Roadmap to Reduce U.S. Food Waste

MassDEP Organics Subcommittee Meeting
October 4, 2016

Presented by:

Adam Rein,
MissionPoint Partners

ReFED | Rethink Food Waste
Through Economics & Data

What is the ReFED *Roadmap?*

ReFED is a nonprofit collaboration formed in 2015 of over 30 business, nonprofit, foundation and government leaders committed to reducing food waste in the United States.

On March 9th, ReFED launched *A Roadmap to Reduce U.S. Food Waste by 20 Percent,* the first ever national economic study and action plan driven by a multi-stakeholder group committed to tackling food waste at scale.

AWARENESS

- Amount of food wasted
- Causes of that waste
- Impacts on the environment & economy

ACTION

- Reduction/ prevention
- Recovery
- Reuse/ Recycle

ReFED Steering Committee, Advisory Council, and *Roadmap* Team

Atticus Trust

New York City

Ahearn
Family
Foundation

THE PROBLEM OF FOOD WASTE

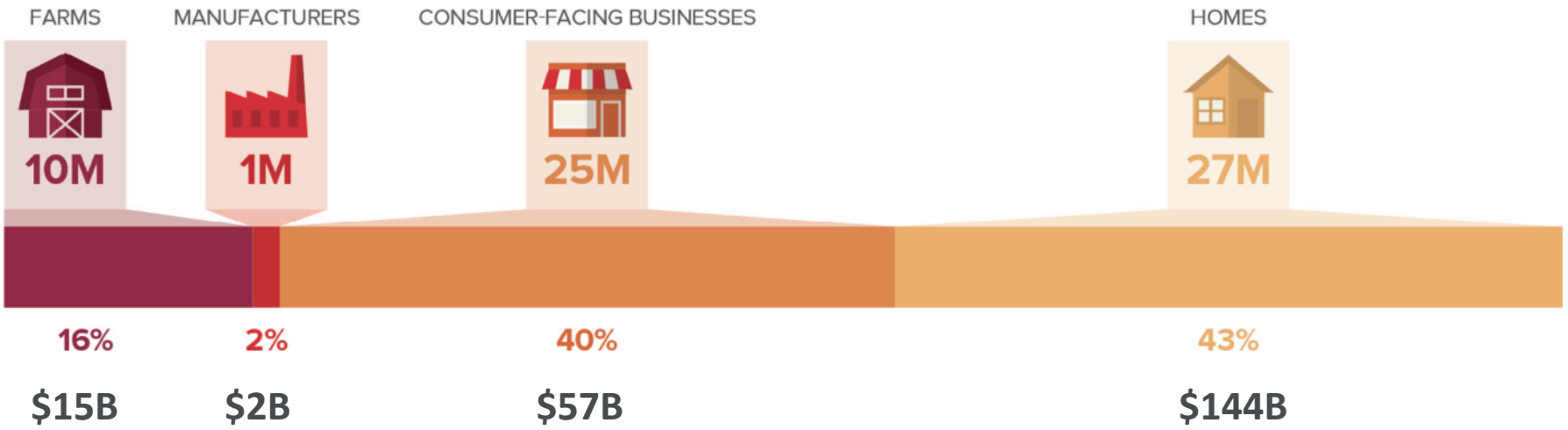
Every year, American consumers, businesses and farms spend $218 billion (roughly 1.3% of GDP) on food that is never eaten.

This waste represents 18% of Cropland, 19% of Fertilizer, 21% of Freshwater, and 5% of GHG emissions.

Image courtesy of National Geographic/Brian Finke

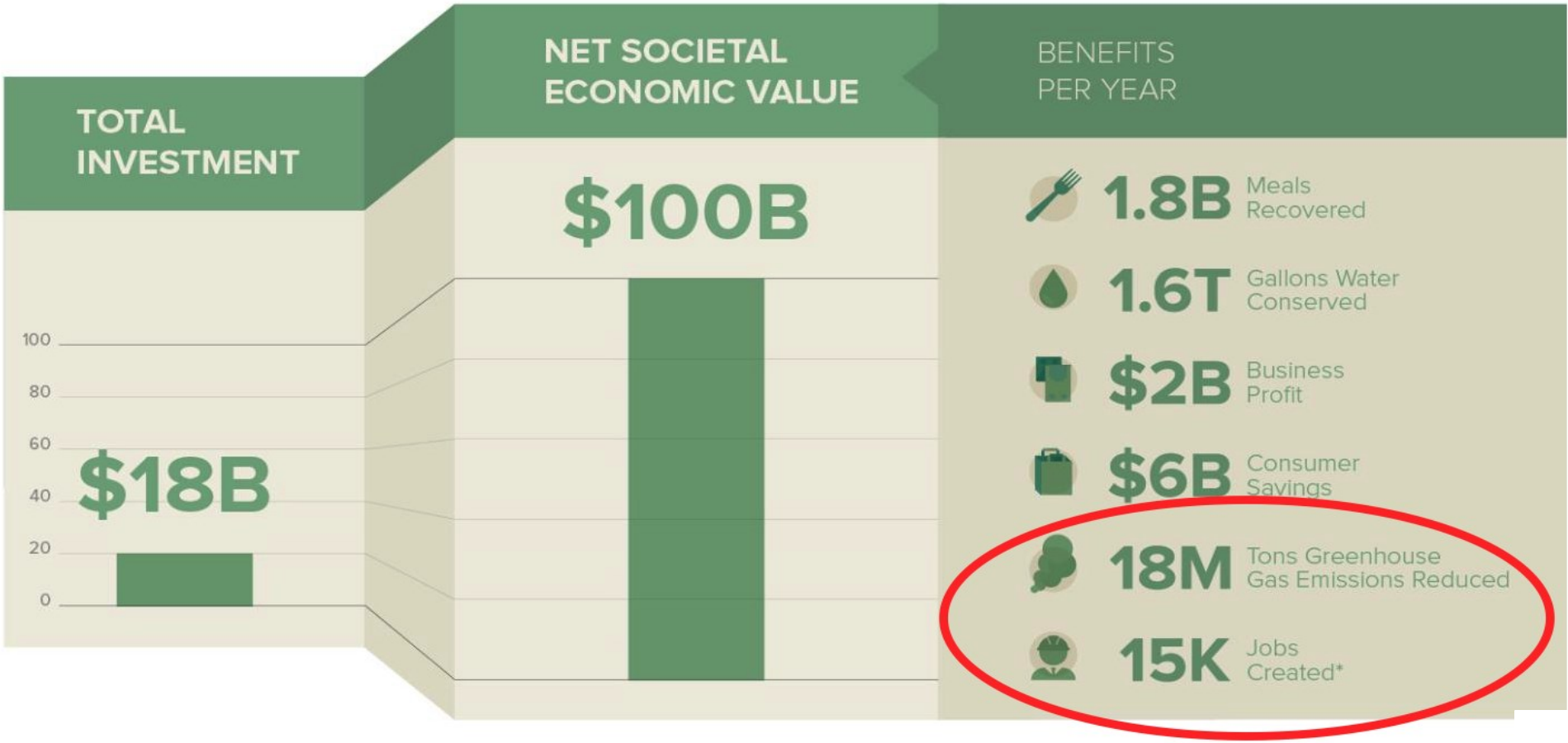
ReFED Food Waste Baseline: Nearly 63M tons of waste per year

FOOD WASTED BY WEIGHT — 63 MILLION TONS ($218 billion)



THE SOLUTIONS AND ECONOMIC ANALYSIS

AN $18 BILLION INVESTMENT IN 27 SOLUTIONS TO REDUCE U.S. FOOD WASTE BY 20% WILL YIELD $100 BILLION IN SOCIETAL ECONOMIC VALUE OVER A DECADE



ReFED

Jobs and environmental benefits not included in $100b calculat
*Jobs created is a total number, not annual new jobs

Data Analysis: 13M tons of potential (20%)

Prevention

- Stopping waste from occurring in the first place
- 12 solutions
- ***Annual Economic Value: $7.7b***
- Most Cost Effective

Recovery

- Redistributing food to people
- 7 solutions
- ***Annual Economic Value: $2.4b***
- Best at Alleviating Hunger

Recycling

- Repurposing waste as energy and agricultural products
- 8 solutions
- ***Annual Economic Value: $121M***
- Greatest Diversion Potential

REDUCE 13.2 M TONS

PREVENTION:	2.6 M TONS
RECOVERY:	1.1 M TONS
RECYCLE:	9.5 M TONS

ReFED

27 Solutions Evaluated

Prevention Solutions	
Packaging, Product & Portions	Standardized Date Labeling
	Packaging Adjustments
	Spoilage Prevention Packaging
	Produce Specifications (Imperfect Produce)
	Smaller Plates
	Trayless Dining
Operational & Supply Chain Efficiency	Waste Tracking & Analytics
	Cold Chain Management
	Improved Inventory Management
	Secondary Resellers
	Manufacturing Line Optimization
Consumer Education	Consumer Education Campaigns

Recovery Solutions	
Donation Infrastructure	Donation Matching Software
	Donation Storage & Handling
	Donation Transportation
	Value-Added Processing
Donation Policy	Donation Liability Education
	Standardized Donation Regulation
	Donation Tax Incentives

Recycling Solutions	
Energy & Digestate	Centralized Anaerobic Digestion (AD)
	Water Resource Recovery Facility (WRRF) with AD
On-Site Business Processing Solutions	In-Vessel Composting
	Commercial Greywater
Agricultural Products	Community Composting
	Centralized Composting
	Animal Feel
	Home Composting

Criteria for Selection

Available Data

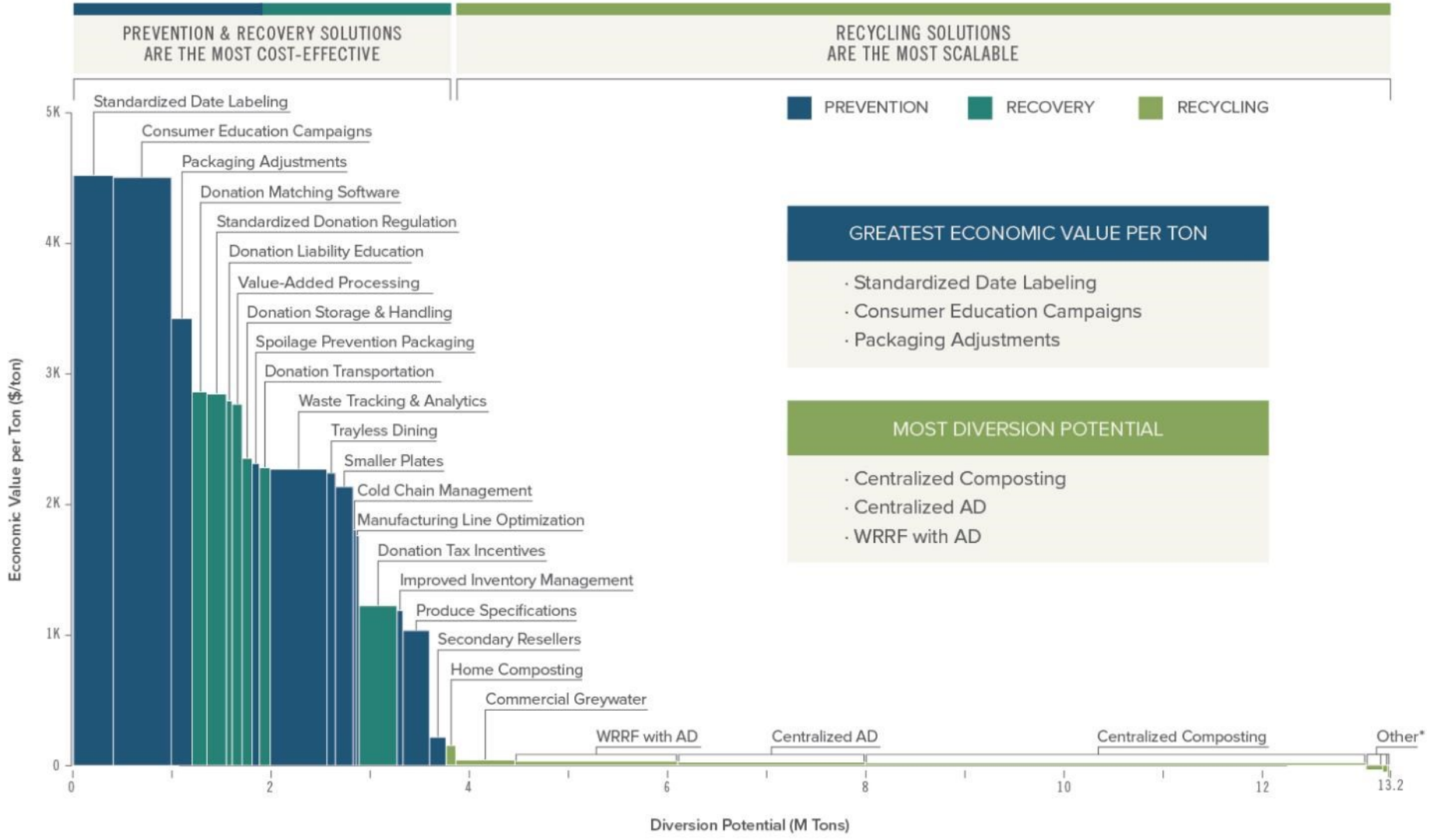
Cost effective

Feasible

Scalable

ReFED

MARGINAL FOOD WASTE ABATEMENT COST CURVE



ReFED

* Other: *Community Composting, Animal Feed, In-Vessel Composting*

Prevention

Generally low levels of investment and food valued at high wholesale/retail prices

Largest net environmental benefit by avoiding wasted resources in agriculture – twice the GHG impact per ton reduced of recycling

<u>Top 3 Most Scalable Solutions:</u>

- *Standardized Date Labeling*
- *Consumer Education Campaigns*
- *Waste Tracking & Analytics*

ReFED

Recovery

3 pillars to scale:

1) Enabling policy that financially incentivizes donations from businesses with standardized regulations

2) Education for businesses on donor liability protections and safe food handling practices

3) Logistics and infrastructure to transport, process, and distribute excess food.

<u>Top 3 Most Scalable Solutions:</u>

- *Donation Tax Incentives*
- *Standardized Donation Regulation*
- *Donation Matching Software*

ReFED

Recycling

Nearly three-quarters of total *Roadmap* diversion potential

- 73% of recycling opportunity expected to come from Centralized Composting and Centralized Anaerobic Digestion (AD) facilities

Northeast, Northwest, and Midwest show the highest economic value per ton from recycling due to high disposal fees and high compost & energy prices

- Generate 53% (2.7M TPY) of composted material at net societal benefit of $30/ton

Top levers to scale recycling: (1) increase in landfill disposal costs, (2) efficiencies in hauling and collection through siting near urban centers, and (3) denser routes

<u>Top 3 Most Scalable Solutions:</u>

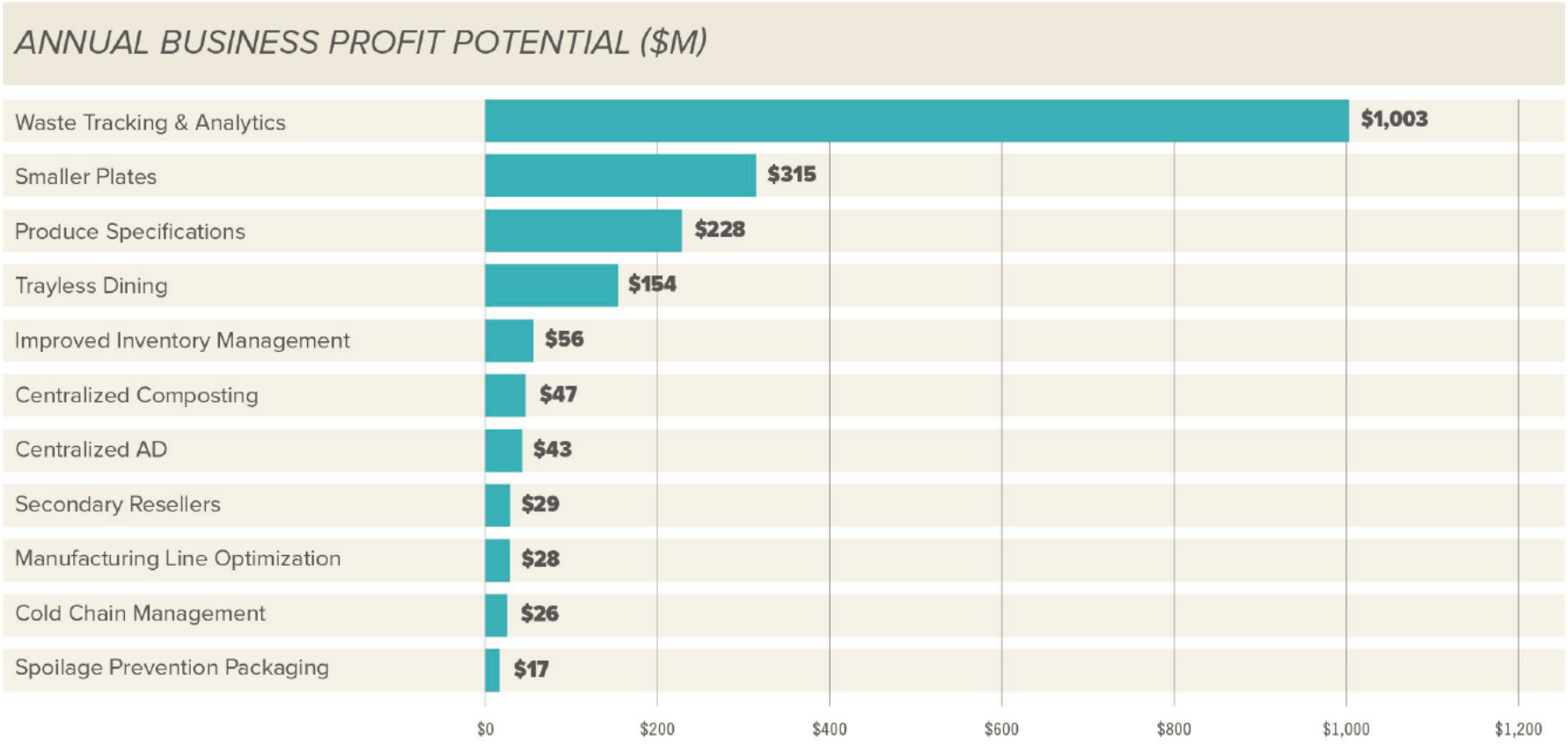
- *Centralized Composting*
- *Centralized Anaerobic Digestion (AD)*
- *Water Resource Recovery Facility with AD*

ReFED

Barriers to Recycling Organics

Barriers	Levers to Drive Action
Cost of Disposal	•Landfill taxes
High Transportation and Logistics Cost (i.e. Hauling)	•Reduce route redundancy •Site facility closer to urban center than landfill disposal alternative
Material Supply Assurance (Quantity)	•Enforcement of organics bans (letters or audits) •Long-term contracts between generators and processors
Packaging and Contamination (Quality)	•Innovation on compostable packaging, and low-cost depackaging equipment •Communication between generators and processors
Access to Financing	•If federal and state programs or impact investors could supply 10% of all project capital in form of grants, potential of 2M additional tons of diversion
End-Market Development	•Municipal incentives for compost use in RFPs •Innovation competitions for compost products
Permitting and Siting	•Factor environmental and social impacts of waste diversion (i.e. cost of siting/building new landfills; benefits of local job creation) into cost-benefit analysis of food waste recycling

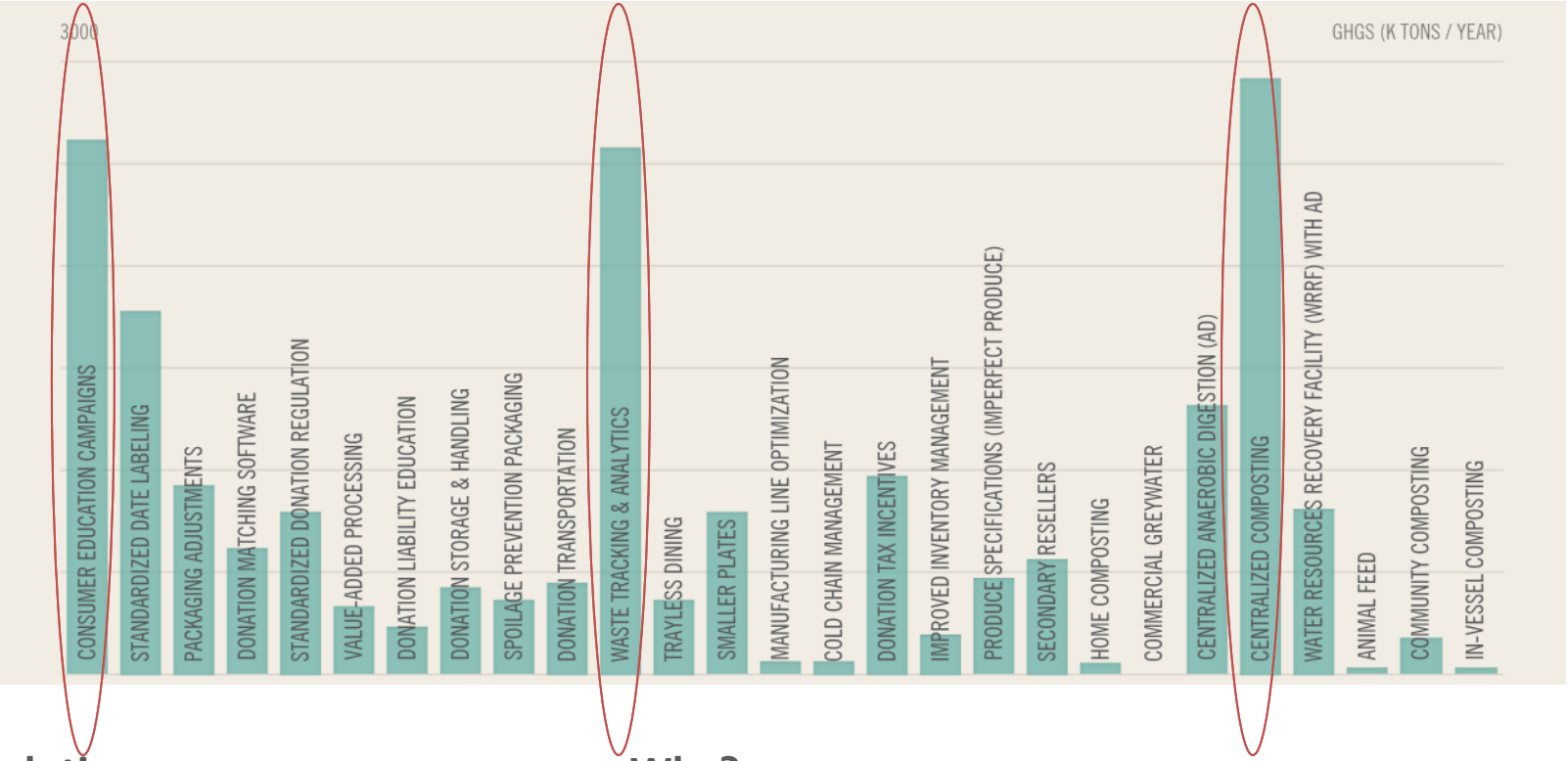
Business Profit Potential: $2 Billion per year



Nearly 80% of the business profit potential is estimated to reside within restaurants, institutions, and foodservice, such as waste tracking & analytics in commercial kitchens

GHG Reductions

Reducing food waste by 20% in the United States has the potential to reduce 18 million tons of greenhouse gases.



Top 3 Solutions:

1. Centralized Composting
2. Consumer Education Campaigns
3. Waste Tracking & Analytics

Why?

- Prevention, which avoids unnecessary fertilizer and fuel use on farms, has 2x the GHG benefits as recycling
- Recycling reduces landfill methane emissions (a greenhouse gas 25x more potent than CO_2)

THE PATH AHEAD TO TAKE ACTION

Levers to Drive Action Across all Stakeholders

Four crosscutting actions needed to quickly cut 20% of waste and put the U.S. on track to achieve a broader 50% food waste reduction goal by 2030.

POLICY
Commonsense tweaks leading to standardized national policy

FINANCING
New catalytic capital and quantified non-financial impacts

INNOVATION
5 focus areas and innovation incubator networks

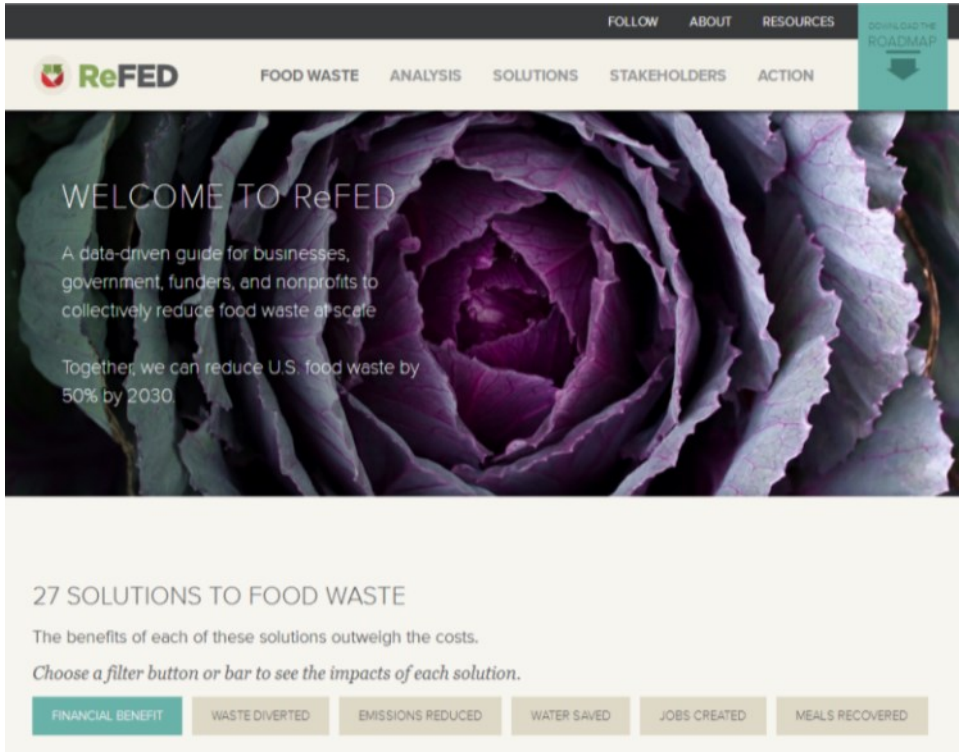
EDUCATION
National Consumer and Employee campaigns

ReFED

Lessons from *Roadmap*: MassDEP Organics Action Plan

- **Focus on prevention *first* - $7.7B in annual Economic Value**
  - Solutions include: Waste Tracking & Analytics; Produce Specifications (Imperfect Produce); Improved Inventory Management
  - Tend to be capital-light → Involve changing behavior through packaging changes, software, and marketing
- **Food Recovery: Half of new potential comes from produce surpluses on farms and at packinghouses**
  - Identify strategies to engage this community to donate, including Donation Matching Software (e.g. Spoiler Alert) and gleaning organizations
- **Centralized AD (1.9M tons of diversion potential) and WRRF with AD (1.6M tons of diversion potential)**
  - Boston MSA is cited as a key region for expansion for both of these solutions
- **Innovation is cited as a key lever to scale solutions for depackaging, distributed recycling, and creating end-markets for compost**
  - Utilize existing innovation accelerators (i.e. MassChallenge) and large # of MA colleges to host competitions focused on these topic areas

How to get involved? Visit refed.com



Interactive Cost Curve ranks solutions by economic value, scalability, and environmental/social benefits

Download and share the Roadmap full report (96pg), Key insights (5pg), and Technical Appendix

Additional Detail on the 27 solutions and priorities for each stakeholder

Future Research Priorities

For additional questions, contact us at info@refed.com

ReFED