

A ROADMAP TO REDUCE U.S. FOOD WASTE BY 20 PERCENT

Key insights

2016



ReFED

Rethink Food Waste
Through Economics and Data



KEY INSIGHTS

The Roadmap to Reduce U.S. Food Waste by 20 Percent was developed to identify the most cost-effective solutions to cut food waste at scale, to define research priorities, and to spur multi-stakeholder action. To download the full Roadmap, join this effort or learn more, go to refed.com.

THE PROBLEM

Today, the United States spends over \$218 billion – 1.3% of GDP – growing, processing, transporting, and disposing of food that is never eaten.

- Each year, 52.4 million tons of food is sent to landfill, and an additional 10.1 million tons remains unharvested at farms, totaling roughly 63 million tons of annual waste.

THE ROADMAP

ReFED envisions a future where combating food waste is a core driver of business profits, job creation, hunger relief, and environmental protection.

- The *Roadmap* shows an achievable path to a 20% reduction of food waste within a decade through 27 cost-effective, feasible, and scalable solutions. These solutions would divert 13 million tons from landfills and on-farm losses.
- Implementing the *Roadmap* is projected to generate 15,000 new jobs, double recovered food donations to nonprofits (1.8 billion meals per year), reduce up to 1.5% of freshwater use (1.6 trillion gallons per year), and avoid nearly 18 million tons of greenhouse gas emissions annually.

ECONOMIC VALUE

The Roadmap will require an \$18 billion investment, less than a tenth of a penny of investment per pound of food waste reduced, which will yield an expected \$100 billion in societal Economic Value over a decade.

- The estimated funding need is \$8 billion of government support via mostly existing legislation, \$7 billion of market-rate private investments, and \$3 billion of philanthropic grants and impact investments.
- Consumers will reap the biggest economic benefit, saving \$5.6 billion annually by cutting unnecessary spending on food that is never eaten.
- Restaurants and foodservice providers could gain the largest business profit improvement — over \$1.6 billion annually — by adopting **Waste Tracking & Analytics, Smaller Plates,** and other solutions.
- Prevention, which avoids unnecessary fertilizer and fuel use on farms, has twice the lifecycle greenhouse gas benefit per ton compared to food recycling. The prevention of unnecessary meat production offers the largest marginal environmental benefit of any category. Recycling reduces landfill methane emissions, while also offering the opportunity to return nutrients to large amounts of degraded soils.

PREVENTION

Solutions that prevent waste in businesses and homes have the greatest Economic Value per ton and net environmental benefit, diverting 2.6 million tons of annual waste.

- The top three solutions with the greatest Economic Value per ton all utilize prevention: **Standardized Date Labeling, Consumer Education Campaigns, and Packaging Adjustments.**
- Prevention solutions are generally capital-light; they involve changing behaviors through packaging changes, software, and marketing.
- At retail, food is worth roughly \$2.50 per pound, magnitudes higher than the value of food scraps for disposal, providing a large economic driver for prevention efforts.



RECOVERY

Food recovery can increase by 1.8 billion meals annually, nearly doubling the amount of meals rescued today and diverting 1.1 million tons of waste.

- The food recovery ecosystem requires three pillars to scale: business education, enabling policy, and available and efficient transportation and cold storage.
- Over half of the opportunity requires legislation, including the maintenance and expansion of tax incentives for business donations and the standardization of food handling safety regulations.
- Nearly half of new recovery potential comes from produce surpluses on farms and at packinghouses, a sector with lower levels of donations today than food retailers.

RECYCLING

Centralized Composting and Anaerobic Digestion (AD), as well as a smaller set of growing distributed solutions, will enable 9.5 million tons of waste diversion — nearly three-quarters of the total potential.

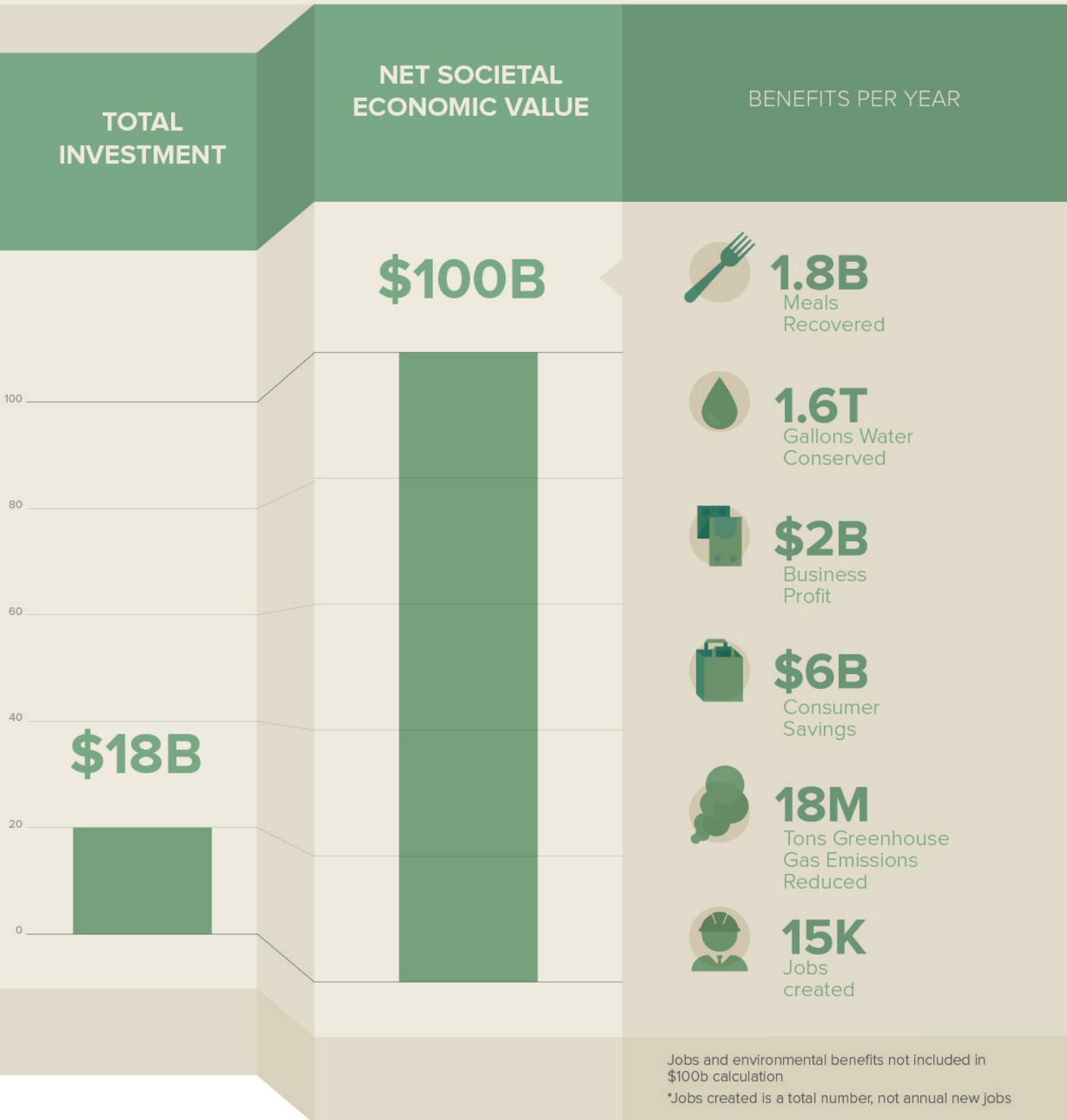
- **Centralized Composting** diverts the most waste, adding over 2 million tons of compost annually to fuel growth in the sustainable farming and environmental remediation markets.
- The Northeast, Northwest, and Midwest can generally realize the most Economic Value from recycling due to high landfill disposal fees and high compost and energy market prices.
- Nearly \$3 billion of investment is needed for recycling infrastructure, mainly for compost and AD processing and collection.
- Municipalities can help build more large recycling projects by including non-financial job and environmental benefits into cost-benefit analyses.
- The top levers to scale recycling beyond the *Roadmap* targets are an increase in landfill disposal costs and efficiencies in hauling and collection through closer siting of organics processing to urban centers and optimized collection routes. Other key bottlenecks to overcome are the high cost of project capital, particularly for AD facilities, and low, unstable pricing for biogas and compost.

TOOLS FOR ACTION

Four crosscutting actions are 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.

- **Financing** – To overcome the bottlenecks to unlocking \$18 billion in financing, \$100-\$200 million annually is needed in catalytic grants, innovation investments, and low-cost project finance. Today, few investors or foundations focus explicitly on food waste.
- **Policy** – Commonsense policy adjustments are needed to scale federal food donation tax incentives, standardize safe handling regulations, and boost recycling infrastructure by expanding state and local incentives and reducing permitting barriers. The biggest lever to accelerate change is comprehensive federal legislation.
- **Innovation** – Key technology and business-model innovations are needed around packaging and labeling, IT-enabled transportation and storage, logistics software, value-added compost products, and distributed recycling. These could be accelerated through a national network of food waste innovation incubators.
- **Education** – Launching a widespread training effort to change the behavior of food business employees is critical. In addition, campaigns to raise food waste awareness among consumers need to attract additional funding and support to expand to the scale of anti-littering and anti-smoking efforts.

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



PRIORITY STAKEHOLDER ACTIONS AT A GLANCE

THESE ACTIONS offer the largest opportunities for each stakeholder to contribute to food waste reduction, both through new initiatives and by expanding existing efforts. They are described in more detail throughout the *Roadmap*.



FARMERS | *Seek to reduce the ~10 million tons of cosmetically imperfect or unharvested food lost each year*

- Collaborate with food businesses to further develop a secondary market for **Imperfect Produce**
- Leverage **Value-Added Processing**, both on farms and through partner organizations, to turn excess produce into soups or shelf-stable products for new profit- or donation-driven businesses



FEDERAL GOVERNMENT | *Cost-effectively create jobs and alleviate hunger through smart policies*

- Retain and expand **Donation Tax Incentives** for businesses that donate food
- Introduce national **Standardized Date Labeling** legislation (if industry does not make voluntary progress)



STATE AND LOCAL GOVERNMENTS | *Pursue holistic approaches to waste reduction — incentivizing prevention, recovery, and recycling to reduce the tax burden and address food insecurity*

- Continue to support organics diversion through use of mandates or landfill or commercial food waste bans, reduce permitting barriers for compost and AD, and enforce programs through incentives or fines
- Implement **Standardized Donation Regulations** across states



MANUFACTURERS | *Expand existing leadership in repurposing excess food through multi-stakeholder collaborations*

- Continue to increase efficiencies through **Manufacturing Line Optimization** to boost profits
- Collaborate with retailers on **Packaging Adjustments, Spoilage Prevention Packaging, and Standardized Date Labeling**



RESTAURANTS & FOODSERVICE | *Save up to \$1.6 billion in food purchasing costs*

- Further adopt **Waste Tracking & Analytics** across all facilities and incorporate **Imperfect Produce** into menus to reduce costs
- Shift consumer behavior with **Smaller Plates** and **Trayless Dining** in all-you-can-eat facilities



FOUNDATIONS | *Provide the ~\$300 million needed annually to protect the environment, alleviate hunger, and develop local economies*

- Provide grant funding for major **Consumer Education Campaigns**, and support multi-stakeholder efforts to enact **Standardized Date Labeling** and educate employees and others on best practices
- Make grants and impact investments to support food donation and recycling infrastructure, including trucks, cold storage, IT systems, and processing facilities



GROCERY RETAILERS | *Increase profits while empowering customers to reduce waste*

- Boost revenues by marketing discounted **Imperfect Produce**, and continue to reduce costs by adopting **Improved Inventory Management** systems and **Spoilage Prevention Packaging**
- Collaborate with retailers and manufacturers to adopt **Standardized Date Labeling** to benefit consumers



INVESTORS | *Generate returns from an untapped \$2 billion market opportunity*

- Provide dedicated funds that offer flexible project finance for compost and AD facilities
- Provide early-stage and growth equity to scale existing business software solutions and innovative technologies that reduce the cost of prevention, recovery, and recycling