Report to the Joint Standing Committee on the Environment and Natural Resources

131st Legislature, First Session

Maine Solid Waste Generation and Disposal Capacity Report for Calendar Years 2020 & 2021

January 2023

Contacts:

Paula Clark
Director, Division of Materials Management
207-287-7718
paula.m.clark@maine.gov

Brian Beneski
Supervisor, Recycling Programs
207-592-0248
brian.beneski@maine.gov

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 State House Station | Augusta, Maine 04333-0017
www.maine.gov/dep

Contents

I. Introduction

This report is submitted to the Joint Standing Committee on Environment and Natural Resources pursuant to 38 M.R.S. § 2124-A which requires the Department to submit a biennial report to the Legislature setting forth information on the statewide generation of solid waste, statewide recycling rates, and available disposal capacity for solid waste. It provides an overview of Maine's solid waste generation, diversion, recycling, and disposal activities for 2020 and 2021, and an evaluation of Maine's progress toward the municipal solid waste (MSW) reduction and recycling goals established at 38 M.R.S. § 2132(1-B), and Maine's statewide recycling goal at 38 M.R.S. § 2132(1). The report also includes a projection of the solid waste disposal needs of Maine for the next 10 years and discussions regarding waste disposal beyond that timeframe.

II. Solid Waste Management in Maine – 2020 & 2021 Highlights

In 2020, a total of 1,930,151 tons of municipal solid waste (MSW) and construction and demolition debris (CDD) was generated in Maine and managed through licensed solid waste facilities or recycling facilities and drop-off points, while a total of 1,872,874 tons was generated and managed in 2021. Maine's per capita disposal rate for this reporting period was approximately 0.69 tons per person in 2020 (1,379.69 pounds), decreasing slightly to 0.66 tons per person in 2021 (1,317.05 pounds). Maine's estimated recycling rate (excluding CDD) was 34% in 2020 and 33.7% in 2021. These per capita disposal and recycling rate estimates were calculated using the best available data as reported by facilities and recycling establishments.

Based on the currently licensed and operating disposal facilities and management systems, the disposal capacity for Maine-generated MSW and its residue streams remains adequate into the near-term future. Beyond 5 years, overall landfill capacity may decrease if several landfills reach currently licensed capacity and do not seek an expansion to increase their capacity.

Maine is not currently meeting its MSW reduction and recycling goals. Overall, solid waste disposal tonnage decreased slightly by 0.4% in Maine over the reporting period from 2020 to 2021 although disposal tonnage has generally been trending upward over the past decade. In contrast, recycling tonnage decreased by 10.6% from 2020 to 2021.

There are a number of factors that have contributed to a recent decline in statewide recycling. As with all commodity markets, recycling commodities markets fluctuate. Global policy changes over the past few years led to a sharp decline in the availability of export markets, resulting in competition for the more limited domestic markets for recyclables, higher processing costs due to the need to meet better quality standards required for domestic processors, and a corresponding cost increase to recycle due to increased supply chain and labor costs. While those global policies disrupted many recycling programs, including China's National Sword policy and changes to the Basel Convention[1] limiting export markets, these policies may create opportunities in the long-term for substantive improvement in domestic markets. Increased focus on domestic processing and scrutiny of packaging recyclability may lead towards the use of more recyclable materials and questioning the sustainability of consuming non-renewable fossil fuels to produce single-use

[1] CalRecycle. (n.d.). *International policies affecting global commodity markets.* https://calrecycle.ca.gov/markets/nationalsword/globalpolicies/

disposable items.[2]

The relatively higher cost of maintaining recycling programs with uncertain revenue streams amidst a competitive labor market and variable commodities markets remains a disincentive for Maine communities to recycle.[3] Additionally, many of the communities that are part of the Municipal Review Committee (MRC) opted in to the "one bin, all in" program in conjunction with the Fiberight/Coastal Resources of Maine mixed waste processing facility that was intended to allow collection of trash without residents having to separate out recyclable material beforehand. With the ceased operation of this facility in 2020, many of the MRC communities were no longer able to process recycling as their infrastructure had already transitioned to the "one bin all in" system. In addition, the lingering effects of the COVID-19 pandemic have contributed to stagnant recycling activity in some regions of the state. Initial concerns over how the virus spread led to a pause on many recycling programs due to fears that handling recyclables could lead to increased spread of COVID-19. Many of these programs have not yet resumed due to the cost of re-starting the programs during a period of unstable recycling material market prices.

III. Generation and Management of Solid Waste in 2020 & 2021

A. Overview of the Management of Maine's Solid Waste

Solid waste in Maine is generated by residential, commercial, institutional, and industrial entities, and is categorized depending on its characteristics and how it is generated. These categories include municipal solid waste (MSW), construction and demolition debris (CDD), wood waste, special waste, and universal waste; various types of waste exist within these categories. This report primarily addresses wastes that are generated by households and businesses, as the generation, recycling rates, and disposal of these waste materials are the focus of 38 M.R.S. § 2124-A. Figure 1 provides a map of landfills accepting municipal solid waste and waste-to-energy facilities.

38 M.R.S. § 1305 assigns responsibility for the management of MSW to each municipality: "Each municipality shall provide solid waste disposal services for domestic and commercial solid waste generated within the municipality." MSW is managed through combinations of municipal and commercial waste handling services, facilities, and systems as each municipality chooses how to meet that responsibility.

Once collected, solid waste may be temporarily stored, transported, recycled, processed, composted, anaerobically digested, beneficially reused, combusted at waste-to-energy facilities, or landfilled. Maine's *Solid Waste Management Rules* (06-096 C.M.R. chs. 400 – 419) set risk-based standards for the handling of solid waste with the ultimate purpose of protecting public health and the environment.

A significant issue that has come to the forefront in recent years and will likely influence multiple aspects of materials management from recycling to landfilling to organics management in the future is the presence of per- and polyfluoroalkyl substances (PFAS). Used in household products, industrial settings, and firefighting foam since the early 1950s, these chemicals are persistent and

[2] Heiges, J., & O'Neill, K. (2022, November 16). What analyzing National Sword can teach us about optimizing US plastics recycling. Waste Drive. https://www.wastedive.com/news/opinion-analyzing-national-sword-plastics-recycling-system-berkeley/636656/

[3] Paben, J. (2022, October 4). Editor's analysis: Are bale prices foreshadowing recession? *Plastics Recycling Update.* https://resource-recycling.com/plastics/2022/10/04/editors-analysis-are-bale-prices-foreshadowing-recession/

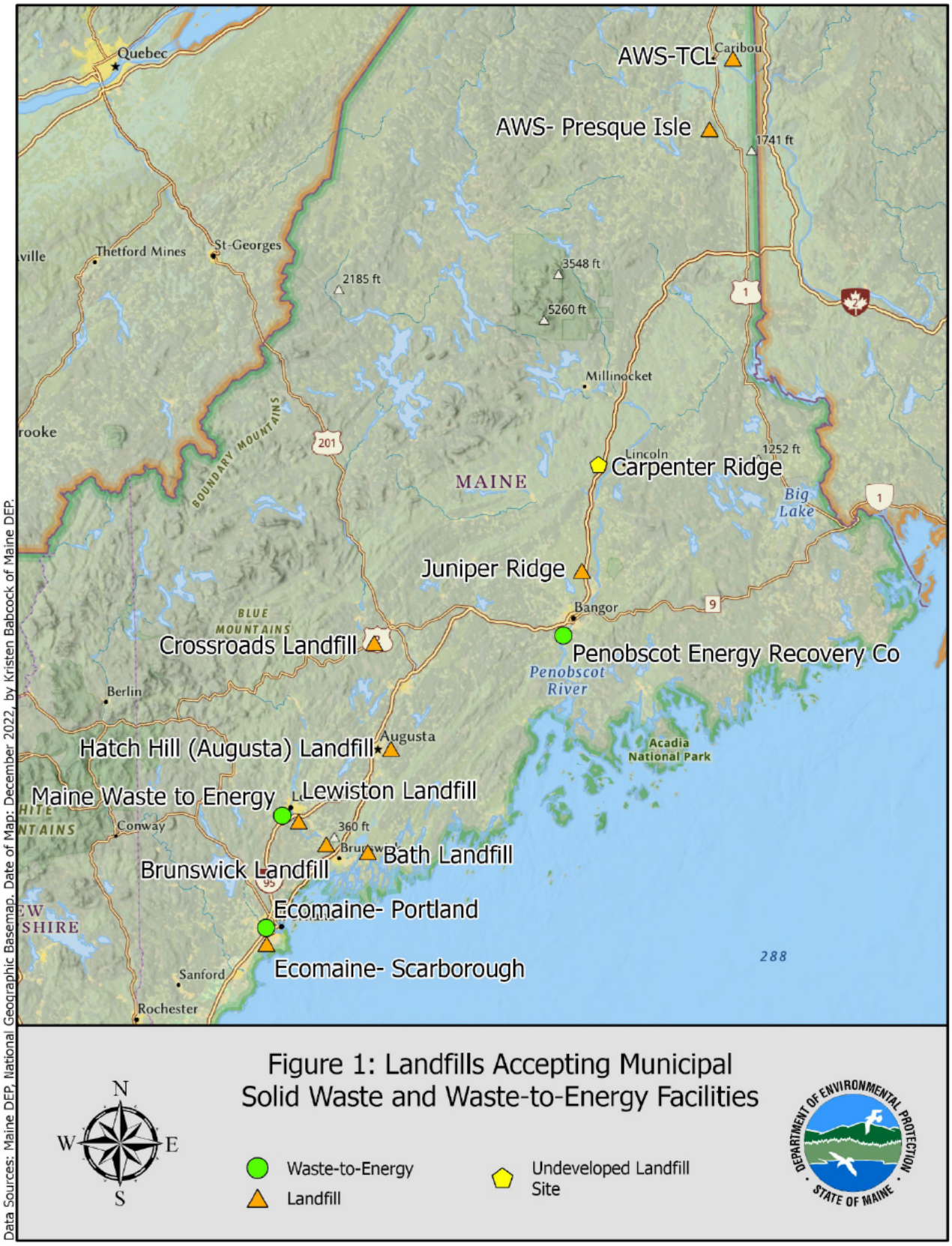

Figure 1: Landfills Accepting Municipal Solid Waste and Waste-to-Energy Facilities

Data Sources: Maine DEP, National Geographic Basemap. Date of Map: December 2022, by Kristen Babcock of Maine DEP.

bioaccumulate in the environment[4]. The Maine Legislature has enacted a number of laws relating to PFAS, including a ban on the land application and distribution of sludge derived products and the regulation of PFAS in food packaging and more broadly in products sold and distributed in Maine.

38 M.R.S. § 2101, Maine's *Solid Waste Management Hierarchy*, sets an integrated approach to solid waste management as State policy. This "hierarchy" establishes waste reduction as the preferred approach and highest priority, followed by reuse, recycling, composting, volume reduction through waste-to-energy incineration, and landfilling as the management option of last resort. In accordance with 38 M.R.S. § 2122 the Department will update and release the "Maine Materials Management Plan," (MMMP) in January of 2024, which will outline strategies for the State to incorporate this hierarchy in the management of waste. The MMMP will examine the management of MSW, CDD and some typical special wastes generated by Maine households and businesses and provide recommendations to help Maine's policymakers identify opportunities to effect positive changes to divert materials from disposal and move the management of various components of the solid waste stream up the hierarchy and treat waste as a valuable resource to be recovered rather than as a liability. It will identify initiatives and opportunities to support ongoing programs to help Maine's municipalities to improve recycling and organics diversion efforts. It will also identify strategies to further address PFAS-containing solid wastes.

B. Overview of Rate Calculations

The total amount of MSW generated in the State has been calculated through analysis of the amounts of waste at their final points of disposition – waste disposed in landfills, incinerated at waste-to-energy facilities, processed, sent for recycling, beneficially used, and reused, where such data is available. Data was acquired from the annual reports of licensed facilities and of recycling establishments for this 2020 and 2021 report period. This includes data from out of state sources, such as landfills which accept exported waste that was generated in Maine. Data on the recycling of electronics, vehicle batteries, consumer batteries, mercury-added lamps and textiles was obtained through a combination of voluntary and mandatory reporting by the specialized businesses that manage these consumer products, including reports required by Maine's product stewardship laws,[5] data from hazardous waste manifests, and reporting by major collectors of recyclable items. Organics recovery by commercial-scale organics management entities is also tracked, but data on backyard, school based, and small, on-farm composting operations is generally not collected, and cannot be included in the calculation of Maine's MSW recycling rate.

It is important to point out that the most preferential waste diversion and reuse activities, meaning those at the top of Maine's waste hierarchy such as reuse of goods through donation and resale or food rescue, often take place through unofficial channels and are not quantified in this report. Such activities may include resale of usable goods through yard sales, online sales or trading platforms, and gleaning or food donation activity. While limited data on diversion of textiles and household goods is collected from the largest nonprofits in Maine, most reuse information is not formally tracked and therefore cannot be included despite the fact that these activities have a significant environmental benefit by preventing waste from being generated and reducing resource extraction, energy consumption, use of production and processing inputs, and pollution associated

[4] *See EPA's guide to PFAS for more information:* https://www.epa.gov/pfas/pfas-explained

[5] Maine's Product Stewardship Framework law affirms product stewardship programs as an integral part of the State's solid waste management strategy. Learn more at https://www.maine.gov/dep/waste/productstewardship/index.html

with producing new goods.

C. Generation of Municipal Solid Waste in Maine

Table 1 presents a summary of the amounts and disposition of MSW generated in Maine in 2020 and 2021 and an overview of recycling rates. CDD generation and disposition is presented in Section D, and wood waste generation and disposition is presented in Section F. These numbers have been adjusted to account for the estimated amounts of material generated in Maine and accepted by licensed solid waste or processing facilities and recycling establishments. For example, if a facility accepted waste or scrap material from Maine and out-of-state entities, this report focuses on activity related to the Maine-generated portion of the facility's accepted material whether that material was landfilled, incinerated, or exported for recycling. This biennial report includes commercial recycling tonnage, such as commercial cardboard recycling, which increases Maine's overall recycling rate. Including commercial recycling numbers as well as residential provides a more complete analysis of the overall recycling rate during the reporting period.

Table 1 - Maine MSW Management - Calendar Years 2020 & 2021

Maine MSW disposition	2020 tons	2021 tons
Maine MSW landfilled in state	408,967	460,128
Maine MSW disposed via waste-to-energy	441,804	365,941
Maine MSW disposed out-of-state	89,046	77,591
Subtotal Maine MSW (exclusive of CDD) disposed	939,817	903,660
Paper, cardboard, plastics, metals, glass, textiles, white goods, and stewardship program materials recycled	211,054	183,501
Other MSW recycled (ferrous and non-ferrous scrap metal, and vehicle batteries)	225,969	225,351
Reported MSW composted[6]	36,052	35,331
Reported MSW anaerobically digested (AD)[7]	11,500	14,755
Subtotal Maine MSW recycled, composted, or anaerobically digested	484,574	458,938
Total Maine MSW generated (exclusive of CDD)	1,424,391	1,362,598
Maine's MSW Recycling Rate (exclusive of CDD)	34.0%	33.7%

D. Management of Construction and Demolition Debris

CDD waste is considered a subset of MSW and is generally handled as a separate waste stream which is typically transported, processed, and disposed of separately from MSW. There are several

[6] Not including backyard, school based, and exempt/small, on-farm composting operations or processing waste such as fish or food processing waste. Compost facilities that accept less than 5 cubic yards of food scraps monthly and on-farm compost facilities that accept less than 60 cubic yards of food scraps monthly are exempt from Department licensing and annual reporting requirements.

[7] Includes only source-separated organics and does not include liquid wastes or sludge, distillate, de-icing fluid, slurry, or fats, oils, and grease.

CDD processing facilities across Maine that separate and mechanically resize materials for recycling, reuse, and disposal. This includes recovering materials such as glass to be processed into cullet for use in new products, recovering wood waste for recycling into particle board or use as fuel, and recovering scrap metal, which provides feedstock for a wide range of manufacturing activities. These facilities process CDD waste generated in Maine and imported into Maine, but only the Maine-generated portion of this material is counted toward Maine's statewide waste generation and recycling information. For example, although 164,346 tons of CDD processing residue was sent to Juniper Ridge landfill for disposal, only 18,156 tons or approximately 11% of this overall tonnage was Maine-generated waste. CDD is disposed at Maine landfills and waste-to-energy facilities. In addition to the larger landfills that accept MSW and CDD, several municipalities operate their own smaller CDD only landfills (further discussed in Section V). Table 2 outlines Maine's CDD disposal rates and the disposition of CDD generated in Maine for 2020 and 2021.

Table 2 - Maine CDD Management - Calendar Years 2020 & 2021

Maine-generated CDD disposition	**2020 tons**	**2021 tons**
Mixed CDD disposed in state	481,050	485,238
Mixed CDD disposed out of-state	4,736	4,424
Processed CDD sent to a landfill for daily cover, shaping, grading[8]	13,828	15,392
Processed CDD recycled into new wood products or glass cullet	5,665	4,887[9]
Processed CDD beneficially used as fuel	831	336
Subtotal Maine CDD recycled into new products & beneficially used as fuel	6,496	5,223
Total CDD generated in Maine	506,110	510,277
Maine's CDD recycling rate (all non-landfill uses)*	1.28%	1.02%

**Solid waste processing facilities (including CDD processing facilities) that generate residue requiring disposal are required under the provisions of 38 M.R.S. § 1310-N(5-A)(B)(2) to "recycle or process into fuel for combustion all waste accepted at the facility to the maximum extent practicable, but in no case less than 50%". For purposes of calculating this recycling rate the law defines "recycle" to include the use of residue at a solid waste landfill "for daily cover, frost protection or other operational or engineering related purpose, including . . . landfill shaping or grading . . ." For purposes of this report and evaluating recycling rates against the State goal, only CDD that has been recycled into new products or beneficially used as fuel has been included.*

E. Management of Special Waste

Special waste, as defined by 38 M.R.S. § 1303-C(34) means "any solid waste generated by sources other than domestic and typical commercial establishments that exists in such an unusual quantity or in such a chemical or physical state, or any combination thereof, that may disrupt or impair effective waste management or threaten the public health, human safety or the environment and requires special handling, transportation and disposal procedures." Special waste includes, but is not limited to: ash, industrial and industrial process waste, wastewater treatment plant (WWTP) grits and screenings and sludge, debris and residuals (including contaminated soil) from nonhazardous chemical spills, petroleum spills and cleanup of those spills, and asbestos and

[8] Includes only Maine-generated portion of CDD wastes from processing facilities located in Maine.

[9] One facility that recycled CDD in 2020 did not report for 2021, so there may be missing data on CDD recycled, but the tonnage is likely to be similar to 2020 and would not represent a significant increase in overall CDD recycling.

asbestos containing waste. Special waste may be composted, beneficially used, land applied, incinerated, anaerobically digested, used as alternative daily cover and/or landfilled. Several industrial facilities in Maine (e.g., paper mills) operate "generator owned" landfills for the special waste generated at their facilities. Special wastes, as they are defined as being generated by sources other than domestic and typical commercial establishments, are not included in the waste generation calculations for Maine in this report. However, special wastes disposed in landfills, used as landfill alternative daily cover, or in other landfill-related applications take up disposal capacity and affect the amount of available disposal capacity in Maine.

F. Management of Wood Waste

Wood waste is another category of solid waste that is frequently generated by households and normal commercial sources and handled at facilities that accept MSW and/or CDD. Wood waste includes brush; stumps; lumber; bark; wood chips; shavings; slabs; edgings; slash; sawdust; wood from production rejects; wood pallets that are not pressure treated or visibly contaminated, and from which fasteners have been removed; that are not mixed with other solid or liquid waste. This report does not attempt to evaluate the amount of brush, stumps, and lumber wood waste but concentrates instead on wood waste generated in residential or commercial sectors during construction and demolition or other operations.

Licensed solid waste facilities in Maine accepted 8,023.88 tons of wood waste in 2020 and 7,723.25 tons of wood waste in 2021. In 2020, approximately 3,708.28 tons of collected wood waste was sent to landfills for shaping, grading, and cover, while 3,484.6 tons were exported for use in manufacturing particle board, and the remaining 831 tons used as biomass fuel. In 2021, 4,023.28 tons of wood waste was used for shaping, grading, and cover in landfills, 3,363.97 tons was shipped out for particle board feedstock, and 336 tons of wood waste was used for biomass fuel. A small amount of clean wood (between 50 to 100 tons) was also landfilled per year.[10]

These numbers have been adjusted to account for estimated amounts of wood waste generated in Maine and accepted by licensed solid waste or processing facilities. For example, if a facility accepted 50 tons of waste from Maine and 50 tons of waste from another state, this report only quantifies the activity related to the Maine-generated portion of the facility's wood waste. As noted above, this report does not factor in wood waste that is processed and marketed for mulch, other landscaping uses, and erosion control material. Data on wood waste that is managed other than at licensed facilities is not tracked and it is likely that the data reported to the Department represents only a small portion of the overall wood waste generated in Maine during the report period.

IV. Progress toward Maine's Waste Reduction and Recycling Goals

A. Maine's Municipal Solid Waste Disposal Reduction Goal

In 2017, Maine's statutory goal for waste reduction was amended to focus on the readily measurable amount of MSW sent for disposal. 38 M.R.S. § 2132(1-B) states:

> ***State waste disposal reduction goal.*** *It is the goal of the State to reduce the statewide per capita disposal rate of municipal solid waste tonnage to 0.55 tons disposed per capita by January 1, 2019 and to further reduce the statewide per capita disposal rate by an additional 5% every 5 years thereafter. The*

[10] Estimated based on partial/incomplete reporting.

baseline for calculating this reduction is the 2014 solid waste generation and disposal capacity data gathered by the department.

In 2014, Maine generated and disposed (at landfills and waste-to-energy facilities) 757,049 tons of MSW, exclusive of CDD. This established the baseline per capita disposal rate at 0.5697 tons per person (Maine's estimated 2014 population was 1,328,903). In 2017, this goal was not only met but exceeded with an estimated 0.54 tons (1,080 pounds) of waste disposed per capita in Maine. However, per capita disposal tonnage during the 2020-2021 reporting period did not meet the statewide goal, as shown in Table 3 below.

Table 3 - Maine MSW Per Capita Disposal - Calendar Years 2020 & 2021

Maine MSW Disposal vs. Goal	2020	2021
Tons MSW Disposed	939,817	903,660
Statewide Population[11]	1,362,359	1,372,247
Per Capita MSW Disposal in Tons	0.69	0.66
Per Capita MSW Disposal in Pounds	1,379.69	1,317.05

Figure 2 below shows the estimated pounds of MSW disposed or recycled per person on a daily basis across Maine since 2013, highlighting a recent uptick in disposal and overall MSW generation.[12]

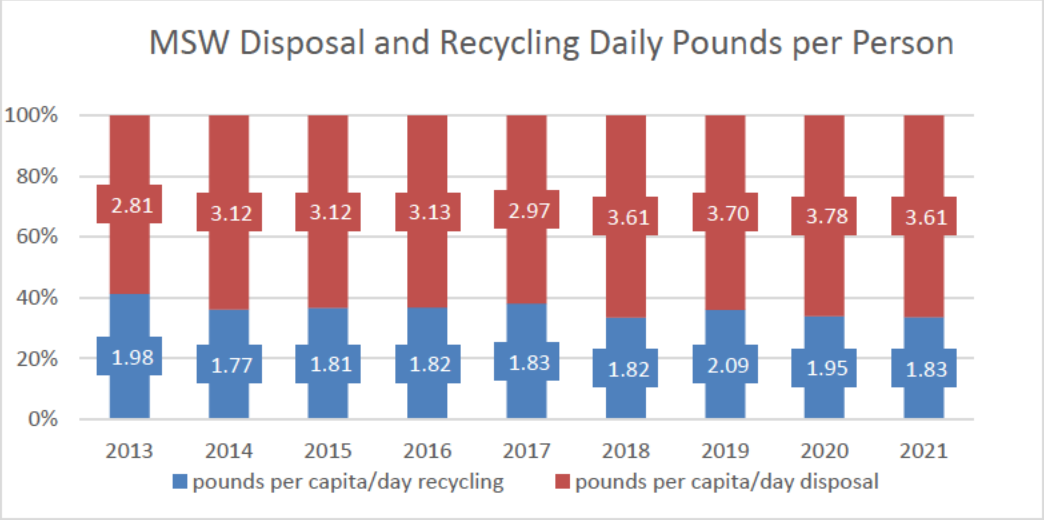

Figure 2. Per Capita (Person) MSW Disposal and Recycling Pounds Per Day

B. Maine's Municipal Solid Waste Recycling Rate

[11] Based on US Census Data for 2020 and US Census Bureau's 2021 Population Estimates Program
[12] Generation includes materials that are disposed as well as those diverted from disposal through recycling or composting.

38 M.R.S. § 2132(1) sets Maine's statewide goal for the recycling of municipal solid waste:

> ***State recycling goal.*** *It is the goal of the State to recycle or compost, by January 1, 2021, 50% of the municipal solid waste tonnage generated each year within the State.*

Unfortunately, waste diversion in the past few years has not kept pace with waste generation, with the result that Maine has not achieved the statewide recycling or composting goal. Maine's statewide recycling rates for 2020 and 2021 were comparable or slightly lower than in years past, as shown in Table 4 below. Maine's MSW recycling rate (including composting and anaerobic digestion) average for 2020 and 2021 was estimated to be 33.9%, with respective recycling rates per year of 34% in 2020 and 33.7% in 2021.

Table 4 – MSW Generation, Disposal, and Recycling since 2017

	2017[13]	2018	2019	2020	2021
Tons MSW Generated	1,165,702	1,327,373	1,421,101	1,424,391	1,362,598
Tons MSW Disposed	721,646	882,074	907,906	939,817	903,660
Tons MSW Recycled	444,056	445,299	513,195	484,574	458,938
MSW % Change (Year over Year)	-3.0%	13.9%	7.1%	0.2%	-4.3%
Disposal % Change (Year over Year)	-5.0%	22.2%	2.9%	3.5%	-3.8%
Recycling % Change (Year over Year)	0.4%	0.3%	15.2%	-5.6%	-5.3%
Estimated Recycling Rate	38.1%	33.5%	36.1%	34.0%	33.7%
Statewide Population	1,331,479	1,338,404	1,344,212	1,362,359	1,372,247
Population % Change (Year over Year)	0.1%	0.5%	0.4%	1.4%	0.7%

The Maine Legislature has taken some steps in recent years to help Maine further its recycling programs, including passing a law to establish an Extended Producer Responsibility (EPR) program for packaging.[14] The Department is in the early stages of implementing this EPR program for packaging, which presents a significant opportunity to expand and improve recycling infrastructure statewide. However, it will be crucial for municipalities to participate in recycling, composting and other waste reduction activities to help Maine achieve its statewide diversion goals. Laws were also enacted prohibiting the use of items that have typically proven problematic for recyclers, including polystyrene foam and single-use plastic bags. Additional funding assistance will soon be made available from the federal government as part of the Bipartisan Infrastructure Law (BIL), which provided appropriations to the U.S. Environmental Protection Agency to fund the Solid Waste Infrastructure for Recycling Grant (SWIFR) program. These grants will provide States with capacity to support long-term planning and data collection needs to demonstrate progress toward the National Recycling Goal and Food Loss and Waste Reduction Goal and advance a Circular Economy for materials[15].

In addition to the ongoing financial assistance that will be available for recycling programs through the EPR for packaging program, the legislature established the Maine Solid Waste Diversion Grant

[13] 2017 year-over-year percent changes reflect a comparison to 2016 data, which is not shown in this table.
[14] The Department's timeline and additional program implementation information is available online at https://www.maine.gov/dep/waste/recycle/epr.html
[15] https://www.epa.gov/recyclingstrategy

Program at 38 M.R.S. § 2201-B (P.L. 2015 c. 461) in 2015 to "assist in the development, implementation or improvement of programs, projects, initiatives or activities designed to increase the diversion of solid waste from disposal in the State". In 2020 and 2021, the Department awarded grants totaling $402,660 to both public and private entities, with a total of $886,000 in funding dispersed since the program began allocating funding in 2018. Maine's Solid Waste Diversion Grant program is open to both public and private entities and has provided funding for 45 different programs and projects focused on waste diversion including organics recovery, recycling, and reuse or waste reduction.

C. Maine's Combined MSW and CDD Recycling Rate

Table 5 shows a breakdown of total waste diversion including CDD and the estimated overall recycling rate for MSW and CDD per year for 2020 and 2021. This table includes the MSW and CDD generated in Maine and disposed out of state in New Hampshire and New Brunswick.

The MSW recycling rate is calculated by dividing the total amount of MSW recycled by the total amount of reported in-state generated MSW. The term "municipal solid waste" is defined in 06-096 C.M.R. ch. 400 as ". . . solid waste emanating from household and normal commercial sources. Municipal solid waste includes front-end process residue from the processing of MSW." Maine has historically included CDD as a subset of MSW since it fits the criteria included in the definition of MSW. However, other states and the U.S. Environmental Protection Agency (US EPA) exclude CDD from their calculations of MSW recycling rates. To address this, the Department has calculated the recycling rate for MSW as defined by the US EPA (Table 1) as well as a recycling and diversion rate for CDD alone (Table 2), and a separate recycling rate that includes both MSW and CDD, shown in Table 5. This approach allows Maine to perform a like comparison with other states' MSW recycling rates, while also enabling Maine to evaluate where additional efforts are needed to improve diversion of the array of materials handled by municipalities in Maine.

Table 5 - Maine CDD & MSW Management - Calendar Years 2020 & 2021

Waste Type and Disposition	2020 tons	2021 tons
Total MSW & CDD reported as generated in Maine	1,930,501	1,872,659
Total MSW & CDD disposed[16] (includes materials used in landfill for cover, shaping, and grading)	1,439,431	1,408,714
Total MSW, CDD, and organics recycled and composted (including wood waste used as fuel chips)	491,070	463,945
Maine's Combined MSW, CDD & Organics Recycling Rate	25.44%	24.77%

D. Reporting Requirements for Recycling

In addition to enacting a new mandatory recycling establishment reporting requirement, the Maine

[16] Includes only Maine-generated portion of CDD processing wastes from processing facilities located in Maine

Legislature made changes to 38 M.R.S. § 2133(7) concerning municipal recycling progress (P.L. 2021 c. 291). Municipal recycling reports, previously submitted on an annual basis, are now required to be submitted biennially. The progress reports include data on what options are available to residents and businesses within each municipality for managing solid waste, including recyclables, organics, and CDD. This reporting requirement is intended to help municipalities and the State assess progress toward achieving an MSW recycling rate of 50%. Municipalities are not required to meet the statewide MSW recycling goal of 50% but are required to demonstrate "reasonable progress" in achieving that goal, as determined by the Department. However, it should be noted that the law does not provide for any consequence to municipalities that do not demonstrate "reasonable progress" or do not report as required. Waste management decisions remain the responsibility of the municipality and decisions and actions at the local level significantly impact the overall statewide MSW recycling rate.

In 2018, 487 municipalities were sent letters notifying them of the reporting requirement and providing instructions on how and when to report. Out of the 487, only 104 municipalities submitted their recycling progress reports to the Department. The Department mailed out postcard notifications prior to the report deadline for the 2019-2020 biennial recycling progress report and received positive feedback on this method of outreach from several municipalities. Reporting rates were much higher for 2019 and 2020, with over 215 municipalities reporting. Out of the municipalities that reported, 85% have a recycling program, while 54% have an organics program, primarily for leaf and yard waste composting. The municipal recycling progress reports provide valuable information that enables the Department to better identify materials management opportunities and needs across the state. The next municipal reports are due to the Department April 30, 2023 and will help further inform discussions about future recycling infrastructure needs.

E. Waste Diversion and Recycling

As outlined in Table 1, in 2020, an estimated 1,424,391 tons of MSW was generated in Maine, while approximately 1,362,598 tons of MSW was generated in 2021. Out of that MSW, approximately 939,817 of MSW was sent for disposal in 2020, and approximately 903,660 tons was sent for disposal in 2021. Maine's MSW is disposed of at either landfills or is utilized at waste-to-energy facilities after which the ash is landfilled.

An estimated 484,574 tons of MSW was diverted from disposal in 2020, and approximately 458,938 tons was diverted in 2021. These MSW materials were diverted from disposal through a number of avenues that include donation and resale, municipal and commercial recycling programs, Maine's product stewardship programs,[17] including the returnable beverage container program, composting and anaerobic digestion, and by scrap metal businesses. Waste diversion activities included in this report primarily include materials that are tracked through licensed facilities or drop-off points. Much of the data is self-reported and may be based on estimates rather than tracking of actual weight by material type. These diversion programs can be categorized in several distinct ways, as detailed below.

1. Donation and Resale

[17] Maine's existing product stewardship programs allow residents and other entities to recycle certain mercury-containing products including light bulbs, auto switches, and thermostats, oil-based and latex architectural paint, rechargeable consumer batteries, and cell phones. New programs for packaging and pharmaceuticals are in the process of implementation.

As noted previously, this report is not able to capture comprehensive data on reuse. The exception is data from several of the largest charitable organizations in Maine, which voluntarily provide estimates for the amount of textiles (clothing, curtains, etc.) and household goods (furniture, toys, books, etc.) they divert from disposal on an annual basis. In total, these entities diverted approximately 13,575 tons of household goods and textiles in 2020 and 11,417 tons in 2021. Figure 3 shows the composition of diverted reuse materials. Reuse tonnage is included in Maine's statewide diversion totals along with recycling, composting, and anaerobic digestion. This reuse data likely represents a small fraction of the overall amount of material diverted through reuse channels in Maine, including transfer station swap shops as well as resale shops, flea markets, online sales, and various trading platforms for buying, selling, and exchanging materials.

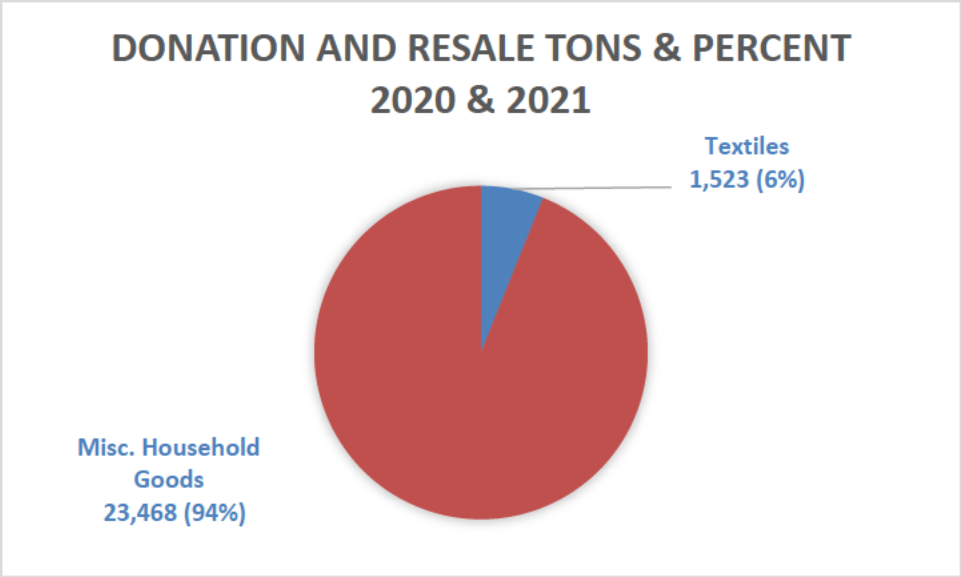

Figure 3. Donation and resale by tons, material, and percent in 2020 and 2021

2. Household/Business Traditional Recyclables Summary

Figures 4 through 10 show the composition in tons and percent of traditional recyclables by material type in 2020 and 2021. Traditional recyclables include regularly generated items such as bottles, cans, cardboard boxes, jugs, tubs, office paper, and unwanted mail. The recyclable materials represented in these figures are typically collected curbside or at municipal transfer stations, as well as through the beverage container redemption program, store drop-off points for plastic film, or recyclables managed internally by businesses that generate large quantities of specific material, such as cardboard. Scrap metal is represented separately from these typical household or business materials. These recyclables have been divided up into four primary categories: plastics, fibers (cardboard and paper), glass, and metal. Each pie chart shows the overall amount by weight and percent of each distinct material per category of recyclable. For example, approximately 904 tons of #1 polyethylene terephthalate (PET) "flat pack"[18] was baled and sent to a processor for use in

[18] "Flat pack" is a term used to refer to berry boxes, clamshells, and other non-bottle polyethylene terephthalate packaging.

new products during the two-year period, and these PET clamshells comprised 3% of the total plastics sent to processors by various recycling establishments during this time frame.

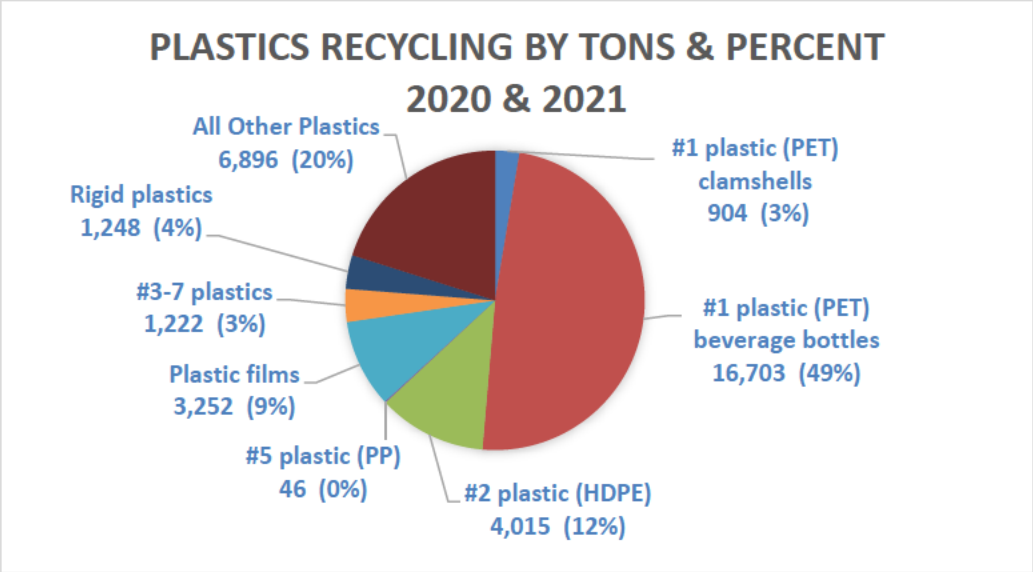

Figure 4. Plastics recycling by tons, material, and percent

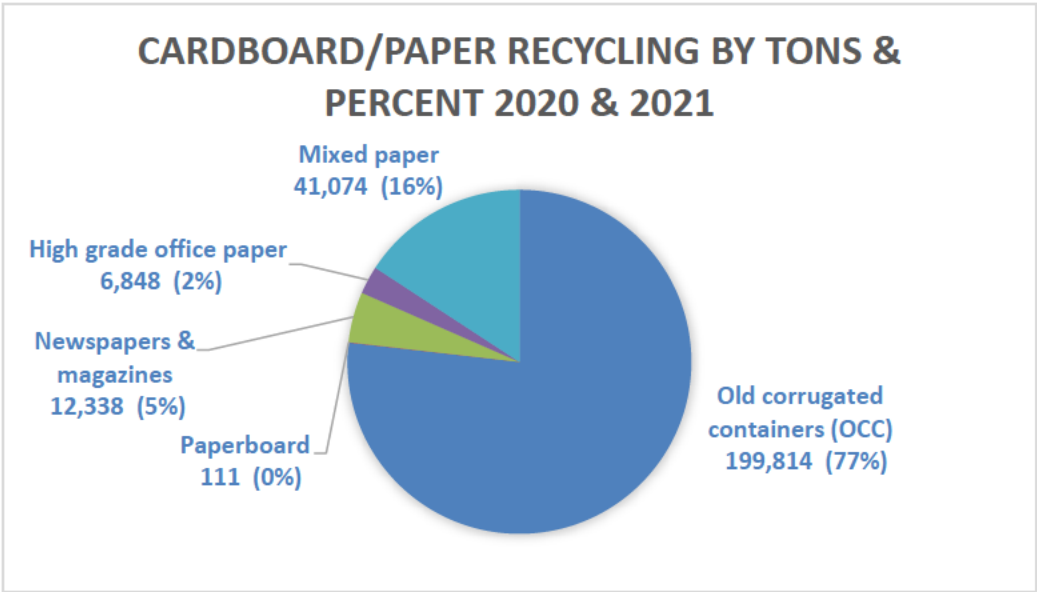

Figure 5. Cardboard and paper recycling by tons, material, and percent

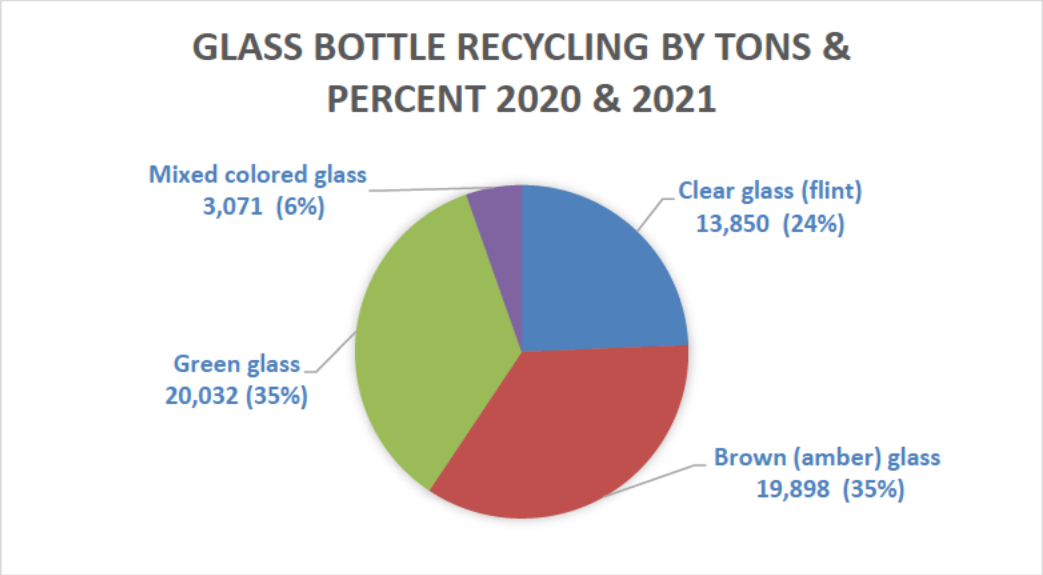

Figure 6. Glass recycling by tons, material, and percent

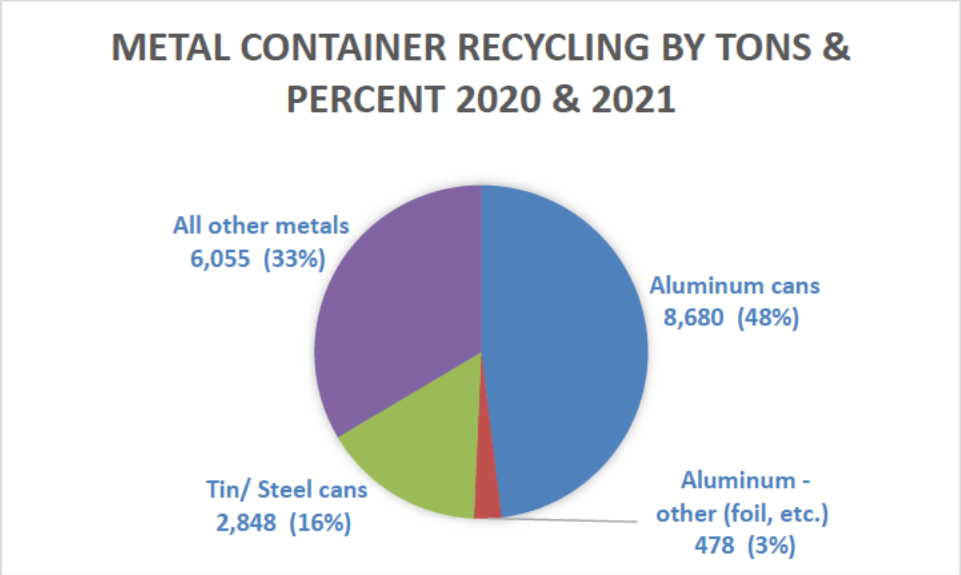

Figure 7. Metal container (includes some foil) recycling by tons, material, and percent

The "bottle bill" or container redemption program falls under the programmatic umbrella of Maine's product stewardship programs and is a crucial piece of the recycling infrastructure throughout the state. A significant amount of the bottles and cans recycled in Maine were collected through the bottle bill program during 2020 and 2021. Figures 7 and 8 below highlight the important contribution of the bottle bill to Maine's statewide recycling efforts.

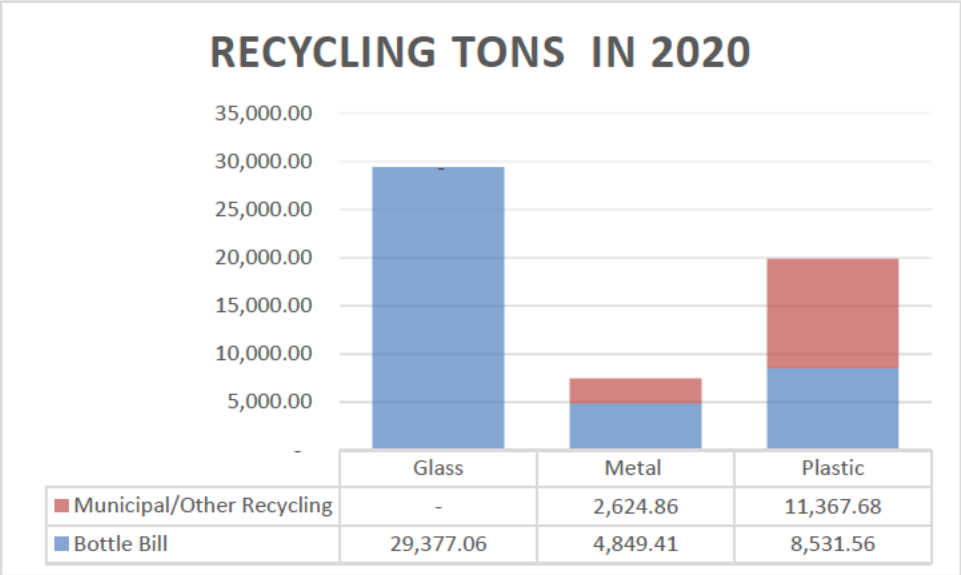

Figure 8. Bottle bill and municipal or other recycling program contributions to statewide recycling of glass, metal,[19] and plastic in 2020

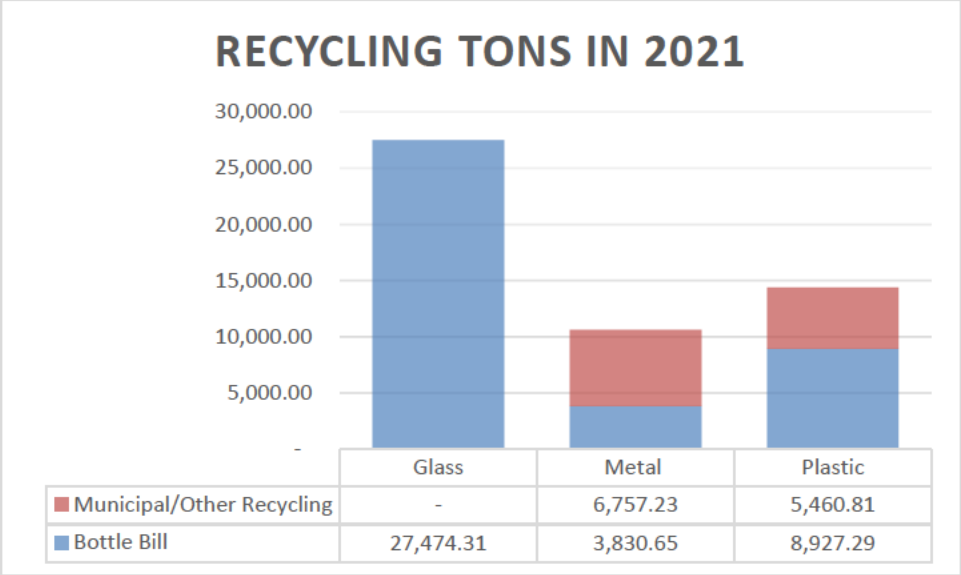

Figure 9. Bottle bill and municipal or other recycling program contributions to statewide recycling of glass, metal, and plastic in 2021

[19] Metal represented here are traditional recyclables such as cans and other materials collected curbside or at transfer stations, not scrap metal such as white goods

3. Scrap Metal Recycling

Scrap metal dealers in Maine recycled an estimated 225,969 tons of scrap metal and vehicle batteries in 2020 and approximately 225,351 tons in 2021.

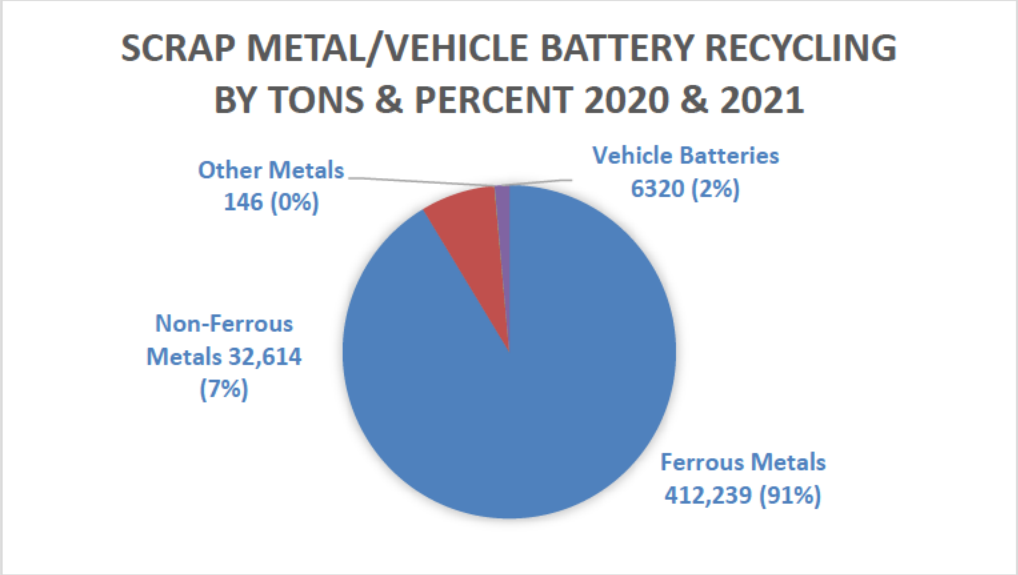

Figure 10. Scrap metal recycling by tons, material, and percent

4. Product Stewardship Programs

Maine's product stewardship laws mandate some level of manufacturer (producer) responsibility for proper product management at the end-of-life for the products that they produce. These laws may also be known as extended producer responsibility ("EPR") laws. EPR provides incentive for manufacturers to consider the end-of-life impacts of their products and relieves the public sector of some of the burden of managing those products. The Department publishes a separate report each year focused specifically on Maine's product stewardship programs, which provides a more in-depth analysis of each program with detailed information on material recovery as well as program performance.

Approximately 5,605 tons of material (excluding organics) were diverted from disposal through Maine's product stewardship programs, as shown in Table 6 below.

Table 6 – Materials Recycled through Maine's Product Stewardship Programs in 2020 and 2021

Product Stewardship Programs Estimated Material Recovery (Tons)							
Year	**Paint**	**Paint Cans**	**Mercury Lamps**	**Mercury Thermostats**	**Electronic Waste**	**Rechargeable Batteries**	**Total**
2020	105	106	95	.47	2,654	14	2,974
2021	131	106	86	1	2,289	17	2,631

5. Organics Management: Composting and Anaerobic Digestion

Organics management covers a wide range of materials; however, for the purpose of this report, municipal solid waste is the primary focus. In addition, municipal organics diversion is generally reported here but the challenges and opportunities to expand these programs are not addressed in detail.

A comprehensive analysis of potential impacts to materials management related to these efforts will be included in the forthcoming 2024 MMMP, as well as an analysis of opportunities related to increasing organics diversion. While waste audits would be needed to confirm how much food is in the residential and commercial waste, the low quantity of food scraps diverted via composting and anaerobic digestion as detailed below suggest there is room to improve Maine's food scrap collection efforts to increase organics diversion.

a. Composting

As with reuse, a great deal of composting activity is not tracked as it takes place informally and at a small, local scale. Composting activity that is not tracked includes backyard, school based, and exempt/small, on-farm composting operations.[20] While large-scale composting of industrial processing waste such as fish or food processing waste, wood shavings, manure, and FOG (fats, oils, and grease) is tracked, this activity is not described in detail here as it is separate from the municipal solid waste stream and not the focus of this report. Approximately 84,191 tons of these industrial and commercial wastes were composted during the reporting period. Organics composting included in Table 7 below includes food scrap and leaf and yard composting from municipalities.

Table 7 – Tracked Composting Activity in 2020 and 2021

Material	2020 Tons	2021 Tons
Food Scraps	12,447.30	15,879.00
Yard Waste	23,605.00	19,452.00
Total	**36,052.30**	**35,331.00**

b. Anaerobic Digestion

During 2020, approximately 11,499.60 tons of source separated organics were sent for anaerobic digestion, while 14,754.90 tons were anaerobically digested in 2021. These organics are collected from municipalities and businesses and provide valuable outputs such as energy and animal bedding amendment. An additional 15,430 tons of material managed via anaerobic digestion included processing waste from commercial operations such as distillate and aircraft de-icer. As with certain industrial and commercial processing waste that is composted, this material is not included in Maine's MSW generation or recovery figures; a list of all facilities licensed to process organics in Maine is available online for more details.[21]

[20] Compost facilities that accept less than 5 cubic yards of food scraps monthly and on-farm compost facilities that accept less than 60 cubic yards of food scraps monthly are exempt from Department licensing and annual reporting requirements.
[21] Lists of licensed composting, anaerobic digestion, and sludge composting facilities: https://www.maine.gov/dep/maps-data/data.html#re

V. Solid Waste Disposal Capacity

In 2020 and 2021, Maine's active solid waste disposal facilities included three waste-to-energy facilities and approximately forty landfills of varying sizes and types. Of these landfills, nine are licensed to accept municipal solid waste or MSW bypass. Of these nine, seven are municipally owned, one is owned by the State but operated by a commercial waste handling company, and one is commercially owned and operated. Nineteen of the forty are municipally owned smaller landfills (generally less than 6 acres in size) that accept wood waste and CDD only; one of these is a small secure landfill that in addition to wood waste and CDD accepts WWTP sludge. Additionally, two municipal landfills that accepted MSW during their operational history now only accept CDD. The remainder of the forty are generator-owned landfills that are associated with a specific manufacturing facility and are licensed to take waste from that facility.

Since the wastes disposed at these generator-owned landfills are specific to those facilities and are not placed into the general waste stream, they are not included in this report for calculating Maine waste generated, disposed, and for determining recycling rates. There is one waste processing facility in Maine that accepts MSW, but it was not fully operational in 2020 and 2021 and is currently not in operation.

A. Current and Projected Capacity

1) Waste-to-Energy Facilities – Current and Projected Capacity

Three waste-to-energy facilities operate in Maine and accept both in state and out of state waste. The total amount of waste accepted by these facilities in 2020 and 2021 can be found in Table 8. Waste-to-energy facilities in Maine accounted for the disposal of 441,804 tons of MSW and 6,817 tons of other waste in 2020 (448,621 total tons) and 365,941 tons of MSW and 4,758 tons of other waste (370,698 total tons) in 2021, averaging about 44% of all Maine-generated MSW waste during those two years.

Table 8 – Tons of Waste Incinerated in W-T-E Facilities – Calendar Years 2020 & 2021

Facility	Maine tons (MSW & other materials)		Imported tons		Total tons	
	2020	2021	2020	2021	2020	2021
ecomaine	173,414	182,396	2,292	2,149	175,706	184,544
Mid Maine Waste Action Corporation (MMWAC)	81,005	83,994	0	0	81,005	83,994
Penobscot Energy Recovery Corporation (PERC)	194,201	104,309	11,596	12,253	205,796	116,561
Total	**448,621**	**370,698**	**13,887**	**14,401**	**462,508**	**385,100**

All three waste-to-energy facilities are expected to maintain their physical capacity to dispose of wastes in the coming years. Table 9 presents available licensed disposal capacity for these facilities.

Table 9 - Available Licensed MSW Disposal Capacity at Maine's Waste-to-Energy Facilities - as of December 31, 2020

Waste-to-Energy Facilities	Annual capacity (tons/year)	2020 (tons/year)	2025 (tons/year)	2030 (tons/year)	2035 (tons/year)
MMWAC – Auburn	70,000	70,000	70,000	70,000	70,000
ecomaine – Portland	170,000	170,000	170,000	170,000	170,000
PERC – Orrington*	310,000	210,000	210,000	210,000	210,000
Total Waste-to- Energy Facility capacity in tons	**550,000**	**450,000**	**450,000**	**450,000**	**450,000**

*The PERC annual capacity of 310,000 is the engineered capacity of its two boilers operating full time. In 2020, PERC changed its boilers' operating time, resulting in an operational reduction in waste incineration capacity to 210,000 tons annually. PERC can revert to handling up to 310,000 tons/year without modifications to any equipment.

2) Landfills – Current and Projected Capacity

The nine landfills that accept MSW or MSW bypass are detailed in Table 10 below, with each landfill's reported amount of waste accepted, capacity data, and estimated life span, as determined by a review of each landfill's annual reports for 2020 and 2021. Not all facilities provided an estimated lifespan and only provided capacity used during the reporting year and remaining capacity. In these cases, the Department estimated the life span using the capacity data provided by the landfill for that specific year. Total amount of waste disposed is based on the actual tonnage of all waste material the landfill received, including waste that was utilized for cover material. In most cases, the landfill capacity used, and capacity remaining is calculated by the facility from annual physical surveys of the landfill. Therefore, capacity estimates include capacity that may have been gained by the landfill through settlement of previously disposed waste as well as capacity used by waste that was utilized as daily cover.

MSW is a commodity, and generators and haulers will seek to find the most cost-effective disposal facility for their material. Landfills will alter their disposal amounts to take into account market conditions for various wastes and ability to use waste as cover material. Therefore, estimates of capacity or life beyond 5 – 10 years may not be accurate, as waste stream amounts can vary significantly from year to year as generators and haulers seek more cost-effective facilities and landfills change their operations.

Table 10 - Current Maine Landfill Capacity

Landfill	Amount of waste disposed	Capacity used in year	Total capacity remaining in licensed area	Estimated life
Hatch Hill – 2020	53,745 tons	78,700 cubic yards	503,000 cubic yards	6.3 years
Hatch Hill – 2021	52,289 tons	52,500 cubic yards	470,000 cubic yards	5.8 years
Bath – 2020	5,389 tons	12,200 cubic yards	332,300 cubic yards	27 years
Bath – 2021	15,858 tons	15,800 cubic yards	321,500 cubic yards	29 years
Brunswick – 2020	3,966 tons	Closed 2021	Closed 2021	Closed 2021
Brunswick – 2021	392 tons*	Closed 2021	Closed 2021	Closed 2021
Presque Isle – 2020	25,070 tons	35,651 cubic yards	116,149 cubic yards	3.4 years current capacity; 17 years potential
Presque Isle – 2021	29,729 tons	30,724 cubic yards	41,260 cubic yards	1.3 years current capacity; 17 years potential
Tri-Community-2020	30,574 tons	13,701 cubic yards	1,431,953cubic yards	20 years current capacity
Tri-Community-2021	25,883 tons	33,680 cubic yards	1,470,812 cubic yards	20 years current capacity
Lewiston Municipal - 2020	17,419 tons	12,124 cubic yards	467,200 cubic yards	38 years
Lewiston Municipal – 2021	17,000 tons	13,330 cubic yards	441,115 cubic yards	33 years
Crossroads Landfill– 2020	395,287 tons	437,745 cubic yards	1,197,999 cubic yards	2.7 years
Crossroads Landfill– 2021	425,442tons	425,442 cubic yards	776,231 cubic yards	1.8 years current area/ 17 years expanded area
Juniper Ridge - 2020	670,463 tons	1,115,000 cubic yards	7,458,799 cubic yards	6.6 years
Juniper Ridge - 2021	726,149 tons	1,274,592 cubic yards	6,184,207 cubic yards	4.8 years
ecomaine – 2020	50,049 tons	13,358 cubic yards	903,008 cubic yards	67 years
ecomaine – 2021	51,095 tons	15,154 cubic yards	887,854 cubic yards	58 years

*Brunswick stopped accepting waste as of April 1, 2021; this reflects their three months of operation in 2021.

The Hatch Hill Landfill is expected to reach capacity in approximately 5-6 years at current fill rates. Augusta is currently considering applying to amend their existing license for a vertical increase expansion, which, at current fill rates, would provide an additional 13 years of capacity. Augusta has not yet determined whether it will move forward with the vertical increase or permanently close the landfill. Augusta currently operates as a regional solid waste facility for eight other communities and is considering putting a cap on how much waste is landfilled annually if the vertical increase is constructed.

The Brunswick Landfill ceased accepting waste in 2021 and is going through the closure process.

The Presque Isle Landfill (PILF) and Tri-Community Landfill (TCL) (located in Fort Fairfield) are both owned and operated by Aroostook Waste Solutions (AWS). AWS is operating the landfills in a manner that will reduce redundancy and provide AWS with waste disposal options for the next 40 years. Both landfills are currently receiving waste, however the PILF, at current fill rates, is expected to reach its constructed capacity in 2023. Upon reaching capacity the PILF will be temporarily closed with an interim cover and AWS will divert all landfill destined waste to the TCL. At current waste generation rates, the TCL is then expected to provide AWS with disposal capacity for an additional 20 years. After the TCL reaches capacity, AWS will permanently close the TCL and re-open the PILF for disposal, which is expected to provide an additional 17 years of disposal capacity.

The Lewiston Landfill, although licensed to accept MSW, only accepted ash from the MMWAC facility and smaller amounts of special waste such as grits and screenings from various sewage treatment facilities, crushed glass, and CDD. The ecomaine landfill also accepted ash from the ecomaine waste-to-energy facility and accepted smaller amounts of similar industrial special waste such as wastewater treatment plant grits and screenings. The ecomaine landfill is also licensed to temporarily store MSW received by the ecomaine's waste-to-energy facility at times when the amount of MSW reaching the ecomaine waste-to-energy facility is greater than its capacity, thus allowing it to process the stored MSW at times of lower daily input.

The Crossroads landfill in Norridgewock is owned and operated by Waste Management, a private company. As a privately owned and operated landfill, it receives waste from outside of Maine in addition to in-state waste. The landfill is expected to reach current constructed capacity within the next two years. However, an expansion has been recently approved and the landfill is expected to start using this new licensed space in 2023. The expansion is expected to add approximately 7,757,000 cubic yards of additional capacity and expand the life of the landfill by 17 years.

The Juniper Ridge Landfill (JRL) is owned by the State and is operated by Casella Waste Systems, a private company. JRL is licensed to accept MSW when it is bypassed from one of the three Maine waste-to-energy facilities and the Coastal MSW waste processing facility in Hampden (discussed later in this report) and front-end processing waste generated by a waste-to-energy facility. It also accepts a variety of special wastes, some of which it utilizes as daily cover as discussed below. JRL also accepts CDD and CDD processing residue, some of which is utilized as daily cover as discussed earlier in this report. As noted in Table 10, JRL has slightly less than five years of remaining capacity, and at this time a formal plan for future expansion has not been put forward.

Landfills that accept waste requiring daily cover are frequently licensed to use a waste material as a specific alternative daily cover (ADC). In 2020 and 2021, Crossroads used the following wastes as ADC: processed utility poles, crushed glass, CDD and wood chips and fines, ashes, contaminated

soil, some WWTP sludge, auto shredder fluff and some other special wastes. JRL is also licensed to use several wastes as ADC: ashes, CDD processing residues and fines, and some contaminated soils. During 2020 and 2021, JRL used CDD fines and processing residues as ADC.

As mentioned earlier, several small (generally less than six acres in size) municipal landfills also operate in Maine. These landfills are limited to accepting CDD, wood waste and small amounts of ash material; one is a small secure landfill that in addition to CDD also accepts WWTP sludge for disposal from several Maine treatment plants. The total amount of waste disposed at these landfills was 27,080 tons in 2020 and 32,216 tons in 2021. As many of these smaller landfills do not have scales, this tonnage is an estimate.

It should also be noted that the City of Rockport and the Mid-Coast Solid Waste Corporation (MCSW) each operate a landfill in spent hard rock quarries. Although earlier during their operation these facilities accepted MSW, they are currently only accepting CDD. Rockland accepted 6,069 tons of CDD waste in 2020 and 18,260 tons in 2021, and MCSW accepted 4,694 tons of CDD waste in 2020 and 2,002 tons in 2021. The City of Rockland is working towards closing its landfill to disposal within two years.

3) Municipal Solid Waste Processing Facility

One MSW processing facility exists in Maine – the Municipal Review Committee, Inc./Fiberight, LLC/Coastal Resources of Maine, LLC waste processing facility (CRM) in Hampden. In 2017, Fiberight LLC and the Municipal Review Committee, Inc. (MRC) (an organization of 115 municipalities developed for the purpose of handling those communities' waste needs) received a license from the Department to develop a new solid waste processing facility designed to accept and manage 650 tons of MSW per day. However, the facility has only operated for a short amount of time in a limited capacity and has been idle since May of 2020, requiring the MRC communities to find other options for their waste.

Until April 2020, MSW from the 115 MRC municipalities was disposed at the Penobscot Energy Recovery (PERC) waste-to-energy facility in Orrington, Maine. When construction of the CRM facility was not completed by April 2020, MRC redirected the MSW from its communities to the privately-owned Crossroads landfill in Norridgewock. MRC had negotiated an exclusive contract with Crossroads for the disposal of "bridge capacity" waste during construction, start-up and initial operation of the CRM facility. Through a waste swap agreement that addressed logistical waste handling issues, waste from the MRC communities was also diverted to JRL.

Currently a portion of waste from the MRC communities is being diverted to PERC while the rest is diverted to Juniper Ridge landfill. During this time period, some of the municipalities that contracted to deliver their MSW to CRM began altering their recycling methods to utilize CRM's sorting process, reducing or eliminating recycling programs that separated out recyclable material from household trash. Since the recyclable portion of the waste was not collected separately or sorted out from the trash, it has been landfilled or incinerated with their MSW, although a small portion of recyclable material delivered to PERC was pulled out from the mixed MSW before incineration.

The MRC is in the process of negotiating a contract with the Revere Capital Advisors group, which would own 95% of the shares of Municipal Waste Solutions, LLC, (MWS), the new identity of the Hampden facility, upon financial closure. The MRC has stated that recapitalization of MWS will fund a Profit Improvement Plan and provide funds to hopefully restart the facility in 2023. If the

facility resumes operation and maintains operational capacity, it will significantly reduce the amounts of solid waste destined for landfilling.

B. Factors Affecting Future Disposal Capacity

1) Closure and Consolidation of Landfills in 2020, 2021, and Near Future

The Brunswick landfill, one of Maine's few remaining municipal landfills, closed in 2021. The facility accepted waste until April 1st of 2021.

Although not expected to greatly impact the solid waste landscape in Maine, a few small municipally operated landfills accepting only CDD are expected to close within the next 5 years. The closure of these landfills will have a minimal impact on future disposal capacity due to the limited amount of waste they are currently receiving.

2) Long Term Landfill Capacity

Maine's anticipated long-term solid waste disposal facilities for MSW include three waste-to-energy facilities, four municipally owned landfills that routinely accept MSW, one state owned landfill, and one privately owned commercial landfill. Using the generation and capacity numbers provided by the facilities, the amount of MSW generated in Maine that was disposed either in a landfill or waste-to-energy facility during 2020 and 2021 is estimated at 1,843,477 tons in total, or at an annual average rate for those years of approximately 921,738 tons. Of this estimate, approximately 403,872 tons per year, or 44% was disposed through waste-to-energy. Waste-to-energy capacity is available for the long term if those facilities are maintained and remain operable. Assuming that these rates were to remain constant, the remaining approximately 517,866 tons of MSW[22] generated per year would require landfill disposal; this does not include consideration of the MSW waste processing facility in Hampden that is currently not operating or landfill capacity for the additional 508,018 tons of CDD generated annually in Maine.[23]

It is apparent that available landfill disposal capacity for the next 5 years is sufficient for current levels of Maine generated MSW.[24] However, Maine may see reduced waste disposal capacity after five years if the Juniper Ridge Landfill and the Hatch Hill Landfill do not apply for an expansion and close. Both landfills have not yet determined whether they will seek an expansion. With the approval of an expansion request, Crossroads landfill has extended its capacity by 17 years at current disposal rates. However, Crossroads landfill's life expectancy may potentially be affected if other landfills were to close or if the MWS facility becomes fully operational. If the MWS facility ever becomes fully operational, it should provide additional capacity through the waste it would process.

In the mid-1990s the Carpenter Ridge landfill, located in T2 R8, was licensed by the State. This landfill has not been completely designed or developed; it is held by the State for future development of disposal capacity if needed. It would provide an estimated two million cubic yards of capacity for special wastes.

[22] This figure includes the estimated amount of MSW landfilled out-of-state per year in 2020 and 2021.
[23] This number reflects the estimated amount of CDD generated on average per year in 2020 and 2021.
[24] The focus of this report is on capacity for MSW. There are waste capacity challenges that will be further evaluated in 2024 relating to other waste streams including PFAS-contaminated wastes and sludges.

The Aroostook County area appears to have disposal capacity well beyond 30 years in both the AWS-Presque Isle and AWS-Tri- Community landfills.

If recycling rates are increased, the overall waste disposal capacity will be extended as the volume of waste needing disposal will decrease. Given the possibility of two major landfills closing after five years, additional resources should be put into increasing Maine's recycling rates in addition to locating waste disposal capacity for future years.

VI. Disposal Fees and Supracompetitive Prices

A. Disposal Fees

Current municipal solid waste tipping fees vary by facility, but with a few exceptions and depending on contract type and length, they generally range from $40 to $100 per ton at Maine's waste-to-energy facilities and landfills, with an estimated average tip fee of around $75. As some fees and contract terms are considered confidential between the facility and their customers, a general range and average are provided to the Department, and thus in this report rather than specific facility fees. Tipping fees for CDD also vary by facility, but they tend to track similar to MSW with some facilities charging slightly more and some charging slightly less, again depending on contract.

The State's Operating Services Agreement with Casella Waste Systems Inc. for the state- owned Juniper Ridge Landfill sets a maximum tipping fee for each waste type. This cap does not include fees established in legislation on wastes being disposed in the landfill.

B. Supracompetitive Pricing

Supracompetitive, when applied to pricing, means prices that are higher than they would be in a healthy competitive market; usually resulting from overconcentration, collusion, or some form of monopolistic practice. 38 M.R.S § 2124-A requires the Department to determine whether changes in available landfill capacity have generated, or have the potential to generate, supracompetitive prices and if so, to provide recommendations for legislative or regulatory changes as necessary.

Currently, available and potential disposal capacity at all the operating municipal, commercial and state-owned landfills within Maine does not appear to have or be at risk of having generated supracompetitive disposal fees. [25]

C. Recycling Pricing

Municipalities must weigh the cost of recycling against comparatively low tipping fees and current ample capacity for disposal. The fact that some municipalities have saved money by cutting recycling programs has led to a situation where Maine is unlikely to meet recycling or per capita disposal reduction goals without solid investments to improve the State's recycling system. The average per-ton cost of recycling is generally higher than disposal under current market conditions, sometimes significantly so. The contracts and pricing arrangements for recycling programs are not widely available public information, so it is difficult to determine the specific price differential, although the Department has heard reports that the number of competitors for

[25] This report's focus is on MSW waste streams. The Department has become aware of cost concerns about disposal fees pertaining to other waste streams like PFAS contaminated sludge and other PFAS contaminated waste streams and will further evaluate those concerns in 2024.

recycling services has diminished, resulting in lack of competition and possibly increased costs for recycling.

Despite the challenges following several years of strain due to global policy and market changes, Maine is well poised to grow recycling programs with the EPR for packaging program in the early stages of development. Shipping delays and Basel Convention[26] changes will likely continue to make domestic recycling markets an attractive and cost-competitive option. However, domestic markets tend to have higher quality standards for material and Maine will need to improve its recycling infrastructure to meet these standards.

As noted above, Maine's Extended Producer Responsibility for Packaging has the potential to lay the foundation for a strong and stable statewide recycling infrastructure. However, for the program to meet its potential, municipal participation is necessary. With possible landfill closures looming beyond five years, now is the time to increase Maine's recycling rate to further extend our disposal capacity.

In the updated "Maine Materials Management Plan," to be published in January of 2024, the Department will provide guidance and direction to municipalities in planning and implementing waste management and recycling programs at the state, regional and local levels. The plan will also highlight specific strategies to reduce waste and increase opportunities to grow Maine's economy by treating waste streams as valuable commodities and move materials up the waste hierarchy from disposal efficiently and effectively.

VII. Solid Waste Industry Consolidation in 2020 & 2021

38 M.R.S. § 2124-A requires that the biennial Waste Generation and Disposal Capacity Report include "…an analysis of consolidation of ownership in the disposal, collection, recycling and hauling of solid waste". The Department has performed a review of the solid waste industry in Maine based on available information and found that there were no significant changes in facilities and services operating in Maine in 2020 and 2021 that may impact future pricing.[27]

The two largest landfills (not considering generator-owned landfills) in Maine which provide the greatest amount of waste disposal capacity are either privately operated (Waste Management Disposal Services of Maine, Inc., a subsidiary of Waste Management, Inc., owns the Crossroads Landfill) or State owned but privately operated (NEWSME, a subsidiary of Casella Waste Systems Inc., operates JRL). Casella Waste Systems and Waste Management are both vertically integrated nationwide waste management services company providing collection, transportation, recycling and disposal services to the communities of Maine. The remaining landfills are all owned and operated by municipalities, groups of municipalities, or regional associations. Two municipal landfills, the Presque Isle Municipal Landfill and Tri-Community Landfill in Fort Fairfield, merged operations in 2019 to form Aroostook Waste Solutions and manage both facilities. Two of the waste-to-energy

[26] The 187 countries that are party to the Basel Convention (the United States is not a party) approved amendments to set rigorous standards on shipping of plastic waste, including the classification of certain common scrap plastics as hazardous material.

[27] While this is true for the 2020-2021 operating years, with passage of both Public Law 2021, Chapter 641, An Act to Prevent the Further Contamination of the Soils and Waters of the State with So-Called Forever Chemicals, and Resolve 2021, Chapter 172, Resolve, To Address PFAS Pollution at State-owned Solid Waste Landfills, facility services and operations at Maine's landfills are likely to change. Further discussion on these changes and impacts are already taking place with various stakeholders and will be further evaluated in 2024.

facilities are owned and operated by quasi- municipal organizations consisting of multiple municipalities, each with partial ownership of the facilities. Non-member municipalities may also use these facilities but will pay higher fees than member municipalities. The Municipal Review Committee, a nonprofit organization consisting of 115 Maine municipalities that originally contracted for MSW disposal with (and held ownership interests in) PERC, dissolved its relationship with PERC in 2020 and is one of the licensees for the MSW processing facility located in Hampden. Currently there appears to be a mix of private and public operating entities that keep disposal pricing somewhat competitive.

The presence of the landfills that serve the entire state (Crossroads and JRL) and the other waste services in the State do provide a measure of competition for waste disposal ancillary services, in addition to the presence of the municipally owned and operated facilities. When setting disposal tipping fees, these municipalities consider the cost of operation of the facility, immediate operational needs and long-term maintenance after closure. These municipal facilities provide an additional level of competition for waste disposal. Collection, hauling, and recycling is also conducted in Maine with a mix of municipal and private entities, as each municipality chooses how it will provide its waste management services to the community.

Overall, fees for solid waste disposal appear competitive. Solid waste disposal rates and fees are still lower than the current rates for most types of recycling when hauling and processing fees are factored in.

Appendix A - Definitions

The following definitions are provided to assist the reader in reviewing this document:

Beneficial Use – *to use or reuse a solid waste or waste derived product as a raw material substitute in manufacturing, as construction material or construction fill, as fuel, or in agronomic utilization.*

Construction/Demolition Debris (CDD) – *solid waste resulting from construction, remodeling, repair, and demolition of structures. It includes but is not limited to: building materials, discarded furniture, asphalt, wall board, pipes, and metal conduits. It excludes: partially filled containers of glues, tars, solvents, resins, paints, or caulking compounds; friable asbestos; and other special wastes.*

Disposal - *the discharge, deposit, dumping, spilling, leaking, placing or incineration of any solid waste into or on any land, air or water so that the solid waste or any constituent thereof may enter the environment or be emitted into the air, or discharged into any waters, including ground waters. This term does not include beneficial use activities approved or exempted under the* Solid Waste Management Rules.

Handle - *to store, transfer, collect, separate, salvage, process, recycle, reduce, recover, incinerate, dispose of, treat, or beneficially use.*

Land clearing debris - *solid wastes resulting from the clearing of land and consisting solely of brush, stumps, soil material, and rocks.*

Municipal Solid Waste (MSW) – *solid waste emanating from household and normal commercial sources. Municipal solid waste includes front end process residue from the processing of municipal solid waste.*

Recycling - *the collection, separation, recovery and sale or reuse of materials that would otherwise be disposed of or processed as waste, and the creation and recovery of reusable materials to create new products; the incineration or use of recovered materials as a fuel for the generation of electricity is not recycling.*

Solid waste - *useless, unwanted or discarded solid material with insufficient liquid content to be free flowing, including but not limited to rubbish, garbage, refuse-derived fuel, scrap materials, junk, refuse, inert fill material, and landscape refuse, but does not include hazardous waste, biomedical waste, septic tank sludge, or agricultural wastes.*

Special Waste – *wastes that are generated by other than domestic and typical commercial establishments that exist in such an unusual quantity or in such a chemical or physical state that require special handling, transportation and disposal procedures.*