# REDUCING THE IMPACT OF FOOD WASTE ON AIR QUALITY AND CLIMATE CHANGE

STATE OF NEW JERSEY
CLEAN AIR COUNCIL

Public Hearing April 16, 2024


Hearing Chair — Maria Connolly, PP, AICP
Hearing Co-Chair — Stephen Milgrom

Editors — Francis Steitz, M.E. (NJDEP)
Richard E. Opiekun, M.A., M.S., Ph.D. (NJDOH)

# New Jersey Clean Air Council Members

Maria Connolly, PP, AICP[c], Chairperson
Richard E. Opiekun, M.A., M.S., Ph.D.[h] Vice-Chairman

Leonard Bielory, M.D.[a]
Sharon Brown[a]
Michael Egenton[e]
Timothy Fekete[g]
Toby Hanna, P.E.[f]
Robert Laumbach, M.D.[i]
Stephen Milgrom[d]
Adam Neuman[j]
Kimberly Scarborough[a]
John Valeri, Jr., Esq.[a]
Allen Weston[b]

[a] public member
[b] representing NJ Association of Counties
[c] *ex officio* member representing NJ Department of Community Affairs
[d] *ex officio* member representing NJ Department of State
[e] representing NJ State Chamber of Commerce
[f] representing NJ Society of Professional Engineers
[g] *ex officio* member representing NJ Department of Agriculture
[h] *ex officio* member representing NJ Department of Health
[i] representing NJ American Industrial Hygiene Association
[j] representing Organized Labor

**New Jersey Clean Air Council's Website**
dep.nj.gov/cleanaircouncil/

## Contents



***Editor's note**: See supporting documents for this report at:*
https://dep.nj.gov/cleanaircouncil/previous-public-hearings/public-hearing-2024/

## EXECUTIVE SUMMARY

The New Jersey Clean Air Council conducted its 2024 public hearing on the 16th of April. The purpose of this year's hearing was to gain further understanding of the extent and impact of air pollution and greenhouse gas emissions from food waste disposal and landfilling, and to develop a series of recommendations to improve air quality using waste reduction strategies and implementation of state of the art control measures to eliminate or recapture GHG emissions.

Food waste is estimated to account for about one third of the food intended for human consumption in the United States. When food is discarded, all resources used in producing, processing, transporting, preparing, and storage are also wasted. These operations all create emissions of air toxics, traditional air pollutants and greenhouse gases. Landfilling food waste exacerbates the climate change crisis due to significant methane, other GHGs, and emission of air toxics. Reducing food waste and managing it better will reduce air pollution and have a positive impact on climate change.

At the annual hearing, the Clean Air Council took testimony that analyzed the following issues:

- Policies,
- Best practices,
- Control technologies,
- Funding opportunities, etc. in each of the categories shown in the USEPA 2023 Wasted Food Scale.


Based upon the expert testimony received during the hearing, the data clearly indicate significant opportunity to reduce food waste and its related air pollution and greenhouse gas contributions. The Council has provided recommendations, detailed below, that emphasize actions that will help New Jersey move forward with this opportunity and reduce air pollution while also creating other environmental and social benefits related to reducing waste of precious resources. The

Council's recommendations are categorized into the following areas: policy development, waste reduction, emission reduction, funding, and stakeholder involvement and partnerships.

## RECOMMENDATIONS

**Policy Development**

To reduce adverse impacts to air quality from food waste, the Council makes the following recommendations to guide development of food waste management policies by NJDEP, NJDOH and their partner agencies at the state and local levels:

- Pursue a leadership by example model across all units of state government where food waste reduction, reuse, and recycling plans are developed and implemented across all executive, judicial and legislative branch offices and facilities. Observations and outcomes from this state government-wide planning endeavor can then be aggregated and best practices shared among agencies and the public.
- Strengthen and clarify guidance to schools and restaurants on safe food donations to promote public education and to dispel current widespread erroneous information on food donation policies and procedures based on the Good Samaritan Law (NJSA 24:4A-1). This guidance can also encompass guidelines for Share Tables. In doing so, consider examples from states that incorporate both regulations and guidance (e.g., Georgia, Minnesota, Montana, Kansas and Colorado).
- Collaborate with Sustainable Jersey for Schools and, as appropriate, individual school districts, to develop policy improvements that enable school food waste composting at a district level.
- Assist NJDOE in drafting language that will amend the Climate Change Education requirement in K-12 schools to add additional focus on food waste and sustainable food systems.
- Evaluate the permitting process for composting facilities based on the modern science of composting and develop specific guidelines and regulations to streamline the process for small, medium, and large-scale facilities.
- Consider development of institutional statewide planning on food waste to urge municipalities and school districts to develop a food waste recovery plan and support school districts to handle their own food waste.
- Collaborate with municipalities to develop outreach and educational materials designed to encourage post-consumer food waste recycling.
- Develop regulations to address liquid food waste recycling from the beverage industry and prioritize liquid waste recycling to wastewater treatment plants.

## Waste Reduction

To reduce adverse impacts to air quality from food waste, the Council makes the following recommendations to guide development of food waste reduction strategies by NJDEP, NJDOH, NJDOE, NJEDA and their partner agencies at the state and local levels:

- Continue the Department's efforts working with established organizations and/or programs (e.g., Rutgers EcoComplex, CUMAC, Sustainable Jersey) to discuss lessons learned and develop strategies for effective education and awareness on waste reduction.
- Implement recurring statewide waste composition audits to track composition of municipal solid waste to determine source apportionment (N.J.A.C. 7:26H; SOLID WASTE UTILITY REGULATIONS Statutory authority: N.J.S.A. 13:1B-3, 13:1D-9, 13:1E-1 et seq., 48:3-1 et seq., 48:13A-1 et seq. and 48:13A-7.1 et seq.; Date last amended: March 5, 2015).
- Develop consumer-oriented fact sheets for the public to explain why food waste is occurring in the first place.
- In partnership with NJDOH and NJDOE, develop a comprehensive program to expand food waste reduction training for the NJ food service industry.
- Partner with NJDOH and local health departments to consider development of a plan to enable secondary markets for food donations.
- Coordinate with NJEDA to develop a plan to incentivize private waste disposal companies to construct additional facilities that accept and recycle food waste throughout the State.

## Emission Reduction

To reduce adverse impacts to air quality from food waste, the Council makes the following recommendations to guide development of emission reductions generated by food waste:

- Streamline the regulatory process for small-scale composting to allow municipalities, school districts, local composting facilities, wastewater treatment facilities, and farms to accept food waste for composting gardens and farming activities to minimize pollution effects from food waste transportation activities.
- Consider options for composting facilities to process materials outdoors. Requiring indoor processing, while an established best practice, can be cost prohibitive for small operations and appears to be a barrier to market entry for new composting operations. The indoor operation requirement stems from the need to prevent offsite odors, which is an important consideration when there are nearby neighbors and sensitive populations, but there are other odor mitigation options that may allow more economical operation, such as siting away from neighbors, processing schedules, material handling changes, etc.
- Encourage school districts throughout the state to develop in-vessel (on-site or enclosed) composting projects in schools.

## Funding

To reduce adverse impacts to air quality from food waste, the Council makes the following recommendations to guide development of funding to promote food waste management and emissions reductions lead by NJDEP, NJDOH, NJDOE and their partner agencies at the state and local levels:

- Consult with NJEDA and other state agencies to consider tax incentive programs for food donations.
- Provide training and technical assistance for expanding best practices across the state though sustainable and equity focused programing in NJ schools.
- Cooperate with the NJDOE to promote certification of sustainability actions in schools and provide available resources.
- Work with municipalities to coordinate the development of municipal composting programs similar to the Hoboken and Princeton programs. Existing NJDEP programs, like the Clean Communities Grant for Litter Removal, may serve as a foundation for a new composting incentive program.

## Stakeholder Involvement and Partnerships

To reduce adverse impacts to air quality from food waste, the Council makes the following recommendations to engage stakeholders and develop partnerships to reduce food waste by NJDEP, NJDOH, and their partner agencies at the state and local levels

- Appoint a multi-agency team within the State of New Jersey, in conjunction with food banks and other stakeholders, to address the lack of clarity on the fundamental legal and policy parameters governing leftover food donation, which would greatly assist in reducing food waste and allow for effective and expanded food donation. Such a "whole of government" approach could clarify when and how food can be donated and should consider the development of clarifying regulations and policies to ensure the expansion of food donation in an environmentally sound manner.
- Coordinate with colleges and universities throughout the state to develop and support data sharing on food waste and disposal practices.
- NJDOH and NJDEP should develop procedures to address nonprofit organizations which receive and distribute food and are known as food banks pursuant to N.J.S.A. 24:4A-4 (The New Jersey Food Bank Good Samaritan Act).
- NJDEP and NJDOH should collaborate on a public education campaign to promote safe and increased leftover food donation. This campaign should target the general public, municipal and county health inspectors, and food donation sites. The campaign should raise awareness of the protections offered by the Bill Emerson Good Samaritan Food Donation Act (Federal) and The New Jersey Food Bank Good Samaritan Act.

- Expand the Recycle Coach app to include information on food pantries, soup kitchens, and others with food to donate or upcycle.

## BACKGROUND

Wasted food (pre-and post-consumer) is estimated to comprise approximately one third of the food produced for human consumption in the United States. As defined by law in New Jersey, food waste (pre-consumer) is defined as:

- Food processing vegetative waste,
- Food processing residue generated from processing and packaging operations,
- Over-ripe produce,
- Trimmings from food,
- Food product overruns from food processing,
- Soiled and unrecyclable paper generated from food processing, and,
- Used cooking fats, oil, and grease.

When food is discarded, all aspects of the pipeline (production requirements, processing, packaging, transportation, distribution, preparation, short-term storage, disposal) contribute to the waste endpoint. Food waste also impacts climate change with its significant greenhouse gas (GHG) footprint. Production, transportation, and handling of food generate significant amounts of carbon dioxide ($CO_2$) emissions and when food ends up in landfills, it generates methane. Food waste contributes more methane emissions than other landfilled material because of its rapid degradation. From 1990-2020 methane emissions from landfilled food waste increased steadily by 295 percent. In 2020, landfilled food waste was responsible for emitting approximately 55mmt $CO_2e$ methane emissions based on a 100-year global warming potential. This is equivalent to the annual GHG emissions from 15 coal-fired power plants.

The U.S. Environmental Protection Agency (EPA) published a report in 2021 on the environmental impacts of food waste (PDF, 12 MB). They have estimated that each year, U.S. food loss and waste consists of 170 million metric tons of carbon dioxide equivalent (million $MtCO_2e$) GHG emissions (excluding landfill emissions) – equal to the annual $CO_2$ emissions of 42 coal-fired power plants. This estimate is in addition to the significant methane emissions from food waste rotting in landfills. An estimate of food loss across the U.S. supply chain can be found in Appendix A. An environmental footprint of the food supply chain in the United States can be found in Appendix B.

If we are to put food waste in perspective according to research conducted by ReFED, a national non-profit working to end food loss and waste:

- If food wastage were a country, it would be the third largest emitting country in the world,

- Global food loss and waste generate annually 4.4 $GtCO_{2e}$ (about 8% of total anthropogenic GHG emissions)(†),
- The contribution of food wastage emissions to global warming is almost equivalent (87%) to global road transport emissions (††).
- The total cost of GHG emissions from global food wastage is $411 billion (USD).

(†) *EC, JRC/PBL, 2012 Emission Database for Global Atmospheric Research, version 4.2.*
(††)*IPCC, 2014 Fifth Assessment Report. Chapter 8: Transportation.*

New Jersey's residents, businesses and institutions discard approximately 3 billion pounds of food into the trash each year. The cost of this waste is $10 billion per year or approximately $1,080 per NJ resident. Most food waste in New Jersey ends up in landfills since the State does not yet have a well-established food waste collection and recycling infrastructure.

There are currently 12 active commercial landfills in the state accepting waste. Emissions are largely attributed to the decomposition of waste in the organic portion of the MSW stream. According to a recent study carried out by the Rutgers University EcoComplex, about 17-19% of MSW is food waste, which generates about 100 cubic meters of methane per ton. Because it takes organic material time to decay, some emissions are locked in from previous decades of waste disposal. Methane can be flared or captured and used for heat or electricity generation.

The Food Waste Reduction Act, which passed in 2017, and established a goal to halve the amount of food waste generated by 2030, using the amount of food waste generated in 2017 as a baseline, about 1.48 million tons, to 740,000 tons. The Law also directed NJDEP to develop and commence implementation of a plan to accomplish this goal. The Plan quantifies food waste in New Jersey and calculates the 50x30 Goal, as well as identifying NJDEP's proposed actions that support the goal and providing a sector identification and analysis (including a toolkit) of food waste reduction strategies.
In 2020 NJ passed the Food Waste Recycling and Food Waste-to-Energy Production Act, which requires large food waste generators that generate a projected average of 52 tons or more per year and are located within 25 road miles of an authorized food waste recycling facility, to source separate and recycle their food waste. The implementing rules and regulations are currently being developed by NJDEP and final adoption is expected in late 2024. The law also established a council (which meets monthly) to report on existing markets for products and energy produced from recycled food waste, investigate the feasibility of providing preferences for these products, and provide policy recommendations to stimulate markets for these products.

It is with this background and the testimony summarized below which forms the Council's recommendations in this year's hearing.

As part of the recommendations to the Commissioner of NJDEP, the Council has asked invited speakers to consider recommendations in the following topic areas while addressing some or all of the listed questions:

a. Policy development
    - Do we need to refine existing regulations related to food donation and if so, how?
    - How can we expand the organics recycling market and what regulatory changes would be required to do this? How can we promote circular economy approaches in food systems, so that there are markets for food waste by-products and supporting businesses that use food waste in their production processes?
    - How can we create comprehensive food waste management policies that address the entire lifecycle of food waste, from production to consumption and disposal?
    - How do we identify and regulate the largest contributors to food waste in NJ?
    - How do we integrate food waste reduction into educational programs? What can be done to emphasize the role of education in preventing wasted food and instilling sustainable practices from an early age.
    - Other policy considerations.
b. Waste Reduction
    - What is the best way to limit agricultural waste, production, packaging, and distribution to reduce excess foodstuffs?
    - What is the importance of setting ambitious and measurable targets for reducing food waste at the state level? How can we establish specific goals for waste reduction?
    - How do we limit household food waste through more expansive and efficient recycling programs for organic materials?
    - What tools are missing to help us better estimate food loss and waste impacts affecting NJ?
    - Other waste reduction strategies.
c. Emission Reduction (short and long-term)
    - What control strategies should be more universally implemented at waste treatment and landfill facilities? Agricultural Operations? Distribution and transportation operations? What specific short-term measures can be implemented to rapidly reduce methane emissions from food waste decomposition in landfills?
    - How can we expand gas recapture at landfills?
    - How do we set reasonable goals for ensuring all landfills develop, use, and maintain Best Available Control Technology over the entire period of operation?
    - How do we set reasonable goals for ensuring all agricultural operations use, and maintain BACT over the entire period of operation?
    - How do we set reasonable goals for ensuring all distribution centers, supermarkets, etc., use, and maintain BACT over the entire period of operation? How do we advance anaerobic digestion infrastructure so that we can reduce short-term methane emissions from decomposing food waste in landfills but also generate renewable energy and nutrient-rich by-products.
    - How do we support and promote community composting programs
    - Other emission reduction objectives.

d. Funding (how-to)
    - How can we expand and fund food donation programs throughout NJ?
    - How can we tailor food production to only what is needed without negatively impacting NJ's agricultural infrastructure?
    - How can we incentivize private sector investment in sustainable technologies? What strategies encourage private sector investment in technologies that reduce air pollution and climate impacts associated with food waste?
    - Other funding sources and opportunities (e.g., grants).
e. Stakeholder involvement/Partnership development
    - Which state agencies should work together to develop food waste reduction and disposal strategies?
    - How can NGOs and community groups work to reduce food waste and optimize disposal practices on a local/county level?
    - How do we identify and target communities that would benefit most from food donation or food upscaling programs?
    - Which organizations could best work with NJDEP to coordinate unified education and outreach on waste reduction, composting, etc.
    - Are there industry associations or other state stakeholder groups of which NJ should be made aware?
    - What opportunities exist for forming partnerships between public and private sector entities involved in food production, distribution, and waste management?
    - How do we create platforms for knowledge exchange, coordinating research efforts, and establishing networks to facilitate information sharing among stakeholders?
    - Other partnership opportunities.
f. Environmental Justice
    - How can we minimize transportation, landfilling and incineration impacts associated with food waste in low-income areas and in disadvantaged communities or communities of color?
    - How can we minimize odor impacts on communities from food waste land application and other food waste operations.
    - How can we support green infrastructure in low-income areas and use food waste to develop "healthier soils" (through composting) in these areas?
    - How can sustainable waste management programs promote job creation and training opportunities? What are the employment opportunities in sectors such as composting, recycling, and the development of clean technologies.
    - Other areas of focus.

## SUMMARY of TESTIMONY

*(Note: Summaries are listed in order of speaker testimony.)*

### Paul Baldauf, Asst. Commissioner, Air, Energy, and Materials Sustainability, NJDEP – Welcome and Opening Remarks

**Opening**

Thank you for having me here today – the Commissioner sends his apologies for not being able to address you, but I'll do my best kick off this year's hearing.

The Clean Air Council is such a shining example of how we can work effectively across multiple levels of government, industry, academia, business (somehow, they let a lawyer on the council in John Valeri) to further positive change.

Over the years, the Clean Air Council has addressed a wide range of important and emerging air quality issues, including power plant pollution, interstate transport, air toxins, mobile sources, cumulative impacts, climate change, fugitive dust emissions, the Impact of the COVID-19 Pandemic on Air Quality and Air Toxics last year.

**Scope**

This year the Council is tasked with advising the Department on how to reduce food waste and control emissions resulting from food disposal. As you are aware, Food waste is estimated to account for about one third of the food intended for human consumption in the United States. When food is discarded, all resources used in producing, processing, transporting, preparing, and storing are also wasted. Landfilling food waste exacerbates the climate change crisis due to significant methane, other GHGs, and air toxics emissions. Food waste contributes more methane emissions than other landfilled material because of its rapid degradation. From 1990-2020 methane emissions from landfilled food waste increased steadily by 295 percent. In 2020, landfilled food waste was responsible for emitting approximately 55mmt $CO_2e$ methane emissions based on a 100-year global warming potential. This is equivalent to the annual GHG emissions from 15 coal-fired power plants. An estimated 61 percent of methane generated by landfilled food becomes fugitive emissions. More needs to be done to eliminate food waste and significantly reduce or recapture gases emanating from landfills.

The presenters who will follow me will each present Specific recommendations that reduce food waste and its associated emissions including:

- Policies,
- Best practices,
- Control technologies,
- Funding opportunities

**Regulatory Work**

The department is developing regulations to implement the Food Waste Recycling and Food Waste-to-Energy Production Act, which requires large food waste generators that generate a projected average of 52 or more tons per year and are located within 25 road miles of an

authorized food waste recycling facility, to source separate and recycle their food waste. The law also establishes a Food Waste Recycling Market Development Council.

We are also developing amendments to our recycling rules now with exemptions to encourage small scale food waste recycling activities including:

- small scale in-vessel,
- outdoor & indoor food waste composting,
- anaerobic digestion,
- food waste transfer activities, and
- feeding wasted food to feedstock.

Other efforts to encourage Food Waste Reduction including:

- Publishing Food Waste Toolkit (https://dep.nj.gov/sustainability/outreach-and-education/food-waste-toolkit/ )
- Funding food waste projects through REA grant funding for higher education
- Working with other organizations to implement steps to reduce food waste and applying EPA grant funding to support food waste reduction initiatives.
- Drafting and proposing for consideration Executive Order to encourage state agencies to reduce food waste and manage unavoidable food waste sustainably.
- Assessing food waste reduction strategies at DEP headquarters

**Closing**

We are early on in our efforts in New Jersey to reduce the air emissions from food waste and we look forward to hearing from our speakers today who will share that New Jersey is making significant progress in reducing air and climate pollutants from food waste and its impacts, more remains to be done to ensure all New Jerseyans benefit from breathing cleaner air. The Commissioner and I are looking forward to the Council's recommendations to the department on future program strategies to assess and reduce pollution from food waste in New Jersey.
In closing I would like to thank the Council for their service including Chair Maria Connelly, Vice-Chair, Richard Opiekun, Hearing Chair Maria Connelly, and Hearing Vice-Chair Stephen Milgrom.

*****

## Craig Coughlin, NJ Assembly Speaker, Legislative District 19

Good morning, everyone. It is a pleasure to be with you. Thank you for the work that you do and have done for quite a while. I appreciate those efforts. I think we are all better off because of your work. I want to thank you for dedicating this hearing to the mitigation efforts and the reduction of food waste. We have been able to take some steps and to make progress in the legislature but there is obviously more work to be done. So, I look forward to learning about some of the options that you are going to discuss today. I look forward to things that we can do collectively to make things better and help eliminate food waste.

As Mike was kind enough to point out, the fight against food insecurity has been at the cornerstone of my speakership. I spend a lot of time on it because the fight against food insecurity and hunger means so much to the people of New Jersey. I view it -- and any of you who have talked to me about it before probably got tired, but the truth of the matter is I think it makes a difference. I see it more not as a governmental function but closer to a moral obligation. The fight against food waste will be able to help. I have discussed the issue with advocates and frontline workers. One of the most frustrating and ironic issues that we deal with is food waste.

I'd like to remind everybody that we can beat hunger and we will because we don't have a food scarcity problem. We have a getting food to hungry people challenge. And it can be maddening just on a human level. I think we all have that sense. That is why there are so many boxes that leave restaurants, because we don't want to just throw away unused good food when there are hungry people in need often in the same community. So, figuring out a way to get that food from restaurants and other places, catering halls, for example, to hungry people is one of the things that we have tried to do some work on, being able to do that work on a donate upcycle section of the EPA's Wasted Food Scale.

I am particularly proud of the state's grants to food banks to scale up recovery and transportation for donated surplus food from restaurants, groceries, grocery stories, farms and catering halls. It makes a real difference. One of our new emphases has been on providing transportation for these things. That is taking a lot of -- if we do that, when we accomplish that, we take a lot of potential waste out of landfills and get them into pantries and ultimately on the tables of our neighbors who need is.

Every year I sponsor a gleaning event, and you're all welcome to come, to salvage excess crops so that our terrific local produce doesn't go to waste. I can tell you this, it is great fun. It's usually a nice Fall day. You get out into the field and pick up apples or potatoes or whatever it is. If you are not familiar with gleaning, I urge everyone to check it out. You will feel good about yourself and you will get some fresh air and get some of your steps in, too. Certainly, we want to prevent it from causing more harm to our environment so it helps in that regard as well.

I am interested in hearing about the work that you are going to do and the work that is being done on large-scale composting and what role the State can play in being of support and assistance in that effort. Extracting energy from food waste is certainly better than just burying it or burning it as I see it. Of course, the ultimate goal will be working with producers and transporters on efficiently rightsizing. Stakeholders today will be offering ideas and sharing potential solutions. To all of you who are going to do that, thank you. And to the Clean Air Council, thank you again for your work. We are lucky in New Jersey to have business, labor, healthcare, environmental experts and advocates all coming together to find solutions. It is what makes government work best and makes all of us better.

Thanks again for letting me be with you this morning. Thank you for the work that you are about to do and for all the work you have done in the past and will do in the future. You are making a difference and that is something I think we all hope to do when we get involved in public service. Thanks everybody and have a great day.

*****

## Serpil Guran, Director, Rutgers EcoComplex Clean Energy Innovation Center, Rutgers, The State University of New Jersey

*Food Waste Reutilization in Achieving Climate Change Mitigation and Circular Economy*

Circularity approach promotes transforming waste practices into circular pathways and redefines waste as a "resource". This approach will achieve GHG emissions reductions and support spurring the economy.

Concept of circular economy emerges as a replacement to the traditional "end-of-life" concept with reducing, alternatively reusing, recycling and recovering materials in production /distribution and consumption processes as an effective pathway for lower-carbon economy. Therefore, promoting integrated concept of recycling, circularity and lower-carbon economy as "circular carbon economy" and emphasizing the transformation of linear make-it /use-it/dispose-it pathway to circular resource recovery pathway can provide better results.

**GHG Emissions Reductions from Efficient Organic Waste Reutilization within Circular Carbon Economy Concept:**

**1. Ensure the Feedstock Quality by Source Separated Collection of Food Waste:**
Municipal solid waste is a complex heterogeneous mix of materials and a single technology treatment of landfilling or incineration approaches proven to be not efficient when it comes to climate change mitigation and circular carbon economy approach. In order to transform these practices for environmentally sustainable and economically feasible new pathways and efficiently valorize waste materials to feed them back into the economy is highly dependent of the quality of the waste and degree of the cross contamination.

Especially, food waste appears to be a low hanging fruit that emerging circular carbon systems can utilize these wastes as feedstocks to produce end-products i.e. fertilizer, chemical industry intermediates and low-carbon energy. These approaches can further displace fossil fuel-based economy and increase the GHG mitigation efficiency overall. However, utilizing contaminated food waste in an anaerobic digester and composting processes creates technical challenges.

Current legislation only requires pre-consumer waste, if the generation is more than 52 tons/year, to be source separated. Therefore, the State should consider collection of pre- and post-consumer food waste as a source separated line to ensure achieving successful projects and consequently, GHG reduction goals.

Source separation can be achieved by mandating/encouraging food waste generators including commercial, industrial and residential, place their waste into separate containers for collecting them separately. In addition, if collected food waste is in packages, i.e., grocery store waste, the separation can be achieved by tearing packages mechanically. This approach can be applied only

to pre-packed food waste. Similarly waste haulers should be mandated/encouraged and made responsible to collect uncontaminated food waste in devoted vehicles to avoid contamination.

**2. Utilize Innovative Technologies & Pathways in Converting Food Waste and Other Organic Waste**

Anaerobic Digestion (AD) of the biodegradable organic fraction of MSW is one of the emerging circular-carbon systems and is a better solution for converting organic waste into clean energy and produces compost-based byproducts, thus extracting the maximum benefits from organic wastes. Circular-carbon reutilization approaches can position organic waste as a valuable resource for energy generation, nutrient recovery as fertilizer and feedstock for further composting and reduced water consumption. Anaerobic digestion will reduce GHG emissions via recovered renewable energy that will displace fossil-based energy and recycled nutrients will displace fossil-based fertilizers. This is a very important feature of the AD process since research shows that landfills currently emit 18% US methane AD facilities are currently being planned throughout the US to divert organic waste from landfills and to produce biogas and compost-based materials as stand-alone facilities. However, identifying a location, that is logistically and technically suitable, is difficult due to the high costs for infrastructure development; issues with securing clean organic waste; power generation system installation difficulties; and location-based permitting constraints.

State would consider integrating organic waste conversion with AD as short-term and mid-term GHG reduction activities. In addition, as long-term planning item, the State may consider integrating other emerging organic waste conversion technologies in utilizing organic waste as a climate change mitigation tool [6,7]

**3. Transform Current Landfills into 21$^{st}$ Century Caliber Facilities by Co-Locating AD Units at the Landfills**

Landfills are estimated to be the third largest source of anthropogenic methane emissions in the US, because of fugitive emissions and other emissions generated prior to cell closure and gas collection system installation. Current landfill designs and operational practices are generally not capable of collecting LFG fully since that is quickly generated from these highly putrescible wastes. There is a growing interest in diverting organics, particularly highly putrescible food wastes, out of landfills to utilize them more efficiently for clean energy production and for nutrient recovery. In landfills, organic material residuals/nutrients are not recovered for beneficial reuse primarily due to the cost and difficulty of separating impurities from mixed MSW prior to disposal. Industrial-scale composting of organic waste does not deliver efficient solutions either, since the aerobic decomposition of the organic waste is not suitable for gas recovery. In addition, there may be pockets of anaerobic decomposition occurring during composting, and as a result, methane leakages may occur from composting. Recently performed, California air survey, by a team of NASA scientists, showed that in addition to landfills as showing up prominently as hot spots for methane leakages, few composting facilities also appeared in the survey as hot spots, despite the belief that compost facilities are not supposed to generate methane [5].

Because “Solid Waste Disposal” is part of NJ counties responsibility, and most of the counties do utilize landfills for waste disposal, landfill owners and operators mostly object diverting food waste from landfills and it will create an impediment for the State in developing efficient GHG reduction plans for near-term and long-term. However, the current landfills can be transformed into better facilities by banning them to bury organic waste in the landfill cells along with other components of MSW and this will help the state to eliminate methane leakages from landfills. Landfills hosting AD units are well positioned to receive for source separated food waste since they can utilize existing waste delivery infrastructure and energy generation assets. Rutgers EcoComplex recommends decision makers to consider allowing landfills to co-locate AD units. With this approach, landfills will be able to remove the negative stigma attached to their current practices and be transitioned into tomorrow’s cleaner and more sustainable operations. Landfills will still receive food waste along with the associated tipping fee and generate a cleaner biogas than landfill gas. In addition, collection of biogas from a digester will be almost 97-99% efficiently as opposed to 75-80% LFG collection efficiency from landfill cells. Landfills with recovered cleaner biogas will still be able to generate renewable energy. Landfills will also be able to generate additional revenue from production of organic fertilizer. Therefore, landfills will not become an economic and environmental burdens for the counties they are located-in and for the State. They will retain jobs and transform into low carbon biorefineries. This approach will provide easier but efficient decision making for the state in diverting food waste from landfill cells.

**4. Transform Wastewater Treatment Facilities into 21st Century Caliber Facilities by Co-Locating AD Units**

New Jersey wastewater treatment facilities can host AD units for reutilizing their waste streams. In addition, if feasible, they can receive food waste from surrounding communities and businesses to utilize the waste in their digesters. Currently, two wastewater treatment facilities in New Jersey, namely Landis Sewerage Authority and Rahway Valley Sewerage Authority are co-digesting food waste along with wastewater. Rutgers EcoComplex’s 2015 study of “Assessment of Biomass Energy Potential in New Jersey” revealed that NJ wastewater treatment facilities’ usable flow for potential biogas generation is approx. 963.5MMgal/day. These facilities’ total design flow reported to be 1,476.7 MMgal/day. Wastewater treatment facilities are also vulnerable for emergency energy shortages because of extreme weather events, which may intensify with climate change. Energy shortage may also occur because of aging energy infrastructure failures. If these facilities become self-energy sufficient by utilizing generated gas biogas for their facilities energy needs and the balance biogas can be used for further energy generation or upgraded as pipeline quality RNG for further utilization. The RNG can be injected into the pipeline or utilized on spot as CNG source as vehicle fuel. These innovative approaches will transform small, mid-size and large wastewater treatment facilities into energy efficient and low-carbon facilities. These facilities can also generate additional revenue by making their digestate available for further land applications as fertilizer, which can displace fossil and mineral-based counterparts. With this approach, wastewater treatment facilities will also retain jobs and transform into low carbon biorefineries. This approach will provide easier but efficient decision making for the state in utilizing organic waste more efficiently.

**5. Support Standalone Anaerobic Digester Projects**

Converting food waste through AD is a proven pathway and widely utilized in Europe. Projects with secured feedstock streams can be located especially in the counties without landfills. Currently, these counties send their waste out of state disposal locations. Therefore, these counties can be chosen as ideal locations for standalone AD projects. When deciding on the location of a project, power generation from biogas and/or pipeline injection of upgraded biogas in the form of RNG should be considered. Additionally, standalone AD projects should include composting steps after the digestion to achieve best carbon utilization.

**6. Assess New Jersey's Categorized Current Baseline Amounts of Food Waste and Organic Waste Generation**

Decision making in achieving short-, mid-, and long-term goals should be based-on reliable food waste and organic waste generation baseline data. Because the characteristics of pre- and post-consumer food waste differ immensely, the State should consider gathering healthy and reliable data quickly while making plans for near and long-term decisions. Detailed waste audits will help the State to determine the availability of food waste for achieving further GHG reduction goals.

**7. Assess Project Pathway and Carbon Reduction Benefits**

It is essential that unbiased third-party verifier should verify new pathways and technologies for waste reutilization before the State allows them to start introducing new projects. Especially co-locating Digesters at the landfills demonstrated in order to other eliminate other landfills objections and prove that the pathway would provide economically feasible solutions along with avoided methane leakages from landfill cells. In addition, it is important to assess the performance of the action items when the State sets a goal for GHG emissions reductions. We recommend that a reliable and comparative GHG based Life Cycle Analysis (LCA) of the projects should be performed by a reliable third-party verifier.

**8. Incentivize Biogas Projects**

Food waste reutilization via Anaerobic Digester technology will achieve efficient and cleaner gas recovery than landfill cells decomposition. State will benefit encouraging above solutions for locating AD technology at landfills, wastewater treatment facilities and standalone digesters. The State may consider creating an incentivized program to encourage project development throughout the state for its GHG reduction activities. Biogas is cleaner and lower carbon than LFG. Therefore, incentivizing Biogas & RNG will accelerate project development and achieve better GHG emissions reduction.

References

1. The Potential Contribution of Waste Management to a Low Carbon Economy

https://zerowasteeurope.eu/downloads/the-potential-contribution-of-waste-management-to-a-low-carbon-economy/
2. https://www.wri.org/blog/2017/08/6-charts-understand-us-state-greenhouse-gas-emissions
3. United Nations Environment Programme (UNEP) and International Solid Waste Association (ISWA) (2015). Global Waste Management Outlook. Wilson DC (Ed) Authors: Wilson DC, Rodic L, Modak P, Soos R, Carpintero A, Velis CA, Iyer M & Simonett O. UNEP International Environment Technology Centre: Osaka, September 2015.Available at: http://web.unep.org/ourplanet/september-2015/unep-publications
4. Wilson, D., & Velis, C., 2015, "Waste management –still a global challenge in the 21st century: an evidence based call for an action, Waste Management & Research, 33(12), 1049-1051.https://journals.sagepub.com/doi/pdf/10.1177/0734242X15616055
5. MSW Management magazine January/February 2020, www.mswmanagement.com
6. Guran, S., 2018, "Sustainable waste-to-energy technologies-Gasification & Pyrolysis" in "Sustainable Food Waste-to-Energy Systems", Ed. T. Trabold & Callie W. Babbitt, 141-158 eBook ISBN: 9780128111581, Paperback ISBN: 9780128111574, https://www.elsevier.com/books/sustainable-food-waste-to-energy-systems/trabold/978-0-12-811157-4
7. Guran, S., 2018, "Sustainable waste-to-energy technologies -Hydrothermal Liquefaction" in "Sustainable Food Waste-to-Energy Systems", Ed. T. Trabold 159-175. & Callie W. Babbitt, eBook ISBN: 9780128111581, Paperback ISBN: 9780128111574 https://www.elsevier.com/books/sustainable-food-waste-to-energy-systems/trabold/978-0-12-811157-4.

*****

## Gary Sondermyer, Vice President of Operations, Bayshore Recycling, Association of New Jersey Recyclers

*New Jersey Statewide Sustainable Food Management Planning & Implementation*

The Association of New Jersey Recyclers (ANJR) has worked cooperatively with other non-profit organizations and the DEP over the past 11 years to advance "sustainable food management." A core objective has been to bring together the "organics community" in New Jersey, to connect the "food waste" and "food recovery" worlds & perform a Statewide gap analysis of barriers to success. Our key policy recommendation is for the Department to adopt a tiered regulatory system for compost facility permitting that exempts small-scale operations, streamlines county planning requirements and uses registrations, general permits or permit-by-rule provisions where appropriate. We further recommend that DEP lead an effort to assess the capability of existing wastewater treatment plant digestion systems to accept liquified food waste as currently done between the Waste Management CORe facility in Elizabeth and the Rahway Valley Sewerage Authority. Finally, ANJR recommends advancing food waste reduction through a holistic approach in concert with other agency efforts, such as those of the Plastics Advisory Council, and to expand the use of the Recycling Coach App to advance real-time food recovery from restaurants.

*****

## Veronique Lambert, Program Manager of Outreach, Training, and Special Projects, Sustainable Institute at the College of New Jersey

*Reducing the Climate Impact of School Food Waste*

How do we change current practice in the school sector to bring about significant climate gas reductions? The presentation reviews the environmental impacts of food waste and shares practices that Sustainable Jersey has been promoting in schools to cut the amount of wasted food. Practices include education and training, separating food waste from other waste, and recovering uneaten food to share or donate. To advance this work, Sustainable Jersey recommends the following:

- Clarify and strengthen guidance on schools implementing share tables and serving as food banks.
- Facilitate schools handling their own food waste within a district with supportive regulation and funding.
- Increase options for sending food waste to external recycling facilities.

*****

## Brian Blair, General Manager, Trenton Renewable Power

*Anaerobic Digestion Decarbonization by Recycling*

Anaerobic digestion of organic waste is a commercially proven and widely accepted method of addressing solid waste management as well as a host of other environmental issues. From a policy perspective, it serves to meet or exceed the goals of the State. It is the most carbon negative of all Class 1 renewable technologies generally recognized under New Jersey law. To date, unlike solar and wind power, it has not received the full recognition necessary to promote its broader commercial adoption. Without establishing a fair value for the energy produced, commensurate with its environmental benefit, there is no economic model which will attract the investment necessary to support growth of this technology.

Growth in the use of anaerobic digestion for food and organic waste management requires further examination of, and in some cases more emphasis on, the priorities of the state's climate objectives, solid waste objectives and energy objectives. Are they out of date? Have the priorities changed? What no longer makes sense from a policy standpoint? What can be done to make the regulatory climate work better to foster the development of anaerobic digestion as a key carbon reduction tool.

**a. Specific health/environmental regulatory recommendations/ Key Points**

1. Green energy electrical tariff for appropriate value for electricity

2. Utility construct does not allow for sufficient cost recovery,
3. Utility can be a barrier to the market
4. Food needs to be recycled but this will fail if costs are not reasonably recovered.
5. Utility Rate Counsel – tends to look at a preferrable electric rate exclusive of all other considerations, this could make coal oil gas the priority Protecting the rate payer, however, should include addressing health/environmental issues.
6. Current bill in legislature requiring counties (solid waste management districts) to rework solid waste management plans to better address food waste. This should be accelerated but it will only work if there is a fair rate on the sale of green electricity.
    a. Currently under the provisions of the Solid Waste Management Act ("SWA") governing food waste. "a hauler can use a waiver process to avoid a digestor facility if the tipping fee charged exceeds that of another facility by ten percent or more. This should be raised to twenty-five percent immediately and the option for a waiver of this nature eliminated over the next three years.
    b. The current obligation to recycle food waste is limited to a twenty-five (25) mile radius around a licensed recycling center. <u>This should be increased to a fifty (50) mile radius immediately, and also eliminated within three (3) years.</u>
    c. <u>NJDEP should be encouraged to better enforce the food waste provisions of the SWA</u>.
7. Permit land application of liquid fertilizer, land applied NJ farmland
    a. Department of agriculture, .
7. Anaerobic digestors as licensed Recycling Centers serve a statewide purpose and a statewide customer base. Yet the county where a digestor is located may be charging a fee on residual disposal that becomes cost prohibitive when the out of county food waste stream directed to a digestor is considered. A preferential rate, or no rate, for disposal of residuals from a facility employing carbon negative technology should be considered.

**b. Specific policy recommendations**

i. New Jersey should develop a system of regulatory review for most favored technologies to make it easier to do business and soften compliance issues that are not affecting the big picture.
ii. Recycling Centers should not be required to pay more for residuals disposal than the tipping fee paid to take in the recyclables in the first place.
iii. As many major solid waste management facilities in N.J. are publicly owned and operated, the State should promote a streamlined pathway for public private partnerships that achieve environmental benefits.
iv. Eliminating organic waste from landfills should be a priority.
    a. This would create significant cost benefits for local government as well as generating environmental gains.
v. PFAS source management – Better regulatory means to identify sources of PFAS contamination should be developed. Waste management and water treatment facilities which receive material already contaminated have been subjected to excess regulatory burdens and costs to detect and report the contamination. This is part of the State's

efforts to identify the actual sources but the traditional regulatory tools being employed are not the best way to do this.

*****

## Sara Elnakib, Dept. Chair and Associate Professor, Dept. of Family and Community Health Sciences, Rutgers Cooperative Extension Service

*Tackling Food Waste through the Food System: Focusing on Schools*

Research conducted by organizations like the WWF has identified key strategies to address the issue of Food Waste in schools. Initiatives such as shifting to offer vs. serve (OVS) models, adopting milk dispensers instead of cartons, and implementing sharing tables to redistribute uneaten food have demonstrated promising effectiveness. These strategies' effectiveness has been confirmed in local New Jersey schools by the Rutgers Cooperative Extension Food Waste Team. Not only do these measures alleviate financial strain, but they also yield economic, environmental, and social benefits. Reductions in food waste can lead to significant cost savings, mitigate environmental degradation associated with excess food disposal, and foster a culture of resourcefulness and sustainability.

The urgency of addressing food waste in school lunch programs cannot be overstated. By reinvesting savings from waste reduction efforts into enhancing food service programs, schools can improve the nutrition, health, and overall well-being of students. Advocating for the widespread implementation of sustainable practices is essential to ensure a healthier future for both students and the planet, underscoring the imperative for collective action and systemic change. For that reason, Rutgers Cooperative Extension is uniquely positioned to offer the New Jersey Clean Air Council the following recommendations based on the suggested recommendation categories:

a. Policy development
    1. Strengthen New Jersey guidance to schools and restaurants on **safe food donations (Use examples from states that incorporated both regulations and guidance/guidelines Georgia, Minnesota, Montana, Kansas and Colorado)**
    2. Support policy improvements to allow for **school food waste composting** at a district level.
    3. Use the **Climate Change Education requirement** in K-12 schools to focus on food waste and sustainable food systems.
    4. Expand Food Waste training for all NJ school food service workers.
b. Funding opportunities
    1. Fund training and technical assistance for expanding best practices across the state though a **sustainable** and **equity focused** programing in NJ schools.
c. Stakeholder engagement/Partnerships (citizen science and/or academic)
    1. Establish a stronger partnership between **municipal health inspectors** and **food donation sites** to ensure safe food donation.

d. Equity and Environmental Justice risks and opportunities
    1. Install a **Share Table** in **EVERY** School in New Jersey which will promote health equity and reduce waste
e. Other
    1. Work with **Colleges** and **Universities** to innovate in food waste reduction efforts that **support food security.**

*****

## Len Gipson, Director of Maintenance and Operations, Camden County Municipal Utilities Authority

*Anaerobic Digestion, Food Waste, and Carbon Footprint*

The CCMUA has successfully piloted a liquid food waste to digestion program that has significantly increased bio-gas production. This increase in biogas allows for more electricity production from the CCMUA's combined heat and power system while at the same time diverting food waste from the conventional waste stream. This pilot program demonstrates the "win-win" that can be achieved from an environmental and financial perspective. Specific recommendations include:

- Wastewater treatment plants are uniquely positioned to accept properly prepared food waste and especially liquid food waste.
- There should be regulations which require liquid foot waste recycling from the beverage industry and pre-processing to remove solids from food processing.
- Wastewater treatment plants with digestion should be required to accept these liquid forms of food waste.
- Wastewater treatment plants can then distribute the biogas that is created or use it to create electricity via a combined heat and power system.

*****

## Jessica Padilla-Gonzalez, Chief Executive Officer, Center for United Methodist Aid to the Community

*Food Rescue: A Vital Strategy to Impact Food Security and Environmental Justice*

Food insecurity is a growing public health issue that affects millions of people in the United States and around the world. In New Jersey, an estimated 1 in 10 households are food insecure, meaning they lack consistent access to enough food for an active, healthy life. At the same time, it is estimated that up to 40% of food in the United States goes to waste, with much of this food ending up in landfills. Food rescue programs offer a solution to these dual challenges, providing nutritious food to those in need and reducing the amount of food waste sent to landfills. Jessica Padilla Gonzalez CEO of CUMAC Echo one of the largest food justice anti-hunger organizations

in Passaic County will explain how her organization utilizes food rescue also known as gleaning to help secure consistent foods to meet the expansive needs of the community and guests they serve.

The presentation would focus on the following policy recommendations that would help advance and enhance this work:

1. A4703/S3364 (2022) - Establishes a food recovery and donation program in the Department of Agriculture to reduce food waste and increase food donations to food banks and other organizations. This bill would establish a program to facilitate the donation of food from farms, wholesalers, retailers, and other food businesses to food banks and other organizations that distribute food to those in need.
2. A5643/S3821 (2021) - Requires certain food retailers to donate unsold food to food banks or other charitable organizations. This bill would require large grocery stores and supermarkets to donate unsold food to food banks or other charitable organizations, rather than sending it to landfills.
3. A5644/S3822 (2021) - Establishes a tax credit for food donations made by businesses. This bill would provide a tax credit to businesses that donate food to food banks or other charitable organizations, to incentivize food donations and reduce food waste.
4. A5645/S3823 (2021) - Establishes a food waste reduction goal for the state. This bill would establish a goal of reducing food waste in New Jersey by 50% by 2030 and require the Department of Environmental Protection to develop a plan to achieve this goal.

*****

## Matthew Wasserman, Vice President, New Jersey Composting Council

*Reducing the Impact of Food Waste on Climate Change*
The NJCC recommends the NJ legislature and NJDEP use the full force of its governmental and public administrative authority to push for the successful implementation of all programs that will drive the state to meet its 50% food waste reduction by 2030 goal as outlined in the Priority Climate Action Plan. This includes bills currently under consideration A2102 (community garden exemptions), A2090 (county food waste reduction strategies), and A2094 (extended producer responsibilities). Because 2030 is only 6 years away, we would also recommend speeding up the permitting process for compost facilities which would include: tiered permitting based on tonnage and the elimination of permitting redundancies between the county SWAC's and the DEP. Finally, we would recommend the NJDEP consider mandatory food waste recycling for municipalities.

*****

# PUBLIC COMMENTS

## Peter Johnsamson (The Nordic Technologies Company)

Nordic circular composting company. Process can produce, biogas and biodiesel as well as organic fertilizers. Small units and larger units are available. No greenhouse gas emissions. All reduced by our methodology. Patented process with microbes. Household size is available.

*****

## Helene Lanctuit (CEO, Share My Meals)

**Much Across NJ, we have the opportunity to reduce food waste by 2.5% by increasing the rate of donation of prepared meals from caterers and supermarkets. Until now, most donated food has come from produce, meat, dairy and baked goods. Now, two important changes can open the door to the donation of prepared meals.**

1. Technology to monitor the shelf life of individual meals.

   The logistics of rescuing prepared meals are more complex than other food since the shelf life of prepared meals is short. Share My Meals has developed STAN (safety, tracking, assignment and navigation) technology that allows the rapid recovery of food and delivery to families within 30 minutes driving distance. Other food rescue organizations have created workable systems. **We would like to see effective technology spread across the state to encourage more meal recovery.**

2. Guidelines for donation.

   The 2022 NJ Food Donation[1] guidelines, designed to encourage safe food donation, contain one ambiguity that discourages corporations from donating from self-service stations (or buffets). **We would like to see these guidelines updated** to clarify when it is safe to donate prepared meals from this type of setting.

These changes would help free up to an additional 120[2] tons per day to be rescued and donated. This volume represents the provision of two meals per week for up to 840,000 individuals. Our practical estimates suggest it should be possible to increase the rate of food donation in the state by 25-30% through the inclusion of self-service stations.

**Opportunity**

Every day in New Jersey, supermarkets and caterers discard up to 120 tons of prepared food from self-service stations - like the hot food bar at Wegmans, Shoprite or Wholefoods, or from large catered events. Prepared meals represent about 2.5% of food waste in NJ. If

rescued, donated and served this would represent increased food security for up to 840,000 individuals[3].

Until recently, food recovery organizations in New Jersey have focused mainly on produce, meat and dairy and bakery products, because the logistics of handling them are easier. Recent technology advances mean that it's now both safe and economically feasible to recover prepared meals and deliver them to food-insecure families. Share My Meals piloted a program in 2020 and is rapidly expanding operations in New Jersey, using a Safety, Tracking, Allocation and Navigation (STAN) technology that ensures meals reach their destination within the short time window available. Other agencies have also created workable technology-based solutions.

>400,000 food insecure people live <30 minutes from a food service corporation that discards prepared meals[4]. Working families particularly need consistent access to healthy balanced meals at the end of the day. Recovered meals provide better nutrition: they have a 51% higher American Health Association dietary score than average household meals, providing improved nutrition to recipients[5].

Corporations have an interest in donating this food and food recovery organizations like Share My Meals and Table to Table have the capability to safely transport them to places of need.

A primary reason that corporations don't donate prepared food is that the current guidelines are ambiguous regarding recovery of food from self-service stations or buffets. Understandably, corporations want to protect themselves from liability.

**Actions Needed**

1. *Update food donation guidance*

In 2022 the Rutgers Cooperative Extension, Center for EcoTechnology (CET), and Sustainable Jersey published guidance for New Jersey food waste generators on opportunities to donate food. The document consolidates federal and state regulations, including information on liability protection, health codes, and more. Generally, the guidance has been helpful in encouraging food donations and guiding safe practices.
The FDA Food Code allows for food that has been stored under protected conditions to be repackaged and served to a consumer (in other words, to be donated).

The 2022 guidance lists, among food that cannot be donated: "previously served food such as from a buffet." The term 'previously served' tends to cause confusion. If food has been placed on a consumer's plate, it has been served and cannot be recovered. However, if the food is in a properly controlled self-service station (sometimes known as a 'buffet'), FDA rules would allow this to be recovered and donated.

Health inspectors and corporations interpret current guidance as 'no food from buffets' and as a result, we are missing a large opportunity.

We need to update NJ food donation guidelines to include information on how to safely donate food from self-service stations or buffets.

We have support for this action from food service corporations e.g. Sodexo, the Rutgers Extension, Family and Community Health Sciences, and other food rescue organizations such as Table to Table. A project team of stakeholders could be convened within a few months to complete this work within one year.

2. *Encourage meal donations from Food Retailers and Caterers*

With updated guidelines, we need an informational campaign for Food Service Corporations, and training for health inspectors. This work could be led by the project team convened to update the guidelines.

3. *Funding to extend safe prepared meal recovery*

Food rescue agencies need financial support to implement meal rescue, and bring meals to where they are needed. The significant impact on food insecurity means that these efforts are important to multiple Government agencies.

| **Conditions Necessary to Recover Prepared Meals and Reduce Food Insecurity** | **Current Situation** | **Actions Needed** |
|---|---|---|
| Clear guidelines and training on safe meal recovery | Current guidelines contain ambiguity that prevents significant recovery | Update guidelines and training |
| Food recovery logistics and technology available | Share My Meals has developed Safety, Tracking, Allocation and Navigation (STAN) technology that supports safe delivery and donation at scale. | Help other food recovery agencies to expand prepared meal rescue through:<br>● Funding<br>● Technology exchange where needed |

| | | |
|---|---|---|
| | Other food recovery agencies recover meals, but tend to focus on produce and products, with room to expand. | |
| Last mile distribution agencies ready to receive | Last mile agencies report significant need, particularly for local hubs | Continue support for last mile agencies' food distribution programs |

1. This guidance document was created by the Rutgers Cooperative Extension, Center for EcoTechnology (CET), and Sustainable Jersey. It consolidates federal and state regulations, including information on liability protection, health codes, and more. Rutgers Cooperative Extension has indicated its willingness to work on updated guidance, and updated health inspector training, to help increase the potential for food donation.
2. Source ReFED. This upper estimate is based on the sum of 'catering overproduction' figures from Food Service and 'overproduction' from Retail Sectors. In practice, based on our experience of working with food service corporations and retailers, we expect this change to increase food donations by 25-30%.
3. ReFED
4. Estimates made based on NJ.com population data.
5. McKinsey study commissioned by Share My Meals

*****

## Christina PioCosta-Lahue (President, Vivaria Ecologics)

The decomposition of organic matter, or food waste, in landfills creates methane, a potent greenhouse gas whose warming effect is more than 80 times powerful as the same amount of carbon dioxide over a 20-year period. The New Jersey Department of Environmental Protection reports that food waste is the single most common material sent to landfills, making up approximately 22 percent of New Jersey's solid waste. That equates to a staggering 325 pounds of food for each New Jersey resident.

An alternative to sending food waste to landfills and incinerators is to compost it into a beneficial soil amendment product. Compost is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds (in accordance with EPA 40 CFR 503 standards) and stabilizes the carbon such that it is beneficial to plant growth. Compost is typically used as a soil amendment, but may also contribute plant nutrients. (AAPFCO definition, official 2018) Finished compost is typically screened to reduce its particle size, to improve soil incorporation.

Composting, which may occur on a small-scale level with a backyard composting pile or at the commercial level with state-of-the-art facilities, has other benefits besides reducing methane emissions and providing a valuable product that cycles nutrients back into the soil. Diverting food waste to composting facilities can save space in landfills, extend their lifespan, and reduce our contributions to waste incinerators, which are often located in overburdened communities.

In 2020, New Jersey attempted to encourage more food waste composting by requiring large food waste generators, such as industrial food processors, supermarkets, restaurants or medical facilities, to recycle their food waste at an authorized food waste recycling facility within 25 road miles. Unfortunately, there are only two authorized food waste recycling facilities in New Jersey, neither of which produces compost as an end product, and there is one commercial scale composting facility that is pending approval by the state. This is nowhere near the scale needed to capture all the food waste generated in New Jersey.

The cost of not having a robust food waste recycling or composting program in New Jersey is that it hinders our ability to reach our goal of reducing greenhouse gas emissions 80 percent by 2050, limits local government's ability to meet increased resident demand for more sustainable ways to handle waste, and does not support our agricultural community by providing a valuable soil amendment for their crops. And, unlike some other actions needed to reduce greenhouse gas emissions, the development of compost facilities can take place in the short-term to achieve immediate results and jump-start an in-state circular economy that reduces waste and pollution, develops high value products and restores our ecosystem.

As a leader in environmental and climate change action, New Jersey must do more to move forward with policies, rules and investments to support companies, local governments, non-profit organizations and community-based groups that want to develop food waste composting facilities.

Here are some ideas that the New Jersey Clean Air Council should consider as it reviews how to reduce food waste and control emissions from food disposal:

- **Eliminate uncertainty in the marketplace through the consistent treatment and application of laws and regulations during the county review process for the siting of compost facilities through the development of guidelines.** Relative to other food waste recycling options, such as anaerobic digestion, composting facilities require a significantly lesser capital outlay and entail a shorter start-up phase. If county Solid Waste Advisory Councils are better prepared to review applications for food waste composting facilities with appropriate knowledge and understanding of operations, the state will be able to make swift progress in establishing a network of composting infrastructure.
- **Update the permitting process to include a tiered permit structure that is based on the modern science of composting.** Rules regarding composting have not been updated for nearly forty years and New Jersey is falling behind other states. Many states follow a tiered permitting approach, which allows for a more fair, proportional permitting cost for small and medium sized operations along with associated requirements that are appropriate for different volumes of throughput. Tiered permitting will open up opportunities for a wider ecosystem of composting sites of varying sizes to develop.
- **Increase public education on the importance of reducing food waste, as well as the benefits of diverting what is left, from landfills or waste incinerators.** Public interest in residential composting is growing, but the infrastructure to accept and waste is essentially non-existent. If the state would like to promote food waste diversion through a

public education campaign, an increase in commercial compost facilities paired with municipal collection systems (either curbside or drop points) is essential.

- **Ensure parity for food waste composting facilities with facilities that use food waste to produce biogas in terms of state rules, policies, climate goals and investment.** Vivaria Ecologics identified a critical barrier to the development of composting infrastructure in New Jersey, which is the requirement that food waste composting be conducted in an enclosure (building). New Jersey is the only state in the country with this rule. We submitted a petition for rulemaking to the NJDEP to remove this requirement: https://dep.nj.gov/wp-content/uploads/rules/petition/pet20231020.pdf. The NJDEP denied this request, though it is based on sound science and logic and proven technology. https://dep.nj.gov/wp-content/uploads/rules/petition/pet20231020noa.pdf This denial only further delays long overdue progress in diverting food waste from landfill and incineration.

As New Jersey moves forward with important clean energy projects, increasing electric vehicle purchases and charging infrastructure, and building decarbonization, it should not leave behind one of the easiest and immediate ways to achieve our climate goals – composting.

Thank you for the opportunity to contribute to this hearing.

*****

## Virginia Lamb (Groundwork Education and Consulting)

I am writing to provide comments on the above-named issue. I listened in at the public hearing on April 16, 2024, as the Council heard many comments on the contribution of food waste to greenhouse gas emissions in NJ and ways that food waste could be reduced and recycled.

I have been working in recycling and composting in NJ since 1987 and am currently the Vice President of the Governors Food Waste Market Development Recycling Council. The Council was enacted pursuant to N.J.S.A. 13:1E-99.122 and requires those generating greater than 50 tons per year of pre-consumer food waste to divert that materials to permitted processing facilities if there is one within 25 road miles and if the cost of recycling does not exceed the cost of disposal of the material as solid waste by more than 10%.

There are currently 2 permitted facilities in NJ, both of which utilize Anaerobic Digestion (AD): Waste Management's CORe Facility in Elizabeth, which creates a slurry and sends it to the Rahway Valley Sewerage Authority which extracts methane energy and uses it on site, and Trenton Renewable Power in Trenton which, as you heard from Brian Blair's presentation at the hearing, extracts methane to power their facility and supply excess energy to the power grid. A third facility AD facility is currently under construction in Linden NJ.

There is just one large scale food waste composting facility in operation in NJ: Ag Choice in Newton, which operates under an NJDEP Research Design and Development (RD&D) permit.

While AD is a piece in the food waste management puzzle, it is capital and technology intensive. It has a relatively low processing capacity and high operating costs. Methane and carbon dioxide are combusted and that pollution must be controlled and monitored. Other gases may result from the process. The resulting digestate, which can be of questionable quality and contaminated with microplastics and PFAS, can contribute to nutrient pollution problems if handled incorrectly.

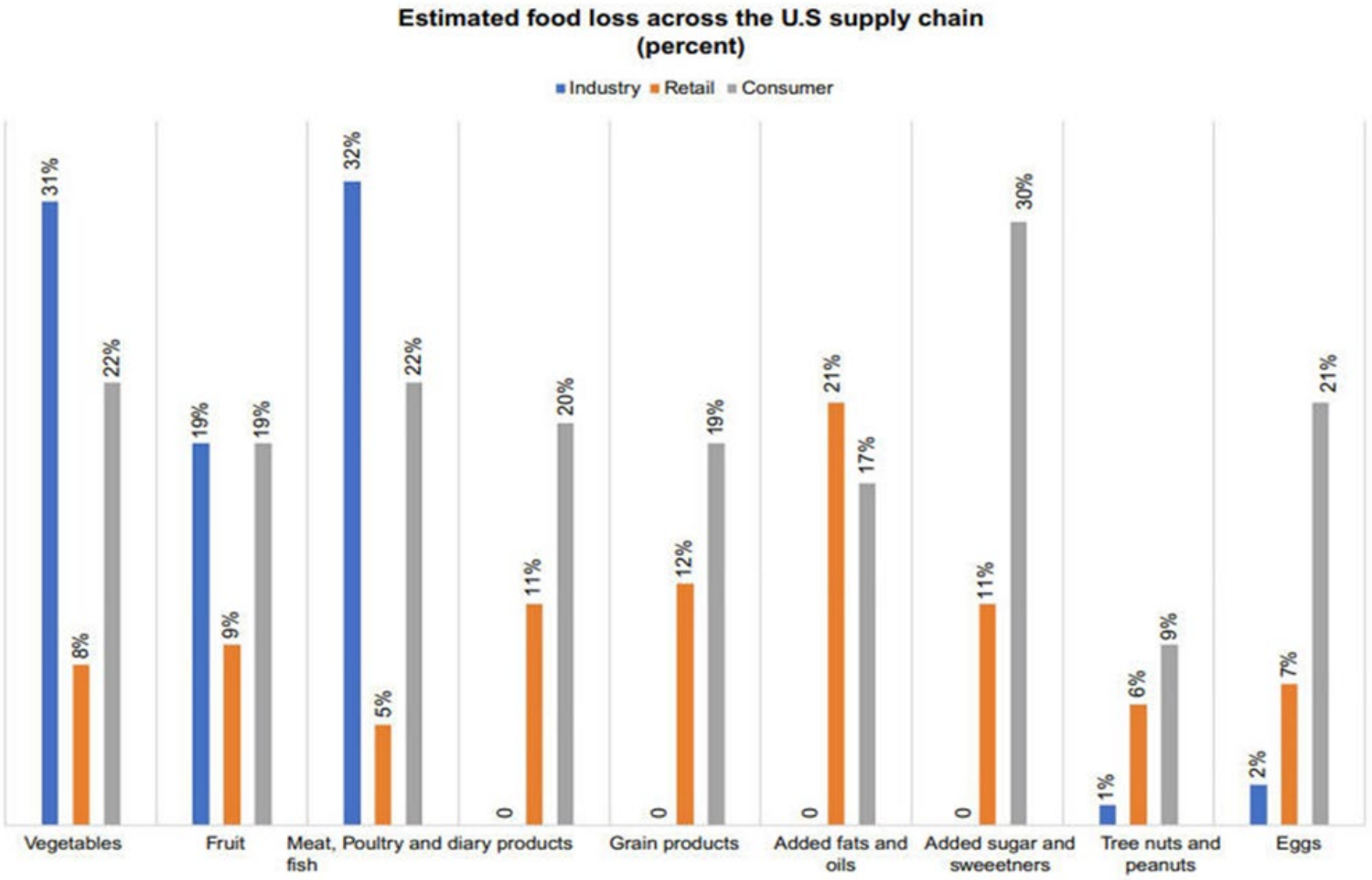
A properly run aerobic composting facility on the other hand has none of these issues. Capital costs are low and $CO_2$ emissions are very low. Methane emissions nonexistent and finished compost is a soil amendment that offers a balanced nutrient source while enhancing the soil and promoting additional carbon storage.

I encourage the CAC to advise the DEP to consider a wide range of technologies and scales when it comes to managing food waste in NJ. Currently it is illegal for a community gardener in NJ to bring their food scraps from home to compost in the garden. Schools must compost in expensive enclosed units. This is excessive regulatory overreach. Small scale composting is happening successfully in communities all across the US and producing high quality compost. Solutions in NJ should be varied and local, which would additionally reduce vehicle miles travelled and the resulting air pollution.

Thank you for your time on this matter.

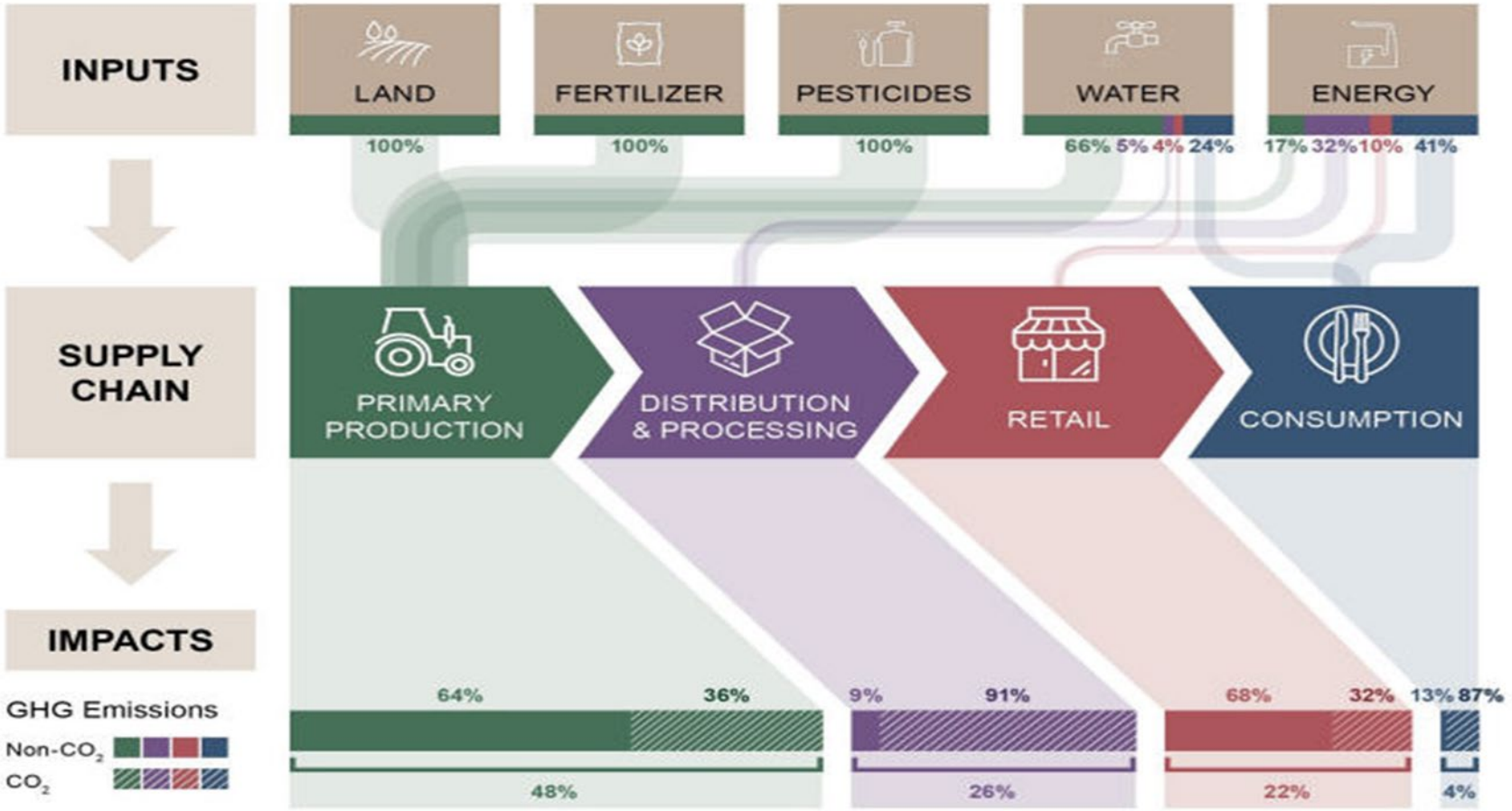
# APPENDICIES

**Appendix A. Food Loss Across U.S. Supply chain.**




From: Dou, Z., Ferguson, J.D., Galligan, D.T., Kelly, A.M., Finn, S.M., Giegengack,. R., 2016 Assessing food wastage and opportunities for reduction", Global. Food Sec. 8,19-26.

**Appendix B. U.S. Food Supply Chain and Environmental Footprint.**




From: Jaglo, K., Kenny, S/., Stephenson, J., 2021, From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste U.S. Environmental Protection Agency Office of Research and Development, EPA 600-R21 171. https://www.epa.gov/land-research/farm-kitchen-environmental-impacts-us-food-waste

## LIST OF ACRONYMS

| | | |
|---|---|---|
| AAPFCO | - | Association of American Plant Food Control Officials |
| AD | - | Anaerobic digestion |
| ANJR | - | Association of New Jersey Recyclers |
| BACT | - | Best available achievable control technology |
| CAC | - | (NJ) Clean Air Council |
| CCMUA | - | Camden County Municipal Utilities Authority |
| CET | - | (Rutgers) Center for EcoTechnology |
| CFR | - | Code of Federal regulations |
| CNG | - | Compressed natural gas |
| $CO_2$ | - | Carbon dioxide |
| $CO_{2e}$ | - | Carbon dioxide equivalents |
| GHG | - | Greenhouse gas |
| $GtCO_{2e}$ | - | Gigatons carbon dioxide equivalents |
| LCA | - | Lifecycle analysis |
| LFG | - | Landfill gas |
| MMgal | - | Million gallons |
| $MtCO_{2e}$ | - | Megatons carbon dioxide equivalents |
| MSW | - | Municipal solid waste |
| NASA | - | National Aeronautics and Space Administration |
| NGO | - | Non-governmental organization |
| NJDEP | - | New Jersey Department of Environmental Protection |

| | | |
|---|---|---|
| NJDA | - | New Jersey Department of Agriculture |
| NJDOE | - | New Jersey Department of Education |
| NJDOH | - | New Jersey Department of Health |
| NJEDA | - | New Jersey Economic Development Authority |
| OVS | - | Offer vs. Serve |
| PFAS | - | Per- and polyfluoroalkyl substances |
| RNG | - | Renewable natural gas |
| SWAC | - | Solid Waste Advisory Council |
| USEPA | - | United States Environmental Protection Agency |
| WWF | - | World Wildlife Fund |

## HISTORY OF THE CLEAN AIR COUNCIL HEARINGS

2023 Air Toxics: How Far Has New Jersey Come in Almost a Quarter Century?

2022 Declining Trends During the Pandemic: Vehicle Miles Traveled and Air Pollutants

2021 Dust in the Wind: Just a Nuisance or Something More?

2020 Past, Present, and Future: Air Quality Around Our Ports and Airports

2019 Global Warming Pollutants in New Jersey: Beyond Carbon Dioxide

2018 Zero Emission Vehicles: Clearing the Air

2017 What Can Be Learned from Low-Cost Air Quality Monitors: Best Uses and the Current State of Technology

2016 The Clean Power Plan: Impact on New Jersey (not released)

2015 Air Pollution Knows No Bounds: Reducing Smog Regionally

2014 Reducing Air Emissions Through Alternative Transportation Strategies

2013 Addressing the Adverse Effects of Climate Change on Air Quality

2012 Transportation and Small Sources of Air Pollution: Challenges and Opportunities to Achieve Healthier Air Quality in New Jersey

2011 The Cumulative Health Impacts of Toxic Air Pollutants on Sensitive subpopulations and the General Public

2010 Vision for the Next Decade: Air Quality and Pollution Control in New Jersey

2009 Electricity Generation Alternatives for New Jersey's Future: What is the Right Mix for Improving Air Quality and Reducing Climate Change?

2008 Improving Air Quality at Our Ports & Airports—Setting an Agenda for a Cleaner Future

2007 Improving Air Quality through Energy Efficiency and Conservation: The Power of Government Policy and an Educated Public

2006 Indoor Air Quality

2005 Air Pollution—Effects on Public Health, Health Care Costs, and Health Insurance Costs

2004 Fine Particulate Matter in the Atmosphere

- Health Impacts in NJ
- Need for Control Measures

2003 Moving Transportation in the Right Direction

2002 Innovative Solutions for Clean Air

2001 Air Quality Needs Beyond 2000

2000 Air Toxics in New Jersey

1999 The Impact of Electric Utility Deregulation on New Jersey's Environment

1998 CLEAN AIR Complying with the Clean Air Act: Status, Problems, Impacts, and Strategies

1997 Particulate Matter: The proposed Standard and How it May Affect NJ

1996 Clearing the Air Communicating with the Public

1995 Strategies for Meeting Clean Air Goals

1994 Air Pollution in NJ: State Appropriations vs. Fees & Fines

1993 Enhanced Automobile Inspection and Maintenance Procedures

1992 Impact on the Public of the New Clean Air Act Requirements

1991 Air Pollution Emergencies

1990 Trucks, Buses, and Cars: Emissions and Inspections

1989 Risk Assessment – The Future of Environmental Quality

1988 The Waste Crisis, Disposal Without Air Pollution

1987 Ozone: New Jersey's Health Dilemma

1986 Indoor Air Pollution

1985 Fifteen Years of Air Pollution Control in NJ: Unanswered Questions

1984 The Effects of Resource Recovery on Air Quality

1983 The Effects of Acid Rain in NJ

1981 How Can NJ Stimulate Car and Van Pooling to Improve Air Quality?

1980 (October) Ride Sharing, Car– and Vanpooling

1979 What Are the Roles of Municipal, County, and Regional Agencies in the New Jersey Air Pollution Program?

1978 How Can NJ meet its Energy Needs While Attaining and Maintaining Air Quality Standards?

1977 How Can NJ Grow While Attaining and Maintaining Air Quality Standards?

1976 Should NJ Change its Air Pollution Regulations?

1974 Photochemical Oxidants

1973 Clean Air and Transportation Alternatives to the Automobile and Will the Environmental Impact Statement Serve to Improve Air Quality in NJ?

1972 The Environmental Impact on Air Pollution: The Relationship between Air Quality, Public Health, and Economic Growth in NJ

1971 How Citizens of NJ Can Fight Air Pollution Most Effectively with Recommendations for Action

1970 Status of Air Pollution from Mobile Sources with Recommendations for Further Action

1969 Status of Air Pollution Control in NJ, with Recommendations for Further Actions

----- END -----