



RUTGERS

New Jersey State Policy Lab

March 2022

**Advancing the New Jersey Sustainable
Organic Material Management Plan:
Opportunities to Increase Food Security and
Reduce New Jersey's Organic Waste**

Authors:

Abigail Brown

Anna Heckler

Tracy Youngster

RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

NJ Climate Change Alliance



Advancing the New Jersey Sustainable Organic Material Management Plan: Opportunities to Increase Food Security and Reduce New Jersey's Organic Waste

March 2022

Suggested Citation:

Brown, A., Heckler, A. & Youngster, T. 2022. Support provided by Jeanne Herb, Marjorie Kaplan, and Gary Sondermeyer. Advancing the New Jersey Sustainable Organic Material Management Plan: Opportunities to Increase Food Security and Reduce New Jersey's Organic Waste. Prepared for the New Jersey Climate Change Alliance. New Brunswick, NJ: Rutgers University, and in partnership with the New Jersey State Policy Lab.

Retrieved from <https://policylab.rutgers.edu/projects/>

This report was prepared with the input of the Steering Committee of the Organics Workgroup of the New Jersey Climate Change Alliance, a statewide network of organizations that collaborate to advance science-informed climate change strategies at the state and local level in New Jersey. This work was produced in partnership with the New Jersey State Policy Lab which is funded by the New Jersey State Office of the Secretary of Higher Education. The New Jersey State Policy Lab is an independent research center operated by the Bloustein School of Planning and Public Policy and the School of Public Affairs and Administration at Rutgers University. The Lab thanks the New Jersey Office of the Secretary of Higher Education for its support and funding. The contents of this report do not necessarily represent the policy of the Office of the Secretary of Higher Education and you should not assume endorsement by elected leadership or other employees of the State of New Jersey. Any omissions or errors are the sole responsibility of the author(s).

Table of Contents

Executive Summary	2
Introduction	13
Research Initiative 1: Food Equity - Aligning State Programs to Address Food Insecurity	19
Research Initiative 2: Develop Central Governance in Food Systems - Food Policy Councils	29
Research Initiative 3: Review of Food Rescue Actions Taken by Healthcare Providers	37
Research Initiative 4: Food Rescue Transportation, Refrigeration and Equipment Assistance	45
Research Initiative 5: Progressive Financial Assistance Programs for Food Rescue, Small-Scale Facility Development, and Large-Scale Facility Development.....	51
Research Initiative 6: Organics Education and Outreach	59
Research Initiative 7: Share Table Legislation in Other States	73
Research Initiative 8: Small-Scale Composting Exemptions	79
Research Initiative 9: Expedited Permitting of Composting Operations	85
Research Initiative 10: Food Rescue Policy Assessment	89
Research Initiative 11: Review Track Record of Co-Digestion Facilities Nationally	97
Research Initiative 12: Available Metrics on Animal Manure Management ...	105
Research Initiative 13: Experience with Regional Manure Management Facility Development.....	109
Additional Research Initiative: Reimagining Prison Food Systems.....	115
Final Review and Key Findings	119
References	125
List of Contributors	145

Executive Summary

This report informs and advances opportunities for action identified by the NJ Climate Change Alliance Organics Workgroup in its *Sustainable Organic Material Management Plan* (SOMMP) by exploring policies and programs in over twenty states for the purposes of reducing wasted food, feeding those in need, and driving organics away from landfills. According to The New Jersey Department of Environmental Protection (NJDEP) *2020 New Jersey Global Warming Response Act 80x50 Report*, organic waste (e.g., food waste, animal manure, yard waste) within the agricultural and waste sectors accounts for 5% of the state's greenhouse gas emissions and targeting the agricultural and waste sectors to reduce and recover organic waste should be a priority strategy for reducing emissions. Along with reducing greenhouse gas emissions, diverting excess food from landfills can help address food insecurity. Based on the SOMMP, the Organics Workgroup leadership identified thirteen areas for further research that became the Research Initiatives undertaken by the research team and outlined in this report. The purpose of this research project was to:

- Investigate leading programs and policies in other states.
- Present lessons learned.
- Provide information to New Jersey policymakers and program directors that can assist decision-making efforts to reduce organic waste, greenhouse gas emissions, and food insecurity.

Research was conducted through interviews and an examination of policies and programs across the country. This report offers examples identified from other cities and states that may provide opportunities for action in New Jersey in a variety of areas including opportunities in state and municipal government, the healthcare sector, the nonprofit sector, the agriculture sector, the waste management sector, local school systems, and institutions of higher education.

The 13 Research Initiatives and key findings, along with an additional section on Reimagining Prison Food Systems, a topic that repeatedly emerged during the research process, are briefly summarized below. Please see the main report for more thorough descriptions, additional examples, and citations.

Research Initiative 1: Food Equity - Aligning State Programs to Address Food Insecurity

The University at Buffalo Global Health Equity Center defines food equity as “the expansive concept that all people have the ability and opportunity to grow and to consume healthful, affordable, and culturally significant foods... Food equity requires that food systems be democratically controlled and community stakeholders determine the policies that influence their food system.” Improving food equity can help reduce food insecurity, which is defined by the U.S. Department of Agriculture as a “household-level economic and social condition of limited or uncertain access to adequate food.” Structural inequities have resulted in low-income and communities of color experiencing higher rates of food insecurity than the rest of the population. Due to the systemic nature of the issue, addressing food insecurity requires a multifaceted approach in which state governments can play a significant role.

The Growing Food Equity in New York City Plan and the North Carolina Food System Resilience Strategy provide ideas for how the government can address systemic inequities to improve food security. These plans include recommendations for their respective communities including: 1) considering food equity in zoning and planning decisions such as in NYC, 2) developing food waste prevention plans for schools and state agencies (e.g., NYC requires that city agencies develop and implement food waste prevention plans), 3) creating an urban/suburban agriculture plan such as in NYC, 4) helping fund advocacy networks to increase food equity, and 5) drafting a statewide food equity plan.

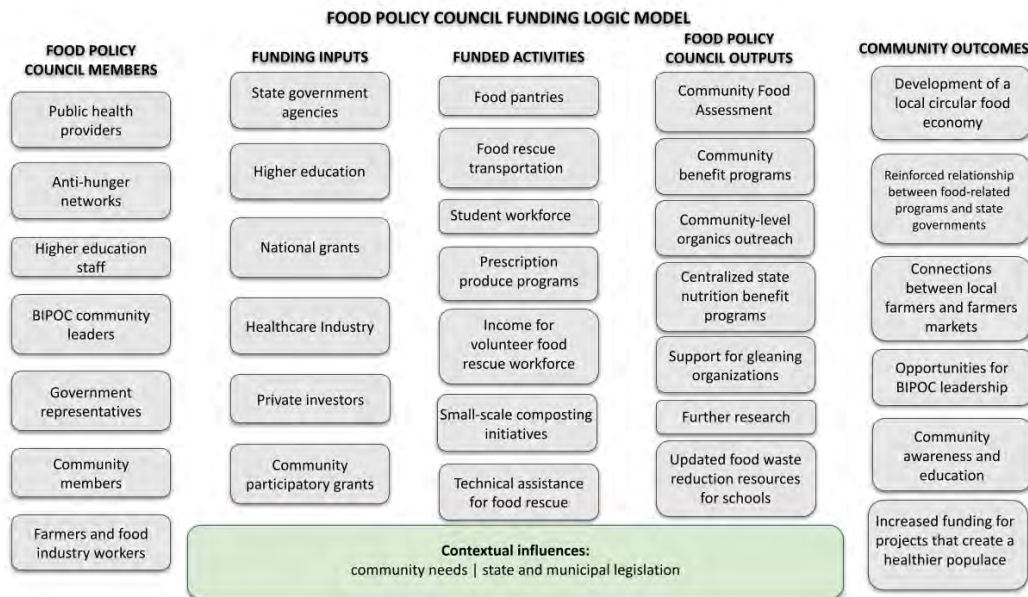
Another opportunity for improving food equity and reducing food insecurity is to increase enrollment of eligible people in government anti-hunger programs (e.g., Supplemental Nutrition Assistance Program). New Jersey’s newly created Office of the Food Security Advocate is tasked with connecting food insecurity programs across the state and could be valuable in helping to streamline anti-hunger programs which could help increase enrollment.

Research Initiative 2: Develop Central Governance in Food Systems - Food Policy Councils

In 2018, the Johns Hopkins Food Policy Council Report defined a *Food Policy Council* (FPC) as “An organized group of stakeholders that may be sanctioned by a government body or may exist independently of government, which works to address food systems issues and needs at the local (city/municipality or county), state/provincial, regional or Native American/First Nations Levels.” A visual summary of common FPC members, funding avenues, activities and goals created by the Research Team is shown below. An FPC model engages grassroots level actors to create change in the food system at the community level. These community-level organizations can then come

together and share ideas, advocate for larger change, and pool resources across FPCs at various levels. Often, these organizations have little to no funding available and bringing funders into the conversation early is important for maximizing impact.

California (27 active FPCs), Massachusetts (17 active FPCs), and North Carolina (31 active FPCs) all have robust statewide FPC networks and large numbers of local FPCs. An example of the work statewide FPCs can accomplish is the advocacy work that the Massachusetts Food Systems Collaborative (MAFSC) accomplished with the Healthy Incentives Program (HIP). MAFSC and their advocacy partners (e.g., stakeholders such as farmers and health care institutions) advocated for the continued funding through the state budget of a USDA-funded pilot program that provided extra SNAP dollars that could only be spent at farmers markets. They raised awareness of the program among legislators and provided space for a coalition of over 300 members to organize, which resulted in \$47 million total since 2017 in funding for HIP from the state budget.



ES-1: The Research Team created this Logic Model to provide a visual representation of example FPC members, actions and results

According to the Johns Hopkins Food Policy Council Database, in New Jersey there is one local-level FPC (New Brunswick Community Food Alliance), one county-level FPC (Passaic County Food Policy Council), and one state-level FPC (New Jersey Food Democracy Collaborative or NJFDC). The NJFDC is a network of individuals and organizations across the food space in New Jersey hosted by Stockton University. To help kickstart the creation of local FPCs, the NJFDC would like to start an FPC incubator program that would help new councils set up their structure,

create long-term goals and plans, and join a support system with other FPCs. Building a network of local FPCs is important because one size does not fit all locations throughout the state and success will depend on addressing concerns at the local level.

Research Initiative 3: Review of Food Rescue Actions Taken by Healthcare Providers

In order to achieve tax exempt status in the United States, non-profit health systems are required to prepare a Community Health Needs Assessment (CHNA) that identifies particular health-related needs within the System's catchment area along with actions that the health care system can take to address those needs. Increasingly, hospitals are beginning to lead community-improvement projects beyond traditional healthcare, including food rescue and community nutrition programs as part of their CHNA commitments. For example, Healthcare Without Harm (a national nonprofit organization that works with healthcare organizations to improve sustainability practices) partnered with Sutter Home Hospitals in California to implement a pilot program to reduce food waste in hospitals using an app-based tracking system and excess food was donated to local food banks.

Produce prescription programs are another avenue for healthcare providers to get involved in helping people access healthy food. These programs involve a collaboration between a healthcare provider and a food retailer, typically a farmers market, and prescriptions for free produce are given to eligible patients. There are several existing programs in New Jersey (e.g., Roots to Prevention's Food Bucks Rx and Elijah's Promise's Veggie Rx programs) and many other nationwide. Sustainable funding is one of the biggest challenges and some states (e.g., Massachusetts and North Carolina) currently use Medicare Waiver Authorities or Medicaid Managed Care Organization Contract Options to help fund produce prescription programs. There are additional opportunities to partner with food rescue and gleaning organizations (organizations that harvest surplus vegetables that will not be sold at market) to tie healthcare with food rescue and further reduce both hunger and food waste.

Research Initiative 4: Food Rescue Transportation, Refrigeration and Equipment Assistance

Infrastructure for food storage and transportation (e.g., refrigeration, trucks, pallet jacks) can introduce logistical challenges in food rescue systems and create barriers to connecting excess food with those in need. This Research Initiative discusses some effective systems of support for food rescue transportation, refrigeration, and assistance, many of which function through partnerships between nonprofits, the private sector, and the government. Learning from these out-of-state systems, New Jersey can improve access to food rescue infrastructure by

encouraging existing sponsorship opportunities from corporations that support refrigeration and transportation. For example, Whole Foods Nourishing our Neighborhoods Grants have provided funds for community-based food rescue organizations across the country to buy new equipment and vehicles. Government grants can also provide support for food rescue infrastructure. At the recommendation of the state's COVID-19 Command Center's Food Security Task Force, Massachusetts launched a \$36 million Food Security and Infrastructure Grant program that has funded programs including increased cold storage for food rescue organizations and refrigerated vans for Mobile Markets and produce prescription sites.

Local or regional food rescue networks and food policy councils can ensure efficient communication and transport routes between food donor and recipient. These networks can also organize collaborations among food pantries, intermediary food rescue groups, and other sectors (which may have unused vehicles that can be repurposed for food transportation). Web-based and mobile applications, such as Food Rescue US and 412 Food Rescue, match excess food with people and organizations in need.

Research Initiative 5: Progressive Financial Assistance Programs for Food Rescue, Small-Scale Facility Development, and Large-Scale Facility Development

A significant hurdle to implementing many organic waste management and food security programs is funding. There are many different mechanisms that could be explored in New Jersey to provide funding and a wide-ranging list of examples from other states is provided in the report. Categories of funding sources include tax credits, state and county grant programs, bonds, trust funds, rebates, programs that offer free waste tracking software, fees, "pay-as-you-throw" municipal garbage collection, public-private partnerships that provide funding for food waste reduction initiatives, national grants, and cap-and-trade programs.

Massachusetts provides an example of a trust fund program. Massachusetts Municipal Waste Combustion facilities are eligible to earn a specific category of renewable energy credits. As part of the requirement for these credits, facilities need to pay 50% of the value of the credits they sell into a Trust Fund managed by the MassDEP. This funds the MassDEP's Sustainable Materials Recovery Program that provides grants for a range of initiatives, including assisting municipalities with waste reduction/recycling projects and increasing organic waste diversion capacity.

Unlike the power-sector focused Regional Greenhouse Gas Initiative (RGGI) in which New Jersey participates, California has an economy-wide cap-and-trade program that sets annually declining limits for how much large greenhouse gas emitters can release into the atmosphere each year. California Climate Investments, a state agency overseeing spending from the cap-and-trade program, has used a portion of cap-and-trade funds to support a competitive grant program, the goal of which is to lower overall greenhouse gas emissions by expanding existing capacity

or establishing new facilities in California to reduce the amount of California-generated green materials, food materials, and/or Alternative Daily Cover being sent to landfills.

Research Initiative 6: Organics Education and Outreach

Most residents, schools, and businesses in New Jersey are not in the habit of separating their organic waste from the trash and education and outreach is necessary to both help create these new habits and to educate on best practices. This section of the report focuses on examples of education and outreach programs for the following sectors: the advanced sector (e.g., production/manufacturing, food services), K-12 schools, and higher education.

New Jersey legislation enacted in 2021 requires large waste generators producing over 52 tons of organic waste per year to separate and recycle their organic waste if they are located within 25 miles of an authorized food waste recycling facility. Many other states with organic waste bans (e.g., NY, MA, RI) contract out education and technical support to a nonprofit or professional organization that specializes in organic waste management education. This allows their respective state regulatory agencies to focus on enforcing regulations.

Organic waste management on K-12 school and college campuses can both help reduce waste and provide hands-on educational opportunities to students. Vermont K-12 schools are required to separate food scraps under the state's Universal Recycling Law and their Department of Environmental Conservation offers numerous resources for on-site composting, food donations, and age-appropriate educational information. For college-level organics management, North Carolina State's Compost Facility and Research Cooperative program helps divert organic waste from landfills, hosts internship opportunities, and integrates faculty and graduate student research into the program.

Education on food packaging date labels is also important for reducing food waste. Date labels are intended to inform consumers on freshness or quality of packaged food, but many think that food is unsafe to eat after the labeled date which is often not true. There is momentum at the state and national level (2021 Food Date Labeling Act) to standardize date labels and provide education on the labeling system which could help reduce food waste.

Research Initiative 7: Share Table Legislation in Other States

Share table initiatives redistribute food waste in school systems by inviting students to place unwanted pre-packaged, non-perishable foods in designated cafeteria spaces for other students to take free of charge. While federal and state level legislation on share tables exist, guidance can

be ambiguous and can increase the amount of food waste generated. As detailed in Research Initiative 7 of this report, Indiana, Nebraska, New Hampshire, Oklahoma, Texas, West Virginia, and Wisconsin offer examples of effective share table implementation. This national review, along with conversations with state agency contacts suggest that New Jersey could improve the clarity of its share table guidance by adding instructions NJ's K-12 School Food Waste Guidelines and including share tables in the Sustainable Jersey Gold Standard system.

Research Initiative 8: Small-Scale Composting Exemptions

In Table 5.4 of the 80x50 Report, the NJDEP has cited the need for regulatory reform and provided a recommendation to “create guidelines/recommendations for county siting and streamlined state planning and permitting of food waste recycling facilities.”

There are many examples from neighboring states of permitting exemptions based on volume. Rhode Island implemented a tiered permitting system to incentivize small-scale composting and operations that have less than 25 cubic yards on-site at any time do not need to register for a permit. Pennsylvania requires a General Permit for facility sites under 15 acres, with no restrictions on compost volume. The Philadelphia Small-Scale composting program is designed to operate on existing urban agriculture sites that are not expected to exceed the 15-acre limit. New York exempts sites that process less than or equal to 1 cubic yard per day or less than to 1,000 pounds per day. New Jersey could implement a tiered system and consider permit exemptions for urban agriculture and associated small-scale composting systems.

An example of a small-scale urban composting system is the District of Columbia's Community Composting Cooperative Network. Each of their fifty locations can handle one hundred active composters and is run by 1-3 Co-op Managers. Each site's capacity would be categorized as small-scale in states with tiered permitting systems.

Research Initiative 9: Expedited Permitting of Composting Facilities

Expediting the permitting process of composting facilities could allow for organic waste processing capacity to be increased more rapidly. The SOMMP report included recommendations for a “Consideration of a “General Permit” or “Permit-By-Rule” approach for non-exempt, but small composting projects such as smaller windrow composting operations.” Windrow composting is the process of placing organic waste into long piles called “windrows” and aerating the piles. These windrow composting sites are typically not considered “small-scale” and would still require permits under tiered permitting regulations in most states but expediting the permitting process could more quickly expand organic waste processing capacity.

This review did not find an existing state program for expedited permitting specifically for windrow composting as most permits are issued based on volume and/or acreage of the composting site and not the specific method of composting. The California EPA report *Enhancing Organic Materials Management by Improving Coordination, Increasing Incentives, & Expediting Decision-Making* provides guidance for expediting the permitting process for organic materials management which includes suggestions such as: 1) creating a General Order for composting operations, 2) consolidating permits so one agency reviews applicable state environmental permits, and 3) creating a permitting workgroup with state agencies and regional permitting officials to facilitate permitting decision-making.

Research Initiative 10: Food Rescue Policy Assessment

There are federal and state level policies that aim to increase the amount of edible food diverted from landfills and redistributed to those in need, but many businesses still send edible food to a composting facility or landfill. Food rescue can be increased by the state through executive order, legislation requiring food rescue, enhanced liability protection, and tax incentives.

The only example found of an executive order that addresses food rescue was Oregon's Executive Order 20-04 which directs the state agencies to "take actions necessary to prevent and recover food waste, with the goal of reducing food waste by 50 percent by 2030." In other states, recent food waste legislation has passed that sets goals and requirements for food rescue; California enacted a bill that sets a goal of rescuing 20% of edible food waste by 2025 and New York enacted a bill requiring businesses to donate excess edible food.

Enhanced liability protections and tax incentives go beyond what is offered at the federal level and are more common ways for states to incentivize food rescue. Examples of enhanced liability protections include protections for donations that go directly to the recipients, for the donation of past-dated food, and when the end-recipient pays for the rescued food. Through tax incentives, California covers up to 50% of transportation costs when food is donated to nonprofits. Additionally, several states (e.g., CA, VA) have expanded tax incentives to include small businesses and farmers.

Research Initiative 11: Review of Track Record of Co-Digestion Facilities Nationally

High technology mechanized composting facilities, such as anaerobic digesters and co-digesters, convert organic waste to biogas energy and produce high-nutrient digestate fertilizer. With about 1.13 million tons of food waste sent to landfills or incinerated across New Jersey each year, about 230,000 tons/year of processing capacity at the two existing water resource recovery

facilities (WRRF) in the state accepting food waste, and about 900,000 tons/year of additional, available organic waste processing capacity across other in-state facilities, co-digestion presents an underutilized opportunity for organic waste reduction and energy generation. The Research Team recognizes the potential of developing as many as nine additional strategically located commercial scale anaerobic or aerobic composting facilities with the support of national grants and other funding strategies discussed throughout this report (subsidies, state grants, tax incentives).

Research Initiative 12: Available Metrics on Animal Manure Management

According to EPA data, manure management contributes to 10% of US methane emissions. Emissions from ruminant animals contribute another 27%. Animal manure recycling provides an avenue to reduce emissions, reclaim nutrients, and generate renewable energy. The types of farms and livestock most prevalent in New Jersey (from independent horse farms to animal feeding operations) result in variable animal manure metrics (in terms of volume, nutrients, and cost), when metrics are measured at all. Surveys of manure management in other states estimate the volume of livestock waste generated and the costs of manure handling. To supplement these estimates, this report also explores the value of manure fertilizer, the estimated savings of manure recycling as fertilizer for cattle, turkey, and hog waste; Nutrient Management Plans and Comprehensive Nutrient Management Plans track these metrics annually across states. An application of estimated manure handling costs in Rhode Island, a state with a farmland-to-acre ratio comparable to New Jersey's, to NJ census counts of farms and livestock would project annual cost of manure and wastewater handling and storage before re-application to land as fertilizer at about \$25 million per year. Due to the economic impact of manure handling and manure fertilizer transportation, and due to the lack of publicly available, state-specific metrics on animal manure management, this research team recommends an audit of NJ nutrient management plans to inform suitable strategies for animal manure management for this state.

Research Initiative 13: Experience with Regional Manure Management Facility Development

National and state resources guide regional manure management facility development. Examples of effective manure management facilities in other states (California, Texas, Oregon, Idaho, Washington) include on-farm biodigesters, settling bins, and weeping walls. Various funding sources at the national and state level may support facility development. Conversations with manure management researchers in New Jersey and Texas reinforce that manure management facility development is most effective with a high supply of manure and consistent centralization and standardization across the state. Given that farms account for about 13% of NJ land acres, the

lower percentage of land occupied by farms in NJ (45th or 0.08% of US land), and the sensitivity of manure as a nutrient and biogas source, NJ may consider deferring this Research Initiative until technology related to on-farm digesters and high nutrient manure fertilizers like biochar (a charcoal-based fertilizer) and struvite (a phosphate mineral) develop further.

Additional Research Initiative: Reimagining Prison Food Systems

Food equity in the prison system, along with the potential for gardening and composting on prison grounds, are topics that repeatedly surfaced throughout the research process despite not being an intended Research Initiative. Prison systems in other states have developed gardening and organic waste management programs that give inmates the opportunity to gain workforce development skills, supplement their diets with fresh produce, and reduce organic waste through on-site composting. The Philadelphia Department of Prisons has a Food Recovery and Composting program where inmates are trained in on-site composting practices through a vocational certificate program in urban farming and landscaping. Removing food scraps from the prisons' waste stream saves the city money, and finished compost is used in prison gardens which grow food for prison meals.

Conclusion

Interviews with agency contacts and a national review of policies and programs highlight state funding (for food equity advocacy networks and food rescue transportation/infrastructure), food policy council creation, tiered community composting permitting, co-digestion facility development, produce prescription programs, and opportunities for food recycling in school systems as mutually reinforcing, high-reward opportunities for organics waste policy improvement in the state. Viable funding strategies include tax credits, national, state, and county grant programs, bonds, trust funds, rebates, fees, pay as you throw initiatives, cap-and-trade programs, and public-private partnerships. Universities, school districts, and state facilities like hospital systems and prisons offer involved workforces that can create space for these programs. Some opportunities for organics waste management, such as co-digestion facility development, manure management facility development, small scale composting, and permitting exemptions may benefit from additional research as policy unfolds and new findings are published. Through collaborative action, NJ can transform its systems of organic waste management and contribute to a more sustainable future.

Introduction

The State of New Jersey is currently advancing an expansive policy agenda to meet statewide targets to reduce greenhouse gas emissions. The New Jersey Department of Environmental Protection (NJDEP) released the *2020 New Jersey Global Warming Response Act 80x50 Report*, which outlines steps the New Jersey state government can take to reduce greenhouse gas emissions to 80% below 2006 levels by 2050.¹ After winning reelection in 2021, Governor Murphy signed an Executive Order creating an interim goal of reducing greenhouse gas emissions 50% by 2030.² This order reinforces a state-level opportunity for climate change action.

The 80x50 Report included a chapter on waste and agriculture which states that “the waste sector emitted 5.3 MMT CO₂e and the agriculture sector emitted 0.4 MMT CO₂e in 2018.” (MMT CO₂e means million metric tons of carbon dioxide equivalent.) A priority strategy for lowering waste-related greenhouse gas emissions suggested in the 80x50 Report is reducing and recovering food waste.¹ Nationally, municipal solid waste (MSW) is responsible for 82% of the total greenhouse gas (GHG) emissions from the waste-management sector. As stated in the Sustainable Organic Material Management Plan (discussed below) “Approximately 30% of the MSW generated is composed of containers and packaging-related materials and another 25% of food and other organic material wastes.” Landfilled food waste accounts for at least 2.6% of total U.S. greenhouse gas emissions and decomposition of organic matter creates 15% of U.S. methane emissions.³

According to Feeding America, Americans waste approximately 40% of all food.⁴ Additionally, during the COVID-19 crisis the projected food insecurity rates in New Jersey rose from 8.6% in 2019 to 12.0% in 2020. The projected child food insecurity rate in New Jersey rose from 9.9% in 2019 to 16.1% in 2020. Although these rates have declined slightly to a projected 11.7% and 15.3% in 2021, they are

1 Barr, H., Orlando, P., Kettig, R., Barry, R. C., Karmarkar-Deshmukh, R., & Kamel, M. (2020). *New Jersey's Global Warming Response Act 80x50 Report*. <https://www.nj.gov/dep/climatechange/docs/nj-gwra-80x50-report-2020.pdf>

2 Murphy, Governor Philip. 2021. EO-274. November 10. <https://www.nj.gov/infobank/eo/056murphy/pdf/EO-274.pdf>

3 Bayshore Recycling. August 2021. “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

4 Feeding America. (2022). *How We Fight Food Waste in the US*. <https://www.feedingamerica.org/our-work/our-approach/reduce-food-waste>

still higher than pre-pandemic food insecurity levels.⁵ The USDA defines food security as “access by all people at all times to enough food for an active, healthy life.”⁶ Food equity is a broader concept that includes food security. The University at Buffalo Global Health Equity Center defines food equity as “the expansive concept that all people have the ability and opportunity to grow and to consume healthful, affordable, and culturally significant foods. Food equity requires that food systems be democratically controlled and community stakeholders determine the policies that influence their food system.”⁷ A more equitable food system can increase food security in a healthy, culturally-appropriate, and democratic manner. An efficient and equitable food system will decrease the amount of wasted food going to landfills, where it would decompose and produce methane gas, and instead use the food to feed hungry New Jerseyans. Food systems encompass food production, processing, packaging, distribution, consumption, and waste management. Sustainable food systems facilitate positive feedback loops of economic, social, and environmental resilience.⁸ An equitable food system can eliminate food deserts, create communal ownership of the food system, consider the racialized history of food, and build a healthier populace. The purpose of this report is to summarize research conducted regarding efforts outside of New Jersey to advance policies, programs and systems that intersect the linked goals of reducing organic waste and promoting food security.

It is also important to establish the meaning of organic waste versus food waste, as both are discussed in this report. The Research Team defines organic waste as any decomposable material, including food waste, animal manure, human waste and non-food plant and animal material (e.g., wood, grass clippings, and dead animals). Food waste can refer to waste at any or all stages in the food cycle including imperfect or rotten food left on the vine, food that spoils before or during the delivery process, food that is purchased and uneaten, food scraps resulting from meal preparation, and food that is prepared, but ultimately not eaten. In practice, sometimes these terms are used interchangeably. For example, New York State has an organic waste ban in place that is called the Food Scraps Law, however the law bans a wider variety of organic waste.⁹

The Organics Waste Management Research Team, hereafter referred to as the Research Team, produced this report as a continuation of research conducted by the New Jersey Climate Change Alliance (NJCCA) Organics Workgroup. The NJCCA is a statewide organization that conducts research to support science-backed climate change solutions at the state and local level. The

5 Feeding America. (2022). *Map the Meal Gap*. Retrieved from Feeding America: <https://map.feedingamerica.org/>

6 USDA Economic Research Service. (2021, September 8). Overview. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/>

7 Raja, S. (2022). *Cultivating Food Equity*. University at Buffalo - Global Food Equity. <http://www.buffalo.edu/globaltheequity/global-projects/foodequity.html>

8 Nguyen, Hanh (2018). “Sustainable Food Systems: Concept and Framework.” Food and Agriculture Organization of the United States. <https://www.fao.org/3/ca2079en/CA2079EN.pdf>

9 New York State Department of Environmental Conservation (2022). Food Donation and Food Scraps Recycling Law. <https://www.dec.ny.gov/chemical/114499.html>

NJCCA Organics Workgroup conducts research and stakeholder engagement in the organic waste management field. In August 2021, the Organics Workgroup published the Sustainable Organic Material Management Plan (SOMMP), which outlined 17 Core Opportunities for Action.³ The SOMMP Opportunities for Action tackle topics including managing organic waste in New Jersey for the purposes of reducing wasted food, feeding those in need, and driving organics away from landfills. The SOMMP was based on a “lightning-fast stakeholder process” conducted in the spring and summer 2021.³ Based on the SOMMP, the Organics Workgroup leadership identified thirteen areas for further research that became the *Research Initiatives* undertaken by our Research Team and outlined in this report. The purpose of this research project was to:

- Investigate leading programs and policies in other states.
- Present lessons learned.
- Provide information to New Jersey policymakers and program directors that can assist decision-making efforts to reduce organic waste, greenhouse gas emissions, and food insecurity.

Using the framework of the 13 Research Initiatives, the Research Team examined policies and programs in other states to address information gaps identified during the development of the SOMMP. Through a review of publicly available documents and interviews with state- and non-profit organizations from over twenty states (CA, CO, CT, ID, MA, MD, MN, NC, NE, NH, NJ, NY, OH, OK, OR, PA, RI, TX, VT, WA, WI, and WV) this report highlights policies and programs that may provide further context for New Jersey around organic waste reduction and feeding those in need. The Research Initiative sections include a mix of lessons from other states, spotlights on example programs and systems, and opportunities for action in New Jersey. Each Research Initiative includes ideas for addressing the problems outlined throughout the section. These ideas suggest action in a variety of areas, from state government to municipal government, the healthcare sector, the nonprofit sector, the agricultural sector, the waste management sector, local school systems, and institutes of higher education.

Research Initiative 1: Food Equity - Aligning State Programs to Address Food Insecurity focuses on methods that New Jersey and other states have used to explicitly incorporate equity into the food system, particularly in the context of the recently established NJDEP Office of Environmental Justice.

Research Initiative 2: Develop Central Governance in Food Systems - Food Policy Councils discusses the development and use of food policy councils throughout the country. A food policy council is a network of organizations and individuals in the food space with the shared goal of improving the local food system through a combination of collaboration, community projects and policy advocacy.

Research Initiative 3: Review of Food Rescue Actions Taken by Healthcare Providers examines the role that healthcare providers can play in improving healthy food access in the communities they serve.

Research Initiative 4: Food Rescue Transportation, Refrigeration and Equipment Assistance investigates strategies and funding mechanisms that other states have developed to address infrastructure challenges in the food rescue space.

Research Initiative 5: Progressive Financial Assistance Programs for Food Rescue, Small-Scale Facility Development, and Large-Scale Facility Development lays out a myriad of example tools from throughout the country to raise and distribute funds in the food system, with a particular focus on organic waste solutions.

Research Initiative 6: Organics Education and Outreach discusses organic waste education programs for the following sectors: the advanced sector, K-12 schools, and higher education.

Research Initiative 7: Share Table Legislation in Other States summarizes share-table programs and related legislation from around the country and shares some best practices for implementation.

Research Initiative 8: Small-Scale Composting Exemptions considers small-scale community composting programs and compares composting facility permitting structures across some states.

Research Initiative 9: Expedited Permitting of Composting Operations explores guidance for expediting the permitting process for composting operations as increased organic waste processing capacity is needed to fulfill state organic waste reduction goals.

Research Initiative 10: Food Rescue Policy Assessment evaluates different policy vehicles for advancing food rescue including executive orders, legislation mandating that businesses donate excess food, enhanced liability protections for food donors, and enhanced tax incentives.

Research Initiative 11: Review of Track Record of Co-Digestion Facilities Nationally emerged from SOMMP-related discussions that New Jersey could update the existing infrastructure in wastewater treatment plants to divert food and biosolids from landfills and accommodate co-digestion. This section describes national context, grant opportunities, and best practices for this infrastructure. Research Initiative 11 also discusses concerns about the bioaccumulation and magnification of per- and polyfluoroalkyl substances (PFAS) when using the resulting effluent in land applications.

Research Initiative 12: Available Metrics on Animal Manure Management reviews New Jersey animal census data and manure management metrics from other states that might inform state inventories of animal manure waste.

Research Initiative 13: Experience with Regional Manure Management Facility Development discusses the implementation of on-farm and regional manure management systems in other states, reviews common funding strategies, and considers emerging research in biochar and struvite.

Additional Research Initiative: Reimagining Prison Food Systems was added by the Research Team to the 13 Research Initiatives outlined by the Organics Workgroup. Throughout the research process, several examples were found of projects aimed at improving prison food equity through gardening and composting initiatives and this section accommodates those examples.

Finally, main takeaways are outlined at the end of the report.

Research Initiative 1

Food Equity - Aligning State Programs to Address Food Insecurity

Description of Research Initiative

This Research Initiative was addressed in Core Opportunity 1 of the SOMMP: Food Equity. This section states that the "opportunity exists to align all State agency actions and programs to address social determinants of health, including food insecurity.... Through State leadership, a coalition of public, private, nonprofit and grassroots organizations can be developed to coordinate efforts and advance food equity in New Jersey."¹⁰ The objective of this Research Initiative is to summarize the existing context of food equity in New Jersey and explore programs addressing food equity from other states.

Background Information and New Jersey Context

An equitable society requires fair and just inclusion, and more specifically "food equity is the expansive concept that all people have the ability and opportunity to grow and to consume healthful, affordable, and culturally significant foods... Food equity requires that food systems be democratically controlled and community stakeholders determine the policies that influence their food system."¹¹ Improving food equity can help reduce food insecurity, which is defined by the U.S. Department of Agriculture as a "household-level economic and social condition of limited or uncertain access to adequate food."¹² Structural inequities have resulted in low-income communities of color experiencing higher rates of food insecurity than the rest of the population, which can lead to detrimental physical and mental health effects.¹³ Due to the systemic nature of the issue, improving food equity and reducing food insecurity requires a multifaceted approach in which state governments can play a significant role. Many state departments have programs either directly or indirectly related to food equity and insecurity issues and aligning these state programs across the various state departments and agencies can better help address these complex issues.

10 Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

11 Raja, S. (2022). *Cultivating Food Equity*. University at Buffalo - Global Food Equity. <http://www.buffalo.edu/globalhealthequity/global-projects/foodequity.html>

12 Economic Research Service. (2021, September 08). *Definitions of Food Security*. U.S. Department of Agriculture. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx>

13 New York City Council. (n.d.). *Growing Food Equity in New York City*. <https://council.nyc.gov/data/food-equity/>

New Jersey has recently passed legislation to help address food insecurity issues.¹⁴ The legislative package signed by Governor Murphy in September 2021 is intended to increase food security through expanding SNAP benefits and increasing funding for food programs for school-aged children.¹⁴ The Office of Food Insecurity Advocate within the Department of the Treasury will also be established which will better allow the state to coordinate anti-hunger initiatives.¹⁴ This was recently updated to be the Office of the Food Security Advocate and was moved under the Department of Agriculture. The Food Security Advocate will oversee food aid programs that are administered across several state agencies and can communicate anti-hunger activities with multiple agencies, including providing information on grant opportunities.¹⁴ Additionally, the 2021 Food Desert Relief Program offered through the NJ Economic Development Authority is designed to help address food deserts by better defining what a “food desert” is and providing funding, tax credits, and technical assistance to help increase access to healthy food in identified NJ food deserts.¹⁵ Urban agriculture, which can help improve local food systems, is already a focus for some groups in New Jersey. The Environmental Justice Advisory Council has provided recommendations for strengthening urban agriculture in their *Urban Agriculture in the Garden State* report¹⁶ and the Rutgers University Office of Urban Extension and Engagement helps coordinate and facilitate programming that includes food security and urban agricultural and food chains. This section provides examples of various opinions and approaches towards how to begin to address the issue of food equity in meaningful ways that complement the work already being done by both New Jersey and non-profits. Sections include addressing the root causes of food waste and insecurity, providing examples of city and statewide food equity plans, and evaluating how to streamline application processes for existing state benefit programs.

Addressing the root causes of food insecurity

Many of the traditional government programs for decreasing food insecurity are charity- or benefit-based models that either redirect excess food to those in need or provide a fixed amount that a person can spend on specific food items determined by the government to be acceptable. These anti-hunger programs are vital for improving short-term food access, but do not address the root causes of food insecurity. The Global Solidarity Alliance (GSA) for Food, Health and Social Justice argues the two fundamental issues that need to be addressed are corporate food waste

¹⁴ New Jersey Department of Human Services. (2021, October 1). *Governor Murphy Signs Legislative Package to Combat Food Insecurity in New Jersey* [Press release]. <https://www.nj.gov/humanservices/news/pressreleases/2021/approved/20211001.html>

¹⁵ New Jersey Economic Development Authority. (2022). *Food Desert Relief Program*. <https://www.njeda.com/food-desert-relief-program%E2%80%8B/>

¹⁶ Environmental Justice Advisory Council. (2019, September). *Urban Agriculture in the Garden State*. New Jersey Department of Environmental Protection. <https://www.nj.gov/dep/ej/docs/ejac-urban-agriculture-white-paper.pdf>

and household food insecurity.¹⁷ Corporate food waste is a symptom of a food system where overproduction is incentivized while household food insecurity is a result of entrenched poverty, low-wages and insecure employment, systemic debt, cuts to social programs, and a defunded housing system.¹⁷ By trying to solve household food insecurity by diverting corporate food waste to people in-need, the underlying issues are ignored.¹⁷ A West Virginia food bank director summarized the emergency food problem as “We’re just feeding the line, not shortening the line. We’re a short-term fix to a long-term problem.”¹⁸ The GSA argues that food charity makes the public and corporations feel good about their donations, while shifting attention away from structural issues that need to be addressed by government policy.¹⁷

Regional Equity Plans

Cities and states have drafted food equity plans for their regions to create a path moving forward for reducing food insecurity while designing a more fair and just food system. These plans have been developed by different regional organizations including city councils and food policy nonprofits. Food equity plans can have different focuses depending on the organization drafting the plan and the region, but some areas of focus are on legislative agendas, funding suggestions, and ideas for how to create networks for local food organizations.

In December 2021, The New Jersey Food Democracy Collaborative (NJFDC), a network of individuals and organizations across the food space in New Jersey, released a draft report entitled *New Jersey Roadmap for Food System Resilience: A Holistic Justice Framework for Food System Transformation*.¹⁹ The Roadmap outlines 11 Core Opportunities for Action that fall under four main goals:

- Establish an equitable and democratic food system.
- Strengthen livelihoods for food producers and food workers in New Jersey.
- Protect the land, water, and biodiversity needed to produce food, maximize environmental benefits from agriculture and fishing.
- Establish and employ a justice-oriented approach to resilience in the food system.

17 Global Solidarity Alliance for Food, Health and Social Justice. (2022). *Why 'Rights not Charity'?* <https://rightsnotcharity.org/why-rights-not-charity/>

18 Dickinson, M. & Lohnes, J. (2019, May 16). *Where do food banks fit in to the fight for a green new deal?* Civil Eats. <https://civileats.com/2019/05/16/where-do-food-banks-fit-in-to-the-fight-for-a-green-new-deal/>

19 Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *NJ Roadmap for Food System Resilience: A Holistic Justice Framework for Food System Transformation*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Roadmap_Food_System_Resilience.pdf

These goals provide a first step to creating a more sustainable and just food system. NJFDC also published a companion piece titled *The New Jersey Food System in a Nutshell: A Holistic View of the New Jersey Food System and its Economic, Environmental, and Social Impacts*.²⁰ This report outlines the definition of a food system and the context of the food system in New Jersey. During a webinar, NJFDC members mentioned that they did not write a full statewide food equity plan due to lack of funding and expressed interest in conducting a full food equity plan if resources become available.²¹

State Benefit Programs

Important food assistance programs include the Supplemental Nutrition Assistance Program (SNAP), National School Lunch Program (NSLP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).²² Programs may also indirectly influence food security through relieving financial burdens that can allow for more resources to go towards food. These programs include Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), Child Tax Credit (CTC), Housing Assistance, and Low-Income Home Energy Assistance Program, among others.²² While these programs can improve food access and help families move out of poverty, many people who are eligible for assistance do not enroll and participation rates vary among programs. The implementation and regulation of a benefits program can influence participation rates. Efforts to streamline the screening and application processes can increase participation rates.²²

Methods for improving benefits enrollment processes include taking advantage of program “linkages” where information from one program application can be used in another program application and redundant steps can be skipped. Establishing “One-Stop” websites where screening and application processes for multiple programs can happen in a single location can also allow for people to take advantage of multiple programs.²³

New Jersey currently has the NJOneApp system, which enables residents to apply for SNAP, TANF, and General Assistance benefits. In 2019, a joint resolution was approved (NJ AJR175) that

20 Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *The New Jersey Food System in a Nutshell: A Holistic View of the New Jersey Food System and its Economic, Environmental, and Social Impacts*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Food_System_in_a_Nutshell.pdf

21 New Jersey Food Democracy Collaborative. (2021, December 3). NJ State of the Food Symposium.

22 Seligman, H.K. & Berkowitz, S.A. (2018, November 16). Aligning Programs and Policies to Support Food Security and Public Health Goals in the United States. *Annual Review of Public Health* 2019, 40, 319-37. <https://www.annualreviews.org/doi/pdf/10.1146/annurev-publhealth-040218-044132>

23 The Annie E. Casey Foundation. (2010, April 1). *Improving Access to Public Benefits – Helping Eligible Individuals and Families get the Income Supports They Need*. <https://www.aecf.org/resources/improving-access-to-public-benefits>

urged the Chief Innovation Officer of NJ to prioritize the enhancement of the NJOneApp and says that “all state anti-hunger programs administered by the Department of Agriculture, Department of Health, or Department of Human Services, which provide needy or vulnerable populations greater access to food, should be made available within the NJOneApp.”²⁴ When the resolution passed, NJOneApp only allowed NJ residents to apply for SNAP, TANF, and General Assistance through Work First New Jersey benefits and as of drafting this report, it does not appear that NJOneApp has expanded to include other anti-hunger programs. While the 2021 legislative package described above aims to better streamline the SNAP application process, it does not appear to address other benefit applications.

Experiences from Other States

Addressing the root causes of food waste and insecurity

This section includes both examples from other states as well as proposed ideas for how to address the root causes of food waste and insecurity.

It has been suggested that to reduce food waste on a large scale, financial incentives should be limited for corporations to donate their excess food and instead, they should be fined for not diverting waste.¹⁸ Money raised from taking away financial incentives and collecting revenue from fines could be used to help organizations on the ground (e.g., providing wages for volunteer food rescue workers.)¹⁸ RecyclLA is a Los Angeles recycling program that requires commercial waste and recycling providers to work with and provide annual funding to local food rescue organizations. It is estimated that partnering food rescue organizations have received over \$1 million in funding and 11 million pounds of food from January 2018-November 2019.²⁵ Another recommendation for reducing food waste is to pay farmers a parity price if they engage in environmentally-sound farming practices so they do not need to overproduce to profit.²⁶

To address the root causes of food insecurity, one recommendation is for the government to provide a jobs guarantee that ensures anyone who wants to work can receive a livable wage.¹⁸ It is argued that guaranteeing income would 1) allow people to afford food and other necessities and 2) reduce demand on emergency food services. Many food charity volunteers and other food industry workers are themselves dependent on food charity. By reducing demand on food charity

24 New Jersey Assembly Joint Resolution (2019). “Urges Chief Innovation Officer to prioritize enhancement of NJOneApp to include all State anti-hunger programs.” Bill No. 175. <https://legiscan.com/NJ/bill/AJR175/2018>

25 Jimbo, M. (2020, January 09). *Should Restaurants Donate Excess Food? The Answer is Not So Simple*. The Counter. <https://thecounter.org/restaurants-donate-excess-food-los-angeles-bread-lounge/>

26 Cook, C. (2020, May 07). *Farmers are destroying mountains of food. Here's what to do about it*. The Guardian. <https://www.theguardian.com/commentisfree/2020/may/07/farmers-food-covid-19>

services, these organizations could focus less on emergency services and more on strengthening the food system (e.g., composting, youth development projects).¹⁸ The local food system can also be strengthened by supporting small- and mid-scale farmers producing diverse food for local and regional markets.²⁶ This could help create jobs and improve a community's ability to feed itself and could increase community resilience during volatile times.

Regional Equity Plans

New York City and North Carolina are two examples of regions that are trying to reduce food insecurity by addressing the systemic inequities that exacerbate the problem in historically disadvantaged communities.

New York City: The New York City Council released their *Growing Food Equity in NYC* report in August 2019.²⁷ This report recognizes the role of government in helping to ensure food for all people and served as a policy agenda for the Council to address food inequity in the city, and many of the Council's recommendations have recently passed the Legislature. Below are several examples of agenda items from the report that highlight how different city departments can be involved in improving food equity.

- Produce Food Waste Prevention Plans for government agencies as they feed tens of thousands of New Yorkers daily (students, seniors, hospital patients).
 - Legislation passed in May 2021 (§ 16-307.2²⁸ and § 16-307.3²⁹) to require the Department of Education (DOE) and city agencies that have entered a food service contract within the last 12 months to develop and implement a Food Waste Prevention Plan, which needed to be submitted by October 2021. The legislation requires that the DOE and city agencies:
 - 1) identify surplus food that can be safely donated, report methods for reducing waste and donating surplus food, and identify barriers for waste reduction or food donation,
 - 2) designate a coordinator to oversee implementation of the plan, and
 - 3) submit an annual report that summarizes actions taken, actions planned, and any changes to the prevention plan.

²⁷ Johnson, C. (2019, August). *Growing Food Equity in New York City – A City Council Agenda*. New York City Council. <https://council.nyc.gov/data/food-equity/>

²⁸ New York City Administrative Code (2021) City agency food waste prevention plans, § 16-307.2. <https://codelibrary.amlegal.com/codes/newyorkcity/latest/NYAdmin/0-0-0-26632>

²⁹ New York City Administrative Code (2021). School food waste, § 16-307.3. <https://codelibrary.amlegal.com/codes/newyorkcity/latest/NYAdmin/0-0-0-26632>

- Expand the Food Retail Expansion to Support Health (FRESH) eligibility areas.
 - The FRESH program was created in 2009 to incentivize development of grocery stores in food deserts by giving property owners the right to construct larger buildings in mixed-residential and commercial neighborhoods if they include a FRESH supermarket. NYC Council worked with DCP planners and economists and recently passed updates to the Land Use application zoning text.³⁰ Changes include:
 - 1) Expanding FRESH to more communities based on a “supermarket needs index.”
 - 2) Preventing clustering of FRESH supermarkets to limit oversaturation.
- Better support and recognize the importance of Urban Agriculture. Urban growers should be viewed as climate resilience stewards and it should be recognized that parks, community gardens, urban farms, and green roofs are key tools in combating and adapting to climate change.
 - In October 2021, the NYC Council passed a Local Law to amend the NYC charter and establish an Office of Urban Agriculture and an urban agriculture advisory board.³¹ The office is within the Office of Long-term Planning and Sustainability and headed by a director with at least one employee. The director will have the power and duty to conduct education and outreach regarding urban agriculture, answer questions about urban agriculture, make recommendations on how to expand urban agriculture to help other objectives of the Office of Long-term Planning and Sustainability, and establish a program in coordination with the Office of Food Policy, Department of Parks and Recreation, Department of City Planning, and other relevant agencies. The urban agriculture advisory board will advise the director, mayor, and council on issues related to urban agriculture.
 - A related Local Law was enacted in November 2021 to require the newly created Office of Urban Agriculture to produce an urban agriculture report every five years in collaboration with food policy educators, representatives from community gardens, and urban farming businesses. The report needs to address current support and policies related to urban agriculture, classification and prioritization of urban agriculture uses, opportunities for expanding the availability of healthy food in low-income neighborhoods, and youth development and education opportunities with regards to local food production.

³⁰ NYC Department of City Planning. (2022). *FRESH Food Stores Updates*. City of New York. <https://www1.nyc.gov/site/planning/plans/fresh2/fresh2-overview.page>

³¹ Establishing an office of urban agriculture and an urban agriculture advisory board, 2021/123. (2021). <https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=4085856&GUID=59099EDA-FFFC-44BA-B150-439BCF4D3A3B&Options=ID%7cText%7c&Search=urban+agriculture>

North Carolina: In August 2021, the North Carolina Food Resilience Advisory Board, Duke World Farm Policy Center, and the Center for Environmental Farming Systems published the *North Carolina Food System Resilience Strategy*.³² This report describes the historical and racial context that creates inequality and insecurity in the food system. The report also considers how to ameliorate these issues by centering equity and explicitly helping BIPOC groups, disadvantaged by historical policies. The authors define seven “critical actions” for North Carolina that would increase food resilience:

- 1) Formalize and invest in a statewide BIPOC-led, community-accountable Food Justice Network.
- 2) Establish a statewide Equitable Food Oriented Development Fund and an Equitable Food Oriented Development Network.
 - In this critical action, the authors suggest working with the Fair Food Fund,³³ which finances projects through impact investing strategies including:
 - Social Impact Notes - offers “in a diverse portfolio of enterprises generating a 10-year term at 2% or 5-year term at 1.5%,”
 - Co-Investment - “Support innovative food enterprises leveraging Fair Food Fund’s due diligence,” and
 - Grants.
 - The city of Camden, NJ already works with the Fair Food Fund to increase access to healthy food.
- 3) Create/Expand Community Participatory Grant Funding for grassroots food systems work.
- 4) Create a statewide Tribal Food Sovereignty Fund.
- 5) Create a North Carolina Black Food and Farm Advocacy Network
- 6) Agricultural Worker Equity, Access and Advocacy Fund and Agricultural Workforce.
- 7) Create a Food Justice Learning Network for North Carolina funders working across the food system.

³² Zuckerman, J., Daly, J., Templeton, G., Conrad, A., Lococo, N., Darwish, S., . . . Hynson, J. (2021). *North Carolina Food System Resilience Strategy Report*. North Carolina Food Resilience Advisory Board, Duke World Food Policy Center and Center for Environmental Farming https://wfpc.sanford.duke.edu/sites/wfpc.sanford.duke.edu/files/NCFoodResiliencyStrategy-August-2021_0.pdf

³³ Fair Food Network. (2020). Fair Food Fund. <https://fairfoodnetwork.org/projects/fair-food-fund/>

State Benefit Programs

The following are examples of organizations, platforms, and programs that help streamline the state benefit application process to increase enrollment:²³

- Ohio Benefits Bank: web-based approach to connect low- and moderate- income people with access to work support
- Minnesota Bridge to Benefits: screening and awareness effort started by the Children’s Defense Fund
- Seedco: national non-profit working with low-income people and communities to apply for benefits. Operates EarnBenefits, a benefit-maximization program, in multiple states.
- Single Stop USA: connects low-income families with public benefits, tax credits, and other essential services
- Pennsylvania COMPASS: web portal for navigating screening, application, and renewal processes for various state benefits.³⁴

Services	Screen	Apply	Refer	Renew	MCA	Provider Search
Health Care: Medical Assistance	✓	✓		✓	✓	
Health Care: CHIP	✓	✓		✓	✓	
Cash Assistance	✓	✓		✓	✓	
Child Care Works Program	✓	✓		✓		✓
Supplemental Nutrition Assistance Program (SNAP)	✓	✓		✓	✓	
Water Assistance: LIHWAP		✓			✓	
Energy Assistance: LIHEAP	✓	✓			✓	
School Meals	✓	✓				
Long Term Living Services – Home and Community Based		✓		✓	✓	✓
Long Term Living Services – Nursing Home and Related Facilities		✓		✓	✓	
Early Intervention, Intellectual Disability or Adult Autism Services			✓			✓

Table 1-1: Available benefits in Pennsylvania's COMPASS web portal ³⁴

Overarching Findings

The concept of food equity is expansive and throughout this research, it was found that organizations are trying to improve food equity while reducing food insecurity through various approaches; some approaches are more comprehensive but more challenging, while others address individual components of food equity and may be more easily achieved but may not address the root causes of the problems.

³⁴ COMPASS. (n.d.). COMPASS - See All Benefits. Pennsylvania State. Retrieved January 11, 2022 from Compass PA: <https://www.compass.state.pa.us/Compass.Web/MenuItems/SeeAllBenefits.aspx?Language=EN>

Addressing the root causes of food waste and insecurity

Throughout the interview process, organizations were found that are trying to address the root causes of food waste and insecurity to comprehensively improve food equity in communities. In interviews, it was argued that to reduce food waste while promoting food equity, overproduction needs to be fined while increased funding needs to be directed towards providing living wage jobs and supporting on-the-ground organizations and local food economies.

Regional Equity Plans

The *Growing Food Equity in NYC* report outlined the New York City Council agenda for improving food equity in the city through legislation, and many of the agenda items in the report were enacted in 2021. Their strategies for improving food equity included considering food equity in zoning and planning decisions, creating an urban agriculture plan to better support and incentivize urban food production, and reducing and diverting food waste by mandating the development of Food Waste Prevention Plans for government agencies. It was expressed in interviews that finding legislative solutions to improve the resiliency of the local food system and supporting on-the-ground organizations are two of the most important ways for improving food equity.

A main theme of the *North Carolina Food System Resilience Strategy* is funding fosters sustainability for organizations in the food space. The authors also note the importance of bringing historically underrepresented voices into the food conversation.

State Benefit Programs

State benefit programs that aim to reduce hunger, either directly through providing money that can be used only for food or indirectly through helping with housing or transportation costs, can be effective tools but many people who are eligible for these programs do not enroll. One method found for improving enrollment was to determine linkages between various state anti-hunger programs and streamline the process for applying to benefits. “One-Stop” models allow for people to be screened for eligibility, submit applications, and access information for various programs all in one location. This helps people more easily find out what they may be eligible for and reduces the time needed for the application process, which has been shown to improve enrollment rates.

Research Initiative 2

Develop Central Governance in Food Systems - Food Policy Councils

Description of Research Initiative

This Research Initiative correlates with Core Opportunity 3: Central Governance in Food Rescue in the SOMMP.³⁵ The goal of this Research Initiative is to supply a standard definition of a Food Policy Council (FPC), to examine the use of FPCs in other states, and to provide a model of how food policy council systems generally operate. As New Jersey currently has one local-level FPC, one county-level FPC and one burgeoning state-level FPC, reviewing the structure existing in other states supplies context to the process of establishing an FPC network.

Background Information and New Jersey Context

In 2018, the *Johns Hopkins Food Policy Council Report*,³⁶ which is comprised of a thorough survey of FPCs throughout the United States and Canada, included the following definition of a Food Policy Council:

An organized group of stakeholders that may be sanctioned by a government body or may exist independently of government, which works to address food systems issues and needs at the local (city/ municipality or county), state/provincial, regional or Native American/ First Nations Levels.

This definition of an FPC will be the basis of this discussion of FPC systems and their actions. The Research Team uses the term ‘food policy council’ to emphasize the effort of these groups to collectively reform food policy, although the actual name used varies.

FPCs include representation from all different food sectors: production, consumption, processing, distribution, and waste recycling/composting and are located at the state, regional, county, or local level. Most FPCs are housed in either a governmental organization (26%), an educational facility or extension group (5%), a non-profit organization (34%) or formed in either an independent

³⁵ Bayshore Recycling. August 2021. “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

³⁶ Bassarab, K., Santo, R., & Palmer, A. (2019). *Food Policy Council Report 2018*. Johns Hopkins Center for a Liveable Future and Food Policy Networks. https://assets.jhsph.edu/clf/mod_clfResource/doc/FPC%20Report%202018-FINAL-4-1-19.pdf

non-profit organization (13%) or grassroots coalition (20%).³⁶ While some FPCs have funding, a substantial portion do not. The 2018 Johns Hopkins report states that 33% of FPCs in the USA and Canada have no funding and 35% have \$1-\$10,000.³⁶ The most common funding mechanisms for FPCs are in-kind donations, private foundations, individuals, local state or tribal government grants, and government budgets.³⁶ Some FPCs have structured relationships with the government that often entails having government employees participating in the FPC.³⁶ This relationship could also consist of government support of the FPC, government seeking advice from the FPC, FPC members appointed by the government or an FPC created by legislation.³⁶ Members of an FPC are most frequently community members, public health providers, anti-hunger/emergency food providers, food production workers, college/university members and government staff.³⁶ It is important for an FPC to have a variety of representatives to create a functional network that has buy-in from all sectors.³⁶ The most common FPC goal is community engagement (60% of respondents).³⁶ Other major goals of FPCs are advocacy and capacity building, strategic or policy planning, education, and networking.³⁶ Main FPC activities include community engagement (support partner organizations, host/co-host educational event, and host community forums) and policy advocacy (meet with policy makers, provide policy recommendations, support, or direct an advocacy campaign).³⁶

In 2019 the New Jersey State Legislature passed A4705/S3232³⁷, which called for the creation of a New Jersey Food Waste Task Force under the leadership of the State Department of Human Services to study the state of food insecurity issues in New Jersey. However, two years have passed since the Governor signed this bill into law and the Task Force has no members. At this point, a statewide FPC could serve in the same advisory role as was intended in creating the Food Waste Task Force and provide needed ongoing advice to the Governor, Cabinet and Legislature regarding food insecurity issues.

On 30 September 2021, Governor Murphy signed S3945³⁸ and established the Office of the Food Insecurity Advocate, which the legislature recently renamed the Office of the Food Security Advocate.³⁹ The Office of the Food Security Advocate is similar to positions in other states that are called a “Food Czar” or a “Food Systems Coordinator.”

As mentioned in Research Initiative 1, the New Jersey Food Democracy Collaborative recently published both an overview report of the New Jersey Food System and a Roadmap for Food

³⁷ New Jersey Assembly (2019). Establishes New Jersey Food Waste Task Force to make recommendations concerning food waste in New Jersey. Bill 4705. Retrieved January 11, 2022 from Legiscan: <https://legiscan.com/NJ/bill/A4705/2018>

³⁸ New Jersey Office of Legislative Services. (2018). S3945 *ScaAa (2R) Establishes Office of Food Insecurity Advocate*. Retrieved November 24, 2021, from New Jersey Legislature: <https://www.njleg.state.nj.us/bills/BillView.asp?BillNumber=S3945>

³⁹ New Jersey Legislature (2021). (2022, January 10). “Revises and renames Office of Food Insecurity Advocate.” Bill A6159. Retrieved January 11, 2022 from New Jersey Legislature: <https://www.njleg.state.nj.us/bill-search/2020/A6159>

System Resilience.^{40 41} These documents along with their recent Food System Symposium⁴² create the foundation for a statewide food plan.

Experiences from Other States

California: California's local 27 FPCs⁴³ generally operate independently of one another within their regions. California's main state actor is the California Food Policy Council (CAFPC), which is housed in a non-profit.⁴³ The CAFPC created a set of ten guiding principles that it circulated for ratification by its members. Members of the CAFPC draft an annual report evaluating the state of food policy in California and highlight projects conducted by local FPCs.⁴⁴ The statement at the end of the 2020 CAFPC annual Food Policy Report illustrates the relationship between the local FPCs and the state council:

CAFPC neither endorses nor critiques the positions taken by individual authors of this report. Nor does it imply support of legislation by member councils of CAFPC. Rather, through this document we seek to provide a tool to understand food movement priorities and to assist organizations in making informed decisions related to their food policy advocacy efforts.⁴⁵

Massachusetts: At the state level, Massachusetts has the Massachusetts Food Policy Council (MAFPC) and the Massachusetts Food Systems Collaborative (MAFSC).⁴³ According to the Johns Hopkins Food Policy Council Directory, the MAFPC is housed in a non-profit, has government appointed members and government employees as council members.⁴³ The MAFPC was created via legislation and serves as an advisory body for the government. Their main goal is:

40 Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *NJ Roadmap for Food System Resilience: A Holistic Justice Framework for Food System Transformation*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Roadmap_Food_System_Resilience.pdf

41 Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *The New Jersey Food System in a Nutshell: A Holistic View of the New Jersey Food System and its Economic, Environmental, and Social Impacts*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Food_System_in_a_Nutshell.pdf

42 New Jersey Food Democracy Collaborative. (2021, December 3). NJ State of the Food Symposium.

43 Johns Hopkins University Center for a Livable Future. (n.d.). *Food Policy Council Directory*. Retrieved from Food Policy Networks: <https://www.foodpolicynetworks.org/councils/directory/online/index.html>

44 California Food Policy Council. (n.d.). *California Food Policy Council*. <https://cafpc.net/>

45 Tran, C., Brinkman, C., Runsten, D., Wong, M., Eskenazi, B., Parker, H., . . . Berndt, S. (2021). *California Food Policy Report 2020*. <https://cafpc.net/reports/>

To increase farming and sales of Massachusetts grown foods and to support programs to bring healthy foods to everyone in the state. Protecting land and water is important as well as training for farmers and workers in the food system.⁴⁶

MAFSC is the state FPC networking hub. They house resources to help start fledgling FPCs. MAFSC advocates for funding of the Healthy Incentives Program, as discussed below.⁴⁷

North Carolina: At the state level, North Carolina has the North Carolina Local Food Council (NCLFC) and Community Food Strategies (CFS).⁴⁸ NCLFC has transitioned from a government-established council structure to a university-embedded council.⁴⁸ NCLFC supports and promotes North Carolina's local food economies and answers research questions from local food councils.⁴⁸ NCLFC specifically, *does not* engage in policy advocacy. CFS formed as a "statewide, collaborative initiative to help support the growth of food policy councils across North Carolina."⁴⁹ After surveying over 1,000 stakeholders, the Center for Environmental Farming Systems', a North Carolina-focused research group, 2010 report *From Farm to Fork* identified the need for a group such as CFS.⁵⁰ CFS houses the North Carolina Food Council Network. They support local food councils through projects including: an annual shared gifting microloan program, how-to webinars/meetings, disseminating knowledge accumulated from working with local FPCs, and acting as a connection hub by providing networking calls and opportunities for the councils to work together and learn from each other.⁴⁹

Spotlight Program: Cincinnati Regional FPC

The Cincinnati Regional Food Policy Council (CRFPC) coordinates food rescue and education efforts in the Cincinnati area.⁵¹ Within the CRFPC, the Community Voices in Food advisory group improves food health and promotes food equity as a public health initiative, with support from the American Public Health association.⁵¹ The Community Voices in Food advisory group

46 Commonwealth of Massachusetts. (2021). *Massachusetts Food Policy Council*. Retrieved January 11, 2022, from Mass.gov: <https://www.mass.gov/massachusetts-food-policy-council>

47 Massachusetts Food System Collaborative. (2021). *Home*. Retrieved January 11, 2022, from Massachusetts Food System Collaborative: <https://mafoodsystem.org/>

48 North Carolina Local Food Council. (2021). *NC Local Food Council: Working Collaboratively Across the State to Support North Carolina's Local Food System*. <https://www.nclocalfoodcouncil.org/>

49 Loop Creative. (2021). *Community Food Strategies*. Retrieved January 11, 2022, from Community Food Strategies: <https://communityfoodstrategies.org/>

50 Curtis, Jennifer, et. al. April 2010. *From Farm to Fork: A Guide to Building North Carolina's Sustainable Local Food Economy, a Center for Environmental Farming Systems report*, Raleigh, N.C.

51 Green Umbrella Regional Sustainability Alliance. (n.d.). *Home*. Retrieved January 11, 2022, from Greater Cincinnati Regional Food Policy Council: <https://www.cincinnatiaregionalfood.org/>

organizes in-school education efforts like the Save the Food Campaign⁵² and the World Wildlife Foundation's (WWF) Food Waste Warriors campaign.⁵³

FPC members communicate between different regional stakeholders, direct funding, and maintain a broad and holistic awareness of strengths and shortcomings within local food rescue networks.⁵¹ This is just one example of a myriad of FPCs that exist at the local and regional level that highlight how the FPC system functions.

Spotlight Program: Michigan Local Food Council Network

University of Michigan's Center for Regional Food Systems hosts the Michigan Local Food Council Network (MLFCN).⁵⁴ As stated on their website, MLFCN's main goals are to:

- Provide a space for local councils to **network** with one another
- Connect local councils to **statewide policy** information, issues, and actions
- Assist local councils in **building capacity**
- Provide **hands-on training** to local food councils
- Connect **local policy** information, issues, and actions to other parts of the state
- Connect local councils to **national policy** information, issues, and actions⁵⁴

The Center for Regional Food Systems works to provide applied research, education and outreach and create a "backbone organization" to promote a better food system.⁵⁴ There is a close connection between the state-level FPC organization and the university research center.

Spotlight Project: MAFSC & the Massachusetts Healthy Incentives Program

Massachusetts received a grant from the United States Department of Agriculture (USDA) several years ago to implement the statewide Healthy Incentives Program (HIP) to provide Supplemental Nutrition Assistance Program (SNAP) recipients with extra SNAP funding that recipients can only spend at farmers markets, farm stands, Community Supported Agriculture, (CSAs) and mobile markets.⁵⁵ SNAP recipients receive extra funding on their Electronic Benefits Transfer (EBT) card

52 Natural Resources Defense Council. (2021). *Savethefood.com*. Retrieved January 11, 2022, from Savethefood.com: <https://savethefood.com/>

53 World Wildlife Fund. (2021). *Bring Food Waste Warriors to Your School*. Retrieved January 11, 2022, from World Wildlife Fund: <https://www.worldwildlife.org/pages/bring-food-waste-warriors-to-your-school#:~:text=WWF%27s%20Food%20Waste%20Warriors%20program%20is%20anchored%20in,the%20saying%20goes%2C%20what%20gets%20measured%20gets%20managed>

54 Michigan State University. (n.d.). Michigan Local Food Council Network. Retrieved January 11, 2022, from Michigan State University Center for Regional Food Systems: https://www.canr.msu.edu/local_food_council_network/index

55 Massachusetts Food System Collaborative. (2021). *Campaign for Health Incentives Program Funding*. Retrieved January 11, 2022, from Massachusetts Food System Collaborative: <https://mafoodsystem.org/projects/campaign-for-healthy-incentives-program-funding/>

when they use SNAP dollars to buy local produce from vendors that participate in HIP. USDA gave Massachusetts funding to do a 3-year pilot program beginning in 2017 to research impact, which the commonwealth ended up spending in less than a year due to the popularity of the program.⁵⁵

MAFSC has stepped in to advocate at the state level for the continued funding of HIP. They have so far successfully secured \$47 million in funding in the state budget since 2017.⁵⁵ Their main argument in favor of HIP is that it may be a cost saving measure because it improves the health of the citizens of Massachusetts, therefore decreasing associated health costs.⁵⁵ Additionally, HIP has boosted the local produce economy by increasing the revenue of HIP vendors by \$9 million because it expands access to a larger customer base.⁵⁵

HIP is unique because it brings together a broad supporting coalition due to its benefit to both SNAP recipients and local farmers.⁵⁵ Massachusetts legislators are widely aware of HIP because of MAFSC's advocacy work and the broad coalition of support among constituents.⁵⁵ MAFSC is currently advocating to ensure HIP has year-round funding and to expand the program to more Massachusetts farmers.⁵⁵ MAFSC is particularly focused on increasing participation in HIP among small-scale farmers, Black, Indigenous and People of Color (BIPOC) farmers and SNAP recipients in urban areas.⁵⁵

Spotlight Project: New York City Community Food Hub Incubator

New York City proposed a similar program as a Community Food Hub Incubator, which would have coordinated interested communities to develop more local food businesses and farm-to-city projects and helped build an economic model that supports and connects growers, producers, community food projects, local small businesses, and existing infrastructure assets (transportation, storage, kitchens).⁵⁶ The idea was to put money into a few pilot programs for creating “micro food hubs” and if these hubs expanded, they could eventually connect. Food equity advocates were strongly pushing for this idea as it would be a way of ensuring that funding is going to people on the ground and not just larger organizations, which advocates believe is the best way to truly promote equity. Investing in one or two community “micro food hubs” is also a way of putting money into capacity and training for dedicated people on the ground, as these initiatives often lack funding. This program did not pass through the most recent legislature, but advocates hope to revisit the idea.

⁵⁶ Johnson, C. (2019, August). *Growing Food Equity in New York City – A City Council Agenda*. New York City Council. <https://council.nyc.gov/data/food-equity/>

Overarching Findings

Funding FPCs

- Bring funders into the conversation early.⁵⁷
- Consider partnering with a university to gain access to the associated resources (funding, facilities, student workforce, etc.).⁵⁷
- Maintain a broad focus to gain access to a wider network of potential funders.⁵⁷
- Funding is not a separate endeavor from the rest of the work of the FPC. The goals of the FPC should be considered in the context of potential funding sources.⁵⁷
- Consider funders from the healthcare industry.⁵⁷
- Diversify funding support to maintain long-term feasibility.⁵⁷
- Demonstrating success attracts resources. This could mean conducting a community food assessment or initiating a small advocacy project that demonstrates a need for the existence of an FPC and the competence of the group looking to start an FPC.⁵⁷

FPCs and Food System Structure

- Policy advocacy work taking place outside of government is important because it limits conflicts of interest and allows less prescribed action to take place.
- A food policy council is not equivalent to an anti-hunger network, which is a common assumption of people just learning about FPCs. An FPC is a group of various actors working to bring resources from all their different sectors together, while an anti-hunger network focuses on the important work of food distribution to those in immediate need.
- Statewide FPCs act as networking hubs for the smaller councils, providing a space to meet and take collective action. These groups — such as the CFS from North Carolina, the MAFSC in Massachusetts and the MLFCN in Michigan — are often outside of government.
- FPCs often create overarching plans when starting out. These documents outline a long-term vision that allows the council to harness and direct the energy around the creation of the FPC towards larger goals over time. At the local level this could be a community food assessment that identifies areas for action. At the state level this could be a statewide food plan.

⁵⁷ Johns Hopkins Center for a Livable Future. (2015). Webinar: Funding Food Policy Councils: Lessons from the Field. <https://www.youtube.com/watch?v=uvhBla1HPRg>

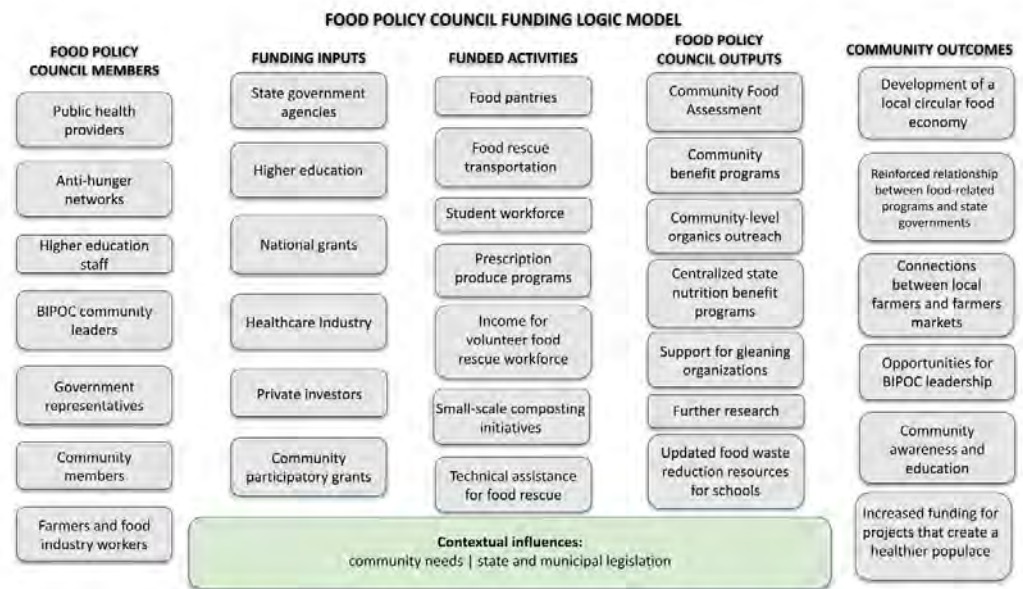


Figure 2-1: The Research Team created this Logic Model to provide a visual representation of example FPC members, actions and results

Research Initiative 3

Review of Food Rescue Actions Taken by Healthcare Providers

Description of Research Initiative

The SOMMP report's After Action Report 6.0: Food Waste Reduction and Donation section has a subsection on the Connection Between Food Rescue and Healthcare which states that "This critical link between healthcare and food needs to be further explored and expanded. This is an area where the State Food Waste Task Force, once named, or Department of Health could lead an effort to bring hospital leadership to the table to further discuss community benefit programs and how they can link to addressing food insecurity and better nutrition."⁵⁸ The report's Table 1.0: Food Waste Reduction and Donation Recommendations lists the following medium-term action item: "Engage statewide and regional healthcare networks to assess their role in performing or coordinating "community benefit" services within municipalities and neighborhoods."

Background Information and New Jersey Context

Healthcare organizations can help improve the health of their patients and community members through engaging in programs that increase healthy food access. Hospitals and other healthcare organizations are well-suited for this role because they are often connected with patients in urgent need and can provide traditional healthcare services along with food distribution in nearby locations to reduce patient burden.⁵⁹ In order to reduce food waste while increasing food access, healthcare organizations can engage in food rescue activities such as diverting excess hospital cafeteria food to those in need or partnering with food rescue or food gleaning organizations to supply food for community programs.

Community Benefit Programs & Food Security

To achieve tax exempt status in the United States, non-profit health systems are required to prepare a Community Health Needs Assessment (CHNA) that identifies particular health-related needs within the System's catchment area

58 Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

59 Gunter, K.E., Peek, M.E., & Tanumihardjo, J.P. (2021, June 23). *As They Take On Food Insecurity, Community-Based Health Care Organizations Have Found Four Strategies That Work*. *Health Affairs*. <https://www.healthaffairs.org/doi/10.1377/forefront.20210616.615098/full/>

along with actions that the health care system can take to address those needs.⁶⁰ Current program guidelines encourage hospitals to become more involved in improving community health through addressing environmental and social determinants.⁶⁰ This has resulted in more hospitals implementing community-improvement projects beyond traditional healthcare, including food rescue and community nutrition programs as part of their CHNA commitments. If a hospital conducts a CHNA and finds that food access, obesity, or chronic health conditions are a significant concern in the community, then a Community Benefit Program that addresses these needs through reducing barriers to healthy food access can be beneficial.⁶⁰ Many programs focus on nutrition and exercise education, but if people cannot access healthy foods, then this education may not be sufficient. These programs can be designed to achieve three primary goals: “1) improve access to healthy, affordable food, 2) support economic and workforce development in low-income communities, and 3) strengthen local and sustainable food systems.”⁶⁰

There are national requirements for Community Benefit Programs and New Jersey also passed a bill that requires nonprofit hospitals to pay \$2.50/bed/year to their host municipality, called a community service contribution.⁶¹ Additional information is needed to determine what programs satisfy both the IRS and state conditions.

Produce Prescription Programs

Produce prescription programs are an increasingly popular type of program where healthcare providers prescribe fresh fruits and vegetables to low-income patients, often those who have existing health conditions (ex: diabetes, heart disease), are pregnant, or are food insecure.⁶² There are many examples of these programs across the country and, while there is some variability in structure, they typically allow patients to use a prescription to obtain vouchers that can then be redeemed for produce at a local farmers market.⁶² Most metrics used to evaluate the effectiveness of these programs focus on participant health outcomes and do not measure diverted food waste. There are also very few examples of programs that advertise the diversion of rescued food to patients and programs primarily emphasize providing healthy and often local food. Based on health metrics, these programs are overall viewed as being successful and worthwhile.⁶²

⁶⁰ Health Care Without Harm. (2018). *Community benefit and healthy food: A national assessment*. <https://foodcommunitybenefit.noharm.org/research-reports>

⁶¹ New Jersey Assembly (2021). “Reinstates prior property tax exemption for nonprofit hospitals with on-site for-profit medical providers...” Bill 1135. <https://legiscan.com/NJ/bill/A1135/2020>

⁶² Wholesome Wave. (2021, April). *Produce Prescription Programs US Field Scan Report: 2010-2020*. https://www.daisaenterprises.com/uploads/4/4/0/5/44054359/produce_prescription_programs_us_field_scan_report__june_2021_final.pdf

Many of these programs have started with limited grant money as pilot programs and cannot continue if funding is not extended.⁶² Most funding comes through private funders, though other sources of funding include Federal Nutrition Incentive Funding (Gus Schumacher Nutrition Incentive Program (GusNIP) and Food Insecurity Nutrition Incentives (FINI)), private healthcare funding, state and municipal government funding, and crowdfunding/donations.⁶² New funding opportunities spur growth of additional produce prescription programs. The two largest increases in innovative programs occurred in 2015 after funding from the 2014 Farm Bill was released, and in 2019 after funding from the 2018 Farm Bill was released which provided GusNIP funds.⁶² There is a desire among program managers to classify Produce Prescription programs as “preventative healthcare services” and to embed the model within Medicaid/Medicare so insurance companies can provide sustainable financial support.⁶² There is currently advocacy work to make this happen at the federal level. There are also actions states can currently take to allow for Centers for Medicaid and Medicare Services (CMS) Waiver Authorities to cover nutrition interventions and for Medicaid Managed Care Organization (MCO) contract options to incentivize produce prescription programs (see tables below).⁶³

Authority	Scope	Example(s)
Section 1115 Demonstration Waivers	<p>These Waivers Allow CMS to:</p> <ul style="list-style-type: none"> - Waive certain provisions of the Medicaid Statute,¹¹⁸ and provide federal funds to pay for services and populations that would not otherwise be covered.¹¹⁹ <p>Application to Nutrition Interventions:</p> <ul style="list-style-type: none"> - States have used Section 1115 Waivers to fund produce prescriptions as part of value-based models designed to address health-related social needs. 	<p>Massachusetts:</p> <ul style="list-style-type: none"> - \$149 million Flexible Services Program establishes funding for Medicaid Accountable Care Organizations to provide food and housing supports (including produce prescriptions) to certain enrollees.¹²⁰ <p>North Carolina:</p> <ul style="list-style-type: none"> - \$650 million Healthy Opportunities Pilots program.¹²¹ Pilots may cover up to \$200 per month of produce prescriptions for certain enrollees.¹²²
Home and Community-Based Services Waivers (Section 1915(c); 1915(i))	<p>These Waivers Allow CMS to:</p> <ul style="list-style-type: none"> - Waive certain provisions of the Medicaid Statute, and provide federal funds to pay for home and community-based services to keep enrollees out of institutional care.¹²³ <p>Application to Nutrition Interventions:</p> <ul style="list-style-type: none"> - States may not provide “room and board” under these Waivers.¹²⁴ However, CMS has allowed states to cover meals, provided they do not constitute a “full nutritional regimen” (i.e., 3 meals a day).¹²⁵ 	<p>Home and community-based services waivers are often used to cover meals, suggesting that states may also be able to use these waivers to cover other nutrition services, such as produce prescriptions.</p> <p>Illinois:</p> <ul style="list-style-type: none"> - Illinois currently has three 1915(c) waivers that include coverage of meals.¹²⁶ These waivers provide home and community-based services for individuals living with HIV/AIDS, brain injuries, or disabilities.¹²⁷

Table 3-1: Medicaid Waiver Authorities Use to Cover Nutrition Interventions⁶³

63 Center for Health Law and Policy Innovation at Harvard Law School (2021, March). *Mainstreaming Produce Prescriptions: A Policy Strategy Report*. <https://chli.org/wp-content/uploads/2013/12/Produce-RX-March-2021.pdf>

Approach	Specific Options	Example(s)
Screening and Coordination Requirements	Provisions that require MCOs to screen for, address, and report on social needs.	<p>According to the Kaiser Family Foundation, as of 2019:</p> <ul style="list-style-type: none"> 25 states required MCOs to screen for social needs. 28 states required MCOs to provide referrals to social service providers. 5 states required MCOs to track referral outcomes. 22 states required MCOs to partner with community-based organizations or social service providers.¹⁴²
Financial Support	<p>In Lieu of Services: Optional service approved by the state as a cost-effective substitute to a service covered under the State Plan.¹⁴³</p> <p>Activities that Improve Health Care Quality: Activities conducted by the MCO designed to improve health quality and outcomes.¹⁴⁴</p>	<p>In Lieu of Services</p> <ul style="list-style-type: none"> New York allows coverage of medically tailored meals as an in lieu of service.¹⁴⁵ California is considering coverage of medically-supportive food and nutrition services as in lieu of services.¹⁴⁶ <p>Activities that Improve Health Care Quality</p> <ul style="list-style-type: none"> Oregon allows coverage of food vouchers as an activity that improves health care quality.¹⁴⁷
Incentive Arrangements	Incentive payment or withholds structures that encourage MCOs to meet target metrics. ¹⁴⁸	<ul style="list-style-type: none"> Michigan links incentive payments to submission of plans related to population health initiatives.¹⁴⁹

Table 3-2: Medicaid MCO Contract Options to Incentivize Coverage of Produce Prescriptions⁶³

Along with unreliable funding, another reported issue with produce prescription programs is that prescriptions can often only be used at farmer’s markets and in NJ, many farmer’s markets only operate for several months every year. There is a desire to partner with retailers other than farmers markets to increase year-round access, but it is challenging to guarantee that vouchers or gift cards are used to purchase only produce at most retailers. One of the few retailers that has gift cards that can be used for restrictive purchasing for produce is Walmart, but they are often not conveniently located and there were other concerns expressed regarding partnering with only one major retailer. While farmers markets are the most common partners, some programs allow for users to redeem produce at grocery stores, health clinics with onsite distribution, mobile markets, or food pantries.

There are currently at least two produce prescription programs in New Jersey, Food Bucks Rx and Veggie Rx. Food Bucks Rx (FBRx) is a program run by Roots to Prevention Camden, which is a collaboration of nonprofits, healthcare providers, and educational and government entities.⁶⁴ It is funded by a BUILD Health award with matching funds from Virtua Health, a nonprofit healthcare system in southern New Jersey. FBRx provides vouchers that can be redeemed for fruits and vegetables. It is operated on Virtua Health’s Camden campus and there are plans to establish six FBRx sites in Camden where vouchers can be redeemed. Virtua mobile farmers markets and food pantries will supply locally grown produce, which will help provide income opportunities for local food growers.

64 Roots To Prevention Camden. (2020). *Our Programs*. Retrieved January 11, 2022 from Roots to Prevention Camden: <https://www.rootstoprevention.com/programs>

Veggie Rx is a collaboration between Robert Wood Johnson’s HIPHOP clinic, the New Brunswick Farmers Market, and Elijah’s Promise Community Kitchen.⁶⁵ Medical students provide free medical care to Elijah’s Promise patrons and write prescriptions for produce, which can be used at the New Brunswick Farmers Market. The Veggie Rx program is limited to the four months of the year that the New Brunswick Farmers Market is open. Elijah’s promise received COVID-related grant funding for “Elijah’s Promise on Wheels,” which delivered hot meals in a food truck. This made the produce prescription program even more effective as they would station the food truck close to the New Brunswick farmers market on market days and they had a medical student giving quick health evaluations to patients and writing produce prescriptions. Prescription recipients could then walk right to the farmers market with their prescription and purchase produce, which increased convenience.

Experiences from Other States

Community Benefit Program Examples

- Sutter Health Hospitals in California were part of a pilot program in collaboration with Healthcare Without Harm to reduce food waste and feed the hungry through donating excess food.⁶⁶ This pilot project was partially funded by CalRecycle through a Food Waste Prevention Rescue Grant Program which is part of California Climate Investments. CalRecycle provided \$313,820 in funding and estimated that over 672,000 pounds of food waste was averted.⁶⁷ Hospital food service workers used Copia technology (an app which helps organizations track their food waste and donate excess food) to track food waste and alert drivers to pick up and deliver food to nonprofits who distribute it to people in need.⁶⁶ The average distance traveled for food donations is 3.4 miles.⁶⁶ Sutter Home Hospitals is part of the California Health Care Climate Alliance which was launched by Healthcare Without Harm. This alliance is a leadership body of state health systems that have committed to protecting the public from health impacts of climate change and contribute to meeting the state’s climate goals.⁶⁸

65 Riley, L. (2021, July 22). *Veggie Rx Promotes Connections Between Food and Health*. Rutgers NEWSROOM. <https://sebsnjaesnews.rutgers.edu/2021/07/veggie-rx-promotes-connections-between-food-and-health/>

66 Smith, M.B. (2020, December 07). *How Unused Hospital Food Is Feeding the Hungry in NorCal*. Sutter Health Vitals. <https://vitals.sutterhealth.org/hungry-people-fed-through-food-waste-reduction-pilot/>

67 CalRecycle. (2019, May 02). *Local Projects Prevent 93 Million Pounds of Food Waste*. State of California. <https://www.calrecycle.ca.gov/newsroom/2019/05may/12>

68 Health Care Without Harm. (2022). *California Health Care Climate Alliance*. <https://noharm-uscanada.org/content/us-canada/california-health-care-climate-alliance>

- Healthcare Without Harm is an international nonprofit that aims to reduce the environmental footprint of hospitals while helping hospitals become more effective community anchors that can help promote equity and sustainability.⁶⁹ They partner with hospitals across the US with examples in California and New England. They have numerous resources⁷⁰ on how hospitals can be involved in various aspects of the food system, and how community benefit programs can be utilized to support food equity. They produced a list of Hospital Community Benefit Roles, which includes providing staff/time expertise, other in-kind contributions such as use of hospital facilities, financial support for an event, or financial support for an organization or ongoing program.⁷¹
- Practice Greenhealth⁷² is a healthcare membership organization that provides sustainability solutions, and they work closely with Healthcare Without Harm. One of their key focus areas is food which includes helping the healthcare industry improve nutritional quality of food in hospitals, supporting a sustainable food system, and increasing access to healthy options for surrounding communities. They have an awards program to acknowledge healthcare centers that are taking steps towards sustainability including a “Circle of Excellence Award for Food.” New Jersey’s Hackensack Meridian Health - Raritan Bay Medical Center has won this award for its sustainability initiatives which have included:⁷³
 - Participating in the “cool food pledge” to reduce meat consumption.
 - Hosting a Zero Waste Dinner to raise awareness of waste-reduction efforts.
 - Launching the WasteWatch program from LeanPath with Sodexo to learn how to better reduce food waste.
- Virtua Health holds a summer farmer’s market in Camden where patients can use vouchers to redeem produce.

69 Health Care Without Harm. (2022). *Healthy Food in Health Care*. <https://noharm-uscanada.org/healthyfoodinhealthcare>

70 Health Care Without Harm. (2018). *Hospital community benefit roles*. <https://foodcommunitybenefit.noharm.org/resources/implementation-strategy/hospital-community-benefit-roles>

71 Health Care Without Harm. (2018). *Hospital Community Benefit Roles*. <https://foodcommunitybenefit.noharm.org/resources/implementation-strategy/hospital-community-benefit-roles>

72 Practice Greenhealth. (2021). About Us. Retrieved January 11, 2022 from Practice Greenhealth: <https://practicegreenhealth.org/about/about-us>

73 Practice Greenhealth. (2021). *Food - Improving the health of patients, staff, and the surrounding community by serving sustainable food*. <https://practicegreenhealth.org/topics/food>

Produce Prescription Programs

- GrowNYC partnered with NYC Health + Hospitals to expand access to healthy foods.⁷⁴ Greenmarket Bucks are \$2 coupons that can be used at GrowNYC Food retail sites. Healthfirst insurance members who are enrolled in a Life Improvement Plan and Complete Care Plan can use their over the counter (OTC) card or receive Green Market Bucks to purchase items at GrowNYC Greenmarkets, farmstands, and Fresh Food Box sites. MetroPlus Medicaid members are eligible to enroll in a program to receive Green Market Bucks (\$265/calendar year). Businesses, community organizations, and nonprofits can also purchase Green Market Bucks to give to employees or group members.
- Just Roots is a farm and food justice organization that runs the Farm to Family (F2F) prescription food and nutrition program in Greenfield, Massachusetts.⁶² In 2020, they collaborated with the Boston Children’s Accountable Care Organization (BCH ACO) to launch this F2F pilot program which is part of the MassHealth (Massachusetts Medicaid) Flexible Services Program. Eligible pediatric patients are prescribed year-round produce boxes through Just Roots that are delivered to patient’s homes.
- High Desert Food & Farm Alliance (HDFFA) Veggie Rx Program in Bend, OR⁶² was started using funding from the state that was allocated for a regional health improvement plan. They partnered with Central Oregon Health Council to build a network of clinical support. Eligible participants who are food insecure and have a health condition can receive \$20 of tokens per month to be redeemed at farmer’s markets. Due to the pandemic, this model shifted to participants picking up dietician-designed meal kits with recipes at a drive-through site. HDFFA’s knowledge of the local food system and emphasis on using local produce has increased farm-direct sales and contributed \$85,507 to the local food economy between when the program started in 2018 and 2020.
- Denver Health Clinic and Denver Food Rescue partner to operate two on-site “No-Cost Grocery Programs” where patients can receive no-cost food that is delivered by Denver Food Rescue twice a week.⁷⁵ The Denver Health Clinic has nutrition educators that have been working with patients identified as needing additional nutritional education and there are plans to start a produce prescription program for these families. This was planned before the pandemic and has since stalled.

⁷⁴ GrowNYC. (2022). *Greenmarket Bucks*. Retrieved January 11, 2022 from GrowNYC: <https://www.grownyc.org/greenmarket/bucks>

⁷⁵ Denver Food Rescue. (n.d.). *What we do*. Retrieved January 11, 2022 from Denver Food Rescue: <https://denverfoodrescue.org/programs/>

Overarching Findings

As organizations that frequently work with vulnerable community members, hospitals and other healthcare organizations can play a role in helping patients access healthy food and additional actions can be taken to simultaneously reduce food waste. Community benefit programs are required for nonprofit hospitals to achieve their tax-exempt status and these programs are increasingly being used to increase access to health food. California's Sutter Health Hospital community benefit pilot program was an example of a hospital working to both distribute food to community members in-need while tracking and diverting excess hospital food using Copia technology. Organizations like Healthcare Without Harm and Practice Greenhealth can help healthcare organizations design and implement community benefit programs that adhere to requirements while addressing food needs of their communities. Produce prescription programs are another way for healthcare organizations to help eligible patients receive free produce and, if partnered with food rescue or gleaning organizations, could also help reduce food waste. Through interviews, it was learned that these programs are generally very popular and have positive impacts on patient health but finding a sustainable funding source is the biggest challenge and there is a desire for Medicare or Medicaid to help provide funding. It was also expressed that for these programs to be more impactful, that they should be able to operate year-round, possibly through operating mobile markets in the wintertime when farmers markets are typically closed.

Research Initiative 4

Food Rescue Transportation, Refrigeration and Equipment Assistance

Description of Research Initiative

In response to Core Opportunity for Action 4 of the SOMMP: “Food Rescue Transportation and Equipment Assistance,”⁷⁶ this Research Initiative outlines case studies of sustainable and resilient food rescue infrastructure implementation from across the country. Many effective systems of support for food rescue transportation, refrigeration, and assistance function through partnerships between nonprofits, the private sector, and the government. Others work with the support of phone applications or other software. Embedding these systems within schools and local communities maintain a low burden of transportation. Some communities explore other opportunities for food waste diversion, like diversion of unused food as animal feedstock. Grants facilitate food rescue processes, and needs assessments inform how food rescue networks can meet the resources needs of the surrounding community. As a component in the network of a circular food waste system, sustainable food rescue practices thrive with the mutual reinforcement of several other Research Initiatives (financial support, school collaboration, etc.) described throughout this report. The community-level food rescue systems described below provide examples for scalable food rescue transportation and assistance practices.

Background Information and New Jersey Context

New Jersey: In New Jersey, organizations like Share my Meals, Table to Table, NJ Food Banks, and the Food Research Action Center have partnered with large-scale manufacturers (like Aramark, Chartwells, and Whole Foods) to accept consistent sources of food waste. The NJ Bergen County Food Security Task Force worked with the Community Food Bank of New Jersey and Table to Table to connect food suppliers to a network of food rescue organizations. With its fleet of seven refrigerated box trucks, Table to Table employed drivers to pick up excess food from some two hundred donors, which they deliver to some 250 partner food rescue agencies from YMCAs to local homeless shelters.⁷⁷ With county leadership, Table to Table provided refrigeration to twenty-four food pantries across the County during the Pandemic, enhancing food distribution services. The Bergen County example of food rescue transportation and assistance may be replicable across NJ, through collaboration with county-level community organizations and Food Policy Councils.

⁷⁶ Bayshore Recycling. August 2021. “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

⁷⁷ *Ibid.*

Community Needs Assessments in New Jersey

During the COVID-19 pandemic, Bergen County conducted a needs assessment of its community to address food security concerns during lockdown.⁷⁸ Feeding America also offers a six-step, CDC-endorsed community need evaluation to determine service needs of a particular setting. If a needs assessment finds an increased demand for services related to food aid, small grants programs can support actions needed to improve local food security.⁷⁹ After conducting some form of Statewide needs assessment, it may be productive to work with the New Jersey Legislature toward establishing an ongoing small grants assistance program to help food rescue organizations pay for such infrastructure as refrigerated box trucks, hydraulic truck lift gates, forklifts and larger, energy efficient refrigerators at food distribution warehouses and smaller refrigerators in food pantries. This could occur either through the existing Clean Energy Program administered by the Board of Public Utilities or through a new program to be administered through the Office of Food Security Advocate and modeled after the BPU Clean Energy Program.⁸⁰

Food Rescue through Diversion to Animal Feedstock

An opportunity for food rescue and organic waste reduction that emerged throughout this national review involves diverting inedible and expired foods to farms for use as animal feedstock. AT&T Conference Center at UT Austin sent over three hundred thousand pounds of leftover food to local farms for use as animal feed in 2019. In New Jersey, state legislation regulates the types of food diverted to certain animals; no meat products may be fed to ruminant animals and foods must be heat-treated before being fed to swine. While in compliance with this legislation, many local farms accept vegetative waste (like fruits) and spent brewery grains for use as animal feed. Brewery waste is a consistent and high-quality source of animal feedstock. J & M Farm in Medford, NJ, receives spent grains from Lower Forge microbrewery and mixes the grains with normal feed for twenty pigs and three cows. By diverting inedible and expired foods to local farms, providers may contribute to organic waste source reduction.

⁷⁸ Bergen County Human Services Advisory Council (January 15, 2021). *Bergen County Needs Assessment 2020*. New Jersey Department of Children and Families. <https://www.nj.gov/dcf/about/divisions/opma/docs/BergenCountyNeedsAssessment2020.pdf>

⁷⁹ Hunger and Health (2021). *Assessing Community Needs*. Feeding America. <https://hungerandhealth.feedingamerica.org/explore-our-work/nutrition-education-initiatives/assessments-education-needs/>

⁸⁰ New Jersey's Clean Energy Program (2021). *Commercial, Industrial and Local Government Programs*. NJ Board of Public Utilities. <https://njcleanenergy.com/commercial-industrial/home/home>

Software Solutions

Portals and phone applications like Food Rescue US, Food Rescue Hero, Food Cowboy, Re-Plate, and 412 Food Rescue match excess food with demand from recipient food shelters. This eliminates the “second string” of food donation between food pantries, along with its associated transportation cost and time burden. Fresh Food Connect is an app that connects extra produce grown by home and community gardeners with neighbors in need.⁸¹ They currently have partners in twenty-five states including New York, but none yet in New Jersey. The Food Rescue Alliance, a Boulder Food Rescue initiative, developed an open-source food rescue logistics software.⁸² Thirteen cities currently use the software and help food rescue organizations manage volunteer shifts, record data, and generate receipts for donors. In New York City, pursuant to Local Law 176, enacted in 2017, the Department of New York Sanitation is required to maintain a food rescue portal (DonateNYC), that allows prospective food donors and recipients to post notifications concerning the availability of food, and to arrange for the transportation or retrieval of such food.⁸³ This food rescue portal assisted City Harvest food rescue organization in its mission to connect with smaller businesses and organizations. Though this web portal was not heavily utilized at first, it became a valuable tool during the pandemic.

Experiences in Other States

California: Waste Not Orange County, a partnership between Orange County Health Care Agency (OCHCA), OC Food Bank, Second Harvest Food Bank, restaurant owners, and Food Finders, coordinates food transportation between food-producing facilities (hospitals, restaurants, and other businesses) and local food pantries. Riverside Food Rescue in California also acts as a liaison for food rescue between local farmers and schools, childcare centers, hospitals, and restaurants. Initiated by a CA Department of Food and Agriculture Specialty Crop Block Grant in 2017 and supported by CalRecycle grants, the organization borrows trucks, coolers, and school nutrition services warehouses to redistribute food by repurposing existing resources.⁸⁴

81 Fresh Food Connect. (n.d.) About Us: Fresh Food Connect. Retrieved January 11, 2022 from Fresh Food Connect: <https://freshfoodconnect.org/about/>

82 Food Rescue Alliance. (n.d.). *Open-Source Food Rescue Logistics Software*. <https://www.foodrescuealliance.org/logistics-software>

83 A Local Law to amend the administrative code of the city of New York, in relation to facilitating food donations, Local Law 2017/176. (2017). The New York City Council. <https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=2984602&GUID=5268FF91-55DD-4407-BF0A-53B7E330EF3E>

84 CalRecycle. (2019, May 02). *Local Projects Prevent 93 Million Pounds of Food Waste*. State of California. <https://www.calrecycle.ca.gov/newsroom/2019/05may/12>

Massachusetts: Franklin County Community Development Corporation operates the Western MA Food Processing Center and works with local farms to help process, store, and distribute their excess produce. For example, if a farm has an excess of broccoli, they can prepare it and store it in a large freezer so then it can be distributed to schools. They also help turn excess produce into value-added products.⁸⁵ Commonwealth Kitchen in Boston also helps farmers develop recipes for their excess produce, process the food, and distribute it to local businesses like hospitals and universities.

Spotlight Project: Massachusetts Food Security and Infrastructure Grant program

Massachusetts has a \$36 million Food Security and Infrastructure Grant program that was created to help fund projects that support goals of the Baker-Polito Administration's COVID-19 Command Center's Food Security Task Force.⁸⁶ Several rounds of grants have already been awarded and an additional call for proposals recently closed in October 2021 with additional grants to be awarded next year. Funded projects have been for increased cold storage for farmers and food rescue organizations, refrigerated cargo vans for use for Mobile Outreach Markets and Produce Rx distribution sites, an insulated winter vegetable storage facility for a farm, equipment for creating a fish canning line, and technology upgrades for nonprofits. Eligible proposals include, but are not limited to, projects intending to:

- Increase the resiliency of the overall food system in the Commonwealth
- Increase capacity for food storage
- Increase capacity of local food distribution partners
- Increase capacity of emergency food network
- Increase capacity of food production by purchasing food processing equipment
- Offer innovative solutions for urban farming

New York: The New York State Pollution Prevention Institute (NYSP2I) assists the NYSDEC with their education, outreach, and technical assistance. In an interview, it was explained that the NYSDEC takes phone calls and helps with food rescue and donation coordination as part of a contract with Feeding NY.

⁸⁵ Franklin County Community Development Corporation (2021). *Food processing Center: About*. Retrieved January 11, 2022 from FCCDC: <https://www.fccdc.org/food-processing-center/>

⁸⁶ Gilvarg, C (2021). *Baker-Polito Administration Announces \$15 Million in Support for the Food Security Infrastructure Grant Program*. Mass.gov. <https://www.mass.gov/news/baker-polito-administration-announces-15-million-in-support-for-the-food-security-infrastructure-grant-program>

Ohio: La Soup in Hamilton County, Ohio creatively repurposes food items when donations are at or near expiration, or when demand for donated food is low.⁸⁷ These organizations may also provide culinary services to receiving food pantries.

Colorado: Denver Food Rescue receives food donations from over fifty retailers including grocery stores, farmers markets, and wholesale distributors. Rescued food is directly delivered to neighborhoods at “No Cost Grocery Program” sites across the city. To best promote food equity in the community, they have a resident-led community board that guides the organization's planning and operations.⁸⁸

Denver Food Rescue primarily uses bikes for transport though they use cars in inclement weather or if they are traveling far distances. They recently received grant funding to purchase six “e-trikes” (electric bikes with front-load cargo) so that they can further reduce the need for car transport and work towards zero-emissions food rescue. This grant came from Denver’s Office of Climate Action, Sustainability, and Resiliency, which was established after receiving support from Denver residents on a ballot initiative. As an organization that is committed to bike transport, members see the city as an important partner and attend Denver Department of Infrastructure meetings to request protected bike lanes along their distribution routes. This not only helps make their food rescue work safer, but their visibility on the streets and in public meetings helps advocate for safe biking that can benefit everyone in the city.

They currently do not own a warehouse for food storage, but they rent refrigerator space from a local farm collective during the summer months when they rescue an abundance of produce from farmers markets. There are challenges without year-round refrigeration depending on the quality of food received and the day that food is rescued, but some members currently view expanding to a warehouse with more infrastructure as potentially more burdensome.

They do not have a centralized sorting location and use space at No-Cost Grocery Program (NCGP) sites where they distribute much of their rescued food. The NCGP aims to make receiving no-cost food easier by setting up sites in community spaces and tries to destigmatize receiving free food by abandoning the term “food pantry.” NCGP sites also encourage everybody in the community to get food there but encourages people to donate money if they can afford it. Providing food to all community members and not just those “in need” helps reduce the stigma of accepting rescued food.

⁸⁷ La Soupe, Inc. (2018). *The Food Insecurity and Waste Problem*. <https://www.lasoupe.org/>

⁸⁸ Denver Food Rescue. (n.d.). What we do. Retrieved January 11, 2022 from Denver Food Rescue: <https://denverfoodrescue.org/programs/>

Denver Food Rescue provides a stipend to its volunteers and has started paying food recipients a small reward (about \$5) if they respond to customer experience and satisfaction surveys. Money for salaries, stipends, and customer rewards has come from City of Denver grants.

Overarching Findings

The research team heard from state contacts that highly localized food rescue efforts ensure low transportation, refrigeration, and equipment costs. By tailoring food rescue efforts to the needs of local communities and college campuses, New Jersey could reduce costs and labor associated with food rescue. Colleges and universities may provide the additional benefits of reliable workforces and funding to support food rescue. The Food Recovery Network at University of Central Oklahoma and the Rutgers Student Food Pantry are two examples of food rescue transportation embedded in university campuses. State agency staff interviewed for this project indicated that effective food rescue practices minimize transportation burdens, capitalize on funding, and utilize existing infrastructure. Collaboration between food pantries and other sectors, like schools, communities, and state park systems (which may have unused personal or public vehicles that can be repurposed for food transportation), will support transportation needs. Texas state agency contacts emphasized the importance of focusing food rescue efforts on pantry staples and commonly known ingredients, carefully mapping types of excess food to food pantry needs, and conducting quality assurance of on-dock food donations to minimize inedible foods. Existing corporate sponsorships, like Whole Foods Nourishing our Neighborhoods Grant or Virtua Health grants, provide refrigerated vans to support refrigeration and transportation. Other small grant assistance programs, like Gannett Foundation's A Community Thrives initiative, USDA micro grants for food security, or Food Security and Nutrition Network's IDEAL grants, support food aid and establish refrigerated food storage facilities in communities with limited access to fresh food. Existing technology and technical assistance teams, like the New York State Pollution Prevention Institute, facilitate food rescue. The research team also heard from NJ state contacts the possible benefits of tax deductions for farmers receiving food waste for use as animal feed, in keeping with state laws about appropriate food items and handling for each livestock type.

Research Initiative 5

Progressive Financial Assistance Programs for Food Rescue, Small-Scale Facility Development, and Large- Scale Facility Development

Description of Research Initiative

Core Opportunity 17: Financial Incentives of the SOMMP states “to achieve many of the stated goals of the DEP in its 80 x 50 Report and those articulated above by the Organics Workgroup, money, business tax incentives, low to zero interest loans and other financial incentives are clearly needed.”⁸⁹ The objective of this Research Initiative is to identify examples of financing programs from throughout the country that states, counties and cities use to fund food waste reduction projects and related initiatives.

Background Information and New Jersey Context

A significant hurdle to implementing many organic waste management and food security programs is funding. There are many different funding mechanisms in the food waste space and a wide-ranging list of examples from other states is provided below. Categories of funding sources include tax credits, state and county grant programs, bonds, trust funds, rebates, programs that offer free waste tracking software, fees, “pay-as-you-throw” municipal garbage collection, public-private partnerships that provide funding for food waste reduction initiatives, national grants, and cap-and-trade programs.

New Jersey recently re-entered into the Regional Greenhouse Gas Initiative (RGGI), which is now an eleven-state cap-and-trade marketplace for emissions from natural gas, coal, and petroleum power plants.⁹⁰ Since rejoining the program in 2020, New Jersey has accrued more than \$214 million.⁹¹ NJDEP rules governing the funding program includes Section N.J.A.C. 7:27D-2.3, which outlines “eligible projects and programs.” Section 7:27D-2.3 (a) 3 allocates up to 10% of the fund to go to the DEP for distribution to local governments for projects that represent a measurable reduction in greenhouse gas emissions. Compost projects might qualify under this section of the rules. However, the State Agency “strategic funding plan” would have to identify composting as eligible, which has not historically occurred.

89 Bayshore Recycling. August 2021. “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

90 New Jersey Department of Environmental Protection. (n.d.). “RGGI 101.” Retrieved January 11, 2022 from Official Site of the State of New Jersey: https://www.nj.gov/dep/aqes/docs/rggi_101_factsheet.pdf

91 New Jersey Department of Environmental Protection. (2022, January 7). Regional Greenhouse Gas Initiative (RGGI). Retrieved January 11, 2022 from Official Site of the State of New Jersey: <https://www.nj.gov/dep/aqes/rggi.html>

Experiences from Other States

Funding Options

Tax Credits

- Philadelphia Sustainable Business Tax Credit⁹²
 - Companies must show current certification of being a B Corp or submit evidence that the business they conduct business in a sustainable manner. Philadelphia defines a sustainable business as a business that gives “substantial consideration to employee, community, and environmental interests in its practices, products, and services.”⁹³
- Maryland offers a tax credit for food donations by qualifying farms - up to 50% credit for conventional products and up to 75% for organic produce.
- Austin, Texas offers a reduction or reuse credit - businesses can offset performance standards for organics recycling through source reduction.⁹⁴ (They have required businesses to rescue surplus food and source-separate food scraps for landfill diversion.)
- Connecticut, Rhode Island, Vermont, and Massachusetts have systems where energy companies that make renewable energy sell credits to competing utility companies that do not make renewable energy. The goal of these systems is to incentivize the creation of renewable energy and for our interest, anaerobic digesters.⁹⁴

State and County Grant Programs

- Alameda County, California has a grant program that provides funding for “innovative and replicable food waste prevention and/or surplus food rescue projects for both businesses and nonprofits.”⁹⁵
- Kings County, Washington has a similar program to Alameda County, but also includes projects emphasizing recycling in the commercial sector. “Projects with an equity and social justice element received priority consideration.”⁹⁵

92 City of Philadelphia (n.d.). *Payments, assistance & taxes Sustainable Business Tax Credit*. Retrieved January 11, 2022, from City of Philadelphia: <https://www.phila.gov/services/payments-assistance-taxes/tax-credits/sustainable-business-tax-credit/>

93 Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Mid-Atlantic Food Waste Policy Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

94 Sandson, K., Broad Lieb, E., Macaluso, L., & Mansell, C. (2019). *Bans and Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws*. Harvard Law School Food Law and Policy Clinic. https://www.chlpi.org/wp-content/uploads/2013/12/Organic-Waste-Bans_FINAL-compressed.pdf

95 Mugica, Y., Rose, T., & Hoover, D. (2019). *Tackling Food Waste in Cities: A Policy and Program Toolkit*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/food-waste-cities-policy-toolkit-report.pdf>

- North Carolina has the Community Waste Reduction and Recycling Grant Program with priority and standard project grants. In 2021 priority projects included initiatives to divert food waste through backyard composting and programs targeting the residential and commercial sectors. This program requires a 20% cash match, and the funding cannot be used for salary, administrative costs, work with consultants, and collection fees from a contractor.⁹⁶
- CalRecycle has three different relevant grant programs: Food Waste Prevention and Rescue Grant Program, Organics Grant Program, and Community Composting for Green Spaces Grant Program.⁹⁷ CalRecycle also has a Greenhouse Gas Reduction Loan Program.⁹⁸ The cap-and-trade program discussed below provides funding for all these programs.

Bonds

- Maryland has bonds that provide capital for general infrastructure projects. Projects installing composting systems and anaerobic digesters could take advantage of this type of funding.⁹³

Trust Funds

- North Carolina has a “Solid Waste Management Trust Fund to promote waste reduction, recycling and other activities related to solid waste management. Funding is provided by the General Assembly, by contributions from public and private sources and through 10 percent of proceeds from a scrap tire disposal fee.”⁹⁶

Rebates

- Austin, Texas’s “Zero Waste Business Rebate of up to \$1,800 is also available to support businesses that are beginning or expanding zero waste initiatives, such as composting or recycling programs.”⁹³

⁹⁶ Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Southeast Food Waste Policy Gap Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/southeast-food-waste-policy-gap-report.pdf>

⁹⁷ California Department of Resources Recycling and Recovery. (2021, May 28). Greenhouse Gas Reduction Grant and Loan Programs. Retrieved January 11, 2022, from CalRecycle: <https://www.calrecycle.ca.gov/Climate/GrantsLoans/>

⁹⁸ *Ibid*

Programs

- StopWaste in Alameda County, California provided medium and large-scale food service operators free licenses of LeanPath software (a food waste tracking program), associated equipment, and technical assistance for one year to help track and reduce food waste.⁹⁵

Fees

- Austin Resource Recovery “uses funding from its Clean Community fee, an \$8.95 monthly fee charged to residents on their utility bill,” to fund zero waste programs.⁹⁴ The funded program gives technical assistance to organizations as they begin organic diversion programs.
- Boulder, Colorado “uses a trash tax on haulers to fund waste reduction programs, including curbside compost collection.” The city excises a tax on haulers, but because consumers have constant demand for waste hauling services, the tax burden is passed along to consumers, so in effect it is not much different than a tax on residents.⁹⁴ The regional government of the Portland, Oregon area has a Regional System fee collected on every ton of soil waste generated that is bound for disposal. This funds recycling, processing, and disposal systems, including scrap collection for composting.⁹⁴
- San Diego, California uses tipping fees to fund zero waste projects. The issue with this system is that as San Diegans divert more waste from the standard waste stream and enters the composting or recycling stream, less money is generated.⁹⁴

Pay As You Throw

- Pay As You Throw (PAYT) program requires citizens to pay for a bag or sticker that will signify to the garbage collectors that they paid to have their refuse picked up. If an individual puts out waste without the required sticker or in the required bag, waste haulers will not collect their refuse.
- Sustainable Jersey currently incentivizes towns to set a PAYT system, but as of the most recent data from 2017, only eight New Jersey towns are implementing a PAYT system.⁹⁹
- Massachusetts has a guide for implementing PAYT programs that includes troubleshooting methods and structural ideas for towns to set up successful systems.¹⁰⁰

⁹⁹ New Jersey Department of Environmental Protection. (2017, June). *Municipal "Pay As You Throw" Trash Collection Systems in New Jersey*. https://www.nj.gov/dep/dshw/recycling/payt_table.pdf

¹⁰⁰ The Commonwealth of Massachusetts Department of Environmental Protection. (2004). *Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs*. January 2004. <https://www.mass.gov/doc/massdep-pay-as-you-throw-implementation-guide/download>

- PAYT programs were recommended as an effective way to directly incentivize citizens to decrease the amount of waste they generate. The average person will not spontaneously become incentivized to change their habits and start composting. PAYT programs provide an important nudge and a very tangible sign of the price of throwing things out.

Public-Private Partnerships

- According to Harvard & CET, “From 2012 to 2014, private foundations awarded \$14.5 million in grants to initiatives related to reducing food waste.”⁹⁴ So, there is certainly an opportunity for private funding in this space as well. This could be particularly advantageous to small-scale projects — such as a town composting initiative — because of low start-up costs.

National Programs

- Northeast Sustainable Agricultural Research & Education (SARE) has a variety of grant programs for furthering research and farmer education in sustainable agricultural practices. In 2020, they funded an on-farm composting efficiency research project in Vermont.¹⁰¹
- The US Environmental Protection Agency (EPA) has a variety of grants at the national and regional level that New Jersey could explore for food waste reduction projects. The EPA also has a wide spread of Food Systems Programs that focus on each step of the food lifecycle.¹⁰²
- The United States Department of Agriculture (USDA) also has funding resources for increasing the efficiency of the food system. Most relevant are their Community Composting and Food Waste Reduction Funding Project¹⁰³ and Agricultural Marketing Service Grants.¹⁰⁴

101 Sustainable Agriculture Research & Education. (2020, September 22). *Dairy Farm Closes Loop with Improved Compost System*. <https://northeast.sare.org/news/dairy-farm-closes-loop-with-improved-compost-system/>

102 United States Environmental Protection Agency. (2021, November 23). *EPA Programs Related to the Food System*. <https://www.epa.gov/sustainable-management-food/funding-opportunities-and-epa-programs-related-food-system>

103 United States Department of Agriculture - Natural Resources Conservation Service. (2021, May 17). *USDA Announces Cooperative Agreements for Community Compost and Food Waste Reduction*. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=NRCSEPRD1777221>

104 United States Department of Agriculture - Agricultural Marketing Service (n.d). *Grants & Opportunities*. Retrieved January 11, 2022, from AMS, USDA: <https://www.ams.usda.gov/services/grants>

Spotlight Program: California's Cap-and-Trade System

California set a statewide goal to achieve an 80% reduction in GHG emissions when compared to 1990 levels by 2050. To regulate emitters, the state established a cap-and-trade program via SB535 in 2012¹⁰⁵ and amended by AB 1550 in 2016.¹⁰⁶ California Climate Investments oversees the disbursement of cap-and-trade revenue to projects that use innovative technologies and reduce pollution. According to their website:

California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling and much more. At least 35 percent of these investments are made in disadvantaged communities and low-income communities and households.¹⁰⁷

The cap-and-trade process establishes an annual declining limit on how much greenhouse gas emitters can send to the atmosphere each year.¹⁰⁸ This means that the limit for the following year is 80% of what largest emitters produced in the current year. This emissions cap equates to the total number of allowances available for purchase. One allowance equals one metric ton of carbon dioxide equivalent emissions. The California Air Resources Board (CARB) sells allowances during a quarterly auction. CARB sets an increasing annual floor price for the allowances. Through this system, each year there are less allowances available for purchase and the unit price of an allowance increases annually. This is the mechanism through which the cap-and-trade process accrues revenue.

According to California's 2021 Annual Report on their cap-and-trade program, to date the program has generated \$14.9 billion for the state.¹⁰⁹ As mentioned in the list above, CalRecycle provides funding through the Food Waste Prevention and Rescue Grant Program, Organics Grant Program, Community Composting for Green Spaces Grant Program,⁹⁷ and Greenhouse Gas Reduction Loan Program.⁹⁷ An example of funding provided through the cap-and-trade program that reflects initiatives discussed in this report is the SANCO Anaerobic Digestion Project. SANCO received a \$3 million Organics Grant from CalRecycle for this project. Their anaerobic digestion system will divert 23,250 tons of food waste per year from landfills. Additionally, the project implementation includes a commitment from the facility to provide the local low-income community with free compost and prioritize hiring residents for positions created by the project.

¹⁰⁵ California Legislative Information. (2012, September 30). *SB-535 California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund*. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=2011201205B535

¹⁰⁶ California Legislative Information. (2016, September 14). *AB-1550 Greenhouse gases: investment plan: disadvantaged communities*. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB1550

¹⁰⁷ California Climate Investments. (n.d.). *Cap-and-Trade Dollars at Work*. Retrieved January 11, 2022, from California Climate Investments: <https://www.caclimateinvestments.ca.gov/>

¹⁰⁸ California Air Resources Board. (2022). *Cap-and-Trade Program*. Retrieved January 11, 2022, from ca.gov: <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about>

¹⁰⁹ California Climate Investments. (2021). *Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds*. http://ww2.arb.ca.gov/sites/default/files/auction-proceeds/2021_cci_annual_report.pdf

Another example is the Wilgenburg West LLC Manure Management Project.¹⁰⁹ Wilgenburg obtained a \$342,207 grant through the California Department of Food and Agriculture Alternative Manure Management Program. The Wilgenburg farm used funds to purchase a large vacuum and to create a cement pad.

Wilgenburg West is now using vacuum suctioning to pick up slurry manure from cow lanes and place wet manure onto windrows of drier manure in a graded compost cement pad. The grade of the compost pad enables water runoff from the facility and compost yard to be captured without interruption of the compost program and allows for annual composting. Approximately six hundred tons of compost are produced each year at Wilgenburg West.

Their reduction in GHG emissions is equal to 4,325 metric tons of CO₂ over five years.

The California cap-and-trade system is not without flaws. The current system allows for emitters to exceed their emissions allowance if they can offset their carbon emissions in alternative ways. As Propublica¹¹⁰ recently reported, one of these options is forest offsets, which entail emitters paying a landowner to not cut down their forest. This preserved forest is then compared to the calculated standard forest for the region and any extra carbon that the preserved forest stores above the standard is awarded as an offset. There are two main issues with this system: 1) the regional forest carbon storage values are calculated at a broad level, but the purchases are taking place at a granular scale, and 2) while it seems the intent is to preserve forests that would otherwise be cut down for logging, the standard is currently that the land owners must only acknowledge that they *could have* cut down their trees.

The first issue leads emitters to choose to protect specific swaths of forest that have carbon storage capabilities high above the regional standard but are still typical forests for their smaller area. Propublica argues that the regional forest carbon storage values should be calculated at a smaller scale and therefore these forest purchases would not award such a high number of offsets. The second issue creates a system where it is not clear that the landowners were going to truly remove the forests and brings into question if their purchase is truly offsetting any carbon. An additional argument against this system is that if you pay someone to not log a specific area, it is likely they will still fell trees, just elsewhere. While there are other ways that California emitters can obtain offsets, it is important that all aspects of the cap-and-trade program are contributing to an overall reduction in atmospheric carbon.

110 Song, L. (2021, June 25). California's Climate Program Is Actually Adding Carbon To The Atmosphere. (S. Bushwick, Interviewer) New York City: Science Friday. <https://www.sciencefriday.com/segments/california-climate-program-co2/#:~:text=California's%20Climate%20Program%20is%20Actually%20Adding%20Carbon%20to%20The%20Atmosphere,-17%3A22%20minutes&text=California%20has%20a%20reputation%20as,the%20most%20about%20c>

Spotlight Project: Massachusetts Renewable Energy Credits

Massachusetts Municipal Waste Combustion facilities are eligible to earn a specific category of renewable energy credits.¹¹¹ As part of the requirement for these credits, facilities need to pay 50% of the value of the credits they sell into a Trust Fund managed by the Massachusetts Department of Environmental Protection (MassDEP). The fund is their primary source for grant and assistance programs.

This funding is partially used for Sustainable Materials Recovery Program (SMRP) grants,¹¹² which provide funding in nine categories:

- Mattress recycling incentive program
- Pay-as-you-throw assistance
- Education and enforcement coordinator
- Recycling and food waste collection carts
- Recycling drop-off containers
- School recycling assistance
- Small-scale initiatives
- Organics capacity/waste reduction projects
- The Recycling Dividends program

Overarching Findings

- There are many examples of funding structures.
- Universities are potential sources of funding, employees/volunteers, and other resources.
- National funding programs can complement state funding initiatives.
- It was mentioned in an interview that program uptake could be an issue when rolling out an opt-in funding program. Program implementers may wish to involve stakeholders in the program creation process to increase its effectiveness.
- Similarly, it was noted in an interview that PAYT programs can successfully incentivize citizens to participate in alternative waste solutions. PAYT programs have had limited implementation thus far in New Jersey.

¹¹¹ Massachusetts Department of Environmental Protection. (n.d.). *310 CMR 19.000: SOLID WASTE MANAGEMENT*. <https://www.mass.gov/doc/310-cmr-19-solid-waste-management/download>

¹¹² Massachusetts Department of Environmental Protection. (n.d.). *Sustainable Materials Recovery Program Municipal Application - Grant Guidelines*. Retrieved January 11, 2022 from Mass.gov: https://www.mass.gov/doc/smrp-municipal-grant-application-guidelines/download?_ga=2.237065024.139920973.1641564994-999404505.1641564994

Research Initiative 6

Organics Education and Outreach

Description of Research Initiative

The SOMMP Report's Core Opportunity 2: Organics Education describes opportunities to develop an "Organics Module" for New Jersey's climate change curriculum, which will be required in K-12 schools in 2022.¹¹³ It also discusses the opportunity to evaluate the effectiveness of organic waste education across the sectors identified in the NJDEP's Food Waste Reduction Plan.

Background Information and New Jersey Context

Most residents, schools, and businesses in New Jersey are not in the habit of separating their organic waste from the trash and sustained outreach is necessary to both help create these new habits and to educate on best practices. There are already some programs in New Jersey that encourage waste reduction and composting, such as Sustainable Jersey and municipal organic waste programs, but a larger statewide effort can be made to encourage various sectors to reduce, donate, or compost their organics. Different outreach and educational materials are needed depending on the population being addressed and it is often beneficial to have a professional organization assist with developing these educational materials.

Contracting Education & Outreach to Professional Organizations

Most states with organic waste bans have contracts with a nonprofit or professional organization to assist with education, outreach, and technical assistance. Through the interview process, this has been identified as an important example for increasing and improving outreach. The state agencies can focus on regulation of organic waste bans, while the professional organizations can focus on assisting businesses and municipalities. Most state agencies do not have the resources or capability to hire additional employees for this work, so having a separately funded organization with the primary goal of outreach, education, and technical assistance can be essential. Businesses and organizations are also generally more open to reaching out to a separate organization for help as not everyone has a positive view of state regulatory organizations.

¹¹³ Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Advanced Sector Organics Education

Advanced sector (e.g., production/manufacturing, food services) organics education and outreach is essential in states that have implemented commercial organic waste bans, such as Vermont, Massachusetts, and New York. As mentioned above, the state departments that regulate the bans provide education and outreach throughout the process and other businesses often emerge to assist with outreach and technical support. Cooperative Extension programs at Land Grant Universities are also uniquely positioned to offer educational materials, guidance, and training for waste generators and processors.

K-12 Schools

Reducing and diverting organic waste in K-12 schools should be a top priority considering how many children are fed in the school system and that schools often have property available for gardening composting. There is also the added educational and societal value of teaching the youngest generation about sustainable practices. New Jersey already has a report on *The State of New Jersey School Food Waste Guidelines - K-12 Edition* which are voluntary guidelines for K-12 schools to follow regarding reducing, recovering, and recycling food waste.¹¹⁴ Sustainable Jersey Schools also has a “Food Waste Management” action item and there is an ongoing School Food Waste Pilot Program¹¹⁵ where three schools are implementing food waste guidelines with assistance from the Rutgers Cooperative Extension Food Waste Team.

Higher Education

College and university campuses are important populations to focus on regarding food waste reduction due to the amount of food they serve, the amount of land they often own, and the influence higher education has on not just the students, but the surrounding communities. Higher education institutions can lead in sustainability efforts and inspire students to practice what they have learned on campus and after they graduate. One study showed that campus composting programs influenced student’s “environmental attitudes, environmental locus of control, and composting knowledge.”¹¹⁶

114 NJ Department of Environmental Protection, Department of Agriculture, Department of Education, Department of Health, & Office of the Secretary of Higher Education. (2019, November). *The State of New Jersey School Food Waste Guidelines - K-12 Edition*. <https://www.nj.gov/dep/seeds/sfwg/docs/K-12.pdf>

115 Sustainable Jersey for Schools. (2021, June 25). *School Food Waste Pilot Program*. <https://www.sustainablejerseyschools.com/grants/school-food-waste-pilot-program/>

116 Waliczek, T., McFarland, A. & Holmes, M. (2016). The Relationship between a Campus Composting Program and Environmental Attitudes, Environmental Locus of Control, Compost Knowledge, and Compost Attitudes of College Students. *HortTechnology* 26, 592-598. DOI: 10.21273/HORTTECH03320-16

Along with a K-12 report, *The State of New Jersey School Food Waste Guidelines* also has a Higher Education version, which provides recommendations and examples for this sector.¹¹⁷ Many New Jersey colleges and universities already make some efforts to reduce and divert food waste, but these efforts are not uniform or widespread. Examples include:

- Ramapo College has a Rocket Composter and offers compost pick-up for students in specific residencies.
- Rutgers University owns and operates a co-digestion system that converts used cooking oil into electricity and hot water. Rutgers also has a student-led composting organization, RU Compost, which started due to student interest and demand. They collect food scraps on a small scale that are composted by student volunteers in a three-bin system on campus.¹¹⁸
- Bergen Community College composts dining hall food waste in either a Rocket Composter or at an off-site facility.

Date Labeling Education

Date labels are the labels on food packaging that intend to provide consumers with information on freshness or quality of packaged food. Examples of date labels include: “sell by,” “best before,” and “expires on.”¹¹⁹ Many consumers believe that food is unsafe to eat after these dates although labels are often conservative and indicate optimal freshness and not food safety, and confusion regarding labeling results in substantial amounts of safe food being thrown out. Ensuring consistent date labels and educating households and businesses on both the meaning of date labels and general food safety practices can help keep food out of landfills.

There are no federal regulations on date labeling, other than for infant formula, and states have broad discretion to regulate date labeling, which has led to inconsistent labeling laws. New Jersey only imposes date labels on shellfish and dairy and restricts sale of these food items past the “sell by” date. Donations of these foods ARE allowed past the “sell by” date due to the New Jersey Food Bank Good Samaritan Act.¹²⁰ Rutgers’ Ralph W. Voorhees Public Service Fellows conducted research on date labeling education in food pantries and found that while most food

117 NJ Department of Environmental Protection, Department of Agriculture, Department of Education, Department of Health, & Office of the Secretary of Higher Education. (2019, November). *The State of New Jersey School Food Waste Guidelines - Higher Education Edition*. <https://www.nj.gov/dep/seeds/sfwg/docs/HighEd.pdf>

118 Rutgers getINVOLVED. (2022). *RU Compost*. <https://rutgers.campuslabs.com/engage/organization/rucompost>

119 Harvard Law School Food Law and Policy Clinic. (2021, October). *New Jersey Food Donation: Date Labels [Legal Fact Sheet]*. https://chlp.org/wp-content/uploads/2021/12/NJ-date-labeling-legal-fact-sheet_Final-Edits44.pdf

120 Food Bank Good Samaritan Act, N.J.S.A. 24:4A-1 to 24:4A-5 (1982). <https://repo.njstatelib.org/bitstream/handle/10929.1/24089/L1982c178.pdf?sequence=1&isAllowed=y>

pantry workers understand that date labels may be inaccurate, they were also generally unaware of where to find accurate information on the subject.¹²¹ Voorhees Fellows also learned that food banks did not distribute past-date items because they did not want to break trust with their clients. Better educational materials are needed to communicate date labels with consumers. Some of the recommendations provided by the Voorhees fellows are to: 1) encourage pantries to freeze foods near their “sell by” date instead of throwing them out, 2) implement a food distribution system based of safety and not a food label, 3) determine a strategy for distributing past-date items, and 4) partner with food safety experts to create educational materials for pantry staff/volunteers and clients.

The Food Date Labeling Act, which was reintroduced in both the House and Senate in December 2021 would standardize national food labeling and create clear labels that differentiate between food safety and optimal freshness. This bill would allow for food to be sold or donated after the food quality date and would override state laws that prohibit foods from being sold after the quality date. It would also require the FDA and USDA to collaborate on consumer education and outreach to raise awareness of the new system. There appears to be state-level momentum for passing date labeling legislation as Senator Bob Smith mentioned this as his main food-related objective during the NJ State of the Food System Symposium in December 2021.¹²²

Experiences from Other States

Advanced Sector

Center for EcoTechnology: The Center for EcoTechnology (CET) is a nonprofit organization that works with states and businesses across the country to save energy and reduce waste.¹²³ The services CET offers are extensive and include assisting states with implementing their organic waste bans through providing technical assistance to businesses and developing targeted educational materials for various sectors. Below are examples of how CET assists other states with their organic waste reduction and diversion efforts.

CET directly helps Rhode Island businesses and institutions reduce and divert wasted food. CET aids at no cost to the organizations and businesses can reach out to CET directly for help. Assistance they provide includes staff training, producing educational materials, and on-site help with compost facilities and expanding operations.

¹²¹ Alvarez, J., Cedano, S., Margolin, B., Nolan, L., Saju, N, & Velez, I. (2021, December). *Middlesex County Food Pantry Product Dating Label Education Project*. Rutgers Bloustein School of Planning and Public Policy - Ralph W. Voorhees Public Service Fellowship Project.

¹²² New Jersey Food Democracy Collaborative. (2021, December 3). NJ State of the Food Symposium.

¹²³ Center for EcoTechnology. (2022). *Reduce Waste At Work*. <https://www.centerforecotechnology.org/reduce-waste-at-work/>

RecyclingWorks in Massachusetts is a recycling assistance program that is funded by the MassDEP and delivered under contract by CET.¹²⁴ They help waste generators comply with the organic waste ban, provide composting technical assistance, and provide guidance on waste reduction, source separation, and food donation.

New York State Pollution Prevention Institute: The New York State Pollution Prevention Institute (NYSP2I) assists the NYSDEC with their education, outreach, and technical assistance.¹²⁵ They also help provide grant funding to regulated businesses and recyclers to implement the upcoming organic waste ban that will be in effect in January 2022. NYSP2I started as a pilot program with a budget of \$500,000 and funding from Empire State Development.¹²³ It is sponsored by the NYSDEC and led by Rochester Institute of Technology. They are currently a collaboration of five research universities and manufacturing extension partnerships across New York State.¹²³

The NYS organic waste law requires the NYSDEC to produce guides for municipalities for residential sector education and the NYSDEC works with NYSP2I to produce these guides so municipalities could separately target residents who are not regulated under the food scraps law. They produced short documents for businesses and designated food scraps generators and provided information on food waste donation.

Advanced Sector

Vermont: The Vermont Department of Environmental Conservation website has resources for businesses & institutions, haulers & facilities, municipalities, and for residential composting. Many of these resources are one-pager documents with clear guidelines targeted for the specific sector being addressed.¹²⁶

New York: The New York State Department of Environmental Conservation (NYSDEC) has the authority to implement the NYS Food Donation and Food Scraps Recycling Law, which was enacted in January 2022.¹²⁷ They began stakeholder meetings in 2015 to obtain input from the regulated waste generators. When the law passed, NYSDEC held additional stakeholder meetings to seek input and to update food scraps generators, organics recyclers, transporters,

124 RecyclingWorks Massachusetts. (n.d.). *Recycling Assistance for Businesses & Institutions*. Retrieved January 11, 2022 from <https://recyclingworksma.com/>

125 New York State Pollution Prevention Institute. (n.d.). *About NYSP2I*. Retrieved January 11, 2022 from <https://www.rit.edu/affiliate/nysp2i/about-nysp2i>

126 Vermont Department of Environmental Conservation. (2022). *Food Scraps*. <https://dec.vermont.gov/waste-management/solid/materials-mgmt/organic-materials>

127 New York State Department of Environmental Conservation (2022). *Food Donation and Food Scraps Recycling Law*. <https://www.dec.ny.gov/chemical/114499.html>

municipal entities, and others interested in the law. They established a listserv to disseminate information about the law and have been holding webinars regularly to provide information about implementation of the law. NYSDEC has a designated e-mail address and phone number for questions or assistance with the Food Scraps Law and is the key contact source for businesses to reach out with questions. Their website contains information on the law, information on food donation assistance, funding updates, information for specific sectors, and lists of food scraps transporters, recyclers, and generators. They are currently working on a Request for Proposals for technical assistance, and they are hoping a non-profit organization bids on it so a separate organization can assist large waste generators without being seen as the “regulators.”

Massachusetts: In interviews, it was explained how Massachusetts DEP (MassDEP) had a long outreach process prior to their organic waste ban. They identified key stakeholders and brought them to the table to discuss their issues and questions. They also had a long-standing partnership with the Massachusetts Food Association, a non-profit trade association for the supermarket and grocery industry. They developed voluntary pilot programs to demonstrate that they could be implemented cost-effectively, and many supermarkets saved money when they began diverting food waste. The MA Food Association was on board from the beginning, and this led to other associations feeling comfortable with joining later. Even though the businesses do not want to be regulated, the lengthy stakeholdering processes combined with pilot programs eased them into it. They also continued outreach and education after regulations were in place.

K-12 Schools

Vermont Schools: Vermont schools are included in Vermont’s Universal Recycling Law which requires schools to recycle required materials and keep food scraps out of the trash.¹²⁸ Schools have the option of having their organic waste hauled to a processing facility or composting on-site. The Vermont Department of Environmental Conservation offers numerous resources for schools including a School Recycling Scorecard, Food Scraps information (e.g., how to construct a compost bin, list of food haulers), food donation information, and an On-site composting guide.

Lunch Out of Landfills!: Mountainside Education & Enrichment is a nonprofit organization in Maryland that works with K-12 schools to implement a Lunch Out of Landfills! (LOOL) program. It mobilizes K-12 students as “solutionists” to reduce food waste and provides a toolkit for schools. This program also utilizes resources from the Food Waste Warriors program mentioned above.¹²⁹

¹²⁸ Vermont Department of Environmental Conservation. (2022). *Universal Recycling for Schools*. Vermont Official State Website. <https://dec.vermont.gov/waste-management/solid/universal-recycling/schools>

¹²⁹ Mountainside Education & Enrichment. (2018). *Lunch Out of Landfills!* <http://www.meegreen.org/programs/lunch-out-of-landfills/>

National Resources: The NRDC has a resource document on Wasting Less Food in K-12 Settings: Best Practices for Success and has suggestions for increasing awareness.¹³⁰ Additionally, The World Wildlife Foundation has a Food Waste Warriors program that provides K-12 lessons, activities, and resources for teachers and students.¹³¹



Figure 6-1: WWF's Food Waste Warriors Educational Toolkits¹²⁹

This report is primarily focused on education techniques for organic waste reduction, but there are opportunities to instruct children and teenagers about food production and nutrition along with waste reduction. This holistic approach to food education can help foster a deeper appreciation of where their food comes from and may help increase motivation to reduce food waste and gravitate towards healthier eating habits.

Examples of K-12 educational programs that emphasize local food and nutrition include:

- 10 Cents a Meal for Michigan's Kids and Farms¹³² is a state-funded program that provides schools and early education centers with matching incentive funding up to ten cents per meal to serve Michigan-grown foods. It encourages school activities like local food taste testing, school gardens, and visiting farmers. This program exposes children to new foods at an early age while supporting the local food economy.

¹³⁰ Natural Resources Defense Council. (2018, November). *Wasting Less Food in K-12 Settings: Best Practices for Success [Issue Brief]*. <https://www.nrdc.org/resources/wasting-less-food-k-12-settings-best-practices-success>

¹³¹ World Wildlife Foundation. (2022). *Be a Food Waste Warrior*. <https://www.worldwildlife.org/teaching-resources/toolkits/be-a-food-waste-warrior>

¹³² 10 Cents a Meal for Michigan's Kids & Farms. (n.d.). About. Retrieved January 11, 2022 from <https://www.tencentsmichigan.org/about>

- GrowNYC School to Gardens¹³³ promotes the facilitation and creation of sustainable gardens in schools across NYC and all Department of Education K-12 schools can register. This program provides grant funding and technical assistance to help schools start and maintain gardens. It also provides ongoing education through regular workshops, an online portal with gardening resources, and a monthly newsletter.
- Teens for Food Justice¹³⁴ is a NYC program that teaches teenagers how to grow food in high-output hydroponic systems. Students learn the science and engineering of constructing and maintaining a hydroponic system. Students also learn to cook with the produce they grew, the nutritional benefits of fresh produce, and smart shopping habits. Food grown goes to school meals and extra food is donated to community organizations. Students who go through this program have become ambassadors for their communities and learn to advocate for food justice.

Higher Education

There are many examples of colleges that have composting and organic waste management programs on campus and a few examples are highlighted in this section.

North Carolina State University: NC State's new Compost Facility and Research Cooperative aims to run a closed-loop organic waste management system.¹³⁵ This program not only helps divert organic waste from landfills, but also hosts internship opportunities, offers tours to classes, and integrates faculty and graduate student research.

Harvard University: As part of Harvard's sustainability initiatives, food scraps, coffee grounds, landscape waste, and compostable products are composted.¹³⁶ Some organic waste is diverted to an off-site processing facility. Harvard Campus Services partners with the Arnold Arboretum to compost landscape waste which is then used in organic landscaping projects on campus. Harvard Law School has a BioGreen 360 in-vessel composter that receives about 1,000 pounds of food daily which produces pellets that can be used in campus landscaping projects.

Johnson County Community College: Johnson County Community College in Overland Park, Kansas has an on-campus composting program that was launched in 2011 through their Center for

133 GrowNYC. (2022). *GrowNYC School Gardens*. <https://www.grownyc.org/school-gardens>

134 Teens for Food Justice. (2022). *Program*. Retrieved January 11, 2022 from <https://teensforfoodjustice.org/program/>

135 North Carolina State University. (2022). *Compost Facility & Research Cooperative*. <https://recycling.ncsu.edu/compost-facility/>

136 Harvard University - Sustainability. (2020). *Composting*. Harvard University. <https://green.harvard.edu/topics/waste/composting>

Sustainability.¹³⁷ Food waste is collected by dining services and work-study students employed by the Center for Sustainability transport the food scraps to a 6-yard in-vessel

composter. Food scraps are mixed with sawdust from the college's woodworking projects and local mills and the end product is used on the college's 2.5-acre farm. JCCC offers a Sustainable Agriculture certificate program, and the farm serves as a classroom for this program and students learn skills related to growing and marketing food, and produce grown is used in dining facilities. They estimate saving \$5,000 in diverted grounds waste per year and \$3,000 per year in waste hauling fees. They also estimate producing 22,200 pounds of compost per year which has an estimated market value of \$5,700 and replaces the need for purchasing fertilizers for the campus farm.

Spotlight: Tompkins County, New York

Tompkins County, New York is an example of a region that has focused on food waste reduction across multiple sectors. There is a composting facility, Cayuga Compost, which collects compost from businesses and residents in the county and sells finished compost. Cornell University also has the Cornell Waste Management Institute that researches organic waste practices and provides resources.¹³⁸ The Cornell Agriculture and Experiment Station has a Compost Facility one-mile from campus that accepts dining hall food scraps, plant residues from university greenhouses, and animal manure and bedding from teaching and research facilities.¹³⁹ This compost facility is also used for teaching purposes and classes hold field trips to the facility and design experiments to teach about the composting process.

Cornell Cooperative Extension offers a Master Composter training program that is open to college students to take for course credits but is also open to all residents of Tompkins County.¹⁴⁰ There are weekly courses that teach students the basics of backyard composting, how larger-scale facilities in the area operate, and the importance of organic waste reduction. Formal classes take place during one semester, but to receive a certificate of completion, a certain number of volunteer hours are required by the end of the calendar year. Volunteers teach classes to the public through Cooperative Extension, ensuring people are properly separating food scraps at festivals and public events, and running food scraps drop off-sites across Tompkins County. They also host an annual "Compost Fair" with compost demonstrations, games, and even a compost-themed band "Rot N

137 Johnson County Community College. (n.d.). *Composting on Campus*. <https://www.jccc.edu/about/sustainability/composting.html>

138

139

140

Roll.” There is a phone number (the “Rot Line”) that Tompkins County residents can call if they need information or advice on food scraps recycling or composting. This has been a valuable program for educating adults and building a grassroots community of people who are invested in the cause to reduce and divert food waste. Many of the Master Composter graduates remain in Tompkins County and continue to volunteer even after their formal requirements are satisfied. There is also a strong relationship between the MC program and the Tompkins County Recycling & Solid Waste Center. Tompkins County Recycling has started food scrap pickup and drop off locations around town, and these locations are primarily staffed by either Master Composters or people who were trained by Master Composters. Much of the program cost is for hiring one dedicated employee to run the program and a large challenge has been to secure continuous funding, though it has proven worthwhile year after year.

The Recycling and Materials Management department of Tompkins County works with local businesses to reduce, reuse, and recycle organic waste through the ReBusiness Partners Program.¹⁴¹ To become a “ReBusiness Partner,” a business needs to complete a waste assessment and get assistance on how to streamline waste handling, examine reuse practices, and codify green purchasing. Once a business becomes a partner, they can get free disposal bins, signage, and reduced fees for a food scraps recycling service. The financial benefits of waste reduction and food scraps recycling are emphasized to businesses and many businesses become partners for the cost savings alone. Other businesses are incentivized by being able to promote sustainable practices to their clientele through storefront signs. It was explained during an interview that this program has been so successful that there is only one large waste generator in Tompkins County that is not already separating organic waste and will need to start doing so when the food scraps ban takes effect in 2022.

Date Labeling Education

Examples of educational materials on date labeling include:

- Food Safety Guide to Reducing Food Waste: Distributing and Using Shelf Stable Donated Products¹⁴²
 - University of Wisconsin-Madison Extension
 - Useful guide for food banks

¹⁴¹ Recycling and Materials Management of Tompkins County. (2021). *ReBusiness Partners*. <https://recycletompkins.org/other-programs-and-services/rebusiness-partners/>

¹⁴² University of Wisconsin-Madison. (2020, January). *A Food Safety Guide to Reducing Food Waste: Distributing and Using Shelf Stable Donated Products*. https://fyi.extension.wisc.edu/safefood/files/2019/12/ReduceFoodWaste_2020.pdf

- Expired?: Date Labels and Food Waste in America¹⁴³
 - Harvard Law School Food Law and Policy Clinic
 - Project aimed at date labeling education
 - Created a film on the subject and has resources on the problems and solutions for reducing food waste due to confusing date labels.
 - Focus on policy changes and less on consumer practices.
- Labels Unwrapped¹⁴⁴
 - Vermont Law School - Center for Agriculture and Food Systems
 - User-friendly website for educating consumers on food labels
- EatByDate¹⁴⁵
 - Website with information for consumers on food shelf life, date labels, and food storage advice.
- ReFED Date Labeling Standardization Tool¹⁴⁶
 - Tool for food manufacturers to help determine if their products need a “discard” label or if they can safely exclude this label and potentially reduce the amount of wasted food.

Overarching Findings

Contracting Education & Outreach to Professional Organizations

Education and outreach targeted towards specific sectors is important for helping businesses that are regulated under organic waste bans comply with regulations, and to also help students and organizations develop new habits for reducing and diverting food waste. Several state environmental regulatory agency representatives were interviewed in states with organic waste bans, and it was repeatedly emphasized that partnering with a separate non-government organization to assist businesses with organic waste management education, outreach, and technical assistance was important for relieving the burden from regulatory agencies. It was also expressed that many businesses prefer working with a separate organization rather than the state regulatory agency which increases the likelihood of a business reaching out for assistance.

143 Expired. (2022). *The Solution*. Harvard Food Law and Policy Clinic. <https://notreallyexpired.com/the-solution-2/>

144 Labels Unwrapped. (2022). *The Labels Unwrapped Project*. Vermont Law School Center for Agriculture & Food Systems. <https://labelsunwrapped.org/about-the-project>

145 EatByDate. (2012). *About Eat By Date - How Long Does Food Last?* <http://www.eatbydate.com/>

146 ReFED. (n.d.). *Date Labeling Standardization Tool*. <https://refed.org/downloads/ReFED-Standardization-Package.pdf>

Advanced Sector Organics Education

States that had ongoing education and outreach both before and after implementation of an organic waste ban reported high compliance rates from regulated businesses. Educational materials directed towards advanced sector businesses were reported to be more effective if they were clear, concise (one-page documents), and available in multiple languages. Information that is useful to include in documents or on a website includes resources on where to find waste haulers and lists of organic waste processing facilities. Providing information to businesses on various benefits of reducing and separating organic waste can also help motivate businesses to divert their organic waste, even if they are not regulated under an organic waste ban. For example, many businesses may be incentivized due to lower disposal fees, while some businesses may benefit from being able to promote that they are engaging in sustainable practices. Programs that provide clear guidance and access to free materials (e.g., signage, food scraps recycling bins) can help make it easier for businesses to participate in organic waste diversion. Through interviews, it was learned that state programs that lowered the costs of food waste tracking software for businesses helped businesses reduce food waste generation.

K-12 Schools

For K-12 schools, organic waste education is important for not only reducing organic waste but for helping younger generations develop new habits. Many schools have property available for on-site organic waste management (composting or an in-vessel system) and on-site management can be a good opportunity to provide hands-on teaching experiences to students of various ages. Incorporating materials on waste reduction, organic waste management, and gardening into the curriculum can help provide a foundation for students to start to build sustainable habits.

Higher Education

For higher education, colleges and universities can develop organic waste management programs where students can learn about food waste recycling and organic waste management sites can also be used for faculty and student research projects. Universities with cooperative extension programs can also be valuable for engaging the surrounding community in organic waste management. Programs like the Master Composter training programs are often run through Cooperative Extensions and can help with student and community engagement and can build a volunteer community workforce to help with education, outreach, and staffing events and organics dropoff sites.

Date Labeling Education

There is currently momentum at the state and national level to standardize food packaging date labels to better reflect food safety versus freshness, and this could help reduce confusion regarding food safety and help reduce food waste. Even without new legislation being passed, education targeted towards various sectors (schools, businesses, households, food pantries) on food packing date labels and food storage techniques to prolong shelf-life can help reduce food waste.

Research Initiative 7

Share Table Legislation in Other States

Description of Research Initiative

Across states, share table initiatives in schools redistribute food waste by inviting students to place whole, pre-packaged, unopened, non-perishable foods in designated common cafeteria spaces for other students to take at no cost. Core Opportunity for Action 7 of the SOMMP identifies that “share table legislation has been adopted or proposed to remove ambiguity and provide prospective donation indemnification research share table legislation in other states,” and expresses the need to “research model legislation developed in other States.”¹⁴⁷ This section outlines national case studies of sustainable and resilient food rescue infrastructure implementation.

Background Information and New Jersey Context

Leftover food serves other students and informs cafeteria menu planning. In some schools, share table items are donated at the end of mealtime. All schools are protected from liability in donating food under the Federal Bill Emerson Good Samaritan Food Act. National publicization and guidance around share table programs - like the FNS endorsement of shared tables and USDA implementation guidance - reinforce share tables as a safe and effective strategy for minimizing and redistributing surplus food.¹⁴⁸

Despite this federal endorsement, only about half of US states provided state-level policy documents to guide monitoring, corrective actions, record keeping, allergy considerations, and best practices for marketing and outreach. One national review deductively analyzed, coded, and scored share table regulation and implementation resources in all fifty states depending on their inclusion of specific, corrective, health-conscious, and standardized policy components.¹⁴⁹ Of the twenty-seven states with documentation of share table implementation, twenty-one allowed reservice, and eleven allowed food donation. Three allowed share table items to be used in the school kitchen as recipe ingredients in cooked

147 Bayshore Recycling (August 2021). “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

148 USDA Food and Nutrition Service (2016, June). *The Use of Share Tables in Child Nutrition Programs*. <https://www.fns.usda.gov/cn/use-share-tables-child-nutrition-programs>

149 Prescott, M. P., Grove, A., Bunning, M., & Cunningham-Sabo, L. (2020). Characterizing and assessing the quality of state K–12 share table policies as a potential mechanism to reduce food waste and promote food security. *Journal of nutrition education and behavior*, 52(1), 21-30. <https://www.sciencedirect.com/science/article/pii/S1499404619310917>

food items. Only three of states that permitted redistribution allowed all three redistribution options, while seven allowed both reservice and food donation. Currently, only nine states with share table guidance explicitly require share table regulations to be approved by local health departments.¹⁴⁹

Even within states, school districts employ different strategies for reducing cafeteria food waste through redistribution. The USDA recognizes possible conflict between federal and state share table policies, and the need for state or district modification of food sharing strategies:

Local and State health and food safety codes may be more restrictive than the [Food and Nutrition Service] requirements or may place specific limitations on which food or beverage items may be reused. To ensure compliance with food safety requirements, [Child Nutrition Program] operators should discuss plans for a share table with their local health department and State agency prior to implementation.¹⁵⁰

A 2020 review of publicly available school administrative unit policy records in Maine demonstrates this district-level variation. Of the 169 policy records coded, eight (6.8%) contained dedicated waste-reduction policies, eighteen (15.5%) contained passing references to food waste, and eleven (9.4%) promoted strategies that have been shown to reduce food waste, without mentioning food waste reduction. Four policy documents prohibited food sharing, and none of the documents promoted food redistribution.¹⁵⁰ This variation in policy, along with school-level logistical challenges, introduce barriers to share table implementation. School administrators raise questions about in-school food sharing safety and liability, express concerns about the uncertainty of which foods are allowed on share tables (like fruits and vegetables), or struggle to overcome the challenge of staff supervision involved. As a result, many schools prioritize alternative food waste reduction options (like offer vs. serve options, scheduling recess before lunch, or composting) before implementing share tables.¹⁵⁰

With over 2,500 K-12 public schools, six hundred school districts, and seventy institutions for higher education, New Jersey offers ample space for school-focused efforts to reduce food waste. Specific to this state, the “School Food Waste Reduction Toolkit” produced by Rutgers, Middlesex County, the Middlesex County Improvement Authority, REPLENISH, Feeding Middlesex County and Elijah’s Promise, addresses in-school share tables.¹⁵¹ A 2019 report of share table policy documentation indicates that strong state policies include clear, understandable, and sequentially organized guidelines for allowable and non-allowable share table items, redistribution

¹⁵⁰ Berry, B., & Acheson, A. (2017). Sharing isn’t easy: Food waste and food redistribution in Maine K–12 schools. *Maine Policy Review*, 26(1), 47-58. <https://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=1760&context=mpr>

¹⁵¹ Elnakib, S., Shukaitis, J., and Flatt, J. (July 2019). *School Food Waste Reduction Toolkit*. <https://njaes.rutgers.edu/school-food-waste/food-waste-summit-toolkit.pdf>

practices, monitoring procedures, corrective actions, and food allergy considerations.¹⁵² This Research Team’s comparative review of national share table policies highlights centralized and unambiguous policy documentation in Indiana, Nebraska, New Hampshire, Oklahoma, Texas, West Virginia, and Wisconsin.

Experiences from Other States

Indiana: Indiana 410 Admin. Code 7-24-201 increased regulations around redistribution of potentially hazardous foods, but schools may still operate Sharing Tables with proper equipment (tables, carts, insulated containers, or refrigerators) and oversight. Prepackaged *non-hazardous* foods may be placed on the Sharing Table to be consumed during the meal period, consumed during later meal periods, or donated if the food item remains packaged and has been examined by a trained food employee and determined to be in good condition. Prepackaged and *potentially hazardous* foods (like unopened milk, cheese, or yogurt) may also be placed on the Sharing Table either directly after purchase or once the buyer is finished with their meal. These items must be consumed or discarded within four hours of the meal period service. The 2015 FAQs outline how schools can implement Sharing Tables safely.¹⁵³ Local non-profits and food policy councils distribute guidance around Sharing Tables.¹⁵⁴

Nebraska: The Nebraska Department of Health and Human Services permits food distribution processing at certain agencies to divert donated food to meal products. Containers of food that are not time or temperature controlled may be reserved if the food item is protected from contamination (for example, if the food container is closed between uses, in a narrow-neck bottle, or still in its original packaging). Some food items more sensitive to time and temperature, like milk, may be redistributed once if refrigeration criteria are met. Packaged foods that do not need refrigeration, fruits with a rind or thick peel (such as bananas and oranges) can also be redistributed. Labeled baskets or containers separate fresh and packaged food items for redistribution, and school staff monitor the shared tables to ensure that items not reserved are discarded upon expiration. Best practices suggested by the Nebraska Department of Education include informing parents and obtaining consent from school boards.¹⁵⁵

152 Prescott, M. P., Grove, A., Bunning, M., & Cunningham-Sabo, L. (2020). Characterizing and assessing the quality of state K–12 share table policies as a potential mechanism to reduce food waste and promote food security. *Journal of nutrition education and behavior*, 52(1), 21–30. <https://www.sciencedirect.com/science/article/pii/S1499404619310917>

153 Click, K. (2015, December). *All Local Health Departments & Other Indiana Food Regulatory Agencies*. Indiana State Department of Health. [https://www.in.gov/health/files/School_Sharing_Tables_and_Food_Recovery_12-23-2015_\(2\).pdf](https://www.in.gov/health/files/School_Sharing_Tables_and_Food_Recovery_12-23-2015_(2).pdf)

154 Greater Cincinnati Regional Food Policy Council (2017 December). School Cafeteria Share Tables. <https://www.greenumbrella.org/resources/GU%20Action%20Teams/Waste%20Reduction%20Action%20Team/OKI%20Share%20Tables%20Guide.pdf>

155 Nebraska Department of Agriculture. “Nebraska Food Code.” https://nda.nebraska.gov/regulations/foods/food_code.pdf

New Hampshire: School districts in New Hampshire implement share tables with the support of student and community groups. In Nashua School District, a student group called Meals Matter (a fiscal agency of the United Way of Greater Nashua) initiated a “share cart” system where students can leave unused wrapped food items for other students to eat. United Way also partnered with the Nashua school district and the Nashua Soup Kitchen to deliver frozen meals to students around school hours. Concord, NH schools prioritize an offer-vs-serve cafeteria option that allows students to select which food items they want, further reducing source food waste. In 2021, a governor signed into law HB 500, codifying schools’ abilities to donate leftover cafeteria food and distribute lunch leftovers for students to eat over the weekend.¹⁵⁶

Oklahoma: As of 2019, Oklahoma Bill 297 permitted schools to redistribute eligible excess food to students. Surplus foods from school breakfast, lunch, snack, or dinner meals may be re-served at the campus cafeteria subject to local, state, and federal requirements. Eligible leftover surplus foods include unserved food; served or unserved food with packaging in good condition, whole produce items or prepared and wrapped produce items, and fruit with a peel or rind (like bananas and oranges). Volunteer school employees may assist with food preparation and redistribution.¹⁵⁷

Texas: Texas Student Fairness in Feeding Act of 2017 (Senate Bill 725) legally allows schools to share leftover foods with classmates. In-school “share carts” allow students to place unwanted food for other students to eat during mealtime (such as in San Antonio’s Northside Independent School District). The Texas Student Fairness in Feeding Act also permits schools to create food pantries on campuses to store donated food and surplus food from cafeterias. This enables some schools to keep leftover packaged food and produce for distribution on campus. This legislation allows for some flexibility in how a school manages food storage and oversight - the bill does not require staff supervision of share tables or carts, and some schools have paid for extra refrigeration to make sure shared foods are temperature controlled.¹⁵⁸

West Virginia: The West Virginia Feed to Achieve Act of 2018 included an initiative called “The Shared Table” to encourage schools to collect unused food appropriate for redistribution.¹⁵⁹ Schools then make that food available throughout the day to students who may be hungry, to provide a method for distribution of that food to be taken home by students experiencing food insecurity. Any unused food can be donated to local food pantries and other entities that distribute food to those in need.

¹⁵⁶ O’Grady, Eileen. “New Hampshire bill would use school leftovers to feed students on weekends.” Valley News. <https://www.vnews.com/School-food-waste-could-help-hungry-citizens-40037929>

¹⁵⁷ House of Representatives (2019). Oklahoma Senate Bill 297. <https://legiscan.com/OK/text/SB297/2019>

¹⁵⁸ Texas Education Agency (September 2017). Student Fairness in Feeding Act Resource Page. Retrieved January 11, 2022 from Texas Education Agency: <https://tea.texas.gov/texas-schools/general-information/student-fairness-in-feeding-act-resource-page>

¹⁵⁹ West Virginia Congress (February 16, 2018). “West Virginia Feed to Achieve Act: Shared Table Initiative” H.R. 4478. https://www.wvlegislature.gov/Bill_Status/bills_text.cfm?billdoc=HB4478%20SUB.htm&yr=2018&sesstype=RS&i=4478

Wisconsin: The Wisconsin Department of Health and Human Services includes a School Nutrition Team that disseminates guidance on Share Tables and No Thank You Tables. While food left at Share Tables in Wisconsin schools may only be circulated to new students during the meal period, food at “No Thank You” tables may not be shared during mealtime. Food items at “No Thank You” tables are inspected, sorted, and potentially redistributed for donation or future meals. Wisconsin’s unique share and “No Thank You” table format mitigates some liability concerns by increasing the level of administrative oversight between food reservice.¹⁶⁰ The Wisconsin Share Table toolkit also outlines allowable shared food items (unopened, pre-packaged items, or whole fruits and vegetables) and protocols for handling temperature-controlled foods. During interviews, Wisconsin School Nutrition team contacts described that a state-specific fact sheet advises school administrators on how to reuse or dispose of leftover foods and encourages school administrators to include details on the share table operating procedure in food safety plans. While the Wisconsin School Nutrition Team monitors the safety and quality of Share Table implementation, they do not currently collect any outcomes on the quantity of food waste diverted.

Wisconsin’s Share and “No Thank You” table format resembles a suggestion from NJ stakeholders to implement a three-level share table concept.¹⁶⁰ Stakeholders suggest that students may 1) leave food on a table for other students to eat; 2) allow students to take food remaining at the end of the day home for consumption; or 3) take unclaimed food to a food rescue organization for redistribution. The Wisconsin DPI School Nutrition Team most frequently observes the first level or simplest level of food-share programming, share tables, during site reviews of school cafeterias. Specific, centralized, and up-to-date guidance on how to implement share tables encourages program uptake by schools.

Overarching Findings

The research team heard from state agency contacts that centralizing state guidance on share tables, maintaining consistency between state guidelines (like toolkits and FAQ documents) and the state food code, and continuing to update that guidance as rules change and as schools ask questions, enhances compliant share table implementation. NJ’s K-12 Food Waste Guidelines for schools may offer a space for this guidance. These instructions may reinforce that, beyond updating the school food and safety plan and communicating with board members, schools need no special approval or permission to begin implementing a shared table. In keeping with recommendations from the NJ SOMMP and experiences in other states, share table instructions may outline three tiers of share table implementation: 1) Leaving food on a table for other students

¹⁶⁰ Wisconsin Department of Public Instruction (2016 June). *Sharing and No Thank You Table Toolkit*. Retrieved January 11, 2022 from: <https://bit.ly/3lgzeOM>

to eat; 2) Allowing students to take food remaining at the end of the day home for consumption; 3) Taking unclaimed food to a food rescue organization for redistribution. The guidance may mention the September 2021 USDA School Food Recovery Act, which offers grants to schools for food waste reduction projects.¹⁶¹ The guidance may also include a memo of approval from the NJ Department of Education School Health Services, the NJ Department of Agriculture School Nutrition Programs, or Governor Murphy. The guidance may link to USDA FNS guidance and encouragement for shared tables in case of hesitance from school boards or health officials/inspectors.¹⁶² The NJ School Nutrition Program home page could also feature share table guidance and approval memos. The detail and formatting standards of share table toolkits and FAQs in other states (Wisconsin School Food Safety Team;¹⁶³ Vermont food sharing tables guidance;¹⁶⁴ Massachusetts share table guidance¹⁶⁵) set standards for NJ implementation guidance.

161 Congress (January 15, 2020). "School Food Recovery Act of 2020." H.R. 5607. <https://www.congress.gov/116/bills/hr5607/BILLS-116hr5607ih.pdf>

162 Regional Directors (February 3, 2012). Guidance on the Food Donation Program in Child Nutrition Programs. US Department of Agriculture. Retrieved January 11, 2022 from: https://fns-prod.azureedge.net/sites/default/files/cn/SP11_CACFP05_SFSP07-2012os.pdf

163 Wisconsin Department of Public Instruction (2016 June). Sharing and No Thank You Table Toolkit. Retrieved January 11, 2022 from: <https://bit.ly/3lgze0M>

164 Vermont Agency of Education (2016 May). Food Sharing Tables - Guidance for Schools. Retrieved January 11, 2022 from: https://education.vermont.gov/sites/aoe/files/documents/edu-food-sharing-tables-guidance-for-schools_0.pdf

165 Massachusetts Department Of Elementary And Secondary Education Office for Food and Nutrition Programs (2014 April). Massachusetts School Meal Programs - Share Table Guidance. Retrieved January 11, 2022 from: <https://thegreenteam.org/wp-content/uploads/2014/04/Share-Table-Guidance.pdf>

Research Initiative 8

Small-Scale Composting Exemptions

Description of Research Initiative

This Research Initiative correlates with Core Opportunity 9: Broader Regulatory Reform in the SOMMP.¹⁶⁶ The objective of this Research Initiative is to provide examples from around the country of existing small-scale composting programs and organic waste permitting structures.

Background Information and New Jersey Context

In Table 5.4 of the 80x50 Report, the NJDEP has cited the need for regulatory reform and provided a recommendation to “create guidelines/recommendations for county siting and streamlined state planning and permitting of food waste recycling facilities.”¹⁶⁷ Small-scale community composting initiatives are an important piece of raising awareness and action on food waste reduction. There is less risk of small-scale composting systems becoming environmentally problematic compared with large-scale facilities and easing regulations for small-scale projects can help incentivize managing organic waste at a local scale. Making the path to community composting clearer through creating a permitting exemption can help bring New Jersey closer to its climate goals by distributing the power to divert food waste from landfills to the communities. New Jersey does not currently have a permitting system for organic waste like the ones described in this section. The state has an opportunity to develop an organic waste permitting structure with small-scale composting exemptions in mind.

Experiences from Other States

Small-Scale Composting Programs

District of Columbia (DC) Community Composting Cooperative Network (CCCN)

The DC CCCN is run by the Department of Parks and Recreation (DPR) and currently has fifty cooperative compost sites.¹⁶⁸ Each site has the capacity for one

¹⁶⁶ Bayshore Recycling. August 2021. “The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan.” <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

¹⁶⁷ Barr, H., Orlando, P., Kettig, R., Barry, R. C., Karmarkar-Deshmukh, R., & Kamel, M. (2020). *New Jersey's Global Warming Response Act 80x50 Report*. <https://www.nj.gov/dep/climatechange/docs/nj-gwra-80x50-report-2020.pdf>

¹⁶⁸ District of Columbia Department of Parks and Recreation. (n.d.). DC.gov Department of Parks and Recreation. Retrieved January 11, 2022 from Community Compost Cooperative Network: <https://dpr.dc.gov/page/community-compost-cooperative-network>

hundred active composters, which is equivalent to one ton of material per month. Approximately 1,000 active members compost twenty tons of material each month. The network can handle more waste within the existing infrastructure. Each Site has 1-3 Co-op Managers who train co-op members, maintain quality control of the site, and organize a monthly workday. Co-op members must take a 1-hour training course, participate 1 hour per month in processing the compost and ensure they respond to communications from the managers. The DPR maintains a live map of the composting cooperative locations and the status of each location (active, offline, or bin built but needs a manager to start).¹⁶⁸ The contact provided on the DPR web page for the Community Composting Cooperative Network was contacted late in our research process and did not respond. Because this program is widespread and well established, it would be worth following up with them again.

Philadelphia Small-Scale Composting Program

The Department of Parks and Recreation in conjunction with the Office of Sustainability is starting up a small-scale composting program for residential waste.¹⁶⁹ COVID-19 delayed the launch of this project, but it will be starting soon.¹⁷³ Pennsylvania has a General Permit WMGR025,¹⁷⁰ which regulates residential and municipal waste composting. This permit does not limit the quantity of compost at the site but does limit the facility size to fifteen acres.¹⁷¹ As the Philadelphia program is described as operating on existing urban farming locations, it is unlikely that any of these sites exceed the size requirement for this permit. At this time, it is unclear whether Philadelphia applied for these permits for their small-scale composting system. The Department of Parks and Recreation will be publishing a press release soon on this project, which may provide additional information that is not available at the time of this report.

Example Organic Waste Regulatory Systems

New York State Tiered Organic Waste Regulatory System¹⁷²

- Exempt sites are those processing less than or equal to 1 cubic yard per day or less than or equal to 1,000 pounds per day and must be “operated in a manner that does not produce vectors, dust or odors that unreasonably impact neighbors of the facility, as

¹⁶⁹ Winberg, M. (2021, July 26). *After a pandemic delay, Philly is finally opening 12 community composting sites*. <https://why.org/articles/after-a-pandemic-delay-philly-is-finally-opening-12-community-composting-sites/>

¹⁷⁰ Pennsylvania Department of Environmental Protection Bureau of Waste Management Division of Municipal and Residual Waste. (2018, February 10). *General Permit WMGR025 Residual and Municipal Waste Composting*. https://files.dep.state.pa.us/waste/bureau%20of%20waste%20management/lib/landrecwaste/residual_waste/gp/WMGR025%20Final%202_10_18.pdf

¹⁷¹ Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Mid-Atlantic Food Waste Policy Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

¹⁷² Thomas Reuters. (2020, November 30). *6 CRR-NY 361-3.2*. [https://govt.westlaw.com/nycrr/Document/Id4d62f22dfe911e7aa6b9b71698a280b?viewType=FullText&originationContext=documenttoc&transitionCategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Document/Id4d62f22dfe911e7aa6b9b71698a280b?viewType=FullText&originationContext=documenttoc&transitionCategoryPageItem&contextData=(sc.Default))

determined by the department, and when no waste remains on-site for more than 36 months.”

- The “registration” category applies for sites processing between fifty-two cubic yards per year and 5,000 cubic yards per year.
- The “permit” category applies for sites processing more than 5,000 cubic yards per year.

Summary of 6NYCRR Part 361-3: Composting Regulations

Composting	Level of Regulatory Oversight	Regulatory Citation
On site (except sludges and animal carcasses)	Exempt	361-3.2(a)(1) & 360.14(b)(1)(ii) & (iii)
Home Composting	Exempt	361-3.2(a)(1)
≤1,000 lbs or ≤1 cubic yard, whichever is greater, of SSO per week	Exempt	361-3.2(a)(2)
≤ 3,000 cubic yards of yard trimmings per year	Exempt	361-3.2(a)(3)
Animal carcasses on a farm (≤10 if non-CAFO)	Exempt	361-3.2(a)(4)
Animal mortalities generated on state or municipally owned properties	Exempt	361-3.2(a)(5)
Animal manure and bedding or crop residues	Exempt	361-3.2(a)(6)
Located on a CAFO (no sanitary waste)	Exempt	361-3.2(a)(7)
>3,000 - ≤10,000 cubic yards of yard trimmings per year	Registration	361-3.2(b)(1)
≤5,000 cubic yards or ≤2,500 wet tons, whichever is less, of SSO per year	Registration	361-3.2(b)(2)
Roadkill animals or routine animal mortalities	Registration	361-3.2(b)(3)
AD Digestate (if allowed under 361-3.3)	Registration	361-3.2(b)(4)
>10,000 cubic yards of yard trimmings per year	Permit	361-3.2(d) & (e)
>5,000 cubic yards or >2,500 wet tons, whichever is less, of SSOW per year	Permit	361-3.2(d) & (e)
Biosolids	Permit	361-3.2(d) & (e)

Figure 8-1: Summary table from NYS Dept. of Env. Conservation website¹⁷³

Rhode Island Tiered Composting Regulations¹⁷⁴

In 2016, Rhode Island implemented new regulations for food waste recycling and composting facilities after working closely with the Rhode Island Food Policy Council. Rhode Island undertook this change because the previous permitting system had prohibitive costs and engineering requirements, which impeded the success of small and medium-sized composting facilities. There has since been a noticeable uptick in the number of small- and medium-sized composting facilities. It was noted that there have not been any problems with improperly

¹⁷³ New York State Department of Environmental Conservation. (n.d.). Regulations on Organic Recycling Facilities. Retrieved January 11, 2022, from New York State Department of Environmental Conservation: <https://www.dec.ny.gov/chemical/97488.html#Composting>

¹⁷⁴ Rhode Island Department of Environmental Management. (2016, May 24). *New Regulations on Composting Operations, Anaerobic Digestion Facilities Now in Effect*. <http://www.dem.ri.gov/news/2016/pr/0524161.htm>

managed small-scale facilities since the loosening of the permitting process.

- The Rhode Island Department of Environmental Management (RI DEM) does not require small-scale operations (e.g., less than 25 cubic yards on-site at any given time) to register for a permit.
- The RI DEM defines medium-scale operations as facilities that process 25-600 cubic yards at any given time. Medium-scale operations must complete a one-time registration form.
 - It was suggested that upon reflection, it would be more useful to make this registration process recurring so that the RI DEM could track the number of active facilities. Currently, RI DEM is not notified when a medium-scale facility ceases operations.
- The RI DEM requires large-scale facilities (e.g., those handling more than six hundred cubic yards of organic waste at any time) to renew registration every 3 years.

This tiered system was intended to promote small business growth as well as composting in local communities for leaf and yard waste, food scraps, and other organic waste. Active farms can apply through the Rhode Island Department of Agriculture, which makes the process easier because the farmers already interact with this agency more than the RI DEM.

Massachusetts Composting Regulations¹⁷⁵

- Smaller operations, including composting sites, receiving less than 30 tons per day and anaerobic digester operations receiving less than one hundred tons per day, may apply for a general permit.
- Larger operations must apply for a more rigorous Recycling, Composting or Conversion (RCC) permit.
- New or expanding operations must file a Site Assignment Application, which includes a process of public comments and notification of abutters.

Overarching Findings

One of the goals of creating a tiered permitting system is to keep small-scale composting facilities in the exempt status category, which lowers the barrier to entry for small-scale composting site creation. It is worthwhile to continue to pursue a connection with the DC Community

¹⁷⁵ Massachusetts Department of Environmental Protection. (n.d.). *310 CMR: Department of Environmental Protection*. <https://www.mass.gov/doc/310-cmr-1600-site-assignment-for-solid-waste-facilities/download>

Composting Cooperative Network as they would have insight into creating a sustainable small-scale composting network. It would be beneficial to follow up with the Philadelphia Parks and Recreation Department and Office of Sustainability again to learn about potential changes in their permit status.

The DC CCCN Composting System represents a general model of small-scale composting initiatives. Below is a comparison of the volume of compost the DC CCCN processes and what is considered small-scale composting in New York and Rhode Island. The intention of this comparison is to give the reader a sense of how volume and time measurements vary and to highlight the difference between DC CCCN maximum possible intake and average intake.

Comparing DC Composting System to NY and RI Regulatory Systems			
State Program	Cubic Yards	Tons	Notes
DC Community Composting Cooperative Network (CCCN) Maximum Possible Intake	1.87 cubic yards per month	1 ton per month	These values represent maximum processing levels for each site per month.
DC Community Composting Cooperative Network Average Intake	0.75 cubic yards per month	0.4 tons per month	The DC CCCN website notes that although there are 50 active sites, the entire system processes approximately 20 tons per month. These values represent average processing levels for each site per month.
NYS Tiered Organic Waste Regulation	Exempt category is 1 cubic yard per day	0.535 tons per day	
Rhode Island Tiered Composting Regulation	Exempt category is 25 cubic yards onsite at any time	13.375 tons onsite at any time	

Note: According to New Hampshire's Department of Environmental Services¹⁷⁶ weight calculation sheet, one cubic yard of food scraps weighs 1,070 lbs. This measurement was used to convert cubic yards and tons.

176 New Hampshire Department of Environmental Services. (n.d.). *Volume-to-Weight Conversion Factors*. <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/vol-to-weight-conversion.pdf>

Research Initiative 9

Expedited Permitting of Composting Operations

Description of Research Initiative

The SOMMP report's Core Opportunity 9: Broader Regulatory Reform states that the "Organics Workgroup members strongly advocate additional regulatory reforms to streamline and support the growth of sustainable organic material management." They mention an opportunity for action is to consider "a "General Permit" or "Permit-By-Rule" approach for non-exempt, but small composting projects such as smaller windrow composting operations."¹⁷⁷

Background Information and New Jersey Context

In addition to the need for regulatory reform to better incentivize small-scale composting efforts, there has also been a need identified to expedite the permitting process of some larger facilities so that organic waste processing capacity can be increased more rapidly without bypassing permits. Windrow composting is the process of placing organic waste into long piles called "windrows" and aerating the piles with air blowers or by manually turning them. These windrows composting sites would not be classified as "small-scale" and would still require permits under most states tiered permitting regulations (as described in Research Initiative 8 above) but expediting the permitting process could more quickly expand organic waste processing capacity.

In an interview, it was explained that a driving factor for expediting the permitting of windrow composting facilities is to create a workable permitting process for the Ag Choice Organics Recycling facility in Andover, NJ. This facility uses windrow composting and has been running on a research and development permit for years. While they are one of the largest composting facilities in the state, they are not listed by the NJDEP as an authorized Food Waste Recycling Facility because of their research and development permit. There is currently no clear path for this facility to register for another type of permit and expediting the permitting of windrow composting facilities could be of value.

¹⁷⁷ Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Experiences from Other States

No examples from other states were found of expedited permitting processes specifically for windrow composting facilities. As highlighted in the previous section on small-scale composting, most permits are for the volume of organic waste processed and NOT the specific type of composting. Distinctions are often made between an anaerobic digestion facility and a composting facility, but the type of composting is not typically specified in state regulations.

The California Environmental Protection Agency released a report titled *Enhancing Organic Materials Management by Improving Coordination, Increasing Incentives, & Expediting Decision-Making* which could be helpful for providing recommendations on expediting the permitting process for composting facilities, in general.¹⁷⁸ This report discusses practices to expedite the permitting process for organic waste management and recognizes the need to rapidly build necessary infrastructure to meet the state's greenhouse gas emission and waste reduction goals. This requires the focus of government representatives and state agencies to expedite the process while not sacrificing public or environmental health that the regulations are intended to protect. While windrow composting is not specifically mentioned, there are other recommendations made that could be useful when considering updates to the New Jersey compost facility permitting process.¹⁷⁹

CalEPA Report Highlights:¹⁷⁹

Actions that have already been taken by the state to expedite organic waste processing and infrastructure.

- California Air Pollution Control Officers Association and CalRecycle have developed options for addressing technical barriers to permitting compost facilities.
- CalRecycle and the Office of Planning and Research have included a new section in their General Guidelines to explain how anaerobic digestion and composting facilities should be addressed in the land use element.
- The State Resources Control Board streamlined the permitting process for composting facilities by adopting the General Waste Discharge Requirements for Composting Operations. This resulted in a 50% reduction in wait time for a composting facility permit.

¹⁷⁸ California Environmental Protection Agency. (2018, November). *Enhancing Organic Materials Management by Improving Coordination, Increasing Incentives & Expediting Decision-Making*. <https://calepa.ca.gov/wp-content/uploads/sites/6/2018/11/CalEPA-Report-Enhancing-Organic-Materials-Management.pdf>

¹⁷⁹ Berkenkamp, J. & Gunders, D. (2017, March 09). *Don't Waste, Donate: Enhancing Food Donations Through Federal Policy*. National Resources Defense Council. <https://www.nrdc.org/sites/default/files/dont-waste-donate-report.pdf>

- The California State Water Resources Control Board issued a statewide General Order for wastewater discharge requirements for composting operations and created a consistent set of standards. This helped expedite timelines for composting operations to receive a permit.
- The Permit Streamlining Act (Gov. Code, § 65920, et seq.) was passed that aims to expedite agency decisions on applications by having 1) transparent permit information and timelines, 2) time limits for decision-making for applications, 3) guidelines for deeming applications complete, 4) limitations on agencies' information requests, 5) time limits for decision-making on permits, 6) guidelines for deeming permits approved, and 7) shorter timelines on decisions when possible.
- The California Office of Permit Assistance helps businesses with permit applications and provides mediation services.
- The Consolidated Permitting Process at CalEPA allows a permit applicant to request one agency to coordinate all state environmental permits.

Recommendations that can be used when making siting and permitting decisions on organic waste management infrastructure:

- State agencies can assist local governments by surveying local government officials to better understand their needs when making siting decisions. They can also provide technical assistance and guidance for organic material management infrastructure siting.
- When working with local and vulnerable community groups, state agencies can hold public forums for high-priority projects and standardize terms and conditions that apply to environmental justice issues that may arise.
- Create a permitting workgroup with relevant state agencies and regional permitting officials to facilitate permitting decisions for high-priority projects.
- Relevant state agencies and regional permitting officials could develop plainspoken permitting guidance documents to explain the permit processes for various organic waste management facilities.
- CalEPA's consolidated permit review process can be enhanced by surveying industry representatives on their needs and creating a team of permitting officials that can assist with applications.
- Create online tools for organic waste management infrastructure including having a centralized location for organic waste management infrastructure topics, including project development, and permitting information. This can include a mapping feature

that allows project managers to better visualize relevant site conditions, demographic information, and local pollution concerns.

- Emission factors and emission control measures can be standardized for organic waste management infrastructure to better streamline permitting decisions.

Overarching Findings

There were no programs found that specifically expedite permitting for windrow composting facilities, but the California Environmental Protection Agency report titled *Enhancing Organic Materials Management by Improving Coordination, Increasing Incentives, & Expediting Decision-Making* could be helpful for providing recommendations on expediting the permitting process for composting facilities, in general. Providing easily accessible information along with technical assistance for compost application permits, streamlining the application process, and creating General Orders for emissions and/or wastewater discharge to create statewide standard for composting operations are all suggestions for expediting the compost permit process which can help increase necessary organic waste management capacity needed to meet state organic waste and greenhouse gas reduction goals.

Research Initiative 10

Food Rescue Policy Assessment

Description of Research Initiative

This research initiative was initially to evaluate the use of executive orders for requiring food retailers to donate excess food. After not finding many examples of the use of executive orders for this purpose, this research initiative was expanded to include an assessment of state food rescue policies, more generally.

Background Information and New Jersey Context

There are federal and state level policies that aim to increase the amount of edible food diverted from landfills and redistributed to those in need, but many businesses still send edible food to a composting facility or landfill. Reasons for this include fear of being held liable for donating food that may get someone sick, added effort, time, and money it can take to separate edible food and transport it to recipients, lack of clear food safety guidance for food donations, and confusion over whether food can be donated at or near its expiration date.¹⁷⁹ States can help increase food rescue through executive order, legislation that requires food rescue, and tax incentives or enhanced liability protections for food donors.

Use of Executive Orders and Legislation Requiring Food Rescue

Executive orders are often used in emergency situations when there is limited time to pass a bill through the legislature or when legislation cannot be passed due to lack of congressional support. While they are a quick means to try to drive behavior in state agencies, they may not be a secure long-term strategy as executive orders can be overturned by a future administration. The Natural Resources Defense Council's *2021 Mid-Atlantic Food Waste Policy Gap Analysis and Inventory Report*¹⁸⁰ places climate change and food waste policies into Strong, Moderate, and Weak categories based on policy vehicle and goals. They rank legislation as being a strong policy vehicle because it demonstrates statewide commitment to the goals, while executive orders are considered Weak vehicles because they can be revoked by later administrations, especially if there is no legislative framework to accompany the executive order.¹⁸⁰

¹⁸⁰ National Resources Defense Council. (2021, August). *Mid-Atlantic Food Waste Policy Gap Analysis and Inventory [Report]*. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

In New Jersey, there are currently no executive orders or legislation aimed specifically at increasing food rescue, though Governor Murphy has issued several executive orders related to climate change and environmental justice.¹⁸¹

Liability Protections

There are both federal and state liability protection policies to protect food donors if there happens to be problems associated with the donated food. The 1996 Bill Emerson Good Samaritan Act Food Donation law provides civil and criminal liability protection to many food donors and nonprofit food recovery organizations if they are acting in good faith and there is no gross negligence involved.¹⁸⁰ Food must be donated to a nonprofit organization and the end recipient cannot pay for the food.

Enhanced liability protections that expand protections compared with the federal liability protections can fall into several categories:

1. Protections when the end recipient pays for the donated food. Allowing food rescue organizations to charge for donated food could provide for greater financial stability by allowing rescue organizations to sell food for reduced cost and using the funds to support their operations. It also allows for more flexible operation models. For example, if a food rescue organization receives more fresh produce than it can quickly distribute then the organization has the option of creating a value-added product (e.g., soup) and selling that to earn revenue.¹⁸⁰
2. Protections for food service establishments and retail stores donating directly to final recipients. There are instances where a donor may want to donate directly to a person in need. For example, a restaurant may want to donate excess food directly to community members or a school may wish to donate excess food directly to a student's family.¹⁸⁰
3. Protection regardless of compliance with non-safety related labeling requirements.¹⁸² Federal labeling requirements include the name of the food, manufacturer's address, net weight, and an ingredient list, among other information although much of this information is not needed to ensure food safety.¹⁸⁰ Food is often donated because it is not properly labeled and if this mislabeling does not affect the food safety (for example, if the net weight is incorrect) then this food could be safely donated.¹⁸⁰
4. Protection for the donation of past-dated foods. The Emerson Act does not address whether donations of past-dated foods are protected from liability, although in a House

¹⁸¹ New Jersey Executive Order No. 274. (2021). <https://nj.gov/infobank/eo/056murphy/pdf/EO-274.pdf>

¹⁸² ReFED. (2021). U.S. Food Waste Policy Finder. Retrieved January 11, 2022 from ReFED: <https://policyfinder.refed.org/>

Committee Report attached to the Emerson Act, Congress acknowledged that donated past-dated food would not constitute “gross negligence” and would be protected. This was not explicitly stated in the statutory text so many food donors and recipients are unaware and exercise caution by not donating past-dated foods.¹⁸⁰ Explicitly providing liability protection to donors that donate past-dated food could clear up confusion and make donors feel more comfortable with donating past-dated food.¹⁸⁰

New Jersey enacted the “Food Bank Good Samaritan Act” in 1982 (N.J.S.A. 24:4A-1 to 24:4A-5), which protects donors from being subject to prosecution resulting from the consumption of donated food.¹⁸³ The donor can be any farmer, processor, distributor, wholesaler, or retailer of food, higher education institution, or gleaner nonprofits, food banks, and their agents.¹⁸³ The distributor can be any food bank or nonprofit organization.¹⁸³ Protections apply for when the end recipient pays for the donated food, which goes beyond the federal liability protections, but no other expansions of liability protection discussed above are included.¹⁸³

Tax Incentives

Tax incentives can be provided to food donors to incentivize donations and help cover costs associated with separating and donating edible food. There are two types of tax incentives: tax deductions and tax credits. Tax deductions reduce the taxpayer’s taxable income, which is then used to calculate taxes owed, while tax credits are a direct reduction in the amount of taxes owed.¹⁸¹ According to the *NRDC’s Don’t Waste, Donate* report¹⁸⁰, tax credits are more effective with lower-margin businesses that may not be able to fully take advantage of tax deductions.

There are currently two federal tax deductions for businesses: a general (non-enhanced) tax deduction and an enhanced tax deduction. The general tax deduction allows some businesses (C-corporations, S-corporations, sole proprietorships, and some LLCs) to claim a tax deduction of the amount of the donated food’s basis (value at the time of sale) and is usually lower than the fair market value. Donations must be used for charitable purposes and donated to a qualified organization, which is explained in section 170 of the Internal Revenue Code. The enhanced tax deduction provides an extra incentive for donation, but there are stricter eligibility requirements including that the food must be used for the care of the ill, needy or infants, and the food may not be transferred by the recipient organization in exchange for money (except nominal amounts for administrative, warehousing, or other similar costs).¹⁸²

¹⁸³ Food Bank Good Samaritan Act, N.J.S.A. 24:4A-1 to 24:4A-5 (1982). <https://repo.njstatelib.org/bitstream/handle/10929.1/24089/L1982c178.pdf?sequence=1&isAllowed=y>

Tax incentives can be expanded to include more categories of food donors and recipients and to help cover additional costs associated with food donations. New Jersey does not currently offer any additional tax incentives for food donation,¹⁸² but the state does offer a financial incentive for hunters to donate venison to food pantries. The Hunters Helping the Hungry program pays hunters \$90/deer, or \$50/deer for deer under 50lbs field dressed weight and the venison is donated to food pantries.¹⁸⁴ This program is currently funded by the NJ Farm Bureau and NJ Department of Agriculture for the 2021/2022 hunting season. The program not only helps provide fresh meat to local food pantries, but also helps control the white-tailed deer population in New Jersey, which causes considerable damage to local ecosystems, agriculture, and transportation.

Experiences from Other States

Executive Orders

Only one executive order was found throughout this research that specifically addresses food waste recovery (Oregon Executive Order 20-04 – see below). Several other states have issued executive orders to reduce and divert organic waste, typically in alignment with greenhouse gas emission reduction goals, without specific mention of food waste recovery (e.g., Maryland’s Waste Reduction and Resource Recovery Plan and Pennsylvania’s Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance).¹⁸¹

The following are examples of recently enacted executive orders and legislation that specifically address food rescue.

Oregon: Executive Order 20-04: Directing State Agencies to Take Actions to Reduce and Regulate Greenhouse Gas Emissions¹⁸⁵ was issued in March 2020. Governor Kate Brown issued this executive order after climate policy bills failed two legislative sessions.¹⁸⁶ This executive order directs the Department of Environmental Quality and the Environmental Quality Commission to “take actions necessary to prevent and recover food waste, with the goal of reducing food waste by 50 percent by 2030, to reduce greenhouse gas emissions resulting from such waste, including but not limited to engaging with states and other jurisdictions, industry, food retailers, and brand manufacturers to develop and implement strategies to prevent and recover food waste.”¹⁸⁵

¹⁸⁴ Hunters Helping the Hungry. (2017). About HHH. Retrieved January 11, 2022 from Hunters Helping the Hungry: <http://www.huntershelpingthehungry.org/about/>

¹⁸⁵ Directing State Agencies to Take Actions To Reduce and Regulate Greenhouse Gas Emissions, Executive Order No. 20-04. (2020). https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

¹⁸⁶ Davis Wright Tremaine LLP. (2021, March 17). *Oregon Regulators’ Ambitious Climate Change Plans Take Shape*. JDSUPRA. <https://www.jdsupra.com/legalnews/oregon-regulators-ambitious-climate-8507305/>

Legislation

California: California's Short-Lived Climate Pollutant Reduction Law¹⁸⁷ (SB 1383) went into effect in January of 2022. This law's purpose is to reduce methane emissions and address food insecurity in California. Residents and businesses are required to separate their organic waste and either use an organics pickup service, self-haul to an organic waste processing facility, or compost on-site. Targets are to reduce statewide disposal of organic waste by 50% by January 1, 2020, and by 75% by January 1, 2025 (based on 2014 levels). It also aims to rescue at least 20% of currently disposed of edible food for human consumption by 2025.

New York State: New York's Excess Food Law (S4176A/ A4398A) went into effect on June 21, 2021. This law requires businesses that generate an average of at least two tons per week of food waste to donate excess edible food to charity.¹⁸⁸

Liability Protections

Enhanced liability protections that expand protections compared with the federal liability protections can fall in the following categories:

1. Protections apply when the end recipient pays for the donated food.
 - OR, ID, MT, AZ, AK, TX, OK, AR, IO, MI, NH, MA, CT, PA, NJ, NC, GA¹⁸²
2. Protection for food service establishments and retail stores donating directly to final recipients.
 - AZ, NM, MN, LA, VT, NH, MA¹⁸²
3. Protection regardless of compliance with non-safely related labeling requirements.
 - OR, CA, NV¹⁸²
4. Protection for the donation of past-dated foods.
 - MA¹⁸²

Additionally, California requires education on liability protections so that potential food donors are aware of their protections and can make an informed decision regarding whether they want to donate their excess food.¹⁸² *The Safe Surplus Food Donation Toolkit - Guidance for Food Facilities* document is an example of educational information created for distribution by Environmental

¹⁸⁷ Rethink Waste. (2022). *SB 1383: State Organics Law*. South Bayside Waste Management Authority. <https://rethinkwaste.org/businesses/laws-ordinances/sb-1383-state-organics-law/>

¹⁸⁸ Food Policy Snapshots. (2021, February 23). *Excess Food Law Requires New York Supermarkets to Donate to Charity*. Hunter College New York City Food Policy Center. <https://www.nycfoodpolicy.org/food-policy-snapshot-excess-food-law/>

Health Departments across California to educate food facilities about safe distribution of food. Topics discussed include state mandates, safe donation practices, and information on liability protections.¹⁸⁹

Tax Incentives

Several states have passed state-level tax incentives for food donations including AZ, CA, CO, IO, KY, MO, OR, SC, and VA along with Washington DC. All the states mentioned, except AZ, offer tax credits rather than deductions.¹⁸² Many states target farmers and businesses with low profit margins with incentives as they are important groups missing out from the federal incentives.¹⁵³ Examples include:

- Virginia offers farmers a tax credit of 30% of fair market value for the donation of food crops to a nonprofit food bank.¹⁸²
- California offers a tax credit equal to 50% of transportation costs paid or incurred for donating food.¹⁸²
- South Carolina provides a tax credit for processing of venison for donation.¹⁸²

The table below summarizes “Best Practice” liability protection and tax incentive policies according to ReFED.¹⁸² New Jersey policies are listed for comparison, though they are not considered “Best Practices” by ReFED.

¹⁸⁹ California Environmental Health Services. (2018, January). *The Safe Surplus Food Donation Toolkit - Guidance for Food Facilities*. <https://www.co.monterey.ca.us/home/showdocument?id=61942>

State	Liability Protection	Tax Incentive
New Jersey	A	None
California	C, F	(1) Tax credit equal to 50% of transportation costs paid or incurred
Oregon	A, C	None
Wisconsin	A	None
New Hampshire	A, B, E	None
Virginia	None	Available to farmers who donate to nonprofit food banks; equal to 30% fair market value & capped at \$5,000/year
South Carolina	None	Tax credit for licensed meat packers, butchers, or processing plants that contract with organizations to process deer for donations; offers \$50/carcass
Massachusetts	A, B, D	None

Key	Food Liability Protection Categories (for above table)
A	Protections apply when end recipient pays for the donated food
B	Protections apply to food service establishments and retail stores donating directly to final recipients
C	Protections regardless of compliance with non-safety related labeling requirement
D	Protection for the donation of past-dated foods
E	Donations can be made to needy individual/individuals or nonprofit organization
F	Provides education and awareness about liability protection

Table 10-1: Examples of "Best Practice" Food Rescue Liability Protection and Tax Incentive Policies According to ReFED¹⁸²

Overarching Findings

There are several policy tools available for increasing food rescue including executive orders, legislation that requires food rescue, liability protection for food donors, and tax incentives for food donors. Executive orders have been used by states to set climate goals, but there were few examples found that were used specifically for requiring food rescue. Recent legislation has passed in California and New York that set food rescue targets and require grocery stores to donate excess food to charity, but they have only been in effect for a short period of time since writing this report so metrics that may indicate effectiveness have not been collected. There are already federal liability protections and tax incentives for food donations, but many states have expanded upon these to extend liability protections to wider groups of food donors and to provide tax incentives to help cover additional costs of food donation under different circumstances. States have expanded liability protections to protect donors regardless of

compliance with non-safety related labeling requirements, for the donation of past-dated food, and so donations can be made directly to needy individuals or non-profit organizations without going through a food rescue organization. California also requires education on liability protection so that tax incentives have been expanded to include more donors (e.g., low profit margin businesses and farmers) and to cover transportation costs related to food donation.

Research Initiative 11

Review Track

Record of

Co-Digestion

Facilities

Nationally

Description of Research Initiative

This Research Initiative responds to SOMMP Core Opportunity 12 to evaluate opportunities for biosolid and source-separated food waste co-digestion at New Jersey wastewater treatment plants (WWTP's) with operational equipment and digester capacity.¹⁹⁰ High technology mechanized composting facilities, such as anaerobic digesters and co-digesters, present an opportunity for impactful environmental and financial benefits through biogas generation. Processing organic solids with co-substrates (like restaurant and cafeteria food waste, food processing waste, and crop residues) improve the nutrient and energy balance of digester facilities, increase methane production for use as biogas, and produce high quality digestate fertilizer.

Background Information and New Jersey Context

Anaerobic digestion involves bacteria breaking down organic waste substrates (such as manure or sewage sludge) in the absence of oxygen. This process generates biogas, which can be used as an energy source (e.g., heat or electricity generation). Co-digestion refers to the anaerobic digestion of compatible organic waste substrates and digestion feedstocks in one digester to increase methane production from low-yielding materials.¹⁹¹ Digestion feedstocks might include restaurant or cafeteria food wastes, food processing waste, crop residues, or FOG (fats, oils, and grease). Co-digestion processes require mixing feedstocks to create a homogenous feed, avoiding materials that may inhibit methane generation, and developing facilities that can handle the significant increase in methane output that is common with co-digestion. Anaerobic and co-digestion processes result in liquid effluent, digestate biosolids, and biogas.¹⁹¹ Liquid effluent and wastewater are recycled through the wastewater treatment process. Digestate biosolids may be composted or land applied as high-nutrient fertilizer (rich in nitrogen and low pH, with highly soluble salts, high CO₂ respiration, and low levels of metals and pathogens). Both anaerobic and co-digestion systems contribute to a circular energy economy, with biogas often used in-house or sold back to the network. While anaerobic digesters using only sewage sludge as a substrate reach

190 Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

191 Braun, R., & Wellinger, A. (2003). Potential of co-digestion. In IEA Bioenergy, Task (Vol. 37). <https://www.iea-biogas.net/files/daten-redaktion/download/publi-task37/Potential%20of%20Codigestion%20short%20Brosch221203.pdf>

an electricity self-sufficiency of around 50%, the addition of co-substrates increases coverage to as high as 80%. In some cases, the WRRF becomes a net energy producer.¹⁹¹ High technology mechanized composting facilities provide a simple diversion outlet for organic waste, with added benefits of supporting wastewater treatment, yielding valuable biogas energy, and producing high-quality fertilizer.

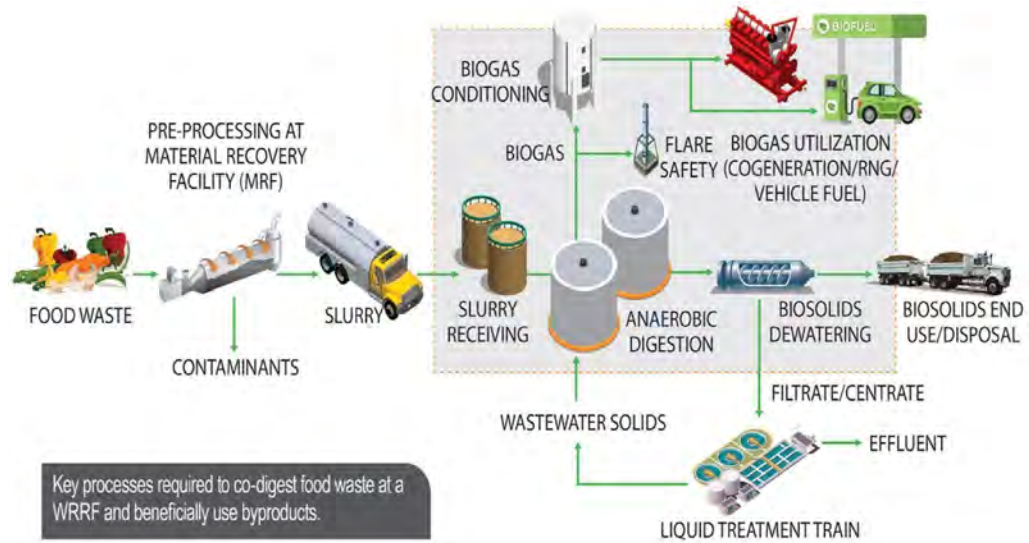


Figure 11.1. California Water Boards (June 2019). Co-Digestion Capacity in California. Carollo Engineers. <https://carollo.com/solutions/california-epa-food-waste-co-digestion-capacity-study/>

The United States lags international biogas infrastructure, with about 1,000 anaerobic digestion facilities across the nation. Europe, the world leader in biogas electricity production, features over 17,400 biogas plants (ranging from small anaerobic digesters on farms to large co-digestion plants).¹⁹²

Research suggests that using co-substrates in anaerobic digestion systems (co-digestion) may improve biogas yields by incorporating missing nutrients and diluting potentially toxic compounds of a sensitive composting system. Investments in co-digestion facility development may maximize the biogas yield of recycled organics.¹⁹³ EPA’s 2017 survey demonstrates the room for increased inclusivity of co-substrates between each of these systems. For example, only one of the surveyed WRRFs included manure substrates in the co-digestion process, while two on-farm

192 Scarlat, N., Dallemand, J. F., & Fahl, F. (2018). Biogas: Developments and perspectives in Europe. *Renewable energy*, 129, 457-472.

193 Wu, Wei. "Anaerobic co-digestion of biomass for methane production: recent research achievements." *Optimization 1* (2007): 1VS. <http://home.eng.iastate.edu/~tge/ce421-521/wei.pdf>

co-digestion facilities and ten stand-alone co-digestion facilities accepted manure waste.¹⁹⁴ More co-digestion systems at WRRFs, including those in New Jersey, may consider treating animal waste. The 1972 Clean Water Act and the European Union's 2007 REACH legislation, designed to improve the protection of human health and the environment from risks posed by chemicals, may offer some guidance on liability in incorporating livestock waste into stand-alone and industrial co-digestion processes.¹⁹⁵ The REACH regulation places responsibility on industries to manage chemical risks of co-substrates and to provide safety information on those substrates.¹⁹⁶

With about 1.13 million tons of food waste sent to landfills or incinerated across New Jersey each year, about 230,000 tons/year of processing capacity at the two existing water resource recovery facilities (WRRFs) in the state accepting food waste, and about 900,000 tons/year of additional, available organic waste processing capacity across other in-state facilities, co-digestion presents an underutilized opportunity for organic waste reduction and energy generation.¹⁹⁷ The recent NJ disposal ban and the likely favorable economics of utilizing existing WRRF digester infrastructure encourage leveraging WRRF operations as an asset in food waste management and a resource for renewable energy.

New Jersey: NJ's Trenton Renewables co-digestion facility and WRR facilities in the state collaborate with retailers, manufacturers, hospitals, and schools to divert 110k tons of food waste from landfills, reduce 480k tons of CO₂ emissions, generate 29K MWh Class I renewable power for return to the PSEG grid, and produce 23K tons of premium compost. The facility saves its partners over \$5 million in costs (transportation, handling, and disposal costs) and generates revenue from disposal fees, renewable energy credits, compost, and fertilizer. The resulting energy output is directed towards charging stations for electric tractor trailers.¹⁹⁸ Rahway Waste Management Inc (WMI) Class C waste recycling facility in Elizabeth also co-digests sewage sludge (biosolids) and liquified food waste, with a current processing capacity of 130,000 tons per year or five hundred tons per day. WMI operates a macerator to convert food waste to a liquid slurry. This slurry is then pumped into tanker trucks and is transported to the Rahway Valley Sewerage Authority wastewater treatment plant where it is injected into an existing, capitalized digester. Here, the digester capacity is better used to generate and capture renewable natural gas, which is cleaned

194 Mata-Alvarez, Joan, Joan Dosta, M. S. Romero-Güiza, Xavier Fonoll, M. Peces, and Sergi Astals. "A critical review on anaerobic co-digestion achievements between 2010 and 2013." *Renewable and sustainable energy reviews* 36 (2014): 412-427.

195 Perkins, Tom (2020). "Questions Remain about using Treated Sewage on Farms." *Civil Eats*. <https://civileats.com/2020/01/30/questions-remain-about-using-treated-sewage-on-farms/>

196 European Chemicals Agency (2021). "Understanding REACH." <https://echa.europa.eu/regulations/reach/understanding-reach>

197 New Jersey Department of Environmental Protection (2019). "Food Waste Reduction Plan." https://www.nj.gov/dep/dshw/food-waste/food_waste_reduction_plan.html

198 NJ Composting Council (October 27, 2021). *Organics Waste Management Summit, 2021*.

and returned to the PSEG utility grid. Two smaller (less than 2 tons per day) in-vessel systems are operational at Kean and Princeton Universities.¹⁹⁹

Estimates from 2015 project that, if New Jersey's food & yard waste were diverted for power generation to anaerobic and co-digestion, New Jersey could avoid over 360,000 tons of CO₂ emissions per year. Using data from NJ solid waste facilities, NJ DEPs draft Food Waste Reduction Plan from August 2019 projected that the total amount of MSW disposed of in New Jersey in 2017 was 5.8 million tons.²⁰⁰ About 22% of MSW disposed of in either a landfill or incinerator in New Jersey is food waste. Therefore, an estimated 1.3 million tons of food waste was disposed of in 2017 in New Jersey (22% of 5.8 million tons disposed). As reported by municipal tonnage recycling reports, the total weight of food waste recycled in 2017 was 161,218 tons; subtracted from the 1.3 million tons of food waste disposed of in 2017, this amounts to about 1.13 million tons of food waste sent to landfills or incinerators in NJ. According to the United States Census Bureau, 9.006 million people resided in New Jersey in 2017.²⁰⁴ This equates to 251 lbs. of food waste ((1.13 million tons food waste/9.006 million residents) x 2,000 lbs.) generated per person per year in New Jersey.

Together, the Trenton Biogas and Rahway Waste Management and RVSA anaerobic and co-digestion facilities operate at a capacity of about 230,000 tons per year.²⁰¹ With 1.13 million tons of food waste being disposed per year, this leaves about 900,000 additional tons available for processing - or nine additional facilities operating at a capacity of 450 tons/day (or seven additional facilities operating at a capacity of five hundred tons/day). While these metrics do not include the tonnage of food waste directed towards composting facilities, community gardens, or food donation, the proportion of food waste involved in those efforts will be small given the potential capacity of commercial food waste processing.

Experiences in Other States

Nebraska: University of Nebraska-Lincoln features an on-campus biodigestion project that processes cafeteria waste. University services partnered with the school's Office of Sustainability and have mobilized student support to publicize biodigestion through articles in the school

¹⁹⁹ Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

²⁰⁰ New Jersey Department of Environmental Protection (2019). "Food Waste Reduction Plan." https://www.nj.gov/dep/dshw/food-waste/food_waste_reduction_plan.html

²⁰¹ Goldstein, Nora (2021). "Large Scale Food Waste Digestion in New Jersey." Biocycle. Accessed online: <https://www.biocycle.net/large-scale-food-waste-digestion-in-new-jersey/#:~:text=Trenton%20Biogas%20opened%20in%20late,and%20unpacked%20food%20waste%20streams>

newspaper and class projects. University service workers indicate that the biodigestion facility campus biodigester reduces dumpster volume and repurposes organic waste.²⁰²

New York: In Tusten, NY, a 2018 DEC Municipal Food Scraps reduction, donation, and recycling program funded the High Solids Organic Waste Recycling System with Electrical Output (HORSE) AD25 micro-digester. HORSE can process between 25 to 175 tons of food waste per year, with larger bioenergy systems available (i.e., Nautilus). The project trains the Tusten Energy Committee on HORSE maintenance and educates RIT and SUNY Sullivan students through operating partnerships.²⁰³ By focusing on local food diversion, the project maintains a cost-benefit balance. Organizers recommend micro-digestion projects as a scalable, community-building organic waste diversion option for municipalities and businesses.

Wisconsin: Wisconsin's Fond du Lac Regional Wastewater Treatment and Resource Recovery Facility co-digests high strength organic wastes from nearby industries, saving disposal costs and fueling a cogeneration engine. The WRRF receives an average of 20,000 gallons of waste per day, primarily from dairy producers. The facility charges a tipping fee of \$20 per 1,000 gallons and uses excess biogas from those wastes to fuel its cogeneration engine and meet 40% of facility electricity needs. Once operating, co-digestion facilities may take actions to regulate the efficiency and quality of biogas produced.²⁰⁴

Monitoring PFAS Contamination

Per- and polyfluoroalkyl substances (PFAS) are an emerging issue in waste management. PFAS are found in detergents, non-stick pans, stain-resistant and waterproof fabrics, fragrances, prescription and nonprescription drugs, disinfectants, pesticides, and other manufacturing products; these ubiquitous contaminants pollute drinking water, treated wastewater, and biosolids. With varied pathways into waste streams and elevated levels of volatility, solubility, environmental mobility, and persistence, PFAS present challenges for ultimate disposal. In 2017, EPA established drinking water health advisories of seventy parts per trillion (ppt) (0.07 micrograms per liter) for the combined concentrations of PFOS and PFOA. EPA's incineration strategy for PFAS removal (1000F) exceeds the temperature threshold for co-digestion facilities (max 140F), and no standardized PFAS screening currently exists for WRRFs. The best-known mitigation strategy for these substances in wastewater is source control, or reduction of the introduction of these

202 Gilbert, J. (2020). The Role Of University Of Nebraska-Lincoln's Biodigester On Sustainable Food Waste Reduction Within Selleck Dining Center. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1260&context=enstudtheses>

203 NJ Composting Council (October 27, 2021). *Organics Waste Management Summit, 2021*.

204 Pennington, M (2021). Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018). US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

materials into the system.²⁰⁵ Some WRRFs attempt to eliminate the compounds by driving them into sludge, where they will be irreversibly bound and not available for uptake - however, this approach is not yet proven to be effective. There are no known methods for removing PFAS chemicals from composts other than to stop accepting feedstocks that contain PFAS. More optimistically, a 2019 screening of all biosolids in Maine, applying very low soil screening levels (2.5 µg/kg for PFOA and 5.2 µg/kg for PFOS), found compost derived from biosolids and food waste to be safe for reuse.²⁰⁶ Based on research conducted for this report, it appears that there would be strong value for policymakers and stakeholders to continue monitoring research related to PFAS screening, reduction, and elimination strategies as co-digestion facility development proliferates throughout the state.

Funding Opportunities

- EPA’s Sustainable Materials Management Anaerobic Digestion Funding Opportunity funds opportunities to accelerate the development of anaerobic digestion capacity and infrastructure, as an alternative to landfilling and a source of environmental benefits in the form of renewable energy and soil health improvement through digestate.²⁰⁷
- SARE northeast offers grant funding for sustainably focused research and education opportunities; these have supported co-digestion projects in other regions.²⁰⁸
- The BPU Clean energy fund provides rebates for new buildings and biomass to energy projects, like co-digestion and anaerobic digestion, as part of their Clean Energy Program, under energy efficiency incentives for commercial, industrial, and local government programs.²⁰⁹
- The New Jersey Economic Development Authority (EDA) has a long history of supporting businesses and offers a broad portfolio of economic development tools such as: jobs-based tax credits, real estate and development tax credits, community development programs, main street technical assistance, innovation economy

²⁰⁵ Schaefer, Charles (2020). “Occurrence of PFAS Compounds in US Wastewater Treatment Plants” The Water Research Foundation. <https://www.waterrf.org/research/projects/occurrence-pfas-compounds-us-wastewater-treatment-plants>

²⁰⁶ Coker, C. (2021). Managing PFAS Chemicals In Composting And Anaerobic Digestion. BioCycle. <https://www.biocycle.net/managing-pfas-chemicals-composting-anaerobic-digestion/>

²⁰⁷ US EPA (2021). *Sustainable Materials Management Anaerobic Digestion Funding Opportunity*. US Environmental Protections Agency. <https://www.epa.gov/sustainable-management-food/sustainable-materials-management-2021-anaerobic-digestion-funding>

²⁰⁸ SARE Northeast (2021). Get a Grant. Northeast Sustainable Agricultural Research and Education. Retrieved January 11, 2022 from <https://northeast.sare.org/grants/get-a-grant/>

²⁰⁹ New Jersey’s Clean Energy Program (2021). Commercial, Industrial and Local Government Programs. NJ Board of Public Utilities. Retrieved January 11, 2022 from <https://njcleanenergy.com/commercial-industrial/home/home>

programs, clean energy programs, and low-interest business financing (including bonds, loan participations, loan guarantees and variable/fixed-rate loans).²¹⁰

- Green Municipal Bonds are fixed-income securities that raise capital for use in financing or refinancing projects and activities with specific climate or environmental sustainability purposes. Green Municipal Bonds have previously funded climate resilient infrastructure related to renewable power projects, clean water projects, and energy-efficiency projects. The Climate Bond Initiative (CBI) reports that municipal green bond issuances grew from \$2 billion in 2014 to almost \$9 billion in 2019.²¹¹

Overarching Findings

Based on NJDEP estimates that about 1.13 million tons of total food waste is generated in New Jersey each year, that about 230,000 tons/year of processing capacity exists at the two existing water resource recovery facilities in the state accepting food waste, and that there are about 900,000 additional tons per year of available commercial food waste processing capacity, this Research Team recognizes the potential of developing as many as nine additional strategically located commercial scale anaerobic or aerobic composting facilities. Some portion of these facilities may lend themselves to being co-digestion facilities located at existing wastewater treatment plants. As many as nine commercial scale facilities appear needed to meet existing food waste generation and demand (at an assumed average daily permitted capacity of 450 tons per day).

State agency staff interviewed for this project indicated the benefits of considering anaerobic digestion capacity and jurisdiction-specific environmental regulations when developing co-digestion facilities. As per EPA guidance, new facilities should also monitor moisture levels, nutrient balance, and pH of incorporated solids when choosing co-digestion feedstocks.²¹² This national review affirmed the consensus reported in the SOMMP that the NJDEP could consider conducting an analysis of existing wastewater treatment plants in New Jersey to assess the potential to co-digest sewage sludge (biosolids) and food waste as currently done at the Rahway Valley Sewerage Authority/Waste management Inc. Should existing digester excess capacity exist, the state might also consider opportunities for high technology composting mechanisms as a means of organic waste recycling and biogas generation, to make best use of existing capitalized environmental infrastructure. NJDEP might consider including a screening for PFAS

210 New Jersey Economic Development Authority (2021). Financing and Incentives: NJ Economic Recovery Act. Retrieved January 11, 2022 from <https://www.njeda.com/financing-and-incentives/>

211 Brennan, Marissa (2020). Growing the US Green Bond Market: Lab 2. Financial Innovations Lab. Milken Institute. https://milkeninstitute.org/sites/default/files/reports-pdf/MI_GreenBondsLab_FINAL%20WEB.pdf

212 AgStar (September 2012). Increasing Anaerobic Digester Performance with Co-Digestion. <https://www.epa.gov/sites/default/files/2014-12/documents/codigestion.pdf>

in this analysis and could create a technical brief for PFAS management at co-digestion facilities comparable to the EPA brief for PFAS waste streams.²¹³

The research team also heard from state contacts (specifically, in Illinois and New Jersey) of the benefits of developing biodigester, anaerobic digestion, and co-digestion systems on university campuses, prisons, and farms. These ecosystems ensure a constant organic waste source and nutrient balance, reduced transportation costs, an outlet for the energy produced, and an existing workforce to assist with engineering and operation.

Technical education centers, such as the UIC TEACH AD, may assist with feasibility analyses to select locations for additional New Jersey co-digestion facilities. Feasibility studies may involve identifying a source of funding (federal, state, or corporate) to subsidize competitive tipping fees and added transportation costs. By seeking financial support and subsidies from the government, local businesses, and EPA grants, new facility developments may reduce the burden of negotiating competitive tipping fees and organizing transportation.

213 Environmental Protection Agency (February 2020). *Technical Brief: Per- and Polyfluoroalkyl Substances (PFAS): Incineration to Manage PFAS Waste Streams*. https://www.epa.gov/sites/default/files/2019-09/documents/technical_brief_pfas_incineration_ioaa_approved_final_july_2019.pdf

Research Initiative 12

Available Metrics on Animal Manure Management

Description of Research Initiative

In response to Core Opportunity 15 of the SOMMP,²¹⁴ a request to logically consider regional management of manure and generate metrics on its generation, final use, and disposal, this research initiative reviews available metrics of manure management across states. According to EPA data, manure management contributes to 10% of US methane emissions. Emissions from ruminant animals contribute another 27%.²¹⁵ Land application of manure as fertilizer enhances soil physical properties such as water-holding capacity and microbial properties, reduces soil dependence on fertilizer, and diminishes runoff. An excellent source of nitrogen, phosphorus, and potassium, livestock waste fertilizer complements soil acidity levels, increases soil organic matter, and conserves costs.²¹⁶ As an opportunity for organic waste reduction, improvements to animal manure recycling practices would enable the agricultural sector to reclaim soil nutrients; as an opportunity for greenhouse gas emissions reduction, improvements to manure management practices could reduce the methane emissions of the agricultural sector and even generate renewable energy.

Background Information and New Jersey Context

National reviews, such as the EPA's 2021 survey of co-digestion facilities, track the uses of manure substrates as a renewable energy source. As detailed in Research Initiative 11, only one WRRF surveyed by EPA included manure substrates in the co-digestion process. While two on-farm co-digestion facilities and ten stand-alone co-digestion facilities accepted manure waste.

All states regulate animal manure management, but few monitor the environmental or economic impacts of manure use as a fertilizer or fuel source. State-specific Nutrient Management Plans and Comprehensive Nutrient Management Plans require farmers to report their livestock units and manure management strategy, along with any areas of special concern. Farms manage

214 Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

215 Environmental Protection Agency. (2021). Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2019. The Agency. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019>

216 Risse, L. M., Cabrera, M. L., Franzluebbbers, A. J., Gaskin, J. W., Gilley, J. E., Killorn, R., ... & Zhang, H. (2006). Land application of manure for beneficial reuse.

manure individually, depending on their size and proximity to cropland. Due to the types of farms and livestock most common in New Jersey, manure generation and management (storage on-site or off-site, and ultimate use as fertilizer or compost) is highly variable depending on the farm and the time of year.

New Jersey: A 2020 inventory shows that New Jersey has some 9,900 farms with 750,000 acres of land in farm operation. The livestock inventory provides that there were 8,600 cows raised for beef, 4,400 cows producing milk and 7,500 hogs. Census data from 2017 indicates that there are 11,000 goats on 1,000 farms, 23,374 horses across 2,754 farms, 1,631,775 egg laying chicken across 1,986 farms, and 25,331 meat chickens across 175 farms. This amounts to 1.13 farms per mile in the state or 13% of state land acres in farms; New Jersey ranks 45th of all states in amount of total farmland, contributing to 0.08% of US land in farms.²¹⁷ New Jersey's livestock inventory sits at 5.03 livestock per square mile, including horses. Comparisons of farmland composition and livestock density across states suggest that Rhode Island (8% of state land acres in farms; 5.35 livestock per square mile), New Hampshire (7% of state land acres in farms; 4.42 livestock per square mile), Massachusetts (7% of state land acres in farms; 0.60 livestock per square mile), Connecticut (10% of state land acres in farms; 13.53 livestock per square mile), and Maryland (25% of state land acres in farms; 23.57 livestock per square mile) could serve as reference points for manure recycling in New Jersey. Livestock per square mile are measured as cattle and hog livestock and exclude counts of chicken livestock.²¹⁸

Experiences in Other States

Rhode Island: A Rhode Island analysis estimated the average annual cost of manure and wastewater handling and storage before re-application to land as fertilizer as \$2,509 per farm, with the highest cost for fattened cattle farms (\$9,112 per farm) and for turkey farms (\$7,940 per farm).²¹⁹ Rhode Island accounts for 0.01% of total US farmland, with about 8% of land acres in farms (60,000 acres).²²⁰ Given New Jersey's 2017 census count of 9,900 farms and Rhode Island's estimate of \$2,509 average annual cost of manure handling per farm, this would amount to about \$25 million in manure handling costs across farms in the state of New Jersey.

217 Cook, Ross (January 2, 2022). "NASS/USDA: Ranking Of States With The Most Land In Farms." Beef2Live. <https://beef2live.com/story-states-land-farms-ranking-1-50-90-113145>

218 United States Department of Agriculture: National Agricultural Statistics Service (2017). "2017 Census of Agriculture." <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

219 Meyer, D. E. (2004). *Costs Associated With Development And Implementation Of Comprehensive Nutrient Management Plans* (Cnmp) (No. 1448-2016-119559).

220 United States Department of Agriculture: National Agricultural Statistics Service (2017). "2017 Census of Agriculture." <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

Colorado: Other states provide additional manure metrics that may guide information that New Jersey collects in a potential inventory or audit. A Colorado survey of farmer’s perceptions of the fiscal impact of cattle manure indicated that farmers value manure fertilizer between \$0.95 and \$3.00 per ton, depending on transportation costs.²²¹

North Carolina: A North Carolina case study of one hog farm estimated that typical North Carolina farrow-wean operation with 4,000 sows produces about 28,800 gallons of manure and excess water per day. The farm in question repurposed 144 gallons (about 5%) of this waste material towards fertilizer, at a calculated savings in fertilizer costs of about \$160 per year.²²²

Overarching Findings

This national review encourages revisiting the offer from members of the Organics Workgroup to work with the Department of Agriculture, SADC, the Rutgers Agriculture Experiment Station, and the Farm Bureau in assembling a basic inventory of manure management across New Jersey. This audit might include reviewing farm nutrient management plans for manure by animal type (horses, cows, pigs, etc.).

Recurring themes in conversations with state contacts include the sensitivity of soil to manure nutrient content and the lower economic value of manure as a renewable energy source. These observations, in addition to an awareness that independent, small farmers feature as the predominant farm type in New Jersey, suggest that manure management strategies may have a proportionally lower impact on organic waste and methane reduction relative to other Research Initiatives included in this report. Some NJ sewage authorities suggest that manure has lower biogas energy potential but may be incorporated into anaerobic digestion for biogas production to maximize its value as an energy source.

More research is needed to quantify the potential environmental and economic benefits of manure management in this state, as well as the consequences of improper management. NJ organics material management strategies could address other Research Initiatives until an audit of NJ manure management practices identifies a better understanding of how manure management strategies interact with the New Jersey agricultural sector. In the meantime, NJ might consider contacting representatives at in-state co-digestion facilities, including those at WRRFs, to encourage them to treat animal waste.

221 Stroheim, E. V., & Hoag, D. L. K. (2021). Valuing Cattle Manure as an Agricultural Resource for Efficiency and Environmental Sustainability. *Sustainability*, 13(16), 9375.

222 Williams, C. M., Zering, K., & Wohlgenant, M. (2005). APPENDIX B. 1 July 2005 (update of October, 2004 version) Cost and Returns Analysis of Manure Management Systems Evaluated in 2004 under the North Carolina Attorney General. *update*.

Research Initiative 13

Experience with Regional Manure Management Facility Development

Description of Research Initiative

Research Initiative 13 responds to Core Opportunity for Action 16,²²³ a request to collect state examples of regional manure management facilities. In an effort to inform evidence-based policies to regionalize animal manure handling, this research initiative conducts a review of national practices in manure management to re-evaluate regional systems for NJ.

Nation-wide guidance exists on regional manure management facility development. USDA Agricultural Waste Field Management handbooks offer general recommendations and standards for manure storage systems.²²⁴ The EPA also shares a compendium of state approaches to manure management²²⁵ and the USDA National Resources Conservation Service provides free publications as part of its Distribution Center.²²⁶ More specialized communications, like Livestock and Poultry Environmental Learning Community and the National Hog Farmer report, supported by the USDA National Institute of Food and Agriculture, produce guidance for smaller scale farms.²²⁷ These recommendations can be tailored to the needs of the farmer and region, depending on manure type, farm size, climate, or other factors.

At the state level, local publications and University Agricultural Extensions share best practices and resources for manure management (i.e., Animal Manure Management Issues of Texas, On Farm Food Safety of Rutgers, Rutgers NJAES fact sheets²²⁸). These brochures support state level communication across farmers about manure management issues. In states with high acreage, intensive animal farms near farmland, on-farm co-digestion, and aerobic composting strategies allow farmers to localize their livestock waste management practices and produce

223 Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

224 US Department of Agriculture (2013). Agricultural Waste Management Field Handbook: Resources for Planning and Designing Animal Waste Facilities. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1144223.pdf

225 United States Environmental Protection Agency (2020). Compendium of State Approaches for Manure Management. <https://www.epa.gov/npdes/compendium-state-approaches-manure-management>

226 "What is the NRCS Distribution Center?" USDA National Resources Conservation Service Distribution Center. <https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?cid=stelprdb1045532>

227 Livestock and Poultry Environmental Learning Community (March 2019). *Off-farm Manure Disposal*. USDA, Extension Foundation. <https://lpec.org/off-farm-manure-disposal/>

228 New Jersey Agricultural Experiment Station. "Animal Agriculture Publications." Accessed online: <https://njaes.rutgers.edu/pubs/>

high quality fertilizer. The EPA AgStar program cites over 263 anaerobic digester facilities operating on livestock farms in the U.S, which are primarily used for manure management.²²⁹

In Oklahoma, all manure is aerobically treated and eventually land applied as fertilizer. Along the west coast, regional organizations like AgStar²³⁰ and Regenis support aerobic digester systems to manage manure waste on larger farms.²³¹

Experiences in Other States

Anecdotal reports of manure management facility development offer a glimpse of some low-maintenance and creative manure management successes, from shallow settling bins to dumpsters to greenhouses to flush and weeping wall systems. On-farm co-digestion systems reduce transportation costs, generate energy, and enhance the nutrient value of manure for use as compost.

California: In California, the CalBioGas Kern County biogas cluster is the recipient of a Dairy Digester Research grant. A network of eight dairy farms earned grant funds to build on-farm digestion systems. Each dairy sends methane captured from the newly constructed dairy digesters into a central upgrading facility; the methane is then upgraded to renewable natural gas and returned to the local gas utility's pipeline to be used as a fossil fuel alternative in heavy-duty trucks and buses.²³²

As discussed in Research Initiative 5, Wilgenburg West dairy farm earned funding from California Climate Investments' Alternative Manure Management Program (AMMP), a product of California's cap-and-trade auction proceeds, to implement a cement compost pad and vacuum suctioning system. The system retrieves slurry manure from cow lanes and places the wet manure onto windrows of drier manure in a graded compost cement pad. The slanted compost pad captures water runoff from the facility and compost yard and allows for annual composting. The project improved the management of 70% of manure, enabled the production of six hundred tons of compost per year, and reduced the equivalent to 4,325 metric tons of carbon dioxide over five years.²³²

229 Pennington, M (2021). *Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018)*. US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

230 US Environmental Protection Agency (2021). AgSTAR: Biogas Recovery in the Agriculture Sector. <https://www.epa.gov/agstar>

231 Regenis (2021). Anaerobic Digesters Overview. <https://www.regenis.net/features/>

232 California Climate Investments (April 2021). Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds: Greenhouse Gas Reduction Fund Monies. http://ww2.arb.ca.gov/sites/default/files/auction-proceeds/2021_cci_annual_report.pdf

Texas: Sierra Dairy of Dublin, Texas expanded its farm in 2005 to feature an economical flush and weeping wall waste separation system.²³³ Weeping wall systems are a simple, low-cost form of effluent management in which water and organic waste are flushed through a series of settling basins. Holes at the bottom of each settling basin separate liquid runoff, with the effluent “weeping” through the basin walls by gravity. Liquid is then pumped back to a central water source for reuse in “flushing” manure waste from barn areas or used as irrigation on farmland. This process reduces the volume of livestock waste and repurposes parts of the waste stream as fertilizer. At Sierra Dairy, this weeping wall system allowed the farm owners to recycle much of their bedding and repurpose the liquid waste as irrigation, with low costs for maintenance and transportation.

Western Regional Facilities: Regenix promotes eleven dairy digester projects across Washington, California, Oregon, and Idaho. The organization offers dairy manure digesters, wastewater treatment systems, and nutrient recovery technology. Energy from digesters meets on-farm energy needs and can be resold to the energy grid for biogas credits. These projects remove phosphorus and nitrogen from the liquid waste stream, allow for precise nutrient application to crops, and reduce the amount of liquid hauled off the farm.²³⁴

In 1980, the owner of a 1,000-head sow farrow-to-finish operation (an operation that raises hogs from birth to slaughter) in the West covered a portion of his existing lagoon to collect methane for on-farm energy applications. The collected methane now fuels a 75-kilowatt engine generator, and waste heat is used for space heat and grain drying. The investment reduced annual operating costs at the facility by \$36,000, providing a 34-percent annual rate of return.²³⁵

Funding Opportunities

- Delaware Department of Agriculture's Nutrient Management Relocation Program, which reimburses farmers \$0.16 per mile per ton (up to \$18 per ton) to transport manure from areas of excess manure to areas in need, can ease transportation burdens related to the land application of manure. Reimbursements also apply to farms sending manure to Perdue AgriRecycle facilities, Delaware’s primary large-scale litter pelletizing facility.²³⁶

233 Mettler, D. (2009). *No Weeping over this System*. Manure Manager. <https://www.manuremanager.com/no-weeping-over-this-system-2556/>

234 Regenix (2021). *Anaerobic Digesters Overview*. <https://www.regenix.net/features/>

235 Natural Resources Conservation Service Texas (1995). *Animal Manure Management*. United States Department of Agriculture. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/technical/dma/rwa/?cid=nrcs143_014211

236 US Environmental Protection Agency (2017). *Non-Regulatory Tools, Guidance and Support Programs: Delaware Manure Relocation Program*. https://www.epa.gov/sites/default/files/2017-01/documents/b_delaware_manure_relocation_program.pdf

- In Nebraska, private companies like Settje manure management offer in-state manure transportation and storage, closing transportation gaps in the economy of manure recycling. The Settje group coordinates resale of over one million tons of manure annually, serving over five hundred farmers and livestock producers throughout the Midwest.²³⁷
- Pennsylvania offers between 50% and 75% of project costs in the form of state tax credits for up to \$250,000 per operation as part of its Resource Enhancement and Protection (REAP) Program, as described in the NJ SOMMP. Farmers, landowners, and businesses earn tax credits for implementing "Best Management Practices" (BMPs) that will enhance farm production and protect natural resources.
- In New Jersey, the USDA's Environmental Quality Incentives Program (EQIP) offers financial and technical assistance to implement conservation practices on eligible agricultural land.²³⁸ Individuals or organizations engaged in the management of an agricultural or forestry operation apply for program funding, with maximum payments of \$300,000 as per the 2008 Farm Bill.
- The NJ Conservation Reserve Enhancement Program (CREP) offers funds to help farmers conserve land and water resources through sustainable manure management facilities.²³⁹ With support of \$100 million in federal funds and state matching, CREP funding covers 100% of costs to establish conservation practices, manage annual rental processes, and offer incentive payments.

Emerging Research

Contemporary research points to the potential for small-scale manure nutrient recycling systems to produce high quality fertilizer directly on farms. Local alternatives to regional manure hauling and composting include pyrolysis to generate biochar fertilizer and on-farm reactors and wetland treatment systems to produce struvite. Biochar is a charcoal-based fertilizer produced through heat and pressure gasification of manure. Struvite is a high nutrient phosphate mineral generated through pyrolysis; a thermal process used to reduce organic waste to phosphate crystals. These strategies enhance the water holding capacity of the soil, improve crop yield, and maintain nutrient balance across multiple rounds of land-application, maximizing the nutrient and energy

237 Settje Agri-Services & Engineering, Inc (2021). *Manure Management*. <https://settje.com/manure-management/>

238 Natural Resources Conservation Service New Jersey (2021). *Environmental Quality Incentives Program*. US Department of Agriculture. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/nj/programs/financial/eqip/>

239 Farm Service Agency (2021). *Conservation Reserve Enhancement Program*. United States Department of Agriculture. <https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index>

value of manure compost.²⁴⁰ Biochar can also be used for animal bedding and in construction projects as cement and stone veneer. Some progress is already being made on biochar use in NJ; as discussed in the NJ SOMMP, the Aries Linden Biosolids Gasification Facility will process 430 tons of biosolids daily into twenty-two tons of biochar, generating clean renewable energy and a concrete amendment.²⁴¹

Struvite also presents an ecologically competitive alternative to traditional fertilizer. The pyrolysis process produces struvite crystals, which restore much of the phosphate and ammonium balance to animal livestock waste or digestate. A 2017 SARE grant to a Rutgers graduate student team supported research into struvite production from an Aerated Fluidized Bed Reactor combined with Constructed Wetland Treatment. The treatment process reclaimed dairy-lagoon wastewater effluent to reduce livestock farm operation costs and control phosphorus levels of manure fertilizer.²⁴² These developing technologies related to on-farm digesters, pyrolysis, and struvite production present opportunities to increase the nutrient yield and decrease the transportation costs of manure management processes. Stakeholders may consider incremental changes to support manure management in the state (such as financial support for manure transportation or farmer-specific communication) as this technology is refined.

New Jersey: The decentralized nature of New Jersey farms and small size of farming operations present a unique opportunity for manure management. Horse manure is the primary form of livestock waste in NJ; most manure waste is collected and managed in dumpsters or piles on-site for later hauling. A handful of manure haulers currently meet the in-state demand of livestock waste. Centralized local composters like Slope Brook Farm, Honey Brook Farm, Down2Earth Farms and Freehold Cartage, a solid waste hauling company, collect livestock waste for resale as fertilizer. Some manure is transported as far as Pennsylvania, where it is used as compost on mushroom farms. Conversations with in-state animal waste scientists reflect on the low level of in-state demand for manure fertilizer and the high volume of manure waste. Demand may be increased by enhancements to the nutrient quality of manure fertilizer through changes to livestock bedding or feed; alternatively, the supply of manure could be more easily diverted to areas in need of manure fertilizer through financial support for transportation.

240 Rehman, A., Nawaz, S., Alghamdi, H. A., Alrumman, S., Yan, W., & Nawaz, M. Z. (2020). Effects of manure-based biochar on uptake of nutrients and water holding capacity of different types of soils. *Case Studies in Chemical and Environmental Engineering*, 2, 100036.

241 Redling, Adam (2019). "Aries Clean Energy breaks ground on New Jersey gasification facility." Waste Today. <https://www.tapinto.net/towns/linden/sections/green/articles/aries-clean-energy-breaks-ground-inlinden>

242 Rabinovich, A (2018). *Reclamation of nutrients and irrigation waters from livestock wastewater*. Sustainable Agricultural Research and Education. <https://projects.sare.org/project-reports/gne17-158/>

Overarching Findings

The research team heard from animal livestock waste scientists in several states (New Jersey, Texas, and Massachusetts) encouragement of on-farm reapplication of livestock waste as fertilizer after aerobic treatment. Contacts also mentioned the benefits of farmers relying on straw for bedding, since hay ferments more easily and facilitates later composting.

State agency contacts reinforced the benefits of offering state tax credits for farms and businesses to develop projects that centralize manure management, in keeping with best management practices to protect natural resources (like the PA REAP program or Delaware's manure transportation tax credit of \$0.16 per mile per ton). This may include subsidies or tax breaks to farms that recycle manure waste through on-farm co-digestion projects, slurry systems, or composting.

The NJ Department of Agriculture might consider creating grant funding opportunities specifically for Animal Waste Management/Non-Point Source Pollution; currently, the NJDA website features a page section for this topic but indicates that no grants are available. The Department of Agriculture could also provide grant funding for animal waste management research (designed for research in pyrolysis, biochar, and struvite) and on-farm co-digestion systems.

NJ might consider leveraging communication on animal agriculture and management to facilitate collaboration between independent farmers and increase farmer awareness of grant and manure collection opportunities. NJAES fact sheets could promote existing national grant opportunities for on-farm co-digestion projects, as well as precision agriculture grants like EQIP and CREP to fund infrastructure development. Magazines or emailed newsletters may celebrate and increase awareness of centralized composting services with manure collection options (Freehold Cartage, Down2Earth farms, and Slope Brook Farm).

Conversations with state contacts also echoed suggestions in the SOMMP to engage state stakeholders such as Northeast Organic Farming Association of New Jersey, New Jersey Equine Advisory Board, New Jersey Horse Council, and New Jersey 4-H to identify barriers to sustainable manure management.

Additional Research Initiative

Reimagining Prison Food Systems

Description of Research Initiative

This research initiative was added by the Research Team to the 13 Research Initiatives outlined by the Organics Workgroup. Throughout the research process, there were several examples found of projects aimed at improving prison food equity through gardening and composting initiatives and a new research initiative was created to accommodate these examples.

Background Information and New Jersey Context

Food equity in the prison system, along with the potential for gardening and composting on prison grounds, are topics that repeatedly surfaced throughout the research process despite not being an intended Research Initiative. Prisons are highly regulated environments that house some of the most vulnerable members of society, and the cost of providing meals coupled with a low regard for the wellbeing of inmates has resulted in insufficient and low-nutritional quality food offered to the prison population.²⁴³ IMPACT/JUSTICE released its *Eating Behind Bars* report which states:

Lower-income communities of color, where affordable healthy food is scarce, disproportionately lose members to prison and then struggle to support them when they return home in worse health. In this way, prisons function as out-of-sight food deserts, perpetuating patterns of poor health in communities that already experience profound inequities.²⁴⁷

Prison reformers believe that people go to prisons as punishment, not to be punished and that inferior quality or insufficient food should never be used as a punishment.²⁴⁴ Several prison systems are reimagining their internal food systems to implement gardening and/or composting programs that can have multiple positive outcomes including improving health and wellbeing of inmates, cutting costs of meals and waste hauling, and reducing organic waste. “It’s easy to blur the lines between “*rehabilitative training*” and “*forcible slave labor*””²⁴⁵

²⁴³ Soble, L., Stroud, K., & Weinstein, M. (2020). *Eating Behind Bars: Ending the Hidden Punishment of Food in Prison*. Impact Justice. impactjustice.org/impact/food-in-prison/#report

²⁴⁴ Rogers, K. (2015, September 23). *When Prison Food Is a Punishment*. Vice. <https://www.vice.com/en/article/539n3d/when-prison-food-is-a-punishment>

²⁴⁵ Borrás, J. (2021, January 21). *Composting Goes Hard Core - in Prison*. Insteading. <https://insteading.com/blog/composting-goes-hard-core-prison/>

and designing and implementing programs should have the primary goal of improving the physical and psychological well-being of inmates, while other potential benefits like cost savings and waste reduction should be viewed as secondary outcomes.

No examples of composting or gardening programs were found in New Jersey state prisons which are run by the NJ Department of Corrections. There is a program called The New Jersey Scholarship and Transformative Education in Prisons (NJ-STEP) which is a collaboration of higher education institutions and the NJ State Parole Board and NJ Department of Corrections, though they do not specifically mention anything about prison education specifically related to sustainability, such as gardening or organic waste managements.²⁴⁶

Experiences from Other States

Examples of prison programs aimed at gardening and/or waste reduction include:

Pennsylvania: The Philadelphia Department of Prisons runs a Food Recovery and Composting²⁴⁷ programs where inmates are trained in on-site composting (aerated static piles) and food recovery practices. The program is part of a vocational certificate program in urban farming and landscaping that fulfills work training objectives. Removing food scraps from the waste stream saves the city tens of thousands of dollars annually in disposal fees. The finished compost is used in the prison's greenhouses and orchard, and excess compost is donated to community projects. Produce from the greenhouses and orchards is also used in prison meals and excess is donated. 685 tons of food waste per year have been diverted into compost throughout citywide prison composting programs, saving the city over \$40,000 in landfill costs.²⁴⁸ Funding has been provided with grants from the US EPA and Philadelphia Office of Sustainability.

Washington: The Washington State Reformatory in Monroe, WA²⁴⁹ offers a vermicomposting program where inmates learn to construct vermicomposting bins and compost food scraps. Finished compost and compost tea (nutrient and microbe-rich water that has leached out of compost and can be used as liquid fertilizer) are used in prison gardens and extra is used by other government institutions. Inmates are included in every step of the process, including writing

246 The New Jersey Scholarship and Transformative Education in Prisons. (n.d.). *About NJ-STEP*. Rutgers University School of Criminal Justice. <https://njstep.newark.rutgers.edu>

247 Center for EcoTechnology. (n.d.). *Wasted Food Solutions: Spotlights from Philadelphia*. <https://wastedfood.cetonline.org/wp-content/uploads/2020/02/Zero-Waste-Philly-Spotlights.pdf>

248 McKeever, A. (2016, October 17). *Philadelphia's Prison System is Fighting Food Waste and Recidivism with an Organic Farm*. Civil Eats. <https://civileats.com/2016/10/17/philadelphias-prison-system-is-fighting-food-waste-and-recidivism-with-an-organic-farm/>

249 Bush, K., Heinitz, E., Pacholke, D., Sinclair, S., Trivett, J., & Vanneste, J. (2015, September 17). *Department of Corrections Walks the Walk On Sustainability*. BioCycle. <https://www.biocycle.net/department-of-corrections-walks-the-walk-on-sustainability/>

instruction manuals and guidebooks, so they can learn various transferable skills. They also learn skills related to organic plant care, which is a growing business and can help prepare them for a job when they are released. This program saves the prison about \$7,800 annually through reduced disposal fees. This is part of Washington State's Sustainability in Prisons Project.

Oregon: The Oregon State Lettuce Grow Program²⁵⁰ offers gardening and horticultural education to adult and juvenile inmates. It is a partnership between volunteers, food leaders, employers, community partners, local universities, the Department of Corrections, and the Federal Bureau of Prisons. The program offers classes on sustainable gardening, greenhouse management, and culinary arts. Inmates can receive a Certificate of Home Horticulture, which is a recognized Oregon job credential. Produce is used for prison meals and extra is donated to food banks. The rate of recidivism among Lettuce Grow students is 3%, compared with the national average of 70% and the Oregon average of 30%.

Prisons have also been sites for successful co-digestion facilities. In 2012, the Federal Bureau of Prisons purchased 76 Eco-Safe Digesters from BioHitech America as part of a commitment to organics recovery goals. As of 2021, prisons were the source of 8% of food waste processed for co-digestion at Wastewater Resource Recovery Facilities, with five facilities receiving feedstock from prisons.²⁵¹

Overarching Findings

Prison systems are being used as sites for organic waste management for both financial reasons (lowered waste disposal fees associated with removing organics from the waste stream) and for inmate workforce training opportunities. Programs can be carefully designed and implemented to create a more sustainable prison food system through gardening and composting programs and, if partnered with local colleges, inmates can earn credits towards certificate programs or degrees which can be helpful for acquiring jobs after release.

250 Growing Gardens. (2022). *What is Lettuce Grow?* <http://www.growing-gardens.org/lettuce-grow/>

251 Pennington, M. (2021). *Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018)*. US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

Final Review and Key Findings

Conclusion

Sustainable organic material management represents an integral part of this country's fight against climate change and can be reinforced throughout the community, commercial, institutional, and industrial sectors. Organic waste contributes to 30% of the municipal solid waste stream and 14% of US methane emissions;²⁵² food waste alone amounts to 22% of the entire municipal solid waste stream,²⁵³ with 40% of the US food supply uneaten.²⁵⁴ The 133 billion pounds of food wasted in the US every year results in a current conservative estimate of \$161 billion retail and consumer loss.²⁵⁵ The fight to curb organic and food waste begins at the state and local level, as initiated by the NJDEP's Global Warming Response Act to reduce state greenhouse gas emissions to 80% of 2006 levels by 2050.²⁵⁶ Each of these Research Initiatives interacts to create a circular system of organic waste reduction in New Jersey, with avenues for minimization at each tier of the waste reduction hierarchy and unique opportunities for involvement from existing in-state networks.

The purpose of this research project was to investigate leading programs and policies in other states, present lessons learned, and provide information to New Jersey policymakers and program directors that can assist decision-making efforts to reduce organic waste, greenhouse gas emissions, and food insecurity. Based on a review of national and in-state organics practices related to 13 Research Initiatives outlined in this report, this Research Team highlights increased state funding (for food equity advocacy networks, food rescue transportation, and food rescue infrastructure), food policy council creation, tiered community composting permitting, co-digestion facility development, produce prescription programs, and opportunities for food recycling in school systems as mutually reinforcing, high-reward opportunities for organics waste policy improvement in the state. Viable funding strategies include tax credits, national, state, and county grant

252 US Food and Drug Administration. April 2021. "Food Loss and Waste." <https://www.fda.gov/food/consumers/food-loss-and-waste>

253 Sandson, K., Broad Leib, E., Macaluso, L., & Mansell, C. (2019). *Bans And Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws*. *The Harvard Law School Food Law and Policy Clinic: Cambridge, MA, USA*.

254 Gunders, D. (2017). *Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill*. Natural Resources Defense Council, 26, 1-26.

255 US Environmental Protection Agency. July 2021. "National Overview: Facts and Figures on Materials, Wastes and Recycling." <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

256 New Jersey Department of Environmental Protection. 2020. "NJDEP Global Warming Response Act 80 x 50 Report." <https://www.state.nj.us/dep/climatechange/mitigation.html>

programs, bonds, trust funds, rebates, fees, pay as you throw initiatives, cap-and-trade programs, and public-private partnerships. Universities, school districts, and state facilities like hospital systems and prisons offer centralized community hubs and involved workforces that will create space for these programs.

By targeting the opportunities for action in each of these Research Initiatives, New Jersey has the potential to meet the national goal of reducing waste by 50% by 2030 and the state goal of reducing GHG emissions by 80% of 2006 levels by 2050. Through collaborative action, NJ can transform its economy of organic waste management and contribute to a more sustainable future.

Next Step Considerations

- Research Initiative 1: Food Equity: Aligning State Programs to Address Food Insecurity:** Government funding creates an element of sustainability and organization among food equity networks. State funding could contribute to a BIPOC-led, community-accountable Food Justice Network and create Community Participatory Grant Funding for grassroots food systems work. To contribute to sustainability among food equity networks, state funding could consider partnering with the Fair Food Fund to increase access to healthy food. New Jersey could also consider funds and advocacy networks for BIPOC and agricultural worker communities.
- Research Initiative 2: Develop Central Governance in Food Systems - Food Policy Councils:** Food Policy strategies in other states indicate the importance of including food waste prevention in zoning and planning decisions, agricultural plans, and food equity plans. The New Jersey Democracy Collaborative (NJFDC) is well poised to take on the role of a statewide FPC.
- Research Initiative 3: Review of Food Rescue Actions Taken by Healthcare Providers:** Community health needs assessments, produce prescription programs, and community benefit programs allow healthcare providers to engage with food equity, food security, and food rescue. New Jersey could take greater advantage of the untapped potential for support and funding from in-state healthcare providers.
- Research Initiative 4: Food Rescue Transportation, Refrigeration and Equipment Assistance:** Learning from out-of-state systems, New Jersey can improve access to food rescue infrastructure by encouraging existing sponsorship opportunities from corporations that support refrigeration and transportation. State-supported grant opportunities and infrastructural investments can facilitate an already powerful network of community-based food rescue and donation initiatives across the state.
- Research Initiative 5: Progressive Financial Assistance Programs for Food Rescue, Small-Scale Facility Development, and Large-Scale Facility Development:** A review of national financial assistance programs for food rescue and facility development

indicate that tax credits, national, state, and county grant programs, bonds, trust funds, rebates, fees, cap-and-trade programs, and public-private partnerships are effective ways to advance food equity. California offers a progressive example of financing.

- **Research Initiative 6: Organics Education and Outreach:** Community-based, accessible, and economically oriented education and outreach materials targeted to specific populations - advanced sector, higher education, and K-12 school systems - may help industries comply with organics waste bans. State policy leaders could consider outsourcing this outreach effort to a contracted professional organization and complementing education with food waste tracking systems and technical assistance.
- **Research Initiative 7: Share Table Legislation in Other States:** Conversations with state agency members and a review of policy records indicate that standardized state share table procedures facilitate source-reduction of food waste in school systems across the nation. This research team heard from several state contacts that effective share table policy includes unambiguous guidance and support for share table procedures to encourage district implementation of share table programming.
- **Research Initiative 8: Small-Scale Composting Exemptions:** NJ might consider implementing a tiered composting system, with large-, medium-, and small-scale composting services, and implementing permit exemptions for urban agriculture and associated small-scale composting systems. Networks of composting cooperatives engage community members and educate the public about the benefits of composting.
- **Research Initiative 9: Example State Programs for Expedited Permitting of Windrow Composting Facilities:** A review of national programming yields few reference points for expedited windrow composting. In general, the composting process could be more streamlined, with plainspoken permitting guidance documents and regional permitting officials to clearly explain different requirements. Simplifying the composting permitting process could encourage more community participation in a low-maintenance strategy to recycle organic waste. Because this review found few state programs for expedited permitting of windrow composting facilities, the state may consider focusing on other practices outlined in this report that may yield more time and resource effective reductions in organic waste.
- **Research Initiative 10: Food Rescue Policy Assessment:** Few states utilize executive orders to advance food rescue beyond legislation issued at the national level. Oregon has issued executive order 20-04, and other states offer in state tax incentives to promote participation in food rescue. Executive orders could support improvements to New Jersey food rescue liability protection and food donation incentives. This topic area requires further communication with out-of-state policy leaders and in-state policy networks to identify what policy would be most beneficial. Because this review found that few states utilize executive orders to advance food rescue, New Jersey could

consider focusing on other practices outlined in this report until after implementation of other practices outlined in this report.

- Research Initiative 11:** Review of Track Record of Co-Digestion Facilities Nationally: Based on NJDEP estimates that about 1.13 million tons of total food waste is generated in New Jersey each year, that about 230,000 tons/year of processing capacity exists at the two existing water resource recovery facilities in the state accepting food waste, and that there are about 900,000 additional tons per year of available commercial food waste processing capacity, this Research Team recognizes the potential of developing as many as nine additional strategically located commercial scale anaerobic or aerobic composting facilities. The research team also heard from state contacts (specifically, in Illinois and New Jersey) of the benefits of developing biodigester, anaerobic digestion, and co-digestion systems on university campuses, prisons, and farms.
- Research Initiative 12 & Research Initiative 13:** Available Metrics on Animal Manure Management & Experience with Regional Manure Management Facility Development: This research team heard from in-state and out-of-state agricultural scientists that the types of farms and livestock most prevalent in New Jersey complicate state inventories of animal waste and suggest the lower value of policy efforts to centralize regional manure management facilities, given speed of implementation and financial returns. As most farm managers handle animal manure independently onsite, NJ may wait to pursue these Research Initiatives until technology related to on-farm manure fertilizer production develops further. As research progresses, the Department of Agriculture could consider state-specific funding, transportation reimbursement programs, and communication to promote opportunities for recycling, diversion of manure waste, and regional manure facility development.
- Additional Research Initiative: Reimagining Prison Food Systems:** Prisons are highly regulated environments that house some of the most vulnerable members of society. Several prison systems are reimagining their internal food systems to implement gardening and/or composting programs that can have multiple positive outcomes, including improving health and wellbeing of inmates, cutting costs of meals and waste hauling, and reducing organic waste. Gardening and composting programs also improve sustainability in the prison system and teach inmates skills that can be applied to “green economy” jobs when they are released. New Jersey could work with the NJ Department of Corrections and The New Jersey Scholarship and Transformative Education in Prisons (NJ-STEP) program to implement gardening and composting programs in state prisons, borrowing from Washington State programs to create a NJ Sustainability in Prisons Project.

2021 Year-In-Review: Food Waste²⁵⁷

Federal Reports		
Title	Organization	Description
U.S. Food Loss and Waste Action Plan	NRDC	plan for Biden administration and Congress to reduce food loss and waste
U.S. Methane Emissions Reduction Action Plan	White House Office	
of Domestic Climate Policy	outlines steps to cut pollution and consumer costs while boosting good-paying jobs	
From Farm to Kitchen: The Environmental Impacts of Food Waste	US EPA	discusses the environmental footprint of food loss and waste and benefits that can be achieved by reducing food waste
Federal Funding		
Infrastructure Act	US Congress	\$70 million/yr for recycling education + improvements to waste management infrastructure
Multiscale Recipes Project	NSF	\$15 million to advance science needed to make food system more sustainable, equitable, and resilient
Urban Agriculture Grants	USDA	\$2 million to 24 local governments for compost and food waste reduction projects
Federal Legislation		
Zero Food Waste/COMPOST Act	US Congress	help support the expansion of food waste reduction and management
Fresh Produce Procurement Reform Act	US Congress	create a USDA program to contract with farmers/other food providers to donate fresh produce or food rescue organizations
School Food Recovery Act	US Congress	create a new program at USDA that would provide grants to schools to work on food waste reduction projects
Food Donation Improvement Act	US Congress	make donating safe food easier or businesses and organizations
Food Date Labeling Act	US Congress	end consumer confusion around food date labeling and boost the consumption and donation of safe, edible food

257 Cabrera, Y., Collins, A.S., Hoover, D., Keating, M., & Sevilla, N. (2021, December 14). 2021 Year-In-Review: Food Waste.

State Legislation		
Recycling & Waste Diversion	Maryland	Organics waste ban for large waste generators
SB 1383, Short-Lived Climate Pollutants Strategy	California	establishes goals for reducing the amount of food waste sent to landfills and amount of food rescued
NYS Food Donation & Food Scraps Recycling	New York	requires large waste generators (2 tons/week) to donate excess edible food and recycle remaining food scraps
Regional and Municipal Reports		
Food Matters Regional Initiative	NRDC	provides support for cities to advance their food waste reduction goals
Model Compost Procurement Policy	NRDC +	
Environmental Law Institute	model policy that municipalities can use to require use of compost products	
Feeding a City: Food Waste and Food Need Across America	NRDC	analyzes results of NRDC's baseline calculator tool applied to 22 U.S. cities
A Toolkit for Incorporating Food Waste in Municipal Climate Action	Environmental Law Institute	includes model provisions that municipalities can use to incorporate food waste measures not their municipal climate plans

References

References are listed in order of appearance.

Introduction

Barr, H., Orlando, P., Kettig, R., Barry, R. C., Karmarkar-Deshmukh, R., & Kamel, M. (2020). *New Jersey's Global Warming Response Act 80x50 Report*. <https://www.nj.gov/dep/climatechange/docs/nj-gwra-80x50-report-2020.pdf>

Murphy, Governor Philip. 2021. EO-274. November 10. <https://www.nj.gov/infobank/eo/056murphy/pdf/EO-274.pdf>.

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Feeding America. (2022). *How We Fight Food Waste in the US*. <https://www.feedingamerica.org/our-work/our-approach/reduce-food-waste>

Feeding America. (2022). *Map the Meal Gap*. <https://map.feedingamerica.org/>

USDA Economic Research Service. (2021, September 8). Overview. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/>

Raja, S. (2022). *Cultivating Food Equity*. University at Buffalo - Global Food Equity. <http://www.buffalo.edu/globalhealthequity/global-projects/foodequity.html>

Nguyen, Hanh (2018). "Sustainable Food Systems: Concept and Framework." Food and Agriculture Organization of the United States. <https://www.fao.org/3/ca2079en/CA2079EN.pdf>

New York State Department of Environmental Conservation (2022). Food Donation and Food Scraps Recycling Law. <https://www.dec.ny.gov/chemical/114499.html>

Research Initiative 1

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Raja, S. (2022). *Cultivating Food Equity*. University at Buffalo - Global Food Equity. <http://www.buffalo.edu/globalhealthequity/global-projects/foodequity.html>

Economic Research Service. (2021, September 08). *Definitions of Food Security*. U.S. Department of Agriculture. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx>

New York City Council. (n.d.). *Growing Food Equity in New York City*. <https://council.nyc.gov/data/food-equity/>

New Jersey Department of Human Services. (2021, October 1). *Governor Murphy Signs Legislative Package to Combat Food Insecurity in New Jersey* [Press release].

<https://www.nj.gov/humanservices/news/pressreleases/2021/approved/20211001.html>

New Jersey Economic Development Authority. (2022). *Food Desert Relief Program*. <https://www.njeda.com/food-desert-relief-program%E2%80%8B/>

Environmental Justice Advisory Council. (2019, September). *Urban Agriculture in the Garden State*. New Jersey Department of Environmental Protection.

<https://www.nj.gov/dep/ej/docs/ejac-urban-agriculture-white-paper.pdf>

Global Solidarity Alliance for Food, Health and Social Justice. (2022). *Why 'Rights not Charity'?*

<https://rightsnotcharity.org/why-rights-not-charity/>

Dickinson, M. & Lohnes, J. (2019, May 16). *Where do food banks fit in to the fight for a green new deal?* Civil Eats. <https://civileats.com/2019/05/16/where-do-food-banks-fit-in-to-the-fight-for-a-green-new-deal/>

Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *NJ Roadmap for Food System Resilience: A Holistic Justice Framework for Food System Transformation*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Roadmap_Food_System_Resilience.pdf

Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *The New Jersey Food System in a Nutshell: A Holistic View of the New Jersey Food System and its Economic, Environmental, and Social Impacts*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Food_System_in_a_Nutshell.pdf

New Jersey Food Democracy Collaborative. (2021, December 3). *NJ State of the Food Symposium*.

Seligman, H.K. & Berkowitz, S.A. (2018, November 16). *Aligning Programs and Policies to Support Food Security and Public Health Goals in the United States*. *Annual Review of Public Health* 2019, 40, 319-37. <https://www.annualreviews.org/doi/pdf/10.1146/annurev-publhealth-040218-044132>

The Annie E. Casey Foundation. (2010, April 1). *Improving Access to Public Benefits – Helping Eligible Individuals and Families get the Income Supports They Need*. <https://www.aecf.org/resources/improving-access-to-public-benefits>

New Jersey Assembly Joint Resolution (2019). "Urges Chief Innovation Officer to prioritize enhancement of NJOneApp to include all State anti-hunger programs." Bill No. 175. <https://legiscan.com/NJ/bill/AJR175/2018>

Jimbo, M. (2020, January 09). *Should Restaurants Donate Excess Food? The Answer is Not So Simple*. The Counter. <https://thecounter.org/restaurants-donate-excess-food-los-angeles-bread-lounge/>

Cook, C. (2020, May 07). *Farmers are destroying mountains of food. here's what to do about it*. The Guardian. <https://www.theguardian.com/commentisfree/2020/may/07/farmers-food-covid-19>

Johnson, C. (2019, August). *Growing Food Equity in New York City – A City Council Agenda*. New York City Council. <https://council.nyc.gov/data/food-equity/>

New York City Administrative Code (2021) City agency food waste prevention plans, § 16-307.2. <https://codelibrary.amlegal.com/codes/newyorkcity/latest/NYAdmin/0-0-0-26632>

New York City Administrative Code (2021). School food waste, § 16-307.3. <https://codelibrary.amlegal.com/codes/newyorkcity/latest/NYAdmin/0-0-0-26632>

NYC Department of City Planning. (2022). *FRESH Food Stores Updates*. City of New York. <https://www1.nyc.gov/site/planning/plans/fresh2/fresh2-overview.page>

Establishing an office of urban agriculture and an urban agriculture advisory board, 2021/123. (2021). <https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=4085856&GUID=59099E-DA-FFFC-44BA-B150-439BCF4D3A3B&Options=ID%7cText%7c&Search=urban+agriculture>

Zuckerman, J., Daly, J., Templeton, G., Conrad, A., Lococo, N., Darwish, S., . . . Hynson, J. (2021). *North Carolina Food System Resilience Strategy Report*. North Carolina Food Resilience Advisory Board, Duke Work Food Policy Center and Center for Environmental Farming. https://wfpc.sanford.duke.edu/sites/wfpc.sanford.duke.edu/files/NCFoodResiliencyStrategy-August-2021_0.pdf

Fair Food Network. (2020). *Fair Food Fund*. Retrieved from Fair Food Network: <https://fairfoodnetwork.org/projects/fair-food-fund/>

COMPASS. (n.d.). *COMPASS - See All Benefits*. Pennsylvania State. Retrieved January 11, 2022 from Compass PA: <https://www.compass.state.pa.us/Compass.Web/Menultems/SeeAllBenefits.aspx?Language=EN>

Research Initiative 2

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Bassarab, K., Santo, R., & Palmer, A. (2019). *Food Policy Council Report 2018*. Johns Hopkins Center for a Liveable Future and Food Policy Networks. https://assets.jhsph.edu/clf/mod_clfResource/doc/FPC%20Report%202018-FINAL-4-1-19.pdf

New Jersey Assembly (2019). Establishes New Jersey Food Waste Task Force to make recommendations concerning food waste in New Jersey. Bill 4705. Retrieved January 11, 2022 from Legiscan: <https://legiscan.com/NJ/bill/A4705/2018>

New Jersey Office of Legislative Services. (2018). *S3945 ScaAa (2R) Establishes Office of Food Insecurity Advocate*. <https://www.njleg.state.nj.us/bills/BillView.asp?BillNumber=S3945>

New Jersey Legislature (2021). (2022, January 10). "Revises and renames Office of Food Insecurity Advocate." Bill A6159. Retrieved January 11, 2022 from New Jersey Legislature: <https://www.njleg.state.nj.us/bill-search/2020/A6159>

Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *NJ Roadmap for Food System Resilience: A Holistic Justice Framework for Food System Transformation*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Roadmap_Food_System_Resilience.pdf

- Cava, J., Elnakib, S., Fisher, R., & Gershman, J. (2021). *The New Jersey Food System in a Nutshell: A Holistic View of the New Jersey Food System and its Economic, Environmental, and Social Impacts*. https://stockton.edu/food-democracy-collaborative/documents/NJ_Food_System_in_a_Nutshell.pdf
- New Jersey Food Democracy Collaborative. (2021, December 3). NJ State of the Food Symposium.
- Johns Hopkins Center for a Liveable Future. (n.d.). *Food Policy Council Directory*. Retrieved January 11, 2022, from Food Policy Networks: <https://www.foodpolicynetworks.org/councils/directory/online/index.html#page-2>
- California Food Policy Council. (n.d.). *California Food Policy Council*. <https://cafpc.net/>
- Tran, C., Brinkman, C., Runsten, D., Wong, M., Eskenazi, B., Parker, H., . . . Berndt, S. (2021). *California Food Policy Report 2020*. <https://cafpc.net/reports/>
- Commonwealth of Massachusetts. (2021). *Massachusetts Food Policy Council*. Retrieved January 11, 2022, from Mass.gov: <https://www.mass.gov/massachusetts-food-policy-council>
- Massachusetts Food System Collaborative. (2021). *Home*. Retrieved January 11, 2022, from Massachusetts Food System Collaborative: <https://mafoodsystem.org/>
- North Carolina Local Food Council. (2021). *NC Local Food Council: Working Collaboratively Across the State to Support North Carolina's Local Food System*. <https://www.nclocalfoodcouncil.org/>
- Loop Creative. (2021). *Community Food Strategies*. Retrieved January 11, 2022, from Community Food Strategies: <https://communityfoodstrategies.org/>
- Curtis, Jennifer, et. al. April 2010. From Farm to Fork: A Guide to Building North Carolina's Sustainable Local Food Economy, a Center for Environmental Farming Systems report, Raleigh, N.C.
- Green Umbrella Regional Sustainability Alliance. (n.d.). *Home*. Retrieved January 11, 2022, from Greater Cincinnati Regional Food Policy Council: <https://www.cincinnatiaregionalfood.org/>
- Natural Resources Defense Council. (2021). *Save the food.com*. Retrieved January 11, 2022, from Save the food.com: <https://savethefood.com/>
- World Wildlife Fund. (2021). *Bring Food Waste Warriors to Your School*. Retrieved January 11, 2022, from World Wildlife Fund: <https://www.worldwildlife.org/pages/bring-food-waste-warriors-to-your-school#:~:text=WWF%27s%20Food%20Waste%20Warriors%20program%20is%20anchored%20in,the%20saying%20goes%2C%20what%20gets%20measured%20gets%20managed>
- Michigan State University. (n.d.). Michigan Local Food Council Network. Retrieved January 11, 2022, from Michigan State University Center for Regional Food Systems: https://www.canr.msu.edu/local_food_council_network/index
- Massachusetts Food System Collaborative. (2021). *Campaign for Health Incentives Program Funding*. Retrieved January 11, 2022, from Massachusetts Food System Collaborative: <https://mafoodsystem.org/>

[org/projects/campaign-for-healthy-incentives-program-funding/](http://www.nyc.gov/projects/campaign-for-healthy-incentives-program-funding/)

Johnson, C., Vazquez, A., Pond, C., Rivera, C., & Popa, L. (2019). *Growing Food Equity In New York City: A City Council Agenda*. New York City Council Legislative Division. <http://council.nyc.gov/data/wp-content/uploads/sites/73/2019/08/growing-food-equity-1.pdf>

Johns Hopkins Center for a Livable Future. (2015). Webinar: Funding Food Policy Councils: Lessons from the Field. <https://www.youtube.com/watch?v=uvhBla1HPRg>

[Research Initiative 3](#)

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Gunter, K.E., Peek, M.E., & Tanumihardjo, J.P. (2021, June 23). *As They Take On Food Insecurity, Community-Based Health Care Organizations Have Found Four Strategies That Work*. Health Affairs.

Health Care Without Harm. (2018). *Community benefit and healthy food: A national assessment*. <https://foodcommunitybenefit.noharm.org/research-reports>

New Jersey Assembly (2021). "Reinstates prior property tax exemption for nonprofit hospitals with on-site for-profit medical providers... Bill 1135." <https://legiscan.com/NJ/bill/A1135/2020>

Wholesome Wave. (2021, April). *Produce Prescription Programs US Field Scan Report: 2010-2020*. https://www.daisaenterprises.com/uploads/4/4/0/5/44054359/produce_prescription_programs_us_field_scan_report__june_2021_final.pdf

Center for Health Law and Policy Innovation at Harvard Law School. (2021, March). *Mainstreaming Produce Prescriptions: A Policy Strategy Report*. <https://chlp.org/wp-content/uploads/2013/12/Produce-RX-March-2021.pdf>

Roots To Prevention Camden. (2020). *Our Programs*. <https://www.rootstoprevention.com/programs>

Riley, L. (2021, July 22). *Veggie Rx Promotes Connections Between Food and Health*. Rutgers NEWSROOM. <https://sebsnjaesnews.rutgers.edu/2021/07/veggie-rx-promotes-connections-between-food-and-health/>

Smith, M.B. (2020, December 07). *How Unused Hospital Food Is Feeding the Hungry in NorCal*. Sutter Health Vitals. <https://vitals.sutterhealth.org/hungry-people-fed-through-food-waste-reduction-pilot/>

CalRecycle. (2019, May 02). *Local Projects Prevent 93 Million Pounds of Food Waste*. State of California. <https://www.calrecycle.ca.gov/newsroom/2019/05may/12>

Health Care Without Harm. (2022). *California Health Care Climate Alliance*. <https://noharm-uscanada.org/content/us-canada/california-health-care-climate-alliance>

Health Care Without Harm. (2022). *Healthy Food in Health Care*. <https://noharm-uscanada.org/healthyfoodinhealthcare>

Health Care Without Harm. (2018). *Hospital community benefit roles*. <https://foodcommunitybenefit.noharm.org/resources/implementation-strategy/hospital-community-benefit-roles>

Practice Greenhealth. (2021). *About Us*. Retrieved January 11, 2022 from Practice Greenhealth: <https://practicegreenhealth.org/about/about-us>

Practice Greenhealth. (2021). *Food - Improving the health of patients, staff, and the surrounding community by serving sustainable food*. <https://practicegreenhealth.org/topics/food>

GrowNYC. (2022). *Greenmarket Bucks*. Retrieved January 11, 2022 from GrowNYC: <https://www.grownyc.org/greenmarket/bucks>

Denver Food Rescue. (n.d.). *What we do*. Retrieved January 11, 2022 from Denver Food Rescue: <https://denverfoodrescue.org/programs/>

Research Initiative 4

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Bergen County Human Services Advisory Council (January 15, 2021). *Bergen County Needs Assessment 2020*. New Jersey Department of Children and Families. <https://www.nj.gov/dcf/about/divisions/opma/docs/BergenCountyNeedsAssessment2020.pdf>

Hunger and Health (2021). *Assessing Community Needs*. Feeding America. <https://hungerandhealth.feedingamerica.org/explore-our-work/nutrition-education-initiatives/assessments-education-needs/>

New Jersey's Clean Energy Program (2021). *Commercial, Industrial and Local Government Programs*. NJ Board of Public Utilities. <https://njcleanenergy.com/commercial-industrial/home/home>

Fresh Food Connect. (n.d.) *About Us: Fresh Food Connect*. Retrieved January 11, 2022 from Fresh Food Connect: <https://freshfoodconnect.org/about/>

Food Rescue Alliance. (n.d.). *Open-Source Food Rescue Logistics Software*. <https://www.foodrescuealliance.org/logistics-software>

CalRecycle. (2019, May 02). *Local Projects Prevent 93 Million Pounds of Food Waste*. State of California. <https://www.calrecycle.ca.gov/newsroom/2019/05may/12>

A Local Law to amend the administrative code of the city of New York, in relation to facilitating food donations, Local Law 2017/176. (2017). The New York City Council. <https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=2984602&GUID=5268FF91-55DD-4407-BF0A-53B7E330EF3E>

Franklin County Community Development Corporation (2021). *Food processing Center: About*. Retrieved January 11, 2022 from FCCDC: <https://www.fccdc.org/food-processing-center/>

Gilvarg, C (2021). *Baker-Polito Administration Announces \$15 Million in Support for the Food Security Infrastructure Grant Program*. Mass.gov. <https://www.mass.gov/news/baker-polito-administration-announces-15-million-in-support-for-the-food-security-infrastructure-grant-program>

La Soupe, Inc. (2018). *The Food Insecurity and Waste Problem*. <https://www.lasoupe.org/>

Denver Food Rescue. (n.d.). *What we do*. Retrieved January 11, 2022 from Denver Food Rescue: <https://denverfoodrescue.org/programs/>

Research Initiative 5

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

New Jersey Department of Environmental Protection. (2022, January 7). Regional Greenhouse Gas Initiative (RGGI). Retrieved January 11, 2022 from Official Site of the State of New Jersey: <https://www.nj.gov/dep/aces/rggi.html>

City of Philadelphia. (n.d.). *Payments, assistance & taxes Sustainable Business Tax Credit*. Retrieved January 11, 2022, from City of Philadelphia: <https://www.phila.gov/services/payments-assistance-taxes/tax-credits/sustainable-business-tax-credit/>

Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Mid-Atlantic Food Waste Policy Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

Sandson, K., Broad Lieb, E., Macaluso, L., & Mansell, C. (2019). *Bans and Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws*. Harvard Law School Food Law and Policy Clinic. https://www.chlpi.org/wp-content/uploads/2013/12/Organic-Waste-Bans_FINAL-compressed.pdf

Mugica, Y., Rose, T., & Hoover, D. (2019). *Tackling Food Waste in Cities: A Policy and Program Toolkit*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/food-waste-cities-policy-toolkit-report.pdf>

Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Southeast Food Waste Policy Gap Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/southeast-food-waste-policy-gap-report.pdf>

California Department of Resources Recycling and Recovery. (2021, May 28). *Greenhouse Gas Reduction Grant and Loan Programs*. Retrieved January 11, 2022, from CalRecycle: <https://www.calrecycle.ca.gov/Climate/GrantsLoans/>

California Department of Resources Recycling and Recovery. (2021, October 21). *Greenhouse Gas Reduction Loan Program*. Retrieved from January 11, 2022, from CA.gov: <https://www.calrecycle.ca.gov/climate/grantsloans/ghgloans/>

New Jersey Department of Environmental Protection. (2017, June). *Municipal "Pay As You Throw" Trash Collection Systems in New Jersey*. NJ.gov: https://www.nj.gov/dep/dshw/recycling/payt_table.pdf

The Commonwealth of Massachusetts Department of Environmental Protection. (2004). *Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs*. <https://www.mass.gov/doc/massdep-pay-as-you-throw-implementation-guide/download>

Sustainable Agriculture Research & Education. (2020, September 22). *Dairy Farm Closes Loop with Improved Compost System*. Northeast Sustainable Agriculture Research and Education. <https://northeast.sare.org/news/dairy-farm-closes-loop-with-improved-compost-system/>

United States Environmental Protection Agency. (2021, November 23). *EPA Programs Related to the Food System*. Retrieved January 11, 2022, from United States Environmental Protection Agency: <https://www.epa.gov/sustainable-management-food/funding-opportunities-and-epa-programs-related-food-system>

United States Department of Agriculture - Natural Resources Conservation Service. (2021, May 17). *USDA Announces Cooperative Agreements for Community Compost and Food Waste Reduction*. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=NRCSE-PRD1777221>

United States Department of Agriculture - Agricultural Marketing Service. (n.d.). *Grants & Opportunities*. Retrieved January 11, 2022, from United States Department of Agriculture - Agricultural Marketing Service: <https://www.ams.usda.gov/services/grants>

California Legislative Information. (2012, September 30). *SB-535 California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund*. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB535

California Legislative Information. (2016, September 14). *AB-1550 Greenhouse gases: investment plan: disadvantaged communities*. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB1550

California Climate Investments. (n.d.). *Cap-and-Trade Dollars at Work*. Retrieved January 11, 2022, from California Climate Investments: <https://www.caclimateinvestments.ca.gov/>

California Air Resources Board. (2022). *Cap-and-Trade Program*. Retrieved January 11, 2022, from ca.gov: <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about>

California Climate Investments. (2021). *Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds*. http://ww2.arb.ca.gov/sites/default/files/auction-proceeds/2021_cci_annual_report.pdf

Song, L. (2021, June 25). California's Climate Program Is Actually Adding Carbon To The Atmosphere. (S. Bushwick, Interviewer) New York City: Science Friday. <https://www.sciencefriday.com/segments/california-climate-program-co2/#:~:text=California's%20Climate%20Program%20Is%20Actually%20Adding%20Carbon%20To%20The%20Atmosphere,-17%3A22%20minutes&text=California%20has%20a%20reputation%20as,the%20most%20about%20c>

Massachusetts Department of Environmental Protection. (n.d.). *310 CMR 19.000: SOLID WASTE MANAGEMENT*. <https://www.mass.gov/doc/310-cmr-19-solid-waste-management/download>

Massachusetts Department of Environmental Protection. (n.d.). Sustainable Materials Recovery Program Municipal Application - Grant Guidelines. Retrieved January 11, 2022 from Mass.gov: https://www.mass.gov/doc/smrp-municipal-grant-application-guidelines/download?_ga=2.237065024.139920973.1641564994-999404505.1641564994

Research Initiative 6

Bayshore Recycling. August 2021. "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

NJ Department of Environmental Protection, Department of Agriculture, Department of Education, Department of Health, & Office of the Secretary of Higher Education. (2019, November). *The State of New Jersey School Food Waste Guidelines - K-12 Edition*. <https://www.nj.gov/dep/seeds/sfwg/docs/K-12.pdf>

Sustainable Jersey for Schools. (2021, June 25). *School Food Waste Pilot Program*. <https://www.sustainablejerseyschools.com/grants/school-food-waste-pilot-program/>

Waliczek, T., McFarland, A. & Holmes, M. (2016). The Relationship between a Campus Composting Program and Environmental Attitudes, Environmental Locus of Control, Compost Knowledge, and Compost Attitudes of College Students. *HortTechnology* 26, 592-598. DOI: [10.21273/HORTTECH03320-16](https://doi.org/10.21273/HORTTECH03320-16)

NJ Department of Environmental Protection, Department of Agriculture, Department of Education, Department of Health, & Office of the Secretary of Higher Education. (2019, November). *The State of New Jersey School Food Waste Guidelines - Higher Education Edition*. <https://www.nj.gov/dep/seeds/sfwg/docs/HighEd.pdf>

Rutgers getINVOLVED. (2022). *RU Compost*. <https://rutgers.campuslabs.com/engage/organization/rucompost>

Harvard Law School Food Law and Policy Clinic. (2021, October). *New Jersey Food Donation: Date Labels* [Legal Fact Sheet]. https://chlp.org/wp-content/uploads/2021/12/NJ-date-labeling-legal-fact-sheet_Final-Edits44.pdf

Food Bank Good Samaritan Act, N.J.S.A. 24:4A-1 to 24:4A-5 (1982). <https://repo.njstatelib.org/bitstream/handle/10929.1/24089/L1982c178.pdf?sequence=1&isAllowed=y>

- Alvarez, J., Cedano, S., Margolin, B., Nolan, L., Saju, N., & Velez, I. (2021, December). *Middlesex County Food Pantry Product Dating Label Education Project*. Rutgers Bloustein School of Planning and Public Policy - Ralph W. Voorhees Public Service Fellowship Project.
- New Jersey Food Democracy Collaborative. (2021, December 3). NJ State of the Food Symposium.
- Center for EcoTechnology. (2022). *Reduce Waste At Work*. <https://www.centerforecotecology.org/reduce-waste-at-work/>
- RecyclingWorks Massachusetts. (n.d.). *Recycling Assistance for Businesses & Institutions*. Retrieved January 11, 2022 from <https://recyclingworksma.com/>
- New York State Pollution Prevention Institute. (n.d.). *About NYSP2I*. Retrieved January 11, 2022 from <https://www.rit.edu/affiliate/nysp2i/about-nysp2i>
- Vermont Department of Environmental Conservation. (2022). *Food Scraps*. <https://dec.vermont.gov/waste-management/solid/materials-mgmt/organic-materials>
- New York State Department of Environmental Conservation (2022). *Food Donation and Food Scraps Recycling Law*. <https://www.dec.ny.gov/chemical/114499.html>
- Vermont Department of Environmental Conservation. (2022). *Universal Recycling for Schools*. Vermont Official State Website. <https://dec.vermont.gov/waste-management/solid/universal-recycling/schools>
- Mountainside Education & Enrichment. (2018). *Lunch Out of Landfills!* <http://www.meegreen.org/programs/lunch-out-of-landfills/>
- Natural Resources Defense Council. (2018, November). *Wasting Less Food in K-12 Settings: Best Practices for Success* [Issue Brief]. <https://www.nrdc.org/resources/wasting-less-food-k-12-settings-best-practices-success>
- World Wildlife Foundation. (2022). *Be a Food Waste Warrior*. <https://www.worldwildlife.org/teaching-resources/toolkits/be-a-food-waste-warrior>
- 10 Cents a Meal for Michigan's Kids & Farms. (n.d.). *About*. Retrieved January 11, 2022 from <https://www.tencentsmichigan.org/about>
- GrowNYC. (2022). *GrowNYC School Gardens*. <https://www.grownyc.org/school-gardens>
- Teens for Food Justice. (2022). *Program*. Retrieved January 11, 2022 from <https://teensforfoodjustice.org/program/>
- North Carolina State University. (2022). *Compost Facility & Research Cooperative*. <https://recycling.ncsu.edu/compost-facility/>
- Harvard University - Sustainability. (2020). *Composting*. Harvard University. <https://green.harvard.edu/topics/waste/composting>

Johnson County Community College. (n.d.). Composting on Campus. <https://www.jccc.edu/about/sustainability/composting.html>

Cornell Waste Management Institute. (2007). *About CWMI*. Retrieved January 11, 2022 from <http://cwmi.css.cornell.edu/about.htm>

Cornell University Agricultural Experiment Station. (2022). *Compost Facility*. <https://cuaes.cals.cornell.edu/farms/farm-services/compost-facility/#:~:text=Cornell%27s%20compost%20facility%2C%20operated%20by,just%20one%20mile%20from%20campus.>

Cornell Cooperative Extension - Tompkins County. (2022). *Master Composters*. <http://cctompkins.org/gardening/composting/master-composters>

Recycling and Materials Management of Tompkins County. (2021). *ReBusiness Partners*. <https://recycletopkins.org/other-programs-and-services/rebusiness-partners/>

University of Wisconsin-Madison. (2020, January). *A Food Safety Guide to Reducing Food Waste: Distributing and Using Shelf Stable Donated Products*. https://fyi.extension.wisc.edu/safefood/files/2019/12/ReduceFoodWaste_2020.pdf

Expired. (2022). *The Solution*. Harvard Food Law and Policy Clinic. <https://notreallyexpired.com/the-solution-2/>

Labels Unwrapped. (2022). *The Labels Unwrapped Project*. Vermont Law School Center for Agriculture & Food Systems. <https://labelsunwrapped.org/about-the-project>

EatByDate. (2012). *About Eat By Date - How Long Does Food Last?* <http://www.eatbydate.com/>

ReFED. (n.d.). *Date Labeling Standardization Tool*. <https://refed.org/downloads/ReFED-Standardization-Package.pdf>

Research Initiative 7

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

USDA Food and Nutrition Service (2016, June). *The Use of Share Tables in Child Nutrition Programs*. <https://www.fns.usda.gov/cn/use-share-tables-child-nutrition-programs>

Prescott, M. P., Grove, A., Bunning, M., & Cunningham-Sabo, L. (2020). Characterizing and assessing the quality of state K–12 share table policies as a potential mechanism to reduce food waste and promote food security. *Journal of nutrition education and behavior*, 52(1), 21-30. <https://www.sciencedirect.com/science/article/pii/S1499404619310917>

Berry, B., & Acheson, A. (2017). Sharing isn't easy: Food waste and food redistribution in Maine K–12 schools. *Maine Policy Review*, 26(1), 47-58. <https://digitalcommons.library.umaine.edu/cgi/view-content.cgi?article=1760&context=mpr>

Elnakib, S., Shukaitis, J., and Flatt, J. (July 2019). *School Food Waste Reduction Toolkit*. <https://njaes.rutgers.edu/school-food-waste/food-waste-summit-toolkit.pdf>

Click, K. (2015, December). *All Local Health Departments & Other Indiana Food Regulatory Agencies*. Indiana State Department of Health. [https://www.in.gov/health/files/School_Sharing_Tables_and_Food_Recovery_12-23-2015_\(2\).pdf](https://www.in.gov/health/files/School_Sharing_Tables_and_Food_Recovery_12-23-2015_(2).pdf)

Greater Cincinnati Regional Food Policy Council (2017 December). *School Cafeteria Share Tables*. <https://www.greenumbrella.org/resources/GU%20Action%20Teams/Waste%20Reduction%20Action%20Team/OKI%20Share%20Tables%20Guide.pdf>

Nebraska Department of Agriculture. "Nebraska Food Code." https://nda.nebraska.gov/regulations/foods/food_code.pdf

O'Grady, Eileen. "New Hampshire bill would use school leftovers to feed students on weekends." Valley News. <https://www.vnews.com/School-food-waste-could-help-hungry-citizens-40037929>

House of Representatives (2019). Oklahoma Senate Bill 297. <https://legiscan.com/OK/text/SB297/2019>

Texas Education Agency (September 2017). *Student Fairness in Feeding Act Resource Page*. Retrieved January 11, 2022 from Texas Education Agency: <https://tea.texas.gov/texas-schools/general-information/student-fairness-in-feeding-act-resource-page>

West Virginia Congress (February 16, 2018). "West Virginia Feed to Achieve Act: Shared Table Initiative" H.R. 4478. https://www.wvlegislature.gov/Bill_Status/bills_text.cfm?billdoc=HB4478%20SUB.htm&yr=2018&sesstype=RS&i=4478

Wisconsin Department of Public Instruction (2016 June). *Sharing and No Thank You Table Toolkit*. Retrieved January 11, 2022 from: <https://bit.ly/3lgze0M>

Congress (January 15, 2020). "School Food Recovery Act of 2020." H.R. 5607. <https://www.congress.gov/116/bills/hr5607/BILLS-116hr5607ih.pdf>

Regional Directors (February 3, 2012). *Guidance on the Food Donation Program in Child Nutrition Programs*. US Department of Agriculture. Retrieved January 11, 2022 from: https://fns-prod.azureedge.net/sites/default/files/cn/SP11_CACFP05_SFSP07-2012os.pdf

Wisconsin Department of Public Instruction (2016 June). *Sharing and No Thank You Table Toolkit*. Retrieved January 11, 2022 from: <https://bit.ly/3lgze0M>

Vermont Agency of Education (2016 May). *Food Sharing Tables - Guidance for Schools*. Retrieved January 11, 2022 from: https://education.vermont.gov/sites/aoe/files/documents/edu-food-sharing-tables-guidance-for-schools_0.pdf

Massachusetts Department Of Elementary And Secondary Education Office for Food and Nutrition Programs (2014 April). *Massachusetts School Meal Programs - Share Table Guidance*. Retrieved January 11, 2022 from: <https://thegreenteam.org/wp-content/uploads/2014/04/Share-Table-Guidance.pdf>

Research Initiative 8

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Barr, H., Orlando, P., Kettig, R., Barry, R. C., Karmarkar-Deshmukh, R., & Kamel, M. (2020). *New Jersey's Global Warming Response Act 80x50 Report*. <https://www.nj.gov/dep/climatechange/docs/nj-gwra-80x50-report-2020.pdf>

District of Columbia Department of Parks and Recreation. (n.d.). *DC.gov Department of Parks and Recreation*. Retrieved January 11, 2022 from Community Compost Cooperative Network: <https://dpr.dc.gov/page/community-compost-cooperative-network>

Winberg, M. (2021, July 26). *After a pandemic delay, Philly is finally opening 12 community composting sites*. <https://whyy.org/articles/after-a-pandemic-delay-philly-is-finally-opening-12-community-composting-sites/>

Pennsylvania Department of Environmental Protection Bureau of Waste Management Division of Municipal and Residual Waste. (2018, February 10). *General Permit WMGR025 Residual and Municipal Waste Composting*. https://files.dep.state.pa.us/waste/bureau%20of%20waste%20management/lib/landrecwaste/residual_waste/gp/WMGR025%20Final%202_10_18.pdf

Center for EcoTechnology, Harvard Law School Food Law and Policy Clinic, and BioCycle Connect, LLC. (2021). *Mid-Atlantic Food Waste Policy Analysis and Inventory*. Natural Resources Defense Council. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

Thomas Reuters. (2020, November 30). *6 CRR-NY 361-3.2*. [https://govt.westlaw.com/nyccr/Document/Id4d62f22dfe911e7aa6b9b71698a280b?viewType=FullText&originationContext=document-toc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/nyccr/Document/Id4d62f22dfe911e7aa6b9b71698a280b?viewType=FullText&originationContext=document-toc&transitionType=CategoryPageItem&contextData=(sc.Default))

New York State Department of Environmental Conservation. (n.d.). *Regulations on Organic Recycling Facilities*. Retrieved January 11, 2022, from New York State Department of Environmental Conservation: <https://www.dec.ny.gov/chemical/97488.html#Composting>

Rhode Island Department of Environmental Management. (2016, May 24). *New Regulations on Composting Operations, Anaerobic Digestion Facilities Now in Effect*. <http://www.dem.ri.gov/news/2016/pr/0524161.htm>

Massachusetts Department of Environmental Protection. (n.d.). *310 CMR: Department of Environmental Protection*. <https://www.mass.gov/doc/310-cmr-1600-site-assignment-for-solid-waste-facilities/download>

New Hampshire Department of Environmental Services. (n.d.). *Volume-to-Weight Conversion Factors*. <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/vol-to-weight-conversion.pdf>

Research Initiative 9

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

California Environmental Protection Agency. (2018, November). *Enhancing Organic Materials Management by Improving Coordination, Increasing Incentives & Expediting Decision-Making*. <https://calepa.ca.gov/wp-content/uploads/sites/6/2018/11/CalEPA-Report-Enhancing-Organic-Materials-Management.pdf>

Research Initiative 10

Berkenkamp, J. & Gunders, D. (2017, March 09). *Don't Waste, Donate: Enhancing Food Donations Through Federal Policy*. National Resources Defense Council. <https://www.nrdc.org/sites/default/files/dont-waste-donate-report.pdf>

National Resources Defense Council. (2021, August). *Mid-Atlantic Food Waste Policy Gap Analysis and Inventory* [Report]. <https://www.nrdc.org/sites/default/files/mid-atlantic-food-waste-policy-gap-report.pdf>

New Jersey Executive Order No. 274. (2021). <https://nj.gov/infobank/eo/056murphy/pdf/EO-274.pdf>

ReFED. (2021). *U.S. Food Waste Policy Finder*. Retrieved January 11, 2022 from ReFED: <https://policyfinder.refed.org/>

Food Bank Good Samaritan Act, N.J.S.A. 24:4A-1 to 24:4A-5 (1982). <https://repo.njstatelib.org/bitstream/handle/10929.1/24089/L1982c178.pdf?sequence=1&isAllowed=y>

Hunters Helping the Hungry. (2017). *About HHH*. Retrieved January 11, 2022 from Hunters Helping the Hungry: <http://www.huntershelpingthehungry.org/about/>

Directing State Agencies to Take Actions To Reduce and Regulate Greenhouse Gas Emissions, Executive Order No. 20-04. (2020). https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

Davis Wright Tremaine LLP. (2021, March 17). *Oregon Regulators' Ambitious Climate Change Plans Take Shape*. JDSUPRA. <https://www.jdsupra.com/legalnews/oregon-regulators-ambitious-climate-8507305/>

Rethink Waste. (2022). *SB 1383: State Organics Law*. South Bayside Waste Management Authority. <https://rethinkwaste.org/businesses/laws-ordinances/sb-1383-state-organics-law/>

Food Policy Snapshots. (2021, February 23). *Excess Food Law Requires New York Supermarkets to Donate to Charity*. Hunter College New York City Food Policy Center. <https://www.nycfoodpolicy.org/food-policy-snapshot-excess-food-law/>

California Environmental Health Services. (2018, January). *The Safe Surplus Food Donation Toolkit - Guidance for Food Facilities*. <https://www.co.monterey.ca.us/home/showdocument?id=61942>

Research Initiative 11

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Braun, R., & Wellinger, A. (2003). Potential of co-digestion. In IEA Bioenergy, Task (Vol. 37). <https://www.iea-biogas.net/files/daten-redaktion/download/publi-task37/Potential%20of%20Codi-gestion%20short%20Brosch221203.pdf>

California Water Boards (June 2019). *Co-Digestion Capacity in California*. Carollo Engineers. <https://carollo.com/solutions/california-epa-food-waste-co-digestion-capacity-study/>

Scarlat, N., Dallemand, J. F., & Fahl, F. (2018). Biogas: Developments and perspectives in Europe. *Renewable energy*, 129, 457-472.

Wu, Wei. "Anaerobic co-digestion of biomass for methane production: recent research achievements." *Optimization 1* (2007): 1VS. <http://home.eng.iastate.edu/~tge/ce421-521/wei.pdf>

Mata-Alvarez, Joan, Joan Dosta, M. S. Romero-Güiza, Xavier Fonoll, M. Peces, and Sergi Astals. "A critical review on anaerobic co-digestion achievements between 2010 and 2013." *Renewable and sustainable energy reviews* 36 (2014): 412-427.

Perkins, Tom (2020). "Questions Remain about using Treated Sewage on Farms." *Civil Eats*. <https://civileats.com/2020/01/30/questions-remain-about-using-treated-sewage-on-farms/>

European Chemicals Agency (2021). "Understanding REACH." <https://echa.europa.eu/regulations/reach/understanding-reach>

New Jersey Department of Environmental Protection (2019). "Food Waste Reduction Plan." https://www.nj.gov/dep/dshw/food-waste/food_waste_reduction_plan.html

NJ Composting Council (October 27, 2021). *Organics Waste Management Summit, 2021*.

Goldstein, Nora (2021). "Large Scale Food Waste Digestion in New Jersey." *Biocycle*. Accessed online: <https://www.biocycle.net/large-scale-food-waste-digestion-in-new-jersey/#:~:text=Trenton%20Biogas%20opened%20in%20late,and%20unpackaged%20food%20waste%20streams>

Gilbert, J. (2020). The Role Of University Of Nebraska-Lincoln's Biodigester On Sustainable Food Waste Reduction Within Selleck Dining Center. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1260&context=enstudtheses>

NJ Composting Council (October 27, 2021). *Organics Waste Management Summit, 2021*.

Pennington, M (2021). Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018). US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

Schaefer, Charles (2020). "Occurrence of PFAS Compounds in US Wastewater Treatment Plants" The Water Research Foundation. <https://www.waterrf.org/research/projects/occurrence-pfas-compounds-us-wastewater-treatment-plants>

Coker, C. (2021). Managing PFAS Chemicals In Composting And Anaerobic Digestion. BioCycle. <https://www.biocycle.net/managing-pfas-chemicals-composting-anaerobic-digestion/>

US EPA (2021). *Sustainable Materials Management Anaerobic Digestion Funding Opportunity*. US Environmental Protections Agency. <https://www.epa.gov/sustainable-management-food/sustainable-materials-management-2021-anaerobic-digestion-funding>

SARE Northeast (2021). Get a Grant. Northeast Sustainable Agricultural Research and Education. Retrieved January 11, 2022 from <https://northeast.sare.org/grants/get-a-grant/>

New Jersey's Clean Energy Program (2021). Commercial, Industrial and Local Government Programs. NJ Board of Public Utilities. Retrieved January 11, 2022 from <https://njcleanenergy.com/commercial-industrial/home/home>

New Jersey Economic Development Authority (2021). Financing and Incentives: NJ Economic Recovery Act. Retrieved January 11, 2022 from <https://www.njeda.com/financing-and-incentives/>

Brennan, Marissa (2020). Growing the US Green Bond Market: Lab 2. Financial Innovations Lab. Milken Institute. https://milkeninstitute.org/sites/default/files/reports-pdf/MI_GreenBondsLab_FINAL%20WEB.pdf

AgStar (September 2012). Increasing Anaerobic Digester Performance with Co-Digestion. <https://www.epa.gov/sites/default/files/2014-12/documents/codigestion.pdf>

Environmental Protection Agency (February 2020). *Technical Brief: Per- and Polyfluoroalkyl Substances (PFAS): Incineration to Manage PFAS Waste Streams*. https://www.epa.gov/sites/default/files/2019-09/documents/technical_brief_pfas_incineration_ioaa_approved_final_july_2019.pdf

[Research Initiative 12](#)

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

Environmental Protection Agency. (2021). Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2019. The Agency. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019>

Risse, L. M., Cabrera, M. L., Franzluebbbers, A. J., Gaskin, J. W., Gilley, J. E., Killorn, R., ... & Zhang, H. (2006). Land application of manure for beneficial reuse.

Cook, Ross (January 2, 2022). "NASS/USDA: Ranking Of States With The Most Land In Farms." Beef2Live. <https://beef2live.com/story-states-land-farms-ranking-1-50-90-113145>

United States Department of Agriculture: National Agricultural Statistics Service (2017). "2017 Census of Agriculture." <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

Meyer, D. E. (2004). *Costs Associated With Development And Implementation Of Comprehensive Nutrient Management Plans (Cnmp)* (No. 1448-2016-119559).

United States Department of Agriculture: National Agricultural Statistics Service (2017). "2017 Census of Agriculture." <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

Stroheim, E. V., & Hoag, D. L. K. (2021). Valuing Cattle Manure as an Agricultural Resource for Efficiency and Environmental Sustainability. *Sustainability*, 13(16), 9375.

Williams, C. M., Zering, K., & Wohlgenant, M. (2005). APPENDIX B. 1 July 2005 (update of October, 2004 version) Cost and Returns Analysis of Manure Management Systems Evaluated in 2004 under the North Carolina Attorney General. *Update*.

Research Initiative 13

Bayshore Recycling (August 2021). "The New Jersey Climate Change Alliance Organics Workgroup: Sustainable Organic Material Management Plan." <https://www.bayshorerecycling.com/wp-content/uploads/2021/09/Organics-Workgroup-SOMMP-Final-Sept-2021.pdf>

US Department of Agriculture (2013). Agricultural Waste Management Field Handbook: Resources for Planning and Designing Animal Waste Facilities. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1144223.pdf

United States Environmental Protection Agency (2020). Compendium of State Approaches for Manure Management. <https://www.epa.gov/npdes/compendium-state-approaches-manure-management>

"What is the NRCS Distribution Center?" USDA National Resources Conservation Service Distribution Center. <https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?cid=stelprdb1045532>

Livestock and Poultry Environmental Learning Community (March 2019). *Off-farm Manure Disposal*. USDA, Extension Foundation. <https://pelc.org/off-farm-manure-disposal/>

New Jersey Agricultural Experiment Station. "Animal Agriculture Publications." Accessed online: <https://njaes.rutgers.edu/pubs/>

Pennington, M (2021). *Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018)*. US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

US Environmental Protection Agency (2021). AgSTAR: Biogas Recovery in the Agriculture Sector. <https://www.epa.gov/agstar>

Regenis (2021). *Anaerobic Digesters Overview*. <https://www.regenis.net/features/>

California Climate Investments (April 2021). *Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds: Greenhouse Gas Reduction Fund Monies*. http://ww2.arb.ca.gov/sites/default/files/auction-proceeds/2021_cci_annual_report.pdf

Mettler, D. (2009). *No Weeping over this System*. Manure Manager. <https://www.manuremanager.com/no-weeping-over-this-system-2556/>

Natural Resources Conservation Service Texas (1995). *Animal Manure Management*. United States Department of Agriculture. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/technical/dma/rwa/?cid=nrcs143_014211

US Environmental Protection Agency (2017). *Non-Regulatory Tools, Guidance and Support Programs: Delaware Manure Relocation Program*. https://www.epa.gov/sites/default/files/2017-01/documents/b_delaware_manure_relocation_program.pdf

Settje Agri-Services & Engineering, Inc (2021). *Manure Management*. <https://settje.com/manure-management/>

Natural Resources Conservation Service New Jersey (2021). *Environmental Quality Incentives Program*. US Department of Agriculture. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/nj/programs/financial/eqip/>

Farm Service Agency (2021). *Conservation Reserve Enhancement Program*. United States Department of Agriculture. <https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index>

Rehman, A., Nawaz, S., Alghamdi, H. A., Alrumman, S., Yan, W., & Nawaz, M. Z. (2020). Effects of manure-based biochar on uptake of nutrients and water holding capacity of different types of soils. *Case Studies in Chemical and Environmental Engineering*, 2, 100036.

Redling, Adam (2019). "Aries Clean Energy breaks ground on New Jersey gasification facility." Waste Today. <https://www.tapinto.net/towns/linden/sections/green/articles/aries-clean-energy-breaks-ground-inlinden>

Rabinovich, A (2018). *Reclamation of nutrients and irrigation waters from livestock wastewater*. Sustainable Agricultural Research and Education. <https://projects.sare.org/project-reports/gne17-158/>

Additional Research Initiative

Soble, L., Stroud, K., & Weinstein, M. (2020). *Eating Behind Bars: Ending the Hidden Punishment of Food in Prison*. Impact Justice. <https://impactjustice.org/impact/food-in-prison/#report>

Rogers, K. (2015, September 23). *When Prison Food Is a Punishment*. Vice. <https://www.vice.com/en/article/539n3d/when-prison-food-is-a-punishment>

Borrás, J. (2021, January 21). *Composting Goes Hard Core - in Prison*. Insteading. <https://instead.com/blog/composting-goes-hard-core-prison/>

The New Jersey Scholarship and Transformative Education in Prisons. (n.d.). *About NJ-STEP*. Rutgers University School of Criminal Justice. <https://njstep.newark.rutgers.edu/>

Center for EcoTechnology. (n.d.). *Wasted Food Solutions: Spotlights from Philadelphia*. <https://wasted-food.cetonline.org/wp-content/uploads/2020/02/Zero-Waste-Philly-Spotlights.pdf>

McKeever, A. (2016, October 17). *Philadelphia's Prison System is Fighting Food Waste and Recidivism with an Organic Farm*. Civil Eats. <https://civileats.com/2016/10/17/philadelphias-prison-system-is-fighting-food-waste-and-recidivism-with-an-organic-farm/>

Bush, K., Heinitz, E., Pacholke, D., Sinclair, S., Trivett, J., & Vanneste, J. (2015, September 17). *Department of Corrections Walks the Walk On Sustainability*. BioCycle. <https://www.biocycle.net/department-of-corrections-walks-the-walk-on-sustainability/>

Growing Gardens. (2022). *What is Lettuce Grow?* <http://www.growing-gardens.org/lettuce-grow/>

Pennington, M. (2021). *Anaerobic Digestion Facilities Processing Food Waste in the United States (2017 & 2018)*. US Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-02/documents/2021_final_ad_report_feb_2_with_links.pdf

Conclusion

US Food and Drug Administration. April 2021. "Food Loss and Waste." <https://www.fda.gov/food/consumers/food-loss-and-waste>

Sandson, K., Broad Leib, E., Macaluso, L., & Mansell, C. (2019). *Bans And Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws*. *The Harvard Law School Food Law and Policy Clinic: Cambridge, MA, USA*.

Gunders, D. (2017). *Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill*. Natural Resources Defense Council, 26, 1-26.

US Environmental Protection Agency. July 2021. "National Overview: Facts and Figures on Materials, Wastes and Recycling." <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

New Jersey Department of Environmental Protection. 2020. "NJDEP Global Warming Response Act 80 x 50 Report." <https://www.state.nj.us/dep/climatechange/mitigation.html>

[2021 Year-In-Review: Food Waste](#)

Cabrera, Y., Collins, A.S., Hoover, D., Keating, M., & Sevilla, N. (2021, December 14). 2021 Year-In-Review: Food Waste.

List of Contributors

Name	Organization
Adam Michaelides	Cornell Cooperative Extension
Barbara Bronstein	Second Servings of Houston
Barry Nash	The North Carolina Local Food Council
Beth Nelson	Sustainable Agriculture Research & Education: North Central
Brittany Peats	Massachusetts Food System Collaborative
Cara Cuite	Rutgers University
Carrie Henderson	Iron Gate Soup Kitchen
Cheyenne Flores	City of Philadelphia Office of Sustainability
Christian Glander	New York Department of Environmental Conservation
Coryanne Mansell	Center for EcoTechnology
Dr. Doug Hamilton	Oklahoma State University Manure Management
Dr. Hailin Zhang	Oklahoma State University Manure Management
Gary Feinland	New York Department of Environmental Conservation
Heidi Rolf	Wisconsin School Nutrition Team
Jamie Anderson	Denver Food Rescue
Jeanine Cava	New Jersey Food Democracy Collaborative
Jennifer Forbes	Vanguard Renewables Co-digestion Facility
Jill Parrish	The University of Texas at Austin, Office of Sustainability
John Fischer	Massachusetts Dept. of Environmental Protection
Josh Kelly	Vermont Dept. of Environmental Conservation
Joshua Lohnes	West Virginia University
Joyce Yao	The North Carolina Local Food Council
Kirsten Homstad	Wisconsin School Nutrition Team
Marcello Pibiri	University of Illinois Chicago Energy Resource Center
Mark Dennen	Rhode Island Dept. of Environmental Management
Melissa Spiesman	Food Rescue US
Mike Westendorf	Rutgers New Jersey Agricultural Field Station
Nadia Johnson	New York City Council
Sandy Briggs	Boulder Office of Climate Initiatives
Savannah Sullivan	Green Umbrella Local Food Action Team
Susan Woods	Food Recovery Network University of Central Oklahoma

The New Jersey State Policy Lab assists the State of New Jersey and its many communities in the design, implementation, and evaluation of state policies and programs by conducting rigorous evidence-based research that considers equity, efficiency, and efficacy of public policies and programs in holistic and innovative ways.

The lab leverages input from a robust network of multidisciplinary scholars, members of the community, and outside policy experts in New Jersey to craft innovative and equitable policy solutions that are sensitive to the needs of our state's diverse population.

By utilizing the combination of strong ties to New Jersey's diverse communities and significant expertise in collecting, cleaning, and analyzing data, the New Jersey State Policy Lab engages and collaborates with stakeholders such as community groups, the state government, and municipal governments to create high quality datasets and evidence that reflects our state's diversity and empowers state policy makers to address the needs of New Jersey communities more effectively, innovatively, and equitably.



RUTGERS

New Jersey State Policy Lab

*A partnership of
Edward J. Bloustein School of Planning and Public Policy, Rutgers-New Brunswick and
School of Public Affairs and Administration, Rutgers-Newark*

New Jersey State Policy Lab
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, N.J. 08901

policylab@ejb.rutgers.edu policylab.rutgers.edu

© 2022, Rutgers, The State University of New Jersey