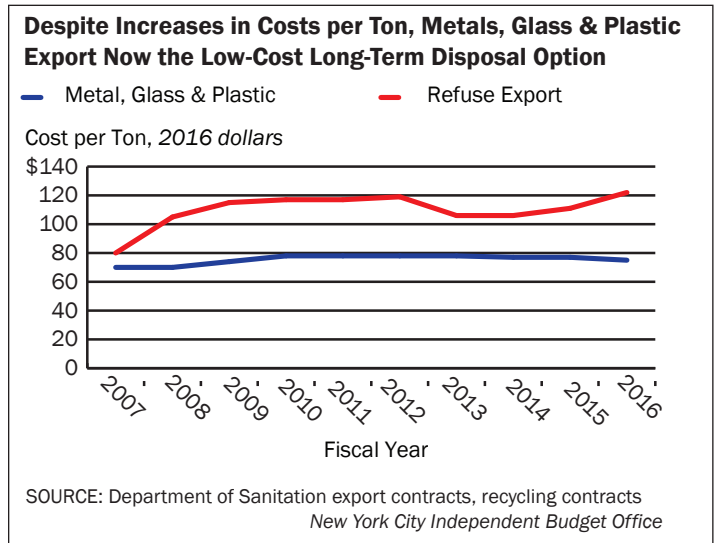


# Per Ton Cost Differential Between Recycling and Refuse Increases

There are two main costs associated with handling the city’s waste—collection and disposal. Waste is collected by Department of Sanitation trucks and hauled to private carters or recyclers who hold contracts with the city to dispose of it either by processing the recycling, or by exporting the refuse to landfills or waste to energy plants. In prior research, IBO has found that the cost of collecting and exporting 1 ton of the city’s recycling is more expensive than collecting and exporting 1 ton of the city’s refuse due to the relative inefficiency of collecting a smaller volume of curbside recycling.

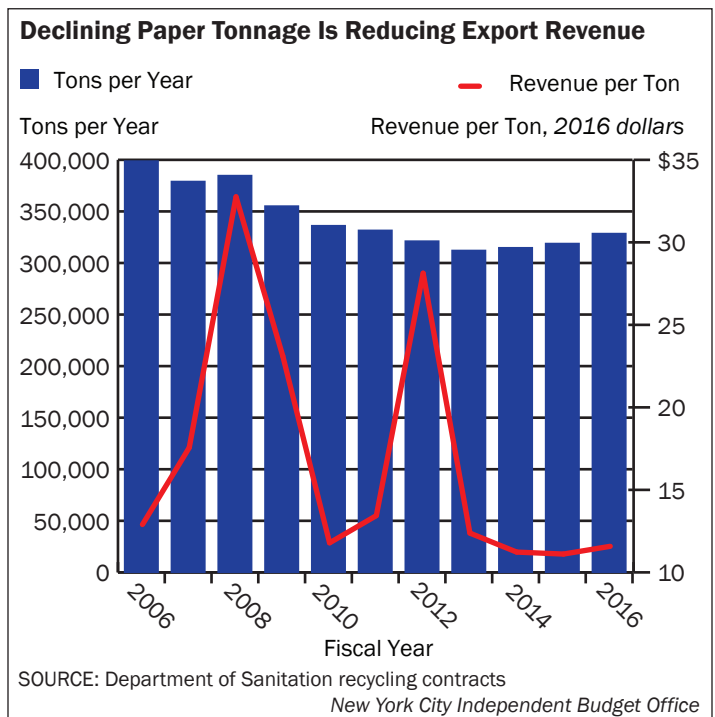
With its goals of increasing the amount of waste recycled, changes made under the SWMP were expected to help close this gap and make recycling more cost-effective. However, as the recycling tonnage declined instead of increasing to SWMP projections, recycling has become increasingly expensive relative to refuse on a per-ton basis, despite the fact that the costs associated with processing recycling have grown more slowly than that of exporting refuse. In 2006, when the SWMP was adopted, the city spent about \$16 more per ton to handle the city’s recycling compared with refuse.<sup>1</sup> In 2014 that differential grew to a peak of \$49 more per ton for recycling, but in 2016 the differential fell back to \$18 per ton as increased recycling tonnage improved collection efficiency and refuse became more expensive to export.<sup>2</sup>

**Per Ton Collection Costs Higher for Recycling.** The majority of the city’s waste is refuse. The smaller share of the city’s waste is recycling, which is further split into two separate streams: paper and metals/glass/plastic. Waste collection costs are heavily dependent on the cost of personnel to operate machinery and pick up curbside bags. The lower tonnage of recycling per route and the need to separate recycling collections at the curb into two streams means that the use of trucks and personnel for recycling is less efficient—and therefore more costly—than refuse to collect. In 2016 it cost \$191 (all costs are in 2016 dollars) per ton to collect recycling compared with \$92 per ton for refuse—a differential of \$99. This is similar to the difference in costs that existed in 2006, the year the SWMP was adopted, when recycling cost \$196 per ton to collect, while refuse cost \$94 per ton—a \$102 differential. The collection cost differential did increase in years when there was greater relative decline in recycling tonnage compared with refuse—for example in 2013 when recycling collections and the diversion rate was at its lowest, recycling cost \$121 more per ton to collect than refuse. But as the



recycling tonnage has picked up in recent years, the per ton collection costs for recycling—and the cost differential between recycling and refuse—have returned close to where they were at the beginning of the SWMP period.

**Per Ton Disposal Costs Greater for Refuse.** For waste disposal, refuse export is the higher cost per ton option, costing \$122 per ton to export in 2016 compared with \$75 per ton to process metals, glass and plastics. Since the SWMP was published, when differences in landfilling and MGP processing costs were within \$10 per ton, at \$80 per ton and \$70 per ton, respectively, the cost of landfill disposal per ton has increased dramatically while MGP



processing costs have increased at a more moderate pace. Over the past 10 years the city has phased in long-term contracts with exporters that send the refuse to sites far from the city, which have come at higher costs than the city's local, short-term export contracts. (See the section on long-term contracts and savings for further details.) The city's MGP recycling processing contracts are also long-term but the facilities are local, which has limited increases in transportation costs. And while MGP recycling costs have risen since 2006, especially as commodities markets for recyclable materials cooled, these increases have been much smaller than increases in the costs of the city's long-term landfill export contracts.

Unlike the refuse and MGP streams, paper processing generates revenue for the city and helps lower the overall cost of recycling disposal, although the revenue per ton is highly variable year to year. In the past few years, the city has generally received around \$12 per ton, but revenue has risen as high as \$20 to \$30 per ton on occasion. The city's paper processing contract is structured with a price floor and ceiling arrangement with credits that accumulate if the market price is outside the range. When the price paid to the city rises above the floor, credits held by the companies that process the paper are used to offset the price increases, thereby generally keeping prices near the \$10 per ton floor. But in some years—most recently in 2012—the price rises high enough to exhaust the saved credits

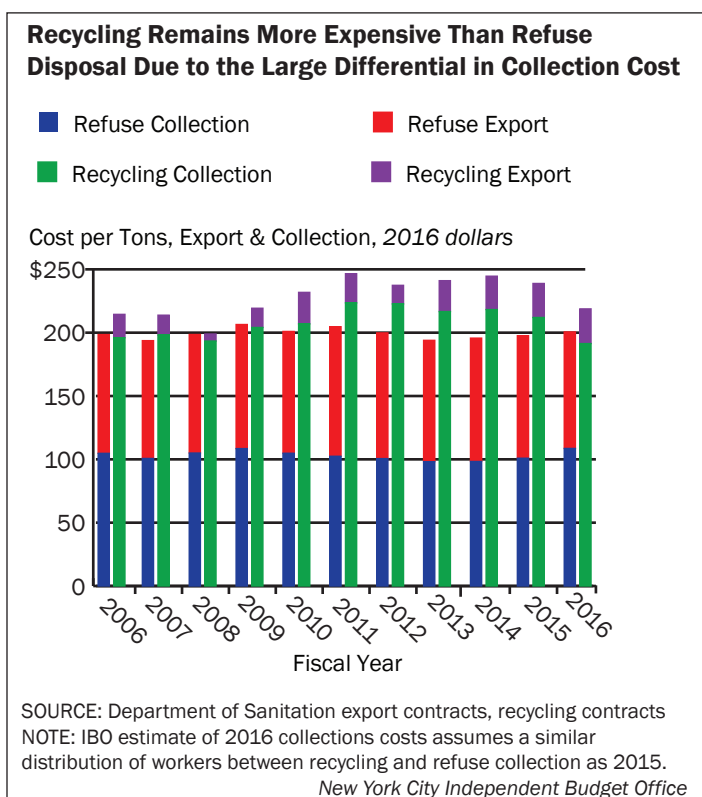
and the revenue received by the city temporarily spikes. If the price were to rise above the \$100 price ceiling, a similar arrangement would come into play in reverse, where the city would accumulate credits while the price is above the ceiling, which would later be used to boost the amount the city receives when the market price returns to within the range.

Despite the occasional spike in the price per ton, total revenue from paper processing has been on a downward trajectory as the total tonnage of paper processed is in decline. Between 2006 and 2016, the tonnage of paper processed declined by 70,000 tons a year, costing the city nearly \$800,000 annually at the 2016 paper price, even as the capture rate for paper increased over the period.

With MGP processing costs lower than the cost of disposing of refuse, and with revenue from the sale of paper offsetting some of the already-lower costs of MGP processing, recycling disposal costs are substantially below the cost of refuse disposal. In 2016 recycling processing costs net of revenue from the sale of paper were \$27 a ton compared with \$109 per ton for refuse export. However, considering total costs per ton, including both disposal and collection, recycling is more expensive.

In 2008 recycling and refuse cost the same amount in total to collect and process/export. From 2008 through 2014 stagnant diversion rates failed to narrow the collection cost gap, and the effects of less paper recycling tonnage and a cooling commodities market combined to make recycling increasingly expensive relative to refuse, with a peak differential of \$49 per ton in 2014. This narrowed slightly to \$41 in 2015, and in 2016 an improvement in the diversion rate due to increased recycling collections combined with increased refuse export costs narrowed the cost differential to the smallest gap since 2009. In 2016 the city spent about \$201 per ton to collect and export refuse—\$18 per ton less than the \$219 per ton it spent on recycling collection and processing.

**Looking Ahead.** Moving closer to achieving the city's goals on increasing the diversion rate and recycling tonnage would have the beneficial side effect of reducing the cost per ton of recycling through improved collection efficiency. DSNY is also moving towards implementing single stream recycling where metals, glass, plastic, and paper would be collected together, further reducing the collection cost per ton for recycling. In addition, improving the capture rate of the most valuable materials could help make recycling more cost effective. DSNY's highest capture rates are for material streams with among the least value, such as



rates of 72 percent and 75 percent for uneconomic green and mixed cullet glass processing, according to the 2013 Waste Characterization Study. Among the most valuable recycled material categories, 60 percent of #2 HDPE plastic is captured, and the city has a 59 percent capture rate for revenue-generating newspaper. Only 28 percent of aluminum cans, one of the most valuable recycled metals, is captured. (Scavenging is a potential barrier to increasing the capture rate of aluminum cans, which, given their value, are collected from recycling bags on the street and delivered to private recyclers for a small cash payout instead of entering the municipal recycling stream.) Increasing the capture rate of these materials could have an outsize effect on the cost efficiency of recycling both by increasing recyclable tonnage to hold down per ton costs and making the recycling stream itself more valuable. However, making the city's recycling stream more valuable by targeting the most valuable materials would only pay off in the long run. The city's processing contract with Sims Municipal Recycling is fixed until the current contract is up for renewal in 2034, but a more valuable mix of recyclable material would allow DSNY to negotiate more favorable terms for future contracts.

## Endnotes

<sup>1</sup>The per ton cost figures shown in this analysis are not comparable to those reported in the Mayor's Management Report (MMR) nor to IBO's 2004 or 2008 cost comparisons. The figures reported in the MMR allocate all departmental spending, including administrative overhead and support functions, plus city spending from central accounts for fringe benefits and debt service attributable to the Department of Sanitation, to each of four primary functions: collection, cleaning, recycling, and disposal. Our analysis includes only DSNY collection and export spending. Administrative and support costs as well as related program costs are not allocated. This is different than the method IBO used in our 2004 and 2008 reports when IBO included some administrative costs. Therefore the cost-per-ton figures in the earlier reports cannot be compared with those presented here. Tonnages used to calculate the cost per ton for collection are from DSNY truck run collection data. Export tonnages are based on DSNY's export contracts. These totals differ slightly due to differences in the tonnage of refuse and recycling DSNY exports or collects and processes.

<sup>2</sup>The 2016 cost differential includes an IBO estimate of the collection cost for 2016 based on 2015 data as 2016 data was unavailable at the time of this analysis.

[Return to "Ten Years After: Assessing Progress on the City's Solid Waste Management Plan" PDF](#) [HMTL](#)

NOTE: This report was updated on August 25, 2017 to reflect new information on waste-to-energy export contracts.