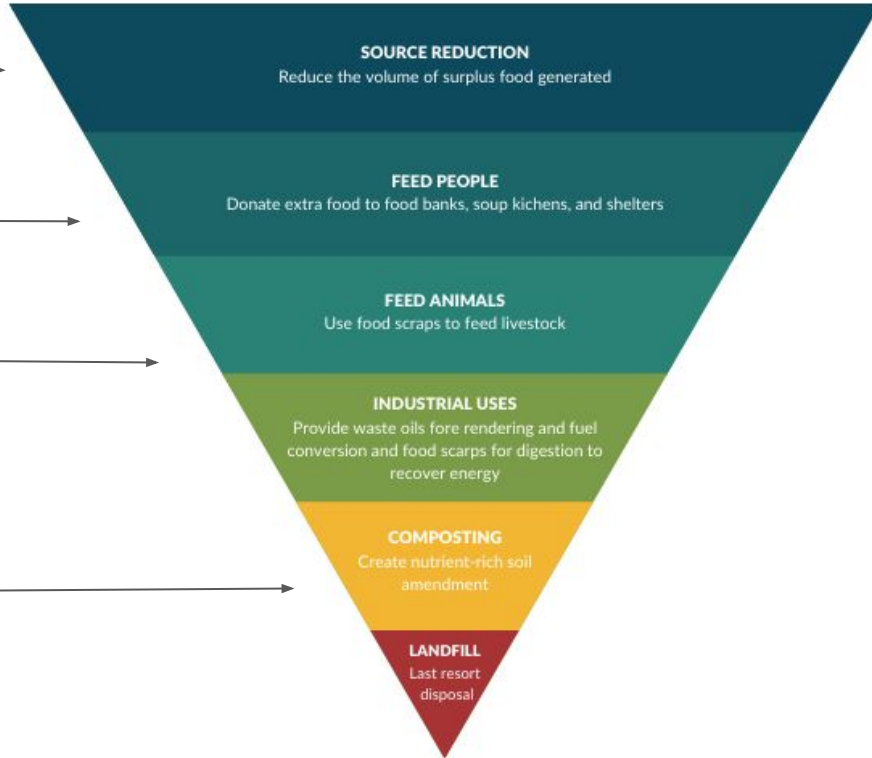




## Top Ten Solutions | **TONS WASTE DIVERTED**



Date Labeling  
Measurement/Reporting  
Incentives  
Technical Assistance/PPPs  
Public education  
Reduction in schools



Tax Incentives  
Liability Protections  
Farm surplus purchasing  
Grant programs/Infrastructure

Removal of Animal  
Feed Restrictions

Support of state/local programs  
Infrastructure grants  
Compost use directives

**MOST  
PREFERRED**

**LEAST  
PREFERRED**

# Stay Connected



@refed

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

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





**FOOD LAW  
*and* POLICY CLINIC**  
HARVARD LAW SCHOOL

# Tackling Food Waste Through Law and Policy

**Emily M. Broad Leib**  
**Director, Food Law and Policy Clinic**  
**Harvard Law School**

# ABOUT FLPC

Provide **legal and policy advice** to nonprofits, government agencies, entrepreneurs, and other organizations on a range of food policy questions



**Educate students** about the role of law and policy in the food system





# FLPC's Food Waste Portfolio

State &  
Local

Examples: technical assistance to state governments; state bill tracking

Federal

Example: U.S. Food Loss and Waste Action Plan; service on EPA FRRCC FACA

Global

Example: Global Food Donation Policy Atlas



THE GLOBAL  
FOOD DONATION  
POLICY ATLAS

UNITED STATES  
**LEGAL  
GUIDE**

THE GLOBAL  
FOOD DONATION  
POLICY ATLAS

ISSUE BRIEF

**PROMOTING  
FOOD DONATION:  
DATE LABELING  
LAW AND POLICY**

NOVEMBER 2021

THE GLOBAL  
FOOD DONATION  
POLICY ATLAS

Choose a policy area ▾

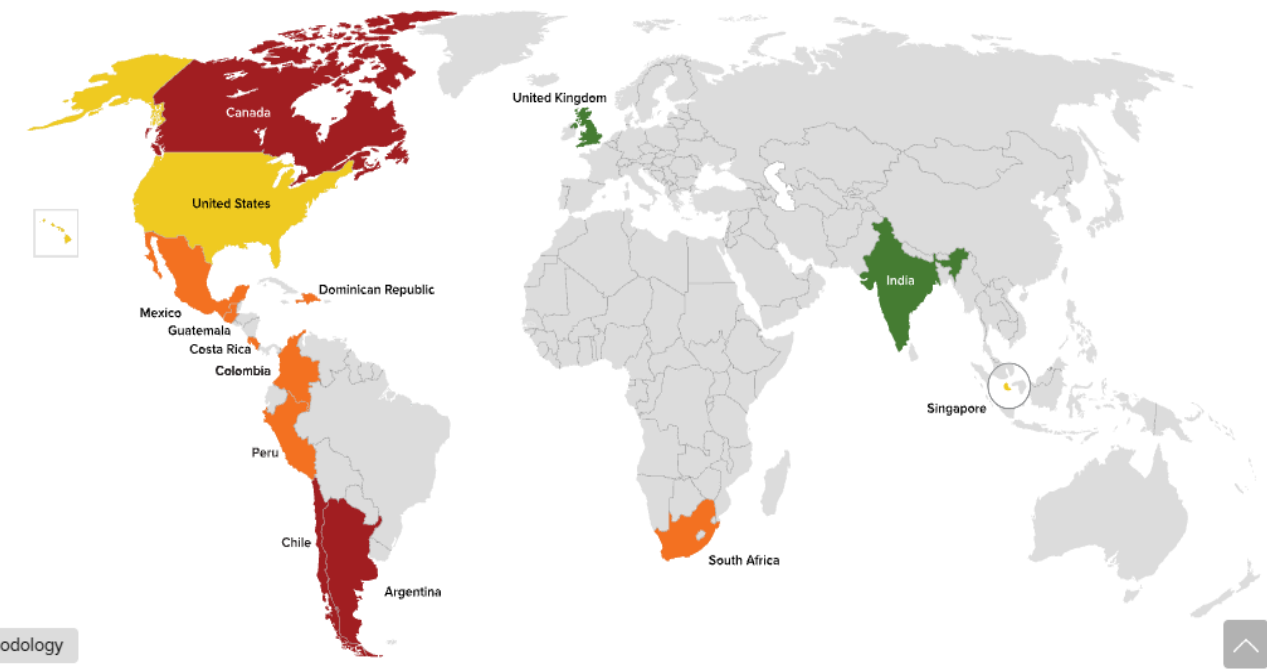
**Food safety for donations**  
All donated food should be safe for consumption and comply with relevant food safety laws and regulations. Yet in many countries there is a lack of knowledge or readily available guidance as to which food safety procedures apply to donations.

- Strong policy
- Moderate policy
- Limited policy
- No policy

Methodology

**Quick-view food donation policy atlas**

Roll over or click countries for more information







# Key Legal Issues



Food Safety



Date Labeling



Liability



Tax Incentives  
& Barriers



Requirements  
& Penalties



Govt. Grants  
& Incentives

# Call to Action on U.S. Food Loss & Waste

## US Food Loss & Waste Policy Action Plan for Congress & the Administration

### INTRODUCTION

Reducing and preventing food loss and waste (FLW) is a global imperative. Up to 40 percent of all food produced is lost or wasted,<sup>1</sup> and addressing this challenge is essential to building a regenerative and resilient food system that helps to mitigate climate change, reverse nature loss, and deliver positive outcomes for both producers and consumers. An estimated \$408 billion is spent each year in the US to grow, process, transport, store, and dispose of food that's never eaten.<sup>2</sup>

Yet proven solutions exist that save money, time, and natural resources.<sup>3</sup> In 2015, the US adopted a national goal of halving FLW by 2030. We can achieve that goal by accelerating public and private sector leadership and building on overwhelming public support for reducing FLW.<sup>4</sup> The Harvard Law School Food Law and Policy Clinic (FLPC), ReFED, the Natural Resources Defense Council (NRDC), and the World Wildlife Fund (WWF) recommend that the Biden administration and Congress take ambitious action to reduce FLW, prioritizing the following:

- 1 Invest in the infrastructure to measure, rescue, recycle, and prevent organic waste from entering landfills and incinerators
- 2 Expand incentives to institutionalize surplus food donation and strengthen regional supply chains
- 3 Assert the US Government's leadership on FLW globally and domestically
- 4 Educate and activate consumers via private and public food waste behavior change campaigns
- 5 Require a national date labeling standard

1. USDA, "Food Waste Facts," 2020, <https://www.usda.gov/foodwaste-facts>.  
2. "Roadmap to 2030: Reducing US Food Waste by 50% and the ReFed Insights Engine" (ReFED, February 2021).  
3. "Roadmap to 2030: Reducing US Food Waste by 50% and the ReFed Insights Engine".  
4. Cary Frank, "US Public Views on Climate and Energy," Pew Research Center, Science & Society (blog), November 25, 2014.

- 1 Invest in prevention and keep waste out of landfills
- 2 Enable surplus food donation
- 3 Show US leadership at home and abroad
- 4 Educate and activate consumers
- 5 Standardize national date labeling

<https://foodwasteactionplan.org/>



# Date Label Regulation

- No federal definition or requirements, except for infant formula
- 41 states regulate and 20 states restrict sale/donation
- 90% of consumers believe dates are safety indicators...
  - BUT date labels are generally suggestions of peak quality
- Standardizing date labels is one of the most cost-effective opportunities for food waste reduction, with a potential of diverting 582.4K tons of wasted food





# Opportunities

- **Progress**

- Voluntary Product Code Dating Initiative
- *Codex Alimentarius* Commission recommendation



- **Recommendations**

1. Standard labels: one for safety, one for quality
2. Allow donation of food past *quality* date
3. Educate businesses and consumers







**EXPIRED**

HOME THE PROBLEM THE SOLUTION LEARN MORE THE FILM ABOUT

**EXPIRED?**

**Date Labels and Food Waste in America**

THE PROBLEM

THE SOLUTION

**[www.notreallyexpired.com](http://www.notreallyexpired.com)**

# Liability Protection for Donation

## Bill Emerson Good Samaritan Food Donation Act (42 U.S.C. 1791) →

- Provides comprehensive liability protection to food donors and nonprofit organizations for food donated to a nonprofit organization for distribution to needy individuals

## Issues

- More than 50% of companies don't donate because of liability
- Comprehensive protection, but not available for certain types of donation
  - I.e., direct donation to needy individuals
  - I.e., donations that charge a low price to end recipient



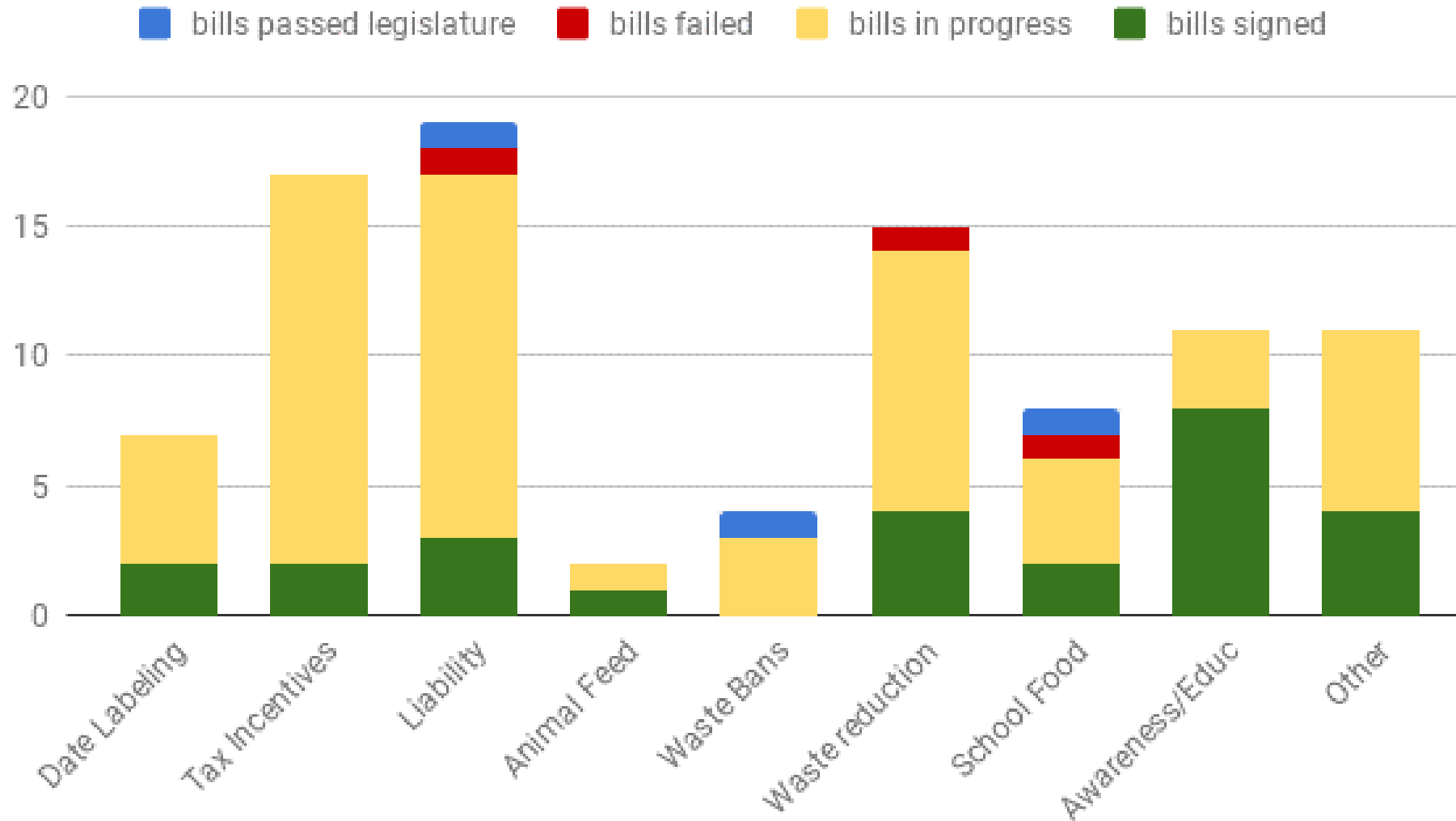
# Donation Requirements or Waste Penalties

- **Organic Waste Restrictions** → 8 states/10 cities in U.S.
  - Massachusetts prohibits sending > **1/2 ton** of food to the landfill per week
- **Donation requirements** →
  - Ex: California requires 20% of edible food be donated





# Trending Issues in State Legislation 2019-20







# LEVERAGING CHILD NUTRITION REAUTHORIZATION TO REDUCE FOOD WASTE



**MAY 2021**



**FOOD LAW  
and POLICY CLINIC**  
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# OPPORTUNITIES TO REDUCE FOOD WASTE IN THE 2018 FARM BILL



**Prevention**



**Recovery**



**Recycling**

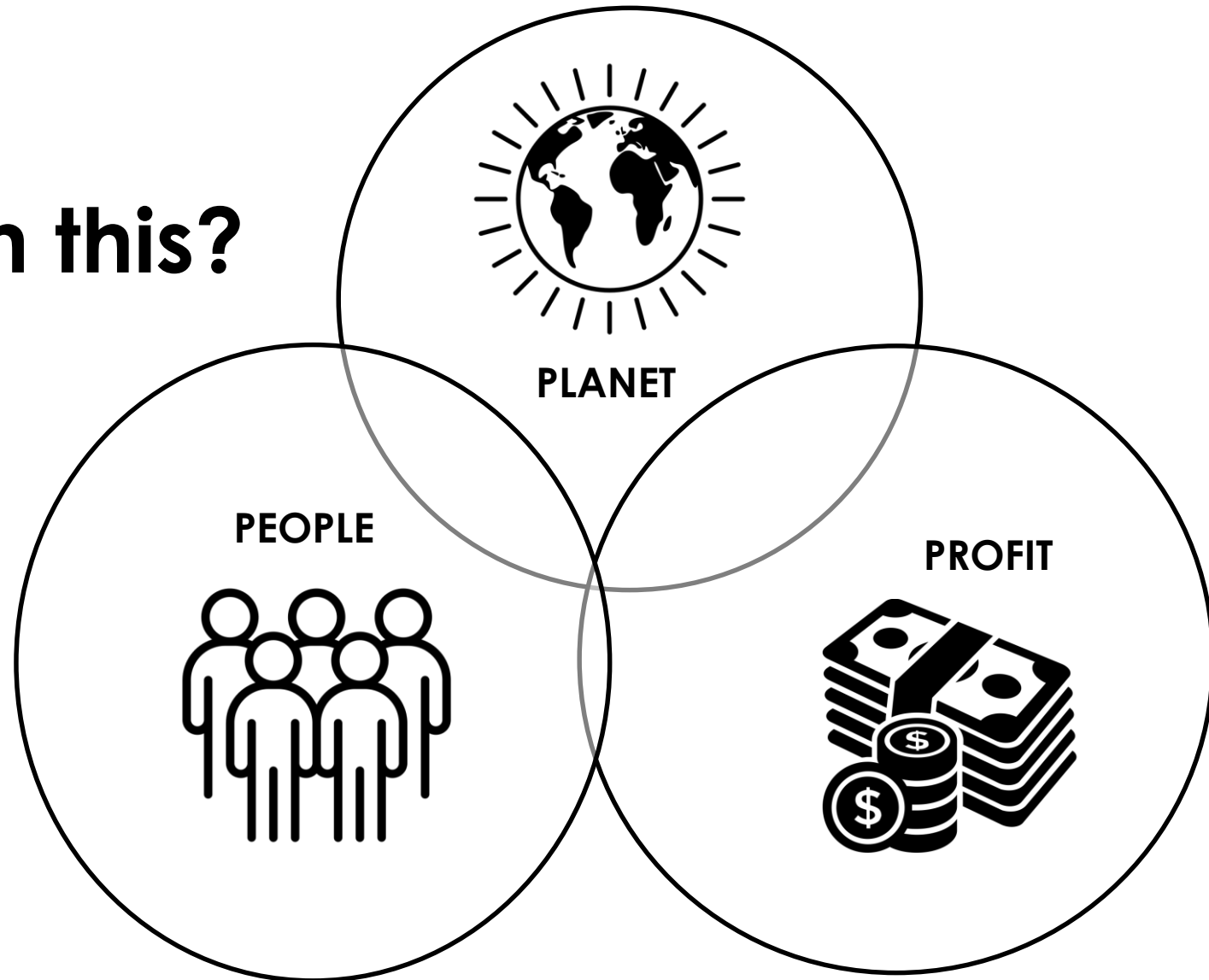


**Coordination**

**May 2017**



# Why focus on this?

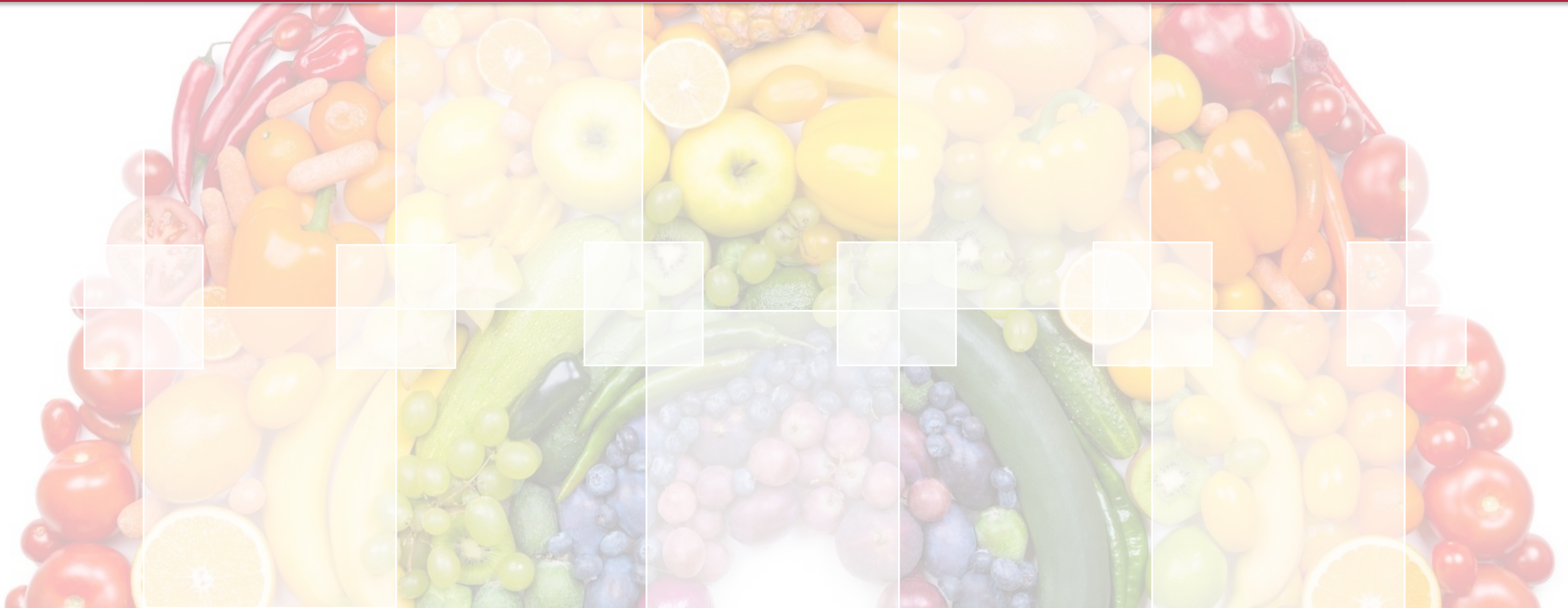




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[www.chlpi.org/flpc](http://www.chlpi.org/flpc)

   @HarvardFLPC





# What did you think of the briefing?

**Please take 2 minutes to let us know at:**  
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***Materials will be available at:***  
[www.eesi.org/121021waste](http://www.eesi.org/121021waste)

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Friday, December 10, 2021