Do you Know Where Essex County's Recyclables Go?

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Executive Summary

What our research found:

1. New Jersey has passed 4 major laws governing recycling since 1981.

2. Essex County as whole only recycles 29% of its waste. In contrast, Germany recycles 62%.

3. Recycling currently employs 27,000 individuals in New Jersey

4. Essex County's decentralized responsibility for recycling makes it difficult to develop a consistent standard for recycling across all 22 municipalities. In contrast, solid waste disposal is handled centrally within the county, with all waste going to the Covanta incinerator in theIronbound section of Newark

5. Even when prices paid to municipalities for recycled materials are low, recycling is far cheaper than landfilling or incinerating those materials, and therefore every effort should be made to increase recycling participation

6. Dual stream recycling (in which homeowners separate paper from other recyclables at the curbside) is more efficient and economical for towns than single stream recycling, in which paper, plastic, and metals are commingled

7. Separate municipal contracts with Material Recovery Facilities (MRFs) limits the types of materials that a municipality can accept for recycling

8. Recycling education needs to be expanded and standardized as a pre- requisite to improving recycling rates

9. Collection of recycling statistics from commercial, industrial, and institutional facilities varies significantly between towns, resulting in failure to claim their maximum tonnage

grants under the Clean Communities and Recycling Act of 1981 and the Recycling Enhancement Act of 2008

10. Essex County municipalities do not maximize their eligibility for state recycling grants and do not use their annual recycling tonnage grants to expand recycling programs within their communities

What We Recommend:

1. Greatly expand recycling education at the municipal and county level

2. Use municipal tonnage grant funds to increase recycling education and to plan expansions of municipal recycling efforts, including better and more complete reporting of all recycling within each municipality in order to maximize municipal tonnage grants

3. NJDEP needs to upgrade their grant reporting systems and reduce the two year lag time between when municipalities report their tonnage and when they receive the grant funds

4. Centralize recycling planning and contracting at the county level to standardize recycling programs throughout the County's 22 municipalities

5. Expand local enforcement of municipal recycling regulations

6. Encourage source reduction and reuse wherever feasible

7. Use state economic development resources to encourage investment by material recovery facilities in state of the art recycling technology

8. Use state economic development resources to encourage companies that

purchase and reuse recycled materials to locate in NJ, thereby creating local markets and job opportunities

9. Encourage municipal composting programs and industrial composting companies that create actual compost for agricultural and gardening uses instead of biogas, which is merely another form of fossil fuels

"What if there's no such thing as recycling and when it's over it's just over?"

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[1] Reprinted with the permission of Conde Naste/New Yorker Magazine

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1. Introduction

This study was conducted as an internship with the Sierra Club's Gateway Group to look at what actually happens to recycled materials after they are placed at the curb or brought to the municipal recycling depot. The research focuses on Essex County recycling and is supplemented with firsthand accounts and facility visits. The goal of this research is to find out what happens to recycled materials in Essex County, to determine the effectiveness of recycling, to identify improvements that can be made to increase the rate of recycling, and to understand what challenges are presented in the recycling process.

Many people are unaware but curious and concerned about what happens to recycling once it is placed in a bin, as there is great variation in programs across the state of New Jersey (See Appendix A). This may have an impact on people's willingness and enthusiasm to recycle. Thus, this research clarifies and explains the discrepancies and uncertainties across recycling in Essex County. Interviews were conducted with recycling coordinators, and other stakeholders, and field trips were made to Covanta Essex, Covanta Rahway, NewTech, and Mazza Recycling.

Although much has been written about failures in recycling, our research shows that the paper, plastic, and metal residents of Essex County put out on the curb every week are, in fact, recycled into new products and materials.

We also found that recycling in Essex County is significantly cheaper for towns and communities than landfilling or incineration.

Our intent was to identify what barriers prevent towns in Essex from diverting more of the solid waste stream away from the Covanta incinerator and towards recycling programs.

Recycling is the process of collecting and processing materials that would otherwise be thrown away and turning them into new products. Recycling keeps large

amounts of materials out of landfills and incinerators. It reduces emissions, saves energy, and conserves natural resources, therefore making it beneficial to many different stakeholders.[2]

By reducing the amount of waste sent to incinerators and landfills, recycling helps conserve virgin materials and natural resources, such as timber and water. It also reduces greenhouse gasses and other pollutants associated with incineration. With recycling, less mining is needed to obtain new raw materials. As we will show later, in Chapter 4, it is significantly cheaper to recycle materials than to incinerate or landfill them.

Economically, recycling facilities create jobs within the United States. In New Jersey alone recycling provides about 27,000 jobs.[3] Recycling creates about 50 jobs for every one job created by sending waste to landfills. Recycling and reuse accounts for about 681,000 jobs in the United States.[4]

On average, Essex County recycles and composts 29% of its waste, landfills about 14%, and incinerates about 57%. The U.S. recycles and composts about 29%, landfills 64%, and incinerates 7% of its waste. Meanwhile, Germany recycles and composts 62% of waste, landfills 34%, and incinerates 4% of its waste. Overall the European Union recycles and composts 40%, landfills about 38%, and incinerates 22% of its waste. So there is definitely room for Essex County to improve its recycling percentage.[5]

While this paper focuses exclusively on recycling, we recognize that recycling is only one component of the effort to reduce emissions, limit plastic waste, and to help the environment. Source reduction and reuse of materials are equally important practices to follow, as they also limit the amount of materials, energy, and resources used.

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[2] https://www.nj.gov/dep/dshw/recycling/RMDC.pdf
[3] https://www.nj.gov/dep/dshw/recycling/wastewise/njwwcasestudy.pdf
[4] https://www.nytimes.com/2023/11/29/opinion/recycling-plastic-paper-aluminum.html?smid=nytcore-ios-share&referringSource=articleShare
[5] https://drive.google.com/file/d/1CMcm1jLc6onbpWzC0qmD3k_AXa7fnSz5/view?usp=sharing

Whenever possible, consumers should avoid purchasing products packaged in single use plastic containers. Examples include using dissolvable laundry sheets instead of liquid detergents, bar soaps instead of liquid hand soaps, or whole vegetables instead of cut vegetables.

2. Key Recycling Legislation

The **Clean Communities and Recycling Act of 1981** is fundamental to recycling in New Jersey, as it created the Municipal Recycling Tonnage Grant Program. Municipalities receive a grant for materials that are documented as having been recycled.

When passed, this landmark grant program was originally voluntary, but in 1987 the Act was amended as the **New Jersey Statewide Mandatory Source Separation and Recycling Act**. It required each municipality in the state to create a recycling program and submit an annual Recycling Tonnage Report. Municipalities continue to receive money via annual grants based on the tonnage they recycle.

Over 25 years later, in 2008, **the Recycling Enhancement Act** established a recycling tax of $3.00 per ton on all solid waste that was accepted for disposal or transfer at solid waste facilities.[6] This tax funds the Recycling Tonnage Grant Program, with 60% of the funds from the tax allocated to this purpose. Though these funds were intended to be used for education and program expansion, most municipalities use them for ongoing expenses, such as salaries.

Another 25% of the fund is allocated to counties for preparing and implementing solid waste management plans. Counties also receive an additional 5% of the fund to be used for public information and education programs regarding recycling. An additional 5% is given as grants to institutions of higher education for several uses, such as to conduct recycling research, and 5% is used by the Department of Environmental Protection for administrative expenses and program planning.[7]

In the Recycling Tonnage Grant Program, municipalities can report both residential and commercial recycling. In 2020 the Department of Environmental Protection (DEP)

[6] https://www.nj.gov/dep/dshw/resource/Tonnage/guide.pdf

[7] https://www.nj.gov/dep/dshw/recycling/whatsnew/rea.htm

awarded about $16.2 million in tonnage grants for recycling 11,522,228 tons from residential, commercial, and industrial sources. The tonnage program includes commercial and industrial recycling. Taking these into account 55% of the total Essex County waste stream was diverted from landfills and incineration in that year[8]. Commercial recycling tonnage is calculated by surveying businesses and private companies.

The Recycling Enhancement Act also created the **Higher Education Research Grant Program** and 5% of funding goes to education institutions.. There is an application process to receive this funding for higher education[9]. The application requires a cover page, a proposal description, and budget[10]. Examples of grants under the program include grants to Kean University and Raritan Valley Community College for composting research, education, and implementing a composting program . Another $74,000 was granted to Bergen Community College to put on composting demonstrations.[11]

Other recycling laws, such as the **Food Waste Recycling and Food Waste-to-Energy Production Law (2020), the Single Use Waste Reduction Act (2020) and New Jersey's Recycled Content Law (2021,**) have encouraged and promoted recycling and waste-to-energy programs. All three laws are explained below

New Jersey's **Food Waste Recycling and Food Waste-to-Energy Production Law** requires large food waste generators, defined as businesses and institutions that generate an average annual volume of at least 52 tons of food waste and are located within 25 road miles of a NJDEP approved food waste recycling facility, to source separate and recycle their food waste. The DEP has designated Waste Management CORe Elizabeth and Trenton Renewable Power as authorized food waste recycling facilities.[12]

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[8] https://www.nj.gov/dep/newsrel/2023/23_0011.htm

[9]https://dep.nj.gov/grantandloanprograms/solid-waste-recycling-enhancement-act-rea-higher-education-research-grant-program/

[10] https://www.nj.gov/dep/grantandloanprograms/docs/rea-higher-ed.pdf

[11] https://ilsr.org/rule/waste-surcharges/new-jersey-waste-surcharge/

[12] https://www.nj.gov/dep/dshw/food-waste-recycling-law/

Waste Management CORe source separates organics and inorganics and adds liquefied materials to anaerobic digesters to produce biogas.[13] Trenton Renewables recycles food waste into biogas, organic compost and fertilizer, and also recaptures glass, plastic, and metal.[14]

The **Single Use Waste Reduction Act (SUWRA)** was signed into law in 2020. The legislation mandated that, starting in November 2021, plastic straws may be provided only upon request of the customer. Effective May 2022, the legislation banned (with specific exemptions) single-use plastic bags and straws, along with limited other products such as paper carryout bags and polystyrene foam food containers. SUWRA, popularly known as the Plastic Bag Ban, establishes that stores equal to or larger than 2,500 square feet can only provide or sell reusable carryout bags, not plastic or paper ones. Single-use paper, not plastic, carryout bags were allowed to be provided or sold by stores less than 2,500 square feet.[15]

The Plastics Advisory Council released a first-year study reporting on the effectiveness of the legislation.[16] The Council surveyed 160 grocery stores and determined that 55 million bags are avoided each month under the SUWRA. A total of 275 convenience stores were surveyed and the Council was able to estimate that an additional 33 million bags are also eliminated per month at these smaller stores.[17]

The **Recycled Content Law** (2021) establishes post-consumer recycled content requirements for rigid plastic containers, glass containers, paper and plastic carryout bags, and plastic trash bags. The law establishes that manufacturers meet minimum recycled content standards for containers and packaging products sold or offered for sale in New Jersey. The law established a required minimum amount of recycled content in

[13] https://www.nj.gov/dep/dshw/food-waste-recycling-law/wm_core_how_it_works.pdf

[14] https://www.nj.gov/dep/dshw/food-waste-recycling-law/trenton-renewables-food-waste-recycling.pdf

[15] https://dep.nj.gov/get-past-plastic/

[16] https://www.nj.gov/dep/newsrel/2023/23_0027.htm#:~:text=Governor%20Murphy%20signed%20the%20law,providing%20single%2Duse%20paper%20bags.

[17] https://dep.nj.gov/wp-content/uploads/pac-first-year-report-2023.pdf

rigid plastic containers, plastic beverage containers, plastic carryout bags, trash bags, glass containers, and paper carryout bags. Standards for all regulated containers and packaging products began on January 18, 2024 and manufacturers are required to submit first-year compliance reports annually starting on July 18, 2025. The DEP is responsible for tracking compliance.[18]

[18] https://www.nj.gov/dep/dshw/recycled-content/

3. The Numbering of Plastics

Plastics are often labeled 1 through 7 with a recycling symbol, but what do these indicators actually mean (Figure 1)? Most material recovery facilities only accept numbers 1, 2, and 5 and here's why:[19]

Figure 1: The numbering of plastics.

1. **Polyethylene Terephthalate (PETE)** is intended for single use products. This includes drinking bottles and supermarket plastic food containers.[20] About 25% of PETE bottles are recycled in the United States. The plastic can be crushed and shredded into small flakes, later to be processed to make new bottles, textiles, or fleece.
2. **High Density Polyethylene (HDPE)** is a stiff plastic. Examples of #2 plastics are milk jugs, detergent bottles, oil bottles, toys, and other plastic bottles. Recycling this product is simple and cost efficient, so 30-40% of HDPE is recycled in the United States. Recycled HDPE can create picnic tables, plastic lumber, waste bins, benches, bed liners for trucks and garden beds, and containers.
3. **Polyvinyl Chloride (PVC)** is a soft and flexible plastic, used to make clear plastic food wrapping, computer cables, garden hoses, rigid pipes, and children's toys. It is also used in construction and for signs and clothing fiber. It can be rigid or flexible, depending on the structure.[21] Only about 1% of PVC, sometimes referred to as the "poison plastic", is recycled because toxins can leach throughout the material's life cycle. PVC contains so many additives that recycling it is difficult and expensive.

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[19] Photo: https://www.google.com/url?q=https://www.greenlivingtips.com/articles/recycling-by-the-numbers.html&sa=D&source=docs&ust=1692375400289202&usg=AOvVaw1yYZgerOwvuTpO-rvOuQoT
[20] https://www.recycletheone.com/recycle-now/how-does-pet-plastic-recycling-work/
[21] https://www.creativemechanisms.com/blog/everything-you-need-to-know-about-pvc-plastic

Therefore, it is recommended that products made with PVC be reused or repurposed. PVC piping can be made into planters and containers.

4. **Low Density Polyethylene (LDPE)** is found in shrink wraps, newspaper sleeves, dry cleaner garment bags, bubble wrap, plastic bags, and squeezable bottles. LDPE products are often reusable, but not always recyclable. Recycled LDPE can be used for plastic lumber, landscaping boards, garbage can liners, and floor tiles. Some plastics, such as plastic bags, may get wrapped around machines in Material Recovery Facilities (MRFs) and cause clogs in the system; therefore the bags cannot be recycled via most municipal recycling programs. However, LDPE bags can be deposited in drop off bins at many grocery stores, where they are collected and sent to facilities specifically designed to recycle these products. In Essex County, Kings, Acme, and ShopRite supermarkets collect and recycle category 4 plastic products.
5. **Polypropylene (PP)** is tough, heat resistant, and lightweight and is used to make brooms, bins, and trays. About 3% of PP products are recycled in the United States.
6. **Polystyrene (PS)** is an inexpensive and lightweight plastic used in egg cartons, plastic cutlery, and packaging material (e.g.,peanut foam chips). It can be broken up easily and disposed of. This material accounts for 35% of residential solid waste disposed of at landfills. Most curbside collections do not accept it, since it is difficult to recycle.[22]
7. **Polycarbonate** is used to make baby bottles, food containers, and other products. Plastic toys such as bikes, playhouses, and sleds also are made from this material. Reusing and recycling protocols are not standardized, leading to limited recycling. BPA, a chemical used in the manufacture of polycarbonate products may leach into food and drink products packaged with BPA, so these materials are generally not reused.[23]

[22] https://learn.eartheasy.com/articles/plastics-by-the-numbers/
[23] https://www.epa.gov/circulareconomy/us-recycling-system

4. Recycling Markets and the Economics of Recycling

So, where do recyclable materials eventually end up? Unfortunately, there is no simple answer.

In 2018, China established a policy called the National Sword Policy that banned the importation of most plastics and other materials in solid waste that were not up to new and stricter standards. Prior to this ban, China was a recipient of a majority of the United States' waste intended for recycling. As a result, the United States began sending plastics to Vietnam, Malaysia, and Thailand, which all later implemented similar bans.

These new regulations resulted in the United States expanding its domestic markets for recycling. Improvements in technology for sorting and recovering materials, use of more recycled materials in the marketplace, and fostering a demand for recycled materials became a necessity.[24]

Municipalities may use either municipal employees or private haulers to collect residential recycling materials from the curbside. Materials are then brought to Material Recovery Facilities (MRFs) to be sorted and baled and then sold to various end markets. The prices and value of materials often change, so the MRFs do not stay loyal to any one end market company.

There is not just one end market or one price for materials, even within one town. For example Bloomfield sends electronics to eRevival, textiles to H&M Leasing, corrugated and mixed paper to Integrity Recycling, commingled to Sims, and leaves,

[24] https://news.climate.columbia.edu/2020/03/13/fix-recycling-america/

stumps, and grass to Nature's Choice.[25] For current material prices, updated charts are provided on www.scrapindex.com/ and www.recyclersexchange.com/

Secondary commodities are bought, sold, and traded in the recycling industry. Just like the stock market, prices paid for materials vary daily, or even hourly, based on the economy, abundance of material, and market demand for that material.

It is important to note that recycling, landfilling, and incineration costs vary per facility and depend on various economic factors. The Atlantic County Utilities Authority (ACUA) lists the costs of different types of waste and recycling rates. The rate for solid waste at ACUA landfills is about $83 per ton.[26] In Essex County, the tipping fee to bring solid waste to the Covanta incinerator in Newark is about $74 per ton.[27]

Recycling costs are outlined in municipal contracts. MRF's charge a processing fee that varies by type of material. The contracts also include a rebate to the municipality based on the average market price that the MRF receives when they resell the products. Municipalities may also incur penalties for contaminated materials in their collections. Pizza boxes and polystyrene thrown into the recycling bin are classic examples of contamination.

Montclair is rebated 85% of the market price for a blend of newspaper, old corrugated containers (OCC), and mixed paper, minus a processing cost of $65 per ton in a contract with Atlantic Coast. If newspapers are not included the processing cost for OCC and mixed paper is reduced to $55, reflecting the higher value of occ and mixed paper compared to newsprint.

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[25] Palagano, Louise. Email exchange, June 14, 2023, https://docs.google.com/spreadsheets/d/1UzS2hz-cLpM8y3TM_hw74_CZuZ0xa8eU/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

[26] https://www.acua.com/Services/Disposal-Rates-Procedures.aspx

[27] Brandon, Craig. Email exchange, June 18, 2023

For commingled glass, plastic, tin, steel, bimetals, and aluminum cans, Montclair receives a rebate of 85% of the market price minus a processing cost of $80 per ton. These rebates vary based on the monthly average market price, hence the change in prices for materials. Atlantic Coast uses a pricing index for post-consumer recyclable waste (https://secondarymaterialspricing.com/) to calculate their rebates to towns.

So, overall, is recycling a cost-effective alternative to incineration in Essex County? Let's look at how these costs play out for Montclair Township and Atlantic Coast.

In July of 2022, after processing costs, Montclair netted $5.00 per ton of mixed paper recycled but had to pay $35.00 for each ton of commingled, since the rebate income did not outweigh the processing costs. The municipality received $1,098.05 for 219.61 tons of mixed paper but had to pay $4,532.08 for 129.488 tons of commingled recycled. However, if the mixed paper and commingled tonnage had been incinerated, the municipality would have been charged $25,937.98 instead of the $3,434.03 charged for recycling, clearly showing the economic benefit of recycling, so Montclair saved a net $22,504 that month by recycling. Projecting this savings over an entire year, Montclair's reduced its solid waste disposal costs by $270,000.

This price difference can change drastically depending on the market price of recycled materials. In September of 2021, Montclair received $26,407 for their recycling. They earned $24,689 for mixed paper and $1,718 for commingled. The town recycled 290 tons of mixed paper and 156 of commingled, for a total of 447 tons of material that month. If that had been incinerated instead of recycled, Montclair would have paid $33,185.[28] Their savings from recycling that month was $59,592. So, although the profit and pricing of recycling material often changes, these examples demonstrate that recycling is the better economic choice.

[28] Brandon, Craig, In person discussion, June 20, 2023

5. Collection Issues

Recycling Rules Vary From Town to Town

The Essex County Utilities Authority holds hazardous waste and e-waste recycling days twice a year and has a designated recycling coordinator, Wayne DeFeo.[29] But there is no county-wide recycling program, unlike Atlantic and some other counties.

Each of the 22 municipalities in Essex County has its own recycling program, its own recycling coordinator, and its own contracts with haulers and Material Recovery Facilities (MRFs) . These contracts must be renewed or rebid every 5 years per New Jersey contracting laws. Townships may also opt to have either private haulers or township employees collect the recycled materials. All towns in Essex County have drop-off locations for residents to bring their recycling, but hours and materials accepted vary significantly from town to town. And finally, municipalities can opt for single or dual stream recycling. As a result, there are differences from town to town as to what materials are accepted.[30]

Figure 2: Trash being picked up to be incinerated by a claw at Covanta Essex

In contrast to the decentralized recycling programs, residential solid waste in Essex County is managed on a county level through a contract with Covanta Essex, a waste-to-energy facility located in the Ironbound section of Newark. All Type 10 (residential) solid waste generated from single and multi-family residential properties in Essex County is sent to the Covanta

[29] https://www.ecuanj.com/portfolio/gallery-image-post/

[30] Photo: Covanta Essex, May 17, 2023

incinerator. Solid waste is brought into the facility by garbage trucks and fed into the incinerator to be burned (Figure 2). Before incineration, solid waste is screened to remove materials that should not be burned. These include toxic or hazardous materials and mattresses. Valuable metals that do not burn are collected from the incinerated ashes and are sold to various metal scrap dealers.[31] The incinerator generates electricity which is sold to PSEG for distribution to the electrical grid.

The incinerator is a big source of contention among the residents of the Ironbound neighborhood due to pollution from the heavy truck traffic bringing garbage to the incinerator and pollution generated from burning the solid waste. As a result of the pollution from the incinerator and other mobile and stationary sources in the area, the residents of the Ironbound suffer high rates of asthma and other respiratory diseases.

Single- vs Dual-Stream Recycling

Since municipalities implement their own recycling programs, they also decide whether the town will participate in single- or dual-stream recycling. Single-stream recycling is a collection system where all bottles, cans, containers, and paper are mixed together in one bin. Under dual-stream recycling, town residents are required to separate bottles, cans, and containers from paper into two bins at the curb.

For example, Millburn is a single stream township and contracts with Giordano Recycling to both collect and process the materials. Montclair has a dual stream collection system and uses township employees to collect materials from the curbside. These materials are then sold to Atlantic Coast to sort and resell.

South Orange recently changed from a single to dual stream collection system. They contract with F. Basso Jr. Rubbish Removal to pick up residential recycling, which is then sent to Bayshore Recycling for processing. Cali Carting, Bayshore Recycling, Waste Management, and Interstate Waste are other MRFs used by Essex County municipalities

[31] https://www.ecuanj.com/essex-county-solid-waste-management/

for residential recycling. Each of these processing facilities varies in technology; therefore, what they accept and recycle varies from town to town in the county.

South Orange Village made the switch to dual stream recycling as a result of rising costs in hauling and the recycling market. Walter Clarke, a member of the South Orange Village Environmental Commission, noted that with a single stream system, the township saw a contamination rate of 34% to 44%, but after switching to a dual-stream system the contamination rate dropped significantly to 2% to 5%. Even though the municipality now collects only 100 tons of recycling per month compared to 130-150 tons when they were single stream, the township receives more money for their recyclable materials due to the lower contamination rate.[32]

While both dual and single stream forms of recycling have their respective benefits, South Orange Village serves as a prime example of why municipalities should switch to dual stream. Although the municipality saw a decrease in tonnage collected when they switched to dual steam, their contamination rates plummeted. More material could be recovered and reused; therefore, their recycling program became more cost efficient.[33]

Another impact of decentralized collection policies is that the types of materials recycled and the rules for what is accepted depends where each town sends its recycling to. This is discussed in more detail in Chapter 7.

[32] Clarke, Walter, Email exchange July 7, 2023
[33] Clarke, Walter, Email exchange, July 7, 2023

6. Issues with Reporting Tonnage

As seen in Figure 3, below, there is great variation in the tonnage grant per person received from municipality to municipality in Essex County. These variances appear to be attributable not only to the differences among recycling programs from town to town, but also the due diligence with which each municipality reports the amount of waste recycled in their community. (Appendix A).

Municipality	Tonnage Grant Amount (2020)	2020 Population	Amount Received Per Resident
Belleville	$51,714.00	38,222	$1.35
Bloomfield	$59,251.59	53,105	$1.12
Caldwell	$11,151.27	9,027	$1.24
Cedar Grove	$18,804.89	12,980	$1.45
East Orange	$97,253.19	69,612	$1.40
Essex Fells	$937.67	2,222	$0.42
Fairfield	$25,664.93	7,872	$3.26
Glen Ridge	$9,805.53	7,802	$1.26
Irvington	$71,439.39	61,176	$1.17
Livingston	$43,303.05	31,330	$1.38
Maplewood	$31,755.00	25,684	$1.24
Millburn	$35,927.53	27,710	$1.30
Montclair	$41,479.20	40,921	$1.01
Newark	$264,896.70	311,549	$0.85
North Caldwell	$12,643.00	6,694	$1.89
Nutley	$45,308.22	30,143	$1.50
Orange	$45,070.89	34,447	$1.31
Roseland	$7,841.76	6,299	$1.24
South Orange	$7,686.18	18,484	$0.42
Verona	$14,908.08	14,572	$1.02
West Caldwell	$50,702.32	11,012	$4.60
West Orange	$63,161.70	48,843	$1.29

Figure 3: Breakdown of Tonnage Grant by population in each municipality.

Every town is required to submit an annual tonnage report, as per the New Jersey Statewide Mandatory Source Separation and Recycling Act. There is a 2-year lag time between report submission and when municipalities are allocated money, so the most recent tonnage reports posted are from 2020. Newark received the largest total grant of $264,896.70 in Essex County. Newark, which has its recyclables picked up by Waste Management, recycled 259,718.16 tons of materials.

But when looking at the proportion of population versus money received, West Caldwell, which contracts with Interstate Waste for recycling, received the largest per person grant ($4.60) in 2020. West Caldwell reported recycling 18,476.56 tons, of which 3,129.49 tons (or 17%) came from food waste, the largest amount reported in Essex County.[34] Most of West Caldwell's food waste tonnage was sent to Darling Ingredients, as shown below by a portion of West Caldwell's tonnage report. West Orange also reported some of their food waste being sent to Darling Ingredients, along with RTI Technologies in Illinois, Greentopia US, Inc., Central Jersey Waste & Recycling, Public Sewer Service, and JA Grease Services, LLC.[35]

Several towns did not report food waste recycled, since it is not mandatory under law to recycle food waste unless a generator meets the requirements of New Jersey's Food Waste Recycling and Food Waste-to-Energy Production Law. As a result, many towns in Essex County miss out on the opportunity to earn larger grants by not reporting food waste recycling and composting tonnage.

For example, Essex Fells neither picks up nor mandates residential recycling. Instead, residents who choose to recycle may bring their paper, cardboard, plastics, and metal on Friday or Saturday to the Department of Public Works Yard. They can also pay Essex Fells' garbage contractor, Direct Waste Services, $25 per month to pick up cardboard, paper , and plastics from the curbside. A small truck is used, so no heavy materials are accepted. As a result, the tonnage grant received per person ($0.42) is the lowest in Essex County, and is barely one tenth of the per capita grant received by neighboring West Caldwell

[34] https://www.nj.gov/dep/dshw/recycling/stats.htm

[35]https://docs.google.com/spreadsheets/d/1j72WHfQ4C19jFbD2LIS-b0UT9yTriU45/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

South Orange also qualified for the same low per capita tonnage grant as Essex Fells in 2020, but that municipality has made recent changes to improve their recycling rates. [36]

County	Municipality	Sector	Material	Material Amount (tons)	End Market Name	End Market State
Essex (07)	West Caldwell (21	Commercial	Plastic Containers (08)	23.07	Waste Industries	NJ
Essex (07)	West Caldwell (21	Commercial	Corrugated (01)	403.14	Reliable Paper Rec	NJ
Essex (07)	West Caldwell (21	Commercial	Tires (15)	26.62	Lakin Tire East, Inc	CT
Essex (07)	West Caldwell (21	Commercial	Corrugated (01)	328.71	Organix Recycling,	IL
Essex (07)	West Caldwell (21	Commercial	Mixed Office Paper (02	6.28	Organix Recycling,	IL
Essex (07)	West Caldwell (21	Commercial	Food Waste (23)	77.83	Organix Recycling,	IL
Essex (07)	West Caldwell (21	Commercial	Mixed Office Paper (02	31.32	All American Recyc	NJ
Essex (07)	West Caldwell (21	Commercial	Concrete / Asphalt / Br	3,219.8	Stavola	NJ
Essex (07)	West Caldwell (21	Commercial	Corrugated (01)	68.04	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Mixed Office Paper (02	13.41	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Newspaper (03)	7.54	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Other Paper/Mag/Junk	15.09	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Glass Containers (05)	5.87	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Aluminum Containers (	2.51	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Steel Containers (07)	2.51	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Commercial	Plastic Containers (08)	6.71	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Industrial (Fa	Corrugated (01)	24.26	Waste Managemer	NJ
Essex (07)	West Caldwell (21	Residential	Heavy Iron (09)	159.8	Covanta	NJ
Essex (07)	West Caldwell (21	Residential	NonFerrous/Aluminum	22.32	Covanta	NJ
Essex (07)	West Caldwell (21	Commercial	Food Waste (23)	2,571.7	Darling Ingredients	NJ
Essex (07)	West Caldwell (21	Commercial	Used Motor Oil (16)	12.31	Lorco Petroleum S	NJ
Essex (07)	West Caldwell (21	Commercial	Anti-freeze (12)	0.05	Lorco Petroleum S	NJ
Essex (07)	West Caldwell (21	Commercial	Fluorescent Lights (24	0.18	Clean Earth	PA
Essex (07)	West Caldwell (21	Commercial	Heavy Iron (09)	83.57	Parkway Iron & Me	NJ
Essex (07)	West Caldwell (21	Commercial	NonFerrous/Aluminum	10.5	Rockaway Recyclir	NJ
Essex (07)	West Caldwell (21	Commercial	White Goods & Light Ir	4.	Rockaway Recyclir	NJ
Essex (07)	West Caldwell (21	Commercial	Batteries (Automobile)	0.5	Rockaway Recyclir	NJ
Essex (07)	West Caldwell (21	Commercial	Anti-freeze (12)	0.15	Clean Harbors	NY
Essex (07)	West Caldwell (21	Commercial	Anti-freeze (12)	0.15	Safety Kleen Syste	RI

Figure 4: A portion of West Caldwell's Tonnage Application from 2020 [37]

For comparison, below are South Orange's tonnage application from 2020 and a portion of Fairfield's tonnage application, illustrating how municipalities send materials to various end markets throughout the state and beyond.

[36] https://www.essexfellsboro.com/departments/public-works

[37] https://docs.google.com/spreadsheets/d/1LhXou_3UqJr-rJtB40xybLbpOliM7NSi/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

County	Municipality	Sector	Material	Material Amount (tons)	End Market Name	End Market State
Essex (07)	South Orange (19	Commercial	Corrugated (01)	4.16	Waste Managemer	NJ
Essex (07)	South Orange (19	Commercial	Corrugated (01)	0.11	Cavalier Environme	NJ
Essex (07)	South Orange (19	Commercial	Heavy Iron (09)	126.51	Covanta	NJ
Essex (07)	South Orange (19	Commercial	NonFerrous/Aluminum	17.67	Covanta	NJ
Essex (07)	South Orange (19	Commercial	White Goods & Light Ir	1.51	Cavalier Environme	NJ
Essex (07)	South Orange (19	Commercial	White Goods & Light Ir	0.18	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Anti-freeze (12)	0.11	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Batteries (Automobile)	0.21	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Used Motor Oil (16)	0.27	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Used Motor Oil (16)	4.46	Slack Enviromental	NJ
Essex (07)	South Orange (19	Commercial	Brush/Tree Parts (17)	3.	Green Rock Recyc	NJ
Essex (07)	South Orange (19	Commercial	Consumer Electronics	0.02	Back Thru The Fut	NJ
Essex (07)	South Orange (19	Commercial	Consumer Electronics	10.54	American Recyclin	NY
Essex (07)	South Orange (19	Commercial	Consumer Electronics	3.23	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	15.	Gold Star Recyclin	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	6.59	Waste Managemer	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	132.8	Green Rock Recyc	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	4.89	Cavalier Environme	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	258.59	Bayshore Recyclin	NJ
Essex (07)	South Orange (19	Commercial	Other Material Not List	0.8	Cavalier Environme	NJ
Essex (07)	South Orange (19	Commercial	Other Material Not List	0.43	Essex County Utilit	NJ
Essex (07)	South Orange (19	Commercial	Oil Contaminated Soil	680.86	Bayshore Recyclin	NJ
Essex (07)	South Orange (19	Commercial	Oil Contaminated Soil	722.86	Clean Earth	NJ
Essex (07)	South Orange (19	Commercial	Wood Scraps (30)	10.8	Cavalier Environme	NJ
Essex (07)	South Orange (19	Residential	Leaves (19)	5,500.	South Orange DPV	NJ
Essex (07)	South Orange (19	Residential	Corrugated (01)	24.73	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Mixed Office Paper (02	18.84	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Newspaper (03)	10.6	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Other Paper/Mag/Junk	21.2	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Glass Containers (05)	8.24	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Aluminum Containers (	3.53	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Steel Containers (07)	3.53	Waste Managemer	NJ
Essex (07)	South Orange (19	Residential	Plastic Containers (08)	9.42	Waste Managemer	NJ
Essex (07)	South Orange (19	Commercial	Concrete / Asphalt / Br	2,074.67	Stavola	NJ

Figure 5: South Orange's Tonnage Application from 2020

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[38] https://docs.google.com/spreadsheets/d/1_bzpq1DHkgt5EW16UU2LqUvw3cPRxH3a/edit#gid=1820933532

County	Municipality	Sector	Material	Material Amount (tons)	End Market Name	End Market State
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	3.	Direct Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	9.6	Direct Waste Servic	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	106.89	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	178.14	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Mixed Office Paper (02	135.72	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Newspaper (03)	76.35	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Other Paper/Mag/Junk	152.69	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Glass Containers (05)	59.38	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Aluminum Containers (	25.45	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Steel Containers (07)	25.45	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Plastic Containers (08)	67.86	Waste Mgmt	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	11.04	Interstate Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Batteries (Automobile)	5.54	P&G Auto	NJ
Essex (07)	Fairfield (07)	Commercial	Tires (15)	8.	Tyrex	PA
Essex (07)	Fairfield (07)	Commercial	Used Motor Oil (16)	18.6	Lorco	NJ
Essex (07)	Fairfield (07)	Commercial	Anti-freeze (12)	2.92	Lorco	NJ
Essex (07)	Fairfield (07)	Commercial	Oil Contaminated Soil	1,628.03	Clean Earth	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	2.08	IWS	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	7,094.2	Tilcon	NJ
Essex (07)	Fairfield (07)	Commercial	White Goods & Light Ir	5.71	Cavalier Environ.	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	18.43	Cavalier Environ.	NJ
Essex (07)	Fairfield (07)	Commercial	Other Material Not List	3.01	Cavalier Environ.	NJ
Essex (07)	Fairfield (07)	Commercial	Wood Scraps (30)	40.73	Cavalier Environ.	NJ
Essex (07)	Fairfield (07)	Commercial	Used Motor Oil (16)	200.8	Lorco	NJ
Essex (07)	Fairfield (07)	Commercial	Used Motor Oil (16)	20.32	Lorco	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	238.	GreenRock	NJ
Essex (07)	Fairfield (07)	Commercial	Heavy Iron (09)	134.6	Covanta Essex	NJ
Essex (07)	Fairfield (07)	Commercial	NonFerrous/Aluminum	18.8	Covanta Essex	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	9.43	J Manzo Recycling	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	430.	Rockrete Recycling	NJ
Essex (07)	Fairfield (07)	Commercial	Tires (15)	2.07	Tryex	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	2.4	Direct Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	1,197.	Weldon Materials	NJ
Essex (07)	Fairfield (07)	Commercial	Glass Containers (05)	17.7	Rubicon	NY
Essex (07)	Fairfield (07)	Commercial	Aluminum Containers (	2.02	Rubicon	NY
Essex (07)	Fairfield (07)	Commercial	Steel Containers (07)	2.02	Rubicon	NY
Essex (07)	Fairfield (07)	Commercial	Plastic Containers (08)	2.53	Rubicon	NY
Essex (07)	Fairfield (07)	Commercial	Batteries (Automobile)	3.94	Interstate Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Tires (15)	1.73	Mercury Tires	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	14.35	Pinto Service, Inc	NJ
Essex (07)	Fairfield (07)	Commercial	Mixed Office Paper (02	3.96	Pinto Service, Inc	NJ
Essex (07)	Fairfield (07)	Commercial	Newspaper (03)	1.98	Pinto Service, Inc	NJ
Essex (07)	Fairfield (07)	Commercial	Other Paper/Mag/Junk	4.45	Pinto Service, Inc	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	129.6	National Transfer	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	2.5	Gaeta	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	2.5	Roselle Disposal	NJ
Essex (07)	Fairfield (07)	Commercial	Brush/Tree Parts (17)	9.07	Reliable Wood	NJ
Essex (07)	Fairfield (07)	Commercial	Concrete / Asphalt / Br	2.21	Reliable Wood	NJ
Essex (07)	Fairfield (07)	Commercial	Stumps (20)	7.75	Reliable Wood	NJ
Essex (07)	Fairfield (07)	Commercial	Wood Scraps (30)	4.09	Reliable Wood	NJ
Essex (07)	Fairfield (07)	Commercial	Brush/Tree Parts (17)	2.	Nature's Choice	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	5.75	Refuse Specialist	CA
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	31.19	Direct Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Mixed Office Paper (02	7.	Integrity Recycling	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	1.5	Interstate Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Tires (15)	27.	Garfield Tire	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	3.5	Direct Waste	NJ
Essex (07)	Fairfield (07)	Commercial	Corrugated (01)	85.	BJF Sanitation	NJ

Figure 6: A portion of Fairfield's Tonnage Application from 2020

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https://docs.google.com/spreadsheets/d/1w_PQpB_YpTQx_OHCeWQ1xHqQ1o42Glje/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

From these tonnage reports, it can be concluded that there is great variation in what materials are reported, the end markets, and from what sectors the materials come from. West Caldwell's, Fairfield's, and Newark's tonnage mostly comes from the commercial sector, while South Orange's predominantly comes from the residential sector, as depicted below in Figures 7-10. Fairfield, South Orange, and Newark did not report industrial recycling, while West Caldwell reported a small amount of corrugated industrial material being recycled at Waste Management.

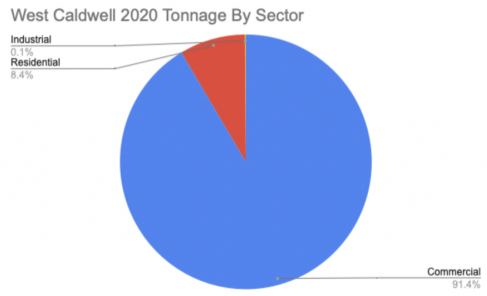

Figure 7: Breakdown of commercial, residential, and industrial tonnage in West Caldwell from the Tonnage Application in 2020

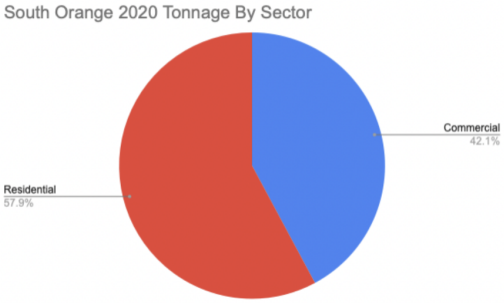

Figure 8: Breakdown of commercial and residential tonnage in South Orange from the Tonnage Application in 2020

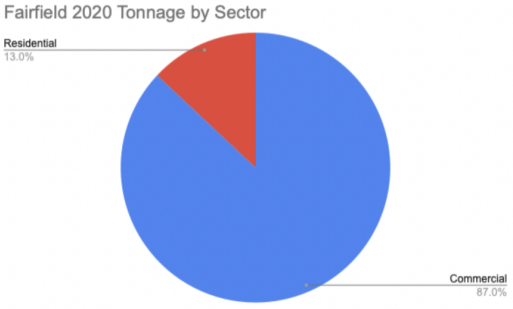

Figure 9: Breakdown of commercial and residential tonnage in Fairfield from the Tonnage Application in 2020

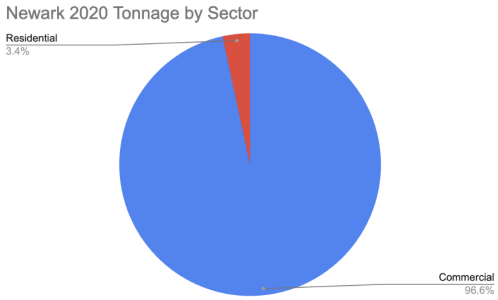

Figure 10: Breakdown of commercial and residential tonnage in Newark from the Tonnage Application in 2020

[40]https://docs.google.com/spreadsheets/d/1NDW25AlMSvZibaBECO5zmXL-ZbAlvcMZ/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

7. Material Recovery Facilities (MRFs)

Once recycling is picked up, whether by a private hauling service or the municipality, the materials are sent to a variety of processing facilities. Processing facilities fit into four basic classifications. Class A recycling facilities are responsible for most common types of recyclable materials (e.g., glass, paper, cardboard, plastic, and metal) and may accept dual- or single-stream materials, depending on the facility. Class B facilities handle construction and demolition materials (e.g., non-treated wood, trees, stumps, leaves, clean concrete, asphalt, and non-hazardous petroleum-contaminated soil). Class C facilities compost plants, food matter, and leaves, and other yard waste. Herman's is a Class C Recycling Center in South Jersey. The facility handles leaves, wood chips, yard trimmings, tree parts, grass clippings, wood pallets, and untreated wood. They also sell compost, garden soil, and mulch.[41] Class D facilities handle materials such as antifreeze, used oils, latex paints, batteries, consumer electronics, and equipment with mercury.[42]

Fires are a particular hazard for MRFs. Atlantic Coast Recycling in Passaic, New Jersey was destroyed in 2021 by a fire. Though the facility is being rebuilt, Atlantic Coast has referred its clients to other recycling facilities for the time being, including to the company's other location in Ocean County.[43]

Gary Sondermeyer, vice president of operations at Bayshore, a Class A MRF, also notes that Bayshore has had fires in 4 intermediate processing facilities because of battery issues. The latest fire was in December of 2019 and everything was completely destroyed.[44]

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[41] https://www.hermansrecycling.com/class-c-recycling-south-jersey.html
[42] https://www.jefferson-recycling.com/2017/03/different-types-recycling-facilities/

[43]https://www.northjersey.com/story/news/passaic/passaic-city/2022/07/12/passaic-nj-atlantic-coast-rebuilding-recycling-center-fire/65370796007/

[44] Sondermeyer, Gary, Phone call, June 15, 2023

Facilities that close or burn down cause problems for municipal recycling programs that are served by those companies. For example, Atlantic Coast's fire impacted recycling programs in Verona, Montclair, and Belleville.[45]

Residential and Commercial Material Recovery Facilities

Figure 11: The recycling stream at Mazza Recycling

Single- and dual-stream Material Recovery Facilities (MRFs) process mixed recyclables and sort them by commodity type for sale to intermediate processors. Materials, whether they are collected via single or dual stream programs, are deposited on the tipping floor, then loaded onto a conveyor belt for a pre-sort, which removes materials that cannot be recycled. Technology such as screens, magnets, and optical sorter equipment supplement manual separation and screening (Figures 11, 12). The screens have different size openings which sort flat materials from bulkier materials.[46] The magnets separate ferrous from non-ferrous materials, and optical sorters sort different types of plastics. However, manual labor is used to pre-sort

Figure 12: Materials being sorted by hand at Mazza Recycling.

[45] Petrone, Fred, Phone call, July 14, 2023
[46] https://www.youtube.com/@mazzarecycling4516/videos

the materials and to provide needed quality control.

Mazza Recycling, an MRF in Tinton Falls, is a single stream Class A facility. Mazza handles all of the residential recycling for Monmouth and Atlantic County, excluding Wall Township. Mazza Recycling typically handles 540-650 tons per day and employs about 250 people. The facility also includes Mazza Mulch, a DEP-permitted Class B Facility. It manufactures high quality landscape products, such as mulch, compost, and topsoil.[47] Mazza receives mulch materials from land clearings and landscaping waste, but it does not handle municipal leaves or grass clippings.

In July 2023, Mazza estimated it sent out 230 truckloads of old corrugated containers, 34 of paper, 32 of heavy metal, 4 of sorted office paper, 56 of polyethylene terephthalate, 6 of HDPE color, 4 of HDPE natural, 4 of polypropylene, 8 of used beverage cans, 14 of tin, and 4 of mixed rigid plastic. Mazza accepts other materials, such as light iron and foil.[48]

Mazza also accepts certain materials from towns outside Monmouth and Atlantic counties. For example, in 2020, Irvington sent 10.61 tons of corrugated materials and 56.75 tons of wood scraps to Mazza.[49] Newark also sent materials to Mazza, as seen in their tonnage report (Figure 13).[50]

Mazza also has a metal recovery facility, similar to Covanta incinerators, where scrap metal is sent to be recycled. Metal is sorted and then melted down in Fairless Hills, Pennsylvania[51].

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[47] Photo: Mazza Recycling Tour, July 27, 2023

[48] Mazza Recycling Tour, July 27, 2023, https://www.youtube.com/channel/UCv5bbeV0JZOPjJ8tOyfsy0g

[49] https://docs.google.com/spreadsheets/d/1Q-baKkb48bLMnEoWyycR2cksRAKODXXY/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

[50] https://docs.google.com/spreadsheets/d/1NDW25AlMSvZibaBECO5zmXL-ZbAlvcMZ/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

[51] https://www.mazzaironsteel.com/

Mazza accepts and recycles aluminum, pie tins, juice boxes, almond milk containers, and pizza boxes,materials which are not commonly recycled in Essex County. On the tour, we also learned that Mazza does not require materials to be fully cleaned. Although these practices are better for processing, Mazza is capable of recycling unclean materials, such as greasy pizza boxes or peanut butter jars with peanut butter. Consistent with Atlantic County's single stream recycling program, 18% of Mazza's stream ends up in the landfill. Rejected materials consist of plastic bags, food, and Styrofoam. Although 10% of Mazza's stream is rigid plastics (also referred to #7) the company has the technology and space to handle this traditionally not-recycled material. Mazza sells all the plastic that they process to domestic industrial facilities, while paper and other products are sent both domestically and internationally.

In contrast to Mazza, **Atlantic Coast Recycling**, Montclair's current MRF, does not recycle pizza boxes, clamshells, cake boxes, or other food-contaminated containers. Greasy pizza boxes and their recyclability reveal the inconsistencies of recycling[52]. For example, Craig Brandon, the former recycling coordinator for Montclair, emphasized how Montclair does not collect these materials, as high contamination rates would result in fines; therefore there is an incentive to have a cleaner stream.

Bayshore Recycling, which is located in Keasbey, takes recyclables from about 60 towns in New Jersey. Bayshore handles mixed paper, aluminum, tin, bimetal, and corrugated paper. Bayshore offers Class B recycling, Class A curbside recycling, soil management, solid waste management, containers and transportation, scrap metal recycling, and marine port services. For the Class A curbside recycling, everything put at the curb is then sorted, similar to the process at Mazza. The facility is permitted by NJDEP to accept over 10,000 tons per day of approved material[53]. Bayshore sends their baled material to a variety of end markets, depending on market prices.

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[52] Mazza Recycling Tour, July 27, 2023

[53] https://www.google.com/url?q=https://www.bayshorerecycling.com/about/&sa=D&source=docs&ust=1692375400288102&usg=AOvVaw1fyTifsgD6gXjrcOkMEkqo

County	Municipality	Sector	Material	Material Amount (tons)	End Market Name
Essex (07)	Newark (14)	Residential	Concrete / Asphalt / Br	4,221	Veolia
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	30,415	Stavola
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	26,438.40	Compliance Servic
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	35,583.41	Bayshore
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	400	Robert Winzinger
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	13.58	J. Manzo Recycling
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	12,780.72	Rockrete Recycling
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	3.60	Mazza Recycling
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	63.29	Waste Managemer
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	440	Robert Winzinger
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	20,643	Weldon Materials
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	3.16	Suffolk Recycling
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	5.25	Cavalier Environme
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	47,648.40	Tilcon
Essex (07)	Newark (14)	Commercial	Concrete / Asphalt / Br	3.40	Commpliance Plus
Essex (07)	Newark (14)	Commercial	Oil Contaminated Soil	186.14	Veolia
Essex (07)	Newark (14)	Commercial	Oil Contaminated Soil	2,345.02	ACUA
Essex (07)	Newark (14)	Commercial	Oil Contaminated Soil	283.01	Puresoil
Essex (07)	Newark (14)	Commercial	Oil Contaminated Soil	253.97	SoilSafe
Essex (07)	Newark (14)	Commercial	Oil Contaminated Soil	12,835.59	Clean Earth of Cat
Essex (07)	Newark (14)	Commercial	Wood Scraps (30)	757.29	Mazza Recycling
Essex (07)	Newark (14)	Commercial	Wood Scraps (30)	540.09	Waste Managemer
Essex (07)	Newark (14)	Commercial	Wood Scraps (30)	11.61	Cavalier Environme

Figure 13: A portion of Newark's Tonnage Application from 2020

[54]

Because different facilities are able to process different materials, varying recycling rules are in place across Essex County. This lack of uniform recycling causes confusion and uncertainty, as people do not know what can or cannot be recycled. Educating residents on specific municipal programs becomes a necessity to achieve low contamination rates.

Plastic Bags Recovery

Plastic bags from stores, dry cleaners and newspaper deliveries are another challenge in recycling. Generally, plastic bags are made out of high density polyethylene, also referred to as #2 plastics. Some plastic bags are also made out of #4 plastic. Plastic

[54] https://docs.google.com/spreadsheets/d/1NDW25AlMSvZibaBECO5zmXL-ZbAlvcMZ/edit?usp=sharing&ouid=114698048031889264657&rtpof=true&sd=true

bags, wraps, and films cannot be placed in curbside recycling bins. Many grocery stores, such as some Kings, Acme, Target, Wegmans, Walmart, and ShopRite locations, have drop-off bins for plastic grocery bags, bubble wrap, plastic mailers, air pillows, most plastic wraps, and other plastic bags, all of which can be recycled. After collection, the materials are baled and sold to independent companies, similar to the residential recycling process. These thin plastic materials are turned into synthetic lumber for decking, park benches, film, pouches, or new plastic bags.[55]

Electronic Recovery

NewTech Recycling, a Class D facility in Somerset, processes electronics. The facility handles computers, cellphones, televisions, printers, copiers, and other equipment and serves New Jersey, Pennsylvania, New York, and Connecticut. NewTech takes in waste from private companies and municipalities, accepting essentially any material with a plug. A large amount of the electronics come from Connecticut, which is a result of the state's established electronics recycling law.[56] Electronic recycling is beneficial because 70% of landfill soil pollution is caused by electronic waste.[57]

At NewTech, material is inventoried and weighed, sorted and sent to downstream facilities for further recycling. Depending on the material, it may or may not be separated. It is economically beneficial to take apart computers, as the memory board holds the most value, but flatscreen televisions are sent as is. Most of the operations in the facility are done by hand, as attention to

Figure 14: Recycling drums to prevent fires from lithium ion batteries.

[55] https://how2recycle.info/sdo
[56] https://portal.ct.gov/DEEP/Reduce-Reuse-Recycle/Electronics/CT-Electronic-Recycling-Law
[57] https://newtechrecycling.com/about-us/

detail is needed when handling electronics and lithium-ion batteries.

Founder and owner, Jim Entwistle, put an emphasis on the dangers and difficulties lithium-ion batteries cause in the recycling process. Damaged, defective, or recalled lithium-ion batteries are hazardous and require special handling. NewTech has recycling drums (Figure 14) with pellets for lithium-ion battery safety. These drums cost around $2,000 per drum. If the battery catches on fire, the pellets surrounding the battery in the drum melt and put out the fire by depriving it of oxygen. Jim Entwistle also predicts a large issue in the future with lithium-ion batteries from electric bikes and scooters.[58] [59]

Styrofoam Recovery

Some towns and counties have implemented voluntary Styrofoam recycling programs.

Both Union and Passaic Counties have county-wide recycling programs for Styrofoam. Each town within Union County has a designated drop off-location, diverting Styrofoam material from landfills and incinerators.[60]

In May of 2023, Passaic County entered into a shared services agreement with the City of Clifton to locate a "densifier" in the city, which is used to compress the polystyrene so that it can be more easily stored and shipped. The recycled material can be used to make picture frames, molding, and baseboards.[61]

Montclair had to suspend its voluntary Styrofoam recycling program, due to the closure of FoamPak, which shut down after 80 years in business[62]. Without an immediate

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[58] NewTech Recycling Tour, July 27, 2023
[59] Photo: https://www.call2recycle.org/product/55-gallon-ddr-lithium-ion-battery-recycling-drum/

[60] https://ucnj.org/recycling/Styrofoam/
[61] https://www.northjersey.com/story/news/passaic/clifton/2023/03/07/passaic-county-looks-to-remove-polystyrene-from-solid-waste-stream/69964188007/#
[62] Newman, Stuart, Email exchange, July 14, 2023

solution, Montclair residents were advised to put Styrofoam in with their regular trash.[63] Union County also had to find a new market for its recycled Styrofoam.

Food Recovery: Composting

Composting is another alternative to incinerating or landfilling food, as one-third of garbage is compostable.[64] Java's Compost, based in Orange, New Jersey, is a private company that collects fruits, vegetables, flowers, houseplants, bread, nuts, grains, compostable plastics, dairy, eggs, eggshells, meat, bones, seafood, coffee grounds, coffee filters, soiled napkins, processed foods, fats, and oils from residential and commercial locations. These compostable materials are then sent to AgChoice in Sussex County, which operates the only industrial composting facility in New Jersey.[65] AgChoice also collects and composts food waste, leaves, coffee, nuts, and bean products from commercial food processing companies, wholesale and retail outlets and a few other municipalities.[66]

Java's Compost provides users with two options: (A) Donate their completed compost to the Urban Agricultural Cooperative, which works with local growers in Newark to help provide fresh and locally grown produce to communities, or (B) have their finished compost returned to them for gardening purposes. Java's Composting supports residential and commercial pickup and community drop-offs.

Java is the only residential program from which AgChoice accepts compostable material . The program has been able to maintain a clean stream through education and communication.[67]

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[63] https://patch.com/new-jersey/montclair/montclair-puts-Styrofoam-recycling-hold-vendor-closes-doors#

[64]https://pirg.org/articles/what-a-waste-at-least-30-of-trash-could-be-composted-instead-of-buried-or-burned/

[65] https://www.youtube.com/@agchoice8429/videos

[66] https://www.ag-choice.com/about/

[67] https://www.javascompost.com/asp-boxes

Although AgChoice is regulated by the NJDEP, it is not an authorized food waste recycling facility under the Food Waste and Food Waste-to-Energy Production Law, despite being a beneficial alternative to incinerating or landfilling.

There have been previous attempts to promote municipal composting in New Jersey, such as in Princeton and Lambertville. The latter also sent their compost to AgChoice. However, these attempts failed due to high contamination rates, reflecting a need for better communication and education. Composting is an economical alternative to recycling or sending materials to the landfill. Lambertville paid about $81 per ton for trash, $60 per ton for recycling, and $60 per ton for composting in 2019.[68]

Likewise, New York City has a proposed composting program that will be city-wide in 2024. The initiative started in Queens and in the first two weeks, 3.5 million pounds of organics were diverted from incineration or landfilling. This program is cost efficient, especially when compared to the previous curbside program. But, in 2022 composting, costs have been cut down to about $467,000 when the previous curbside program cost about $1,625,000.[69]

New Jersey needs to develop additional composting facilities to expand composting, which reduces food waste and has been proven to be successful in New York City.

[68] https://www.newhopefreepress.com/2019/07/03/lambertville-seeks-to-curb-bad-habits/
[69] https://dsny.cityofnewyork.us/wp-content/uploads/2023/01/queens-organics-collection-progress-december2022.pdf

8. Education

Recycling education is an important and necessary aspect to improving recycling rates. It will help decrease contamination rates and increase recycling participation. Both goals can be achieved through a greater understanding of how and what to recycle.

Countries within the European Union recycle and compost about 40% of their solid waste while Essex County recycles and composts only 29% of its waste stream. Increasing educational programs is needed to help Essex County achieve the same recycling rates as in Europe.

One of the most common issues facing municipalities is a lack of education. Information about recycling collection schedules, recycling procedures, and what is accepted needs to be mainstreamed across many forms of media. Wayne DeFeo, Essex County Recycling Coordinator emphasized a need to promote correct information[70]. Municipal websites are sometimes outdated or incorrect. Given that recycling contracts change every five years, what can or cannot be recycled also may change. Brenda Anderson, Clean Community Coordinator of Newark, also emphasized a need for an abundance of correct information[71]. Recycling information, as she noted, must be on several platforms, both digital and paper, for residents to be aware of what is going on with their recycling program.

The DEP maintains an online tool called Recycle Coach that enables NJ residents to keep track of recycling schedules and contact their municipal representatives about recycling issues. Recycle Coach helps to educate the public and increase recycling rates. Every town in New Jersey has access to Recycle Coach. Some towns, such as Cedar Grove, promote other apps, such as Remyndr, which reminds residents when and what to recycle. These applications can help make recycling information clear and accessible to every

[70] DeFeo, Wayne, Phone call, June 5, 2023
[71] Anderson, Brenda, Phone call, May 30, 2023

resident in the state if they are properly used, updated in a timely fashion, and actively promoted. Promoting the use of Recycle Coach or Remynder will notify residents when their recycling is picked up and where to drop off recycling that is not collected at the curb.

How effective are Recycle Coach and Remyndr? When we asked this question to municipalities, we often received an uncertain answer. It is unclear how impactful these applications are, as the towns do not publicize them. The programs are designed to educate residents, but they need to be widely promoted to be successful.

This is not the only area in which municipalities fall short on recycling education. There needs to be an emphasis in the classroom across Essex County. Students can be taught about their municipal programs, so that they understand what can and cannot be set out for recycling in their individual communities.

The Recycling Market Development Council released a report in 2022 making legislative, policy, and administrative recommendations to improve recycling in New Jersey. The Council recommends that the Recycling Enhancement Act be revised so that $250,000 is specifically set aside for a statewide public education campaign to be overseen by the DEP. [72] The goal of this campaign is to educate the public about recycling contamination issues and general recycling practice. There is recognition that there needs to be a push for better recycling education, but action needs to be taken.

It is imperative that Essex County communities use their Recycling Enhancement Act grants to improve and promote recycling education, as action and education are falling short of meeting recycling goals. Use of funding in a proper manner will help promote recycling participation and emphasize clear restrictions to municipal recycling programs. Most local governments fold their grant money into their general budget to be used for salaries or pre existing programs instead of promoting a public education campaign. The

[72] https://www.nj.gov/dep/dshw/recycling/RMDC.pdf

5% of funding allocated for recycling research by colleges and universities can also be used to help residents understand their individual recycling programs. Therefore, proper utilization of this funding can help achieve higher participation and decreased contamination rates.

With proper allocation of funding and promotions about local recycling programs, improvements in recycling can be made. These changes can be as formal as incorporating recycling education into public school curricula, sending messages through Recycle Coach or Remyndr, publicizing drop-off locations and hours, and posting announcements throughout towns and on social media platforms.

9. The Bottom Line - 8 Recommendations to Improve Recycling in Essex County

As natural resources continue to be wasted and the climate crisis accelerates, recycling is a necessary solution. It is effective, especially when done right and when residents are educated. It takes 95% less energy to recycle aluminum than it does to make it from raw materials. Recycled steel, newspaper, plastics, and glass saves production energy, along with saving water[73]. Recycling also cuts water use by 40%, when compared with making new products.[74] Recycling creates jobs and saves the environment. Without recycling, we will continue to be reliant on landfilling and incineration, and on mining raw materials.

It is important to note that recycling is not an end-all solution, as there needs to be reduction and reusing, the classic "3 Rs" to waste reduction. But, recycling is necessary for the future of the environment.

With legislation, implementation, and education, recycling programs in Essex County can be improved. Through the Tonnage Grant Program, townships will continue to receive financial compensation for recycling, but townships must use their funds to encourage higher participation rates and to expand recycling programs to increase the types and amounts of materials recycled.

To truly increase recycling rates and recycling's effectiveness, there must be a push for the following:

1. **Expand recycling education**

[73] https://nems.nih.gov/environmental-programs/pages/benefits-of-recycling.aspx

[74]https://www.nytimes.com/2023/11/29/opinion/recycling-plastic-paper-aluminum.html?smid=nytcore-ios-share&referringSource=articleShare

2. **Use tonnage grants to expand recycling programs instead of offsetting current expenses**
3. **Establish countywide recycling contracts to standardize recycling procedures throughout Essex County**
4. **Enforce recycling regulations**
5. **Encourage Source Reduction**
6. **Use state and federal investments and incentives to expand and automate material recovery facilities, including industrial composting**
7. **Use state and federal investments and incentives to expand domestic markets for recyclable materials**
8. **Change New Jersey's Food Waste Recycling and Food Waste-to-Energy Production Law to include industrial composting facilities as approved food waste processors**

1. **<u>Expand recycling education</u>**

Recycling education is vital to successful recycling. Without knowing what is accepted in their community, there are enthusiastic recyclers who will add contaminants into the recycling stream and others who throw recyclable products into the trash.

2. **<u>Use tonnage grants to expand recycling programs instead of offsetting current expenses</u>**

Everyone needs to learn how to properly recycle for the benefit of the environment. Educational programs can help future generations understand what can and cannot be recycled, and *why.* Tonnage grant programs are not properly used. They are currently used to continue funding established recycling programs or to fund salaries. These funds need to be put toward improvements and education, which is the fundamental purpose of this government funding. Tonnage grant funding should be used

for recycling education and expanding participation rates and the types of materials recycled.

The state needs to encourage municipalities to do a better job of surveying their businesses and nonprofit entities (e.g., houses of worship, social welfare organizations and schools) to include any recycling done by those companies and organizations in their recycling tonnage applications. This would increase the amount of money earned by the municipalities in their tonnage grants, which can then be used to further invest in recycling.

Also importantly, the NJDEP should shorten the grant cycle to eliminate the 2-year delay in processing tonnage grants. The grant program was originally developed in the pre-computer age. This may require investment in new computer systems and programs to more efficiently automate the process. The DEP's 5% share of the recycling tax under the 2008 Recycling Enhancement Act should be used for this purpose.

3. **Establish county-wide recycling contracts to standardize recycling procedures throughout Essex County**

From town to town in Essex County there is wide variation about what can be recycled. Styrofoam may be accepted in one town but not another (Appendix A). Having a single Essex County-wide contract would eliminate all of this confusion and inconsistency. Implementing a countywide residential and specialty recycling program would allow residents to have more opportunities to recycle and to gain a better understanding of when and what they can recycle.

From town to town within the county, recycling rules would be consistent eliminating confusion on what can and cannot be recycled. Therefore, establishing countywide recycling programs can create more uniform and concise recycling rules,

eliminating confusion among residents and making recycling education consistent across the board. [75]

Somerset County, for example, has a countywide program. Somerset County has recycling drop offs and recycling days where you have to prove county residency; the municipality within the county does not matter. In Essex County, there are drop offs for recycling in each town, but only residents of the town can use their municipality's drop off. Countywide programs allow for more flexibility in times and location.

Somerset and Atlantic Counties both use a single MRF that processes all recycling from those two counties: Bayshore for Somerset and Mazza for Atlantic County. Having one recycling program in a county limits the amount of variation and confusion about what is recyclable. Information is uniform across all municipalities within the county. And higher volumes of recycled materials will encourage capital investment by the MRFs to ensure that the newest and most efficient equipment is available.

4. **<u>Enforce recycling regulations</u>**

Though recycling education is imperative and impactful for increasing recycling rates, enforcement in recycling is also beneficial. As emphasized by Essex County recycling coordinator, Wayne DeFeo, there is a need for enforcement in recycling. People are not held accountable in many towns for what they put at the curb. When speaking to Fred Petrone at Atlantic Coast, he also suggested a tagging program such as Verona. The municipality has a township employee check certain streets of the town each week. Residents who include ineligible materials in their recycling are tagged. A log of tagged containers is maintained by the Department of Public Works. Large amounts of unaccepted materials and multiple violations result in recycling education and clarification of the recycling rules.[76] Contamination can lead to fines and penalties for the

[75] https://www.co.somerset.nj.us/government/public-works/recycling-solid-waste/general-recycling

[76]https://www.veronanj.org/media/Public%20Works/Tagging%20Program/Tagging%20Press%20Release%20October%202020.pdf

municipality from the MRF, costing townships more money. Fines can also act as a form of education, showing the resident that they are recycling improperly.

5. **Encourage Source Reduction**

Though recycling is a way to limit what ends up in the incinerator or landfill, it is equally important to reduce at the source. Choosing products that are reusable limits what ends up being wasted, stopping the issue at the source. For example, providing reusable cups at coffee shops eliminates waste. Encouragement for source reduction is needed at the state and federal levels. Residents should also be encouraged to sell, swap or donate old toys, clothes, and other products that would otherwise go to landfills or incinerators.

6. **Use state and federal investments and incentives are needed to expand and automate material recovery facilities, including industrial composting**

MRFs can be an expensive, but very necessary, investment. Funding is needed and government support would expedite and ultimately improve facilities. For example, Mazza's equipment is made and designed by Van Dyk Recycling Solutions, which is based in Connecticut and serves recycling facilities across North America.[77] Mazza invested about $15 million in its equipment. Without support and guaranteed commitments, it becomes difficult to justify the capital investment for high tech recycling technology. Putting money and support into effective equipment is necessary to achieve higher recycling rates.

Allocating money from taxes or the tonnage grant program to go to improving material recovery facilities would allow for more efficient recycling and sorting practices. More funding and advanced technology may help facilities to handle and recycle products that cause issues with current machinery, such as plastic bags.

[77] https://vdrs.com/beginnings/

Investing in industrial composting is also a necessary step for the state and federal governments to take. Without proper financial resources, it is difficult for facilities and townships to implement a composting program. Putting money into composting will allow municipalities to distribute composting bins, pay for haulers, and build facilities that have the means to handle residential or commercial compost.

7. **Use state and federal investments and incentives are needed to expand domestic markets for recyclable materials**

Putting an emphasis on creating domestic markets would incentivize facilities to recycle more plastics. If there is no end market for a product, the MRF has little incentive to recycle it. This may require state and federal legislation. For example, Styrofoam can be recycled. But there are limited resources and end markets for the product. Increasing domestic markets and funding new technologies would allow for MRFs to be able to recycle and sell more products. And just as important, encouraging domestic markets for recycled products will create jobs for New Jersey residents.

8. **Amend New Jersey's Food Waste Recycling and Food Waste-to-Energy Production Law to include industrial composting facilities as approved food waste processors.**

Increasing mandated recyclables in Essex County and New Jersey will also increase recycling rates. For example, food waste is not a mandated recyclable in Essex. But, under New Jersey's Food Waste Recycling and Food Waste-to-Energy Production Law, large generators within 25 road miles of a food waste facility must recycle their food waste. The DEP has designated the facilities Waste Management CORe Elizabeth and Trenton Renewable Power as locations to handle food waste under this law.

Lowering the cut-off number to below 52 tons per year would require more generators to recycle food waste. For example, Montclair State University is not required, by law, to recycle their food waste. For the 2022 Fiscal Year, 16.65 tons of food waste was

reported from Montclair State.[78] Requiring businesses and institutions to recycle food waste would increase recycling rates and continue to divert materials from landfills or incinerators.

Establishing composting mandates would divert large amounts of food waste from incineration and landfilling. New York City's staggered implementation of a composting program has already proven to be successful; New Jersey and Essex County should follow NYC's lead.

THE BOTTOM LINE:

Ultimately, recycling is an effective practice, but there needs to be improvements to programs to increase recycling rates and efficiency. Such improvements start with education and understanding how to recycle properly, but education must be followed by increased investment in recycling technology.

[78] Cochran, Adeline, Email exchange, July 24, 2023

9. Appendix A:

It is very important to understand your municipal program and what is accepted and not accepted. Below is a matrix that breaks down the basics of each municipal program in Essex County and clearly demonstrates the variation from town to town.

	Residential Recycling Company	Accepted Materials	Not Accepted Materials	Municipal Link
Belleville	Atlantic Coast Fibers	Paper, cardboard, plastic bottles/food containers (including berry and Yogurt cups, numbers 1, 2 and 5, glass bottles, glass jars, metal cans (including empty non-hazardous aerosols like whipped cream cans and air freshener sprays), cartonirs	Caps, lids, cups, no plastic bottles/containers with 3,4,6, or 7, large plastic items (kitty litter pails), flower pots, flat plastic food trays, pill bottles, aluminum foil/trays/styrofoam, plastic bags, hardback books, frozen food, food-contaminated boxes, loose paper, bulbs, glassware, dishes, window glass, motor oil, paint or pesticide containers, aluminum foil, plastic wrap	https://www.bellevillenj.org/_Content/pdf/Recycling-Materials-Acceptance.pdf
Bloomfield	Suburban Disposal Inc. (Roselle Disposal-Bulk Waste and Garbage Collection)	Commingled materials include plastic non-toxic containers with Number 1, Number 2, and Number 5 recycling logos on bottom. Detergent Bottles, Juice, Milk, Soda, Water, mixed paper	Window glass, mirrors, motor oil/antifreeze containers	https://www.bloomfieldtwpnj.com/286/Curbside-Recycling
Caldwell	Cali Carting	glass, plastic, metal parcels, (including cardboard, paper) Aluminum, glass & plastic - Remove labels from bottles, but bottle caps can remain, Magazines, junk mail, etc. placed in rigid reusable containers.	Bottle caps (site does not specify more)	https://caldwell-nj.com/garbage
Cedar Grove		aluminum/tin cans, glass bottles/jars. Plastic containers with #1 through #7 on the bottom (food beverage, yogurt, detergent, shampoo bottles), cartons (cream, milk, and soy milk, juice, soup and broth, wine), books (soft covered), junk mail, letters/envelopes, magazines/catalogs, newspapers, office/colored paper, paper bags, cardboard (flattened), phone books, all corrugated cardboard boxes,	Recycling containers more than 35 pounds, drinking/window glass, flower pots, light bulbs, styrofoam, cardboard not flattened/larger than 18 inches, paper plates, paper towels, Paper cups, wax coated cardboard	https://cedargrovenj.org/wp-content/uploads/2023/06/2023-2024-CG-Recycling-Guide.pdf
East Orange	Suburban Disposal Inc.	Newspapers, cardboard, food cans, baby food jars, pet food cans, mustard jars, soda cans, pickle bottles, beer cans/bottles, juice cans/bottles, liquor bottles, spray cans, soft drink bottles, milk/water/juice jugs, laundry detergents/bleach/softener bottles	Window glass, dishes, drinking glasses, bulbs, paint cans, aluminum foil pans, yogurt cups, food storage tubs, motor/oil bottles, plastic bags	https://www.eastorange-nj.gov/DocumentCenter/View/2185/EastOrangeRecycling2023-2
Essex Fells	Drop off only at the recycling center	Cardboard, commingled plastic, glass, tin, newspaper, books, magazines, metal		https://www.essexfellsboro.com/departments/public-works
Fairfield	Gaeta	Green/brown/clear bottles/jars, beverage/soup/juice/pet food cans, any plastic container with #1 or #2 marred on the bottom, milk/soda/detergent containers	Mirrors, plate glass, dishes, china, blue/white class, paper bags, boxes, plastic bags, tin foil, pie plates, pots and pans, toys, plastic furniture, waste oil	http://www.fairfieldnj.org/recycling-drop-off.html
Glen Ridge	Atlantic Coast Fibers	Plastic bottles, jugs, containers, jars (all marked #1, #2, and #5), food cans, clean foil.metal trays, mail, envelopes, paper bags, writing paper, newsprint, magazine	Plastic bags, non-recycling plastic, plastic lids, plastic caps, wax cardboard, milk/juice/ice cream/aseptic packing (soap boxes), frozen food boxes, microwave trays, shredded paper, soiled paper, napkins, ceramics, diapers, scrap metal, hardcover books, styrofoam	https://www.glenridgenj.org/recycling.htm https://www.glenridgenj.org/images/handyrecyclingflyer.jpg
Irvington		Paper and flattened cardboard, plastic bottles, food containers, glass bottles and jars, cartons, metal cans	Houses, hangers, hardback books, frozen food boxes, soiled boxes, foil, bulbs, cookware, window glass,motor oil, batteries, hazardous hotels, 3/4/6/7 plastics, styrofoam, plastic bags, plastic wrap, air pillows, needles, shredded paper	https://irvington.net/wp-content/uploads/2022/06/Recycling-Calendar-Important-Info.jpg
Livingston	Bayshore Recycling Co.	Plastic, glass, cans, newspaper, cardboard, chipboard, brown paper bags, phone books, cereal and food boxes, clean pizza boxes, shipping boxes, paperback books	Waxed paper or waxed books, styrofoam, plastic bags	https://www.livingstonnj.org/DocumentCenter/View/586/Green-Guide-to-Livingston-PDF
Maplewood	Bayshore Recycling Co.	Corrugated cardboard, boxboard, paper bags, junk mail (including window envelopes), office paper, newspaper and magazine, 1/2/5 plastic containers and bottles with caps, glass bottles/jars (with lids), aluminum cans, pie tins, catering trays, steel/tin food cans, gable top cartons (OJ, Milk, aseptic packaging), justice boxes	Any materials with food or greasy resides, Pizza boxes, wax cardboard, paper/cardboard tubes/packaging padding, plastics without any recycling numbers, #3/4/6/7, plastic bags and plastic film, styrofoam, batteries, Aerosol cans, aluminum foil, electronics, hoses, ropes, wires, wood, stickers, corks, clothing, motor oil containers, electrical and mechanic toys, light bulbs, mirrors, window glass, ceramic plates, cups, mugs, food waste, medical waste, poisonous waste, hazardous waste	https://www.maplewoodnj.gov/government/public-works/recycling-and-waste-disposal

Millburn	Giordano Recycling	clear/brown/green glass, clean food containers/jars, soft drink/beef/wine/liquor bottles, plastics 1/2/5, tin cans, aluminum cans, brown paper bags, newspaper, magazines, printer and high grade paper, junk mail, corrugated boxes	Plastic bags, food, liquid, clothing, hoses, wires, chains, electronics	https://www.twp.millburn.nj.us/166/Recycling https://www.twp.millburn.nj.us/DocumentCenter/View/3476/Instructions-for-Single-Stream-Recycling-PDF?bidId=
Montclair	Atlantic Coast Fibers	Containers, plastics marked 1, 2, 5, tin cans, aluminum cans, clear/brown/green class, milk/juice containers, aseptic packaging, plastics containers, laundry detergent, healthcare products, envelopes, newspaper cardboard paper bags, magazines, catalogs, all office paper (with or without stables), junk mail, postcards,	Bottle topics, lids, straws, no metal or glass (other than food and beverage containers), microwave trays, plastic bags, flower pots, nursery trays, food trays, dishware, toys, paint cans, styrofoam, mirrors, window/car glass, light bulbs, ceramics, pots, panama toasters, small appliances, plastics without a number on them, needles, rubber houses, hazardous materials, paper bags, coat hangers, aerosol cans. Food and party trays, electrical equipment, plastic fencing, hardcover books, wax-coated materials, pizza boxes, soiled paper	https://www.montclairnjusa.org/government/departments/community_services/garbage__recycling__bulky_waste/recycling_informationne
Newark	Waste Management	Paper and boxes, glass bottles and jars, cans, plastic bottles and jugs, beverage cartons	Construction debris, paint, drywall, fooding, glass windows, car parts	https://www.newarknj.gov/departments/recyclingnor
North Caldwell	hauled by Gaeta and sent to Waste Management	Newsprint, magazines, paperback and hardcover books, junk mail, paper bags, phone directories, catalogs, cardboard boxes, glass bottles, gars (without lids), cans (aluminum and bimetal), plastic containers with 1/2/5,	Window glass, mirrors, plastic bags	https://www.northcaldwell.org/sites/g/files/vyhlif7596/f/uploads/north_caldwell_2023_trash_and_recycling_schedules.pdf
Nutley		Aluminum cans, tin cans, glass bottles and jars, plastic containers with #1-#7 on the bottom, cream/milk/soy milk cartons, juice and individual juice cartons, wine cartons, soup/broth cartons, books, junk mail, letters and envelopes, magazines and catalogs, newspapers office and colored paper, paper bags, paperboard, shredded paper	Recycling containers weighing more than 35 lbs, drinking/window glass, plastic shopping bags, flower pots, light bulbs, styrofoam, other types of plastic, wax coated cardboard, paper cups, paper towels, paper plates, soiled papers/cartons, not broken down cardboard	https://www.nutleynj.org/media/PublicWorks/2023-2024%20Recycling%20Guide.pdf
Orange		Aluminum beverage cans, glass, plastic bottles and jars, household tin cans (pet food cans also), plastic soft drink bottles, milk/water/juice jugs, laundry detergents/black/softener bottles	Window glass and mirrors, light bulbs, aluminum foil pans, motor oil bottles, bathroom plastics, dishes, drinking glasses, spray can and paint cans, toys, yogurt cups and food storage tubs, plastic bags	https://orangenj.gov/DocumentCenter/View/2085/Recycle-Brochure-2023ro
Roseland		Newspaper, magazines, junk mail, telephone books , glass, aluminum, tin and plastic food and beverage containers, household containers	Hard and soft cover books, computer paper, mirrors, window glass, light bulbs aluminum foil and trays, crystal, ceramic cups and plates drinking glasses, plastic toys	https://www.roselandnj.org/recycling-garbage/pages/recycling-collection
South Orange	Bayshore Recycling Co. (first picked up by F. Basso Jr. Rubbish Removal Inc.)	Corrugated cardboard, boxboard, paper bags, junk mail (including window envelopes), office paper, newspaper and magazine, 1/2/5 plastic containers and bottles with caps, glass bottles/jars (with lids), aluminum cans, pie tins, catering trays, steel/tin food cans, gable top cartons (OJ, Milk, aseptic packaging), justice boxes	Any materials with food or greasy resides, Pizza boxes, wax cardboard, paper/cardboard tubes/packaging padding, plastics without any recycling numbers, #3/4/6/7, plastic bags and plastic film, styrofoam, batteries, Aerosol cans, aluminum foil, electronics, hoses, ropes, wires, wood, stickers, corks, clothing, motor oil containers, electrical and mechanic toys, light bulbs, mirrors, window glass, ceramic plates, cups, mugs, food waste, medical waste, poisonous waste, hazardous waste	https://www.southorange.org/489/Recycling

Verona	Atlantic Coast (brings it to Waste Industries)	Flattened cardboard, magazines, office paper, junk mail, phone books, brown paper bags, newspapers and inserts, paperboard, aluminum cans, clear/amber/green glass bottles, tin/steel cans, plastic food/beverage containers, water and beverage bottles, detergent bottles, shampoo bottles, yogurt/various food containers, 1/2/5 containers, Glass bottles (all colors, Glass jars (all colors), Food cans Aluminum cans, Plastic bottles (types 1,2 & 5), Clamshell containers (types 1,2 & 5)- all others are garbage, Magazine, All envelopes, Copy paper, Paperback books, Hardcover books (with hard cover removed), Phone books, Catalogs, Office paper, Newspaper, Greeting cards, Non-metallic gift wrap (flatten), Tissue boxes, Brown bags, Paper tissue rolls, Newspaper inserts, Chipboard boxes including cereal, cookie, pasta, cake, crackers, detergent (remove plastic liner, flatten and shake out crumbs), Poster board (without foam backing), Backing from writing pads, Shredded paper (Place in brown shopping bags with the open end stapled shut not open)	Empty aerosol cans (which contained a food, health or beauty products are garbage –all other products in aerosol cans are HHW), Microwave trays (the glass or plastic trays found in your microwave oven), Plastic bags (Plastic bags can jam sorting equipment) Bring to local supermarket i.e. Kings, Shopright or Foodtown, Motor oil and antifreeze bottles (empty place in garbage), Plastic flower trays and pots, Hard plastic toys, Plastic coat hanger, Plastic drum and crates (hard plastic), Prescription bottles (white and brown), Plastic cups, knives, spoons and forks, Window glass, Drinking glasses, Light bulbs (fluorescent and CFL) HHW, Pyrex glass, Glass candle jars (Yankee Candle etc.), Mirrors, Glass vases, Pool chemical containers (HHW), Pesticide containers (HHW), 5 gallon pails (spackle, driveway sealer and paint- bulk garbage), No broken glass (garbage), No Styrofoam of any kind (garbage), Plastics coded #3, #4, #6, #7, Waxed paper and corrugated boxes, Tissue paper, Napkins, Paper towels, Frozen food boxes (these boxes have a sprayed on coating to prevent the paperboard from getting wet), Paper plates, Paper cups, Metallic and plastic coated paper, Carbon paper, Labels/sticker paper, Manila envelopes with plastic bubbles or Tyvek envelopes, Photographs, Pet food bags (Lined with plastic), Furnace filters, Pizza boxes stained with food, oil, or grease	https://veronaec.org/garbage-recycling/
West Caldwell	Interstate Waste	Aluminum Cans, Glass Bottles and Jars, Plastic Bottles, jugs, and food containers (#1, #2, and #5), Newspaper, Magazines, cereal boxes, junk mail, paperback books, Mixed Office Paper - shredded paper must be in clear plastic bags or paper bags, Corrugated Cardboard - Flattened and tied	glass cookware, drinking glasses, light bulbs, plate glass, or children's toys. pizza boxes, napkins, paper towels, hard-covered books, or gable-top containers.	https://www.westcaldwell.com/departments/recycling
West Orange	Atlantic Coast Fibers	Glass beverage and food containers (all colors), aluminum beverage containers, tin/steel food cans, plastic containers for beverages, food, detergents and shampoo type plastics with a recycling #1, #2, or #5.. Newspaper, flattened cardboard, magazines, office paper, junk mail, catalogs, phone books, paperback books and books with hard covers removed	Plastic bags, Styrofoam, Styrene	https://www.westorange.org/651/Recycling-Curbside-Collection

Figure 15: The recycling company, what is accepted, and what is not accepted by each town in Essex County.[79]

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https://docs.google.com/spreadsheets/d/1fxy0HOdYVxZXvVw2t55ESCWZ_rINEmAdkEFw6_GAcuo/edit?usp=sharing