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2012 MRF Material Composition Study

Background

To assist Stewardship Ontario in setting Blue Box fees for stewards each year, MRF Material Composition Studies are undertaken at a sample of material recycling facilities (MRFs) on an annual basis. These studies provide comprehensive data on the composition of Blue Box materials within material bales when they are being marketed to downstream processors. In addition, they also help to inform how materials flow through the sorting system and if they are managed with other like materials, enabling Stewardship Ontario to set fees for specific materials and to set recycling rates.

The recovery rates for each Blue Box material are calculated as follows: material recovered for recycling in Ontario municipal recycling programs divided by material generated in Ontario households.

Estimates of each Blue Box material generated are determined from the curbside waste composition studies. The quantity of each material recovered for recycling is based on the data reported by municipalities. This is by far the most comprehensive data on the material recovered because all municipalities must report and the data covers all material recovered throughout the year.

However, while some materials sorted and sold to markets correspond to material categories reported by stewards, e.g. steel, PET, many other recyclables are sorted and marketed as mixtures of recyclables, rather than the specific materials supplied into the market by stewards. For example, paper materials are marketed as various grades of newsprint and other mixtures of cardboard and printed paper.

At any time, the composition will depend on the specific materials targeted by the recycling program, the strength of markets for each materials and the sorting approach of each MRF. In order to determine the amount of each Blue Box material recovered for recycling, compatible with the categories of materials reported by stewards, it is necessary to measure the composition of the products sorted, sold and shipped to re-processors by MRFs.

Like the curbside composition studies, this is accomplished through studying a sample of products from a representative selection of MRFs.

What is a bale?

A bale is the end product of the MRF sorting process – it is typically composed of a specific material or mixture of materials and compacted together into a bale, ready for shipment to buyers.

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Methodology

MRF Material Composition Studies are undertaken annually. Material is extracted before it is baled for sale to re-processors and examined to identify the typical mix of materials in any given bale. Stewardship Ontario engages third parties to carry out the studies according to specifications and supervises the studies to assure quality control and accuracy.

The results of the composition studies are used to allocate the quantities of recovered Blue Box materials reported by municipalities to the various fee material categories.

2012 MRF Material Composition Study:

The MRF Material Composition Studies carried out in spring 2012, were conducted in both single-stream MRFS (those that accept all types of recyclables together in one container) and multi-stream MRFs (those collecting recyclables in multi-streams: paper, cardboard, glass, plastics and metals) across Ontario. Samples from a wide variety of material bales were extracted and analysed for the composition of materials within. The study results were recorded into datasheets with a predefined set of material categories.

The MRFs where MRF Material Composition Studies were carried out included:

- Cornwall
- Kingston
- London
- Norfolk
- Northumberland
- Quinte
- Waterloo
- Halton Region
- York

The data collected was also compared to prior year studies to identify trends and handling practices for individual materials.

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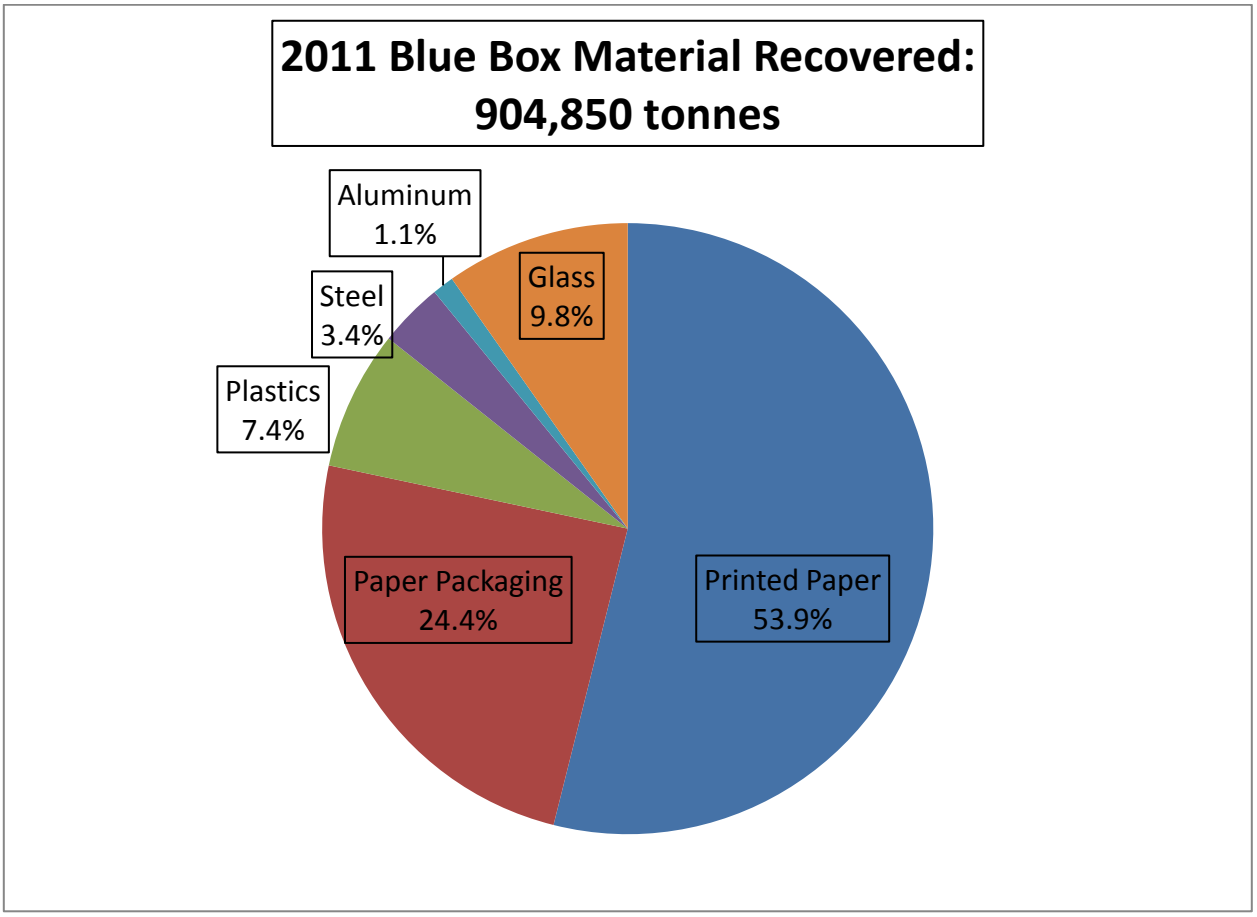
Key Findings

Printed paper and paper packaging are typically the main recyclable materials recovered in the Blue Box; 2011 was no different.

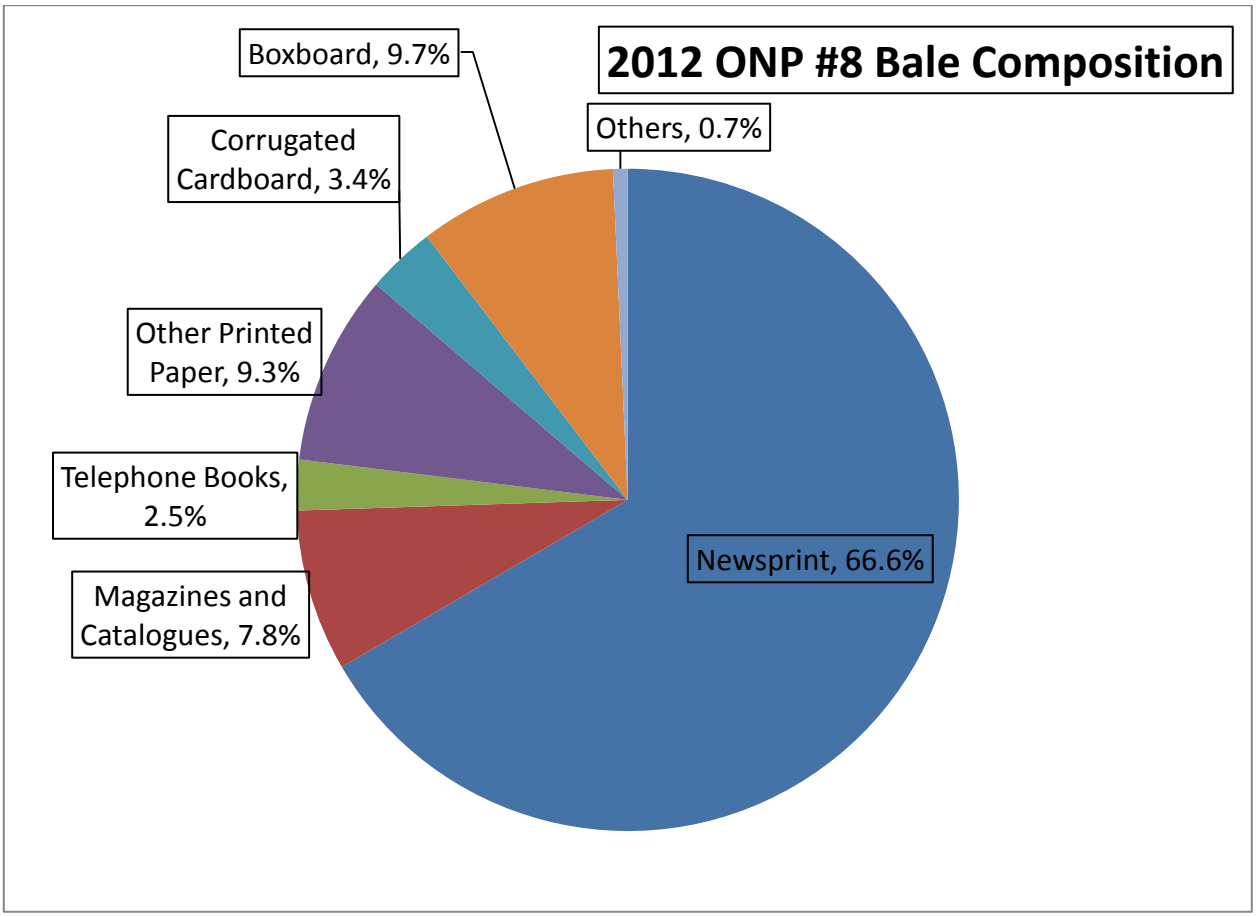
In 2011, 904,850 tonnes of materials were recycled in the Blue Box system. In the subsections below, the composition of each type of bale is provided proportionately, as measured in the recent MRF composition studies.



Bale Compositions

Old Newspaper (ONP) #8 – Paper

An ONP #8 bale typically has the highest newsprint content. However, in Ontario MRFs it also includes significant quantities of other paper materials. The actual composition from this year's study showed that newsprint along with magazines, boxboard and other printed paper made up over 94 per cent of the bale.



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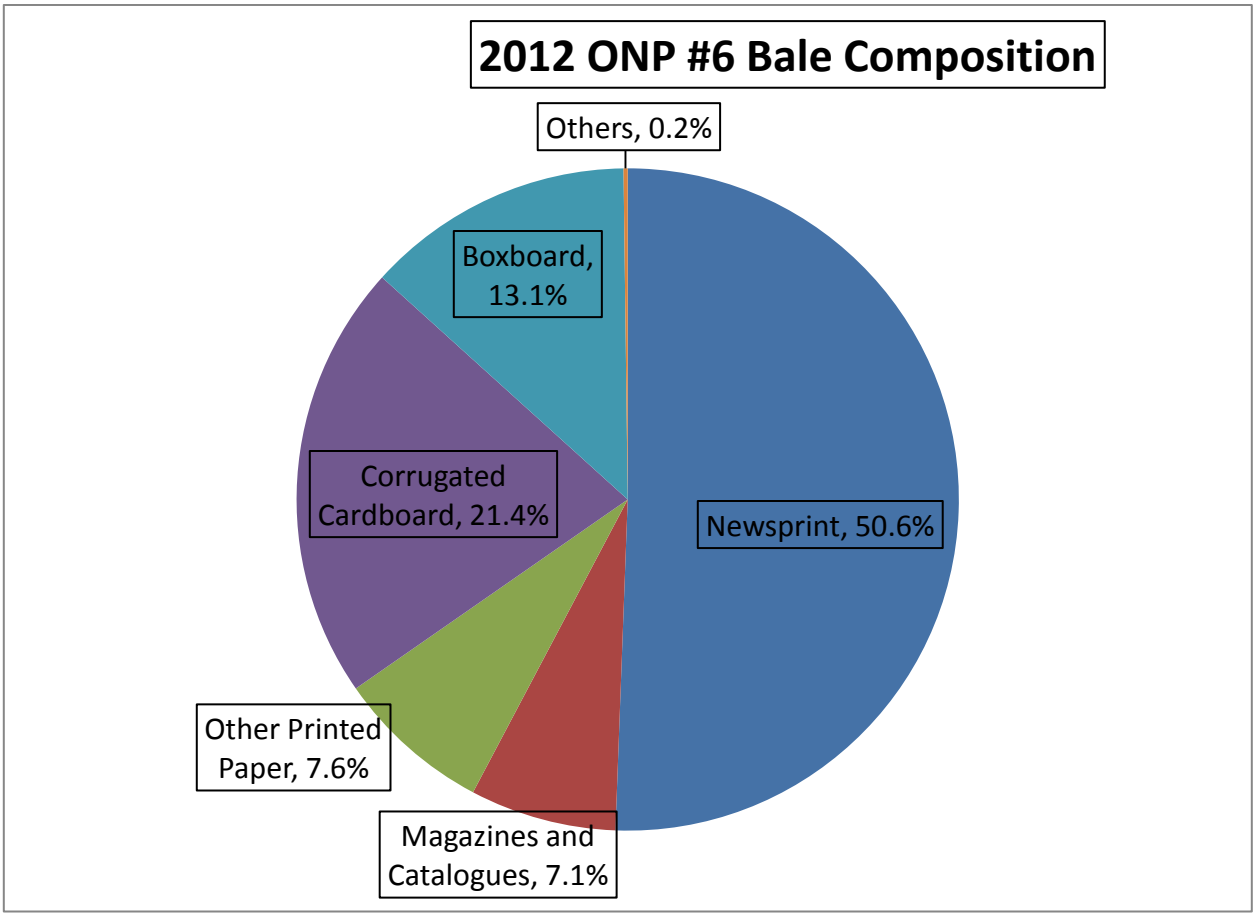
ONP #6 – Paper

ONP #6 bales are typically comprised of a mix of newsprint, corrugated cardboard and boxboard, but are less rich in newsprint than ONP#8. The bales from this year's study showed that newsprint made up half of the bale, with corrugated cardboard next making up 21 per cent, followed by boxboard at 13 per cent.



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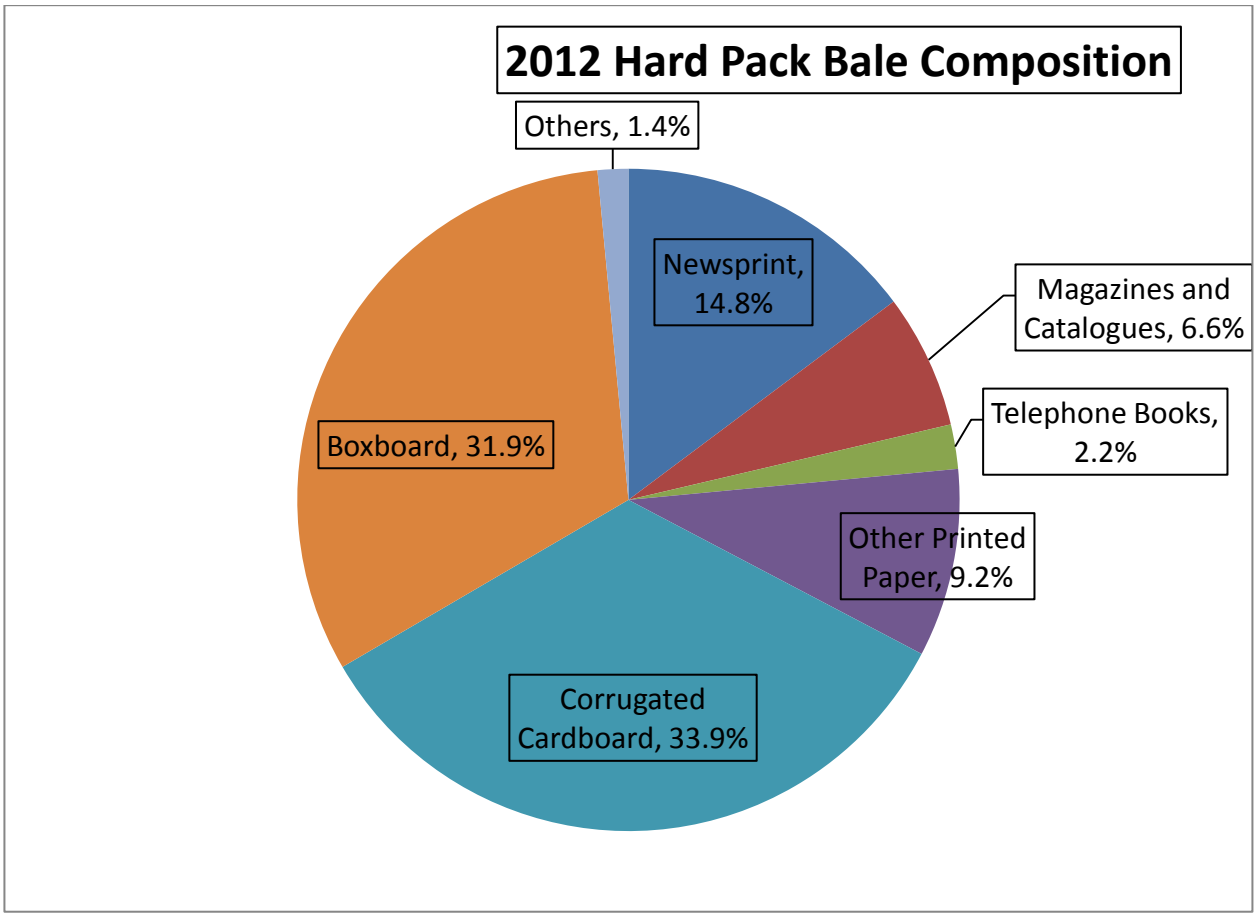
Hard Pack

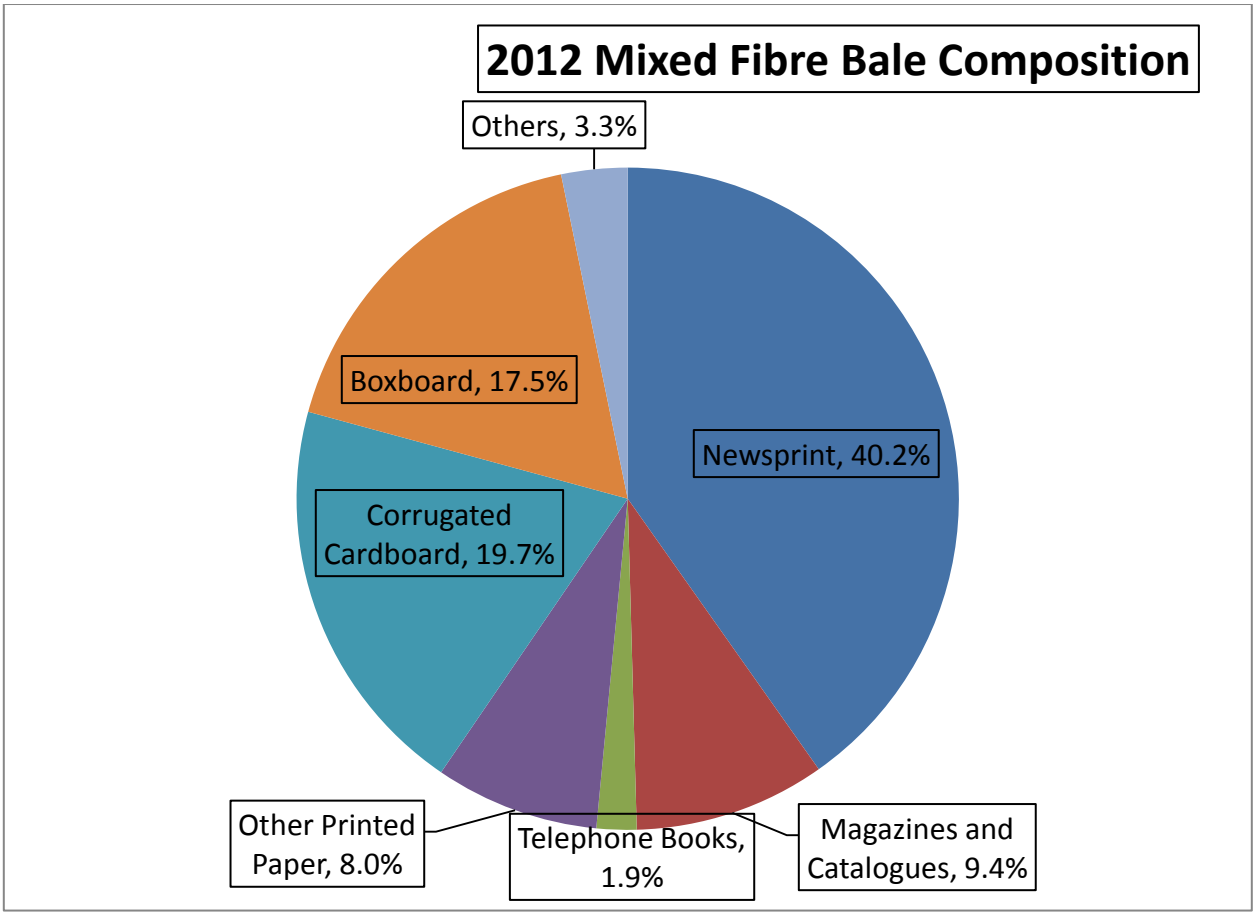
Hard pack bales are typically composed largely of a mix of corrugated cardboard and boxboard. The study results this year reflected a similar mix as in past studies. At single-stream MRFs, hard pack bales were composed of 64.7 per cent of corrugated cardboard and 31.3 per cent of boxboard. At multi-stream MRFs, hard pack bales contained 26.8 per cent corrugated cardboard and 32.1 per cent boxboard, while considerable amounts of newsprint, 15 per cent, and other printed paper, nine per cent, were also found.



Mixed Fibres

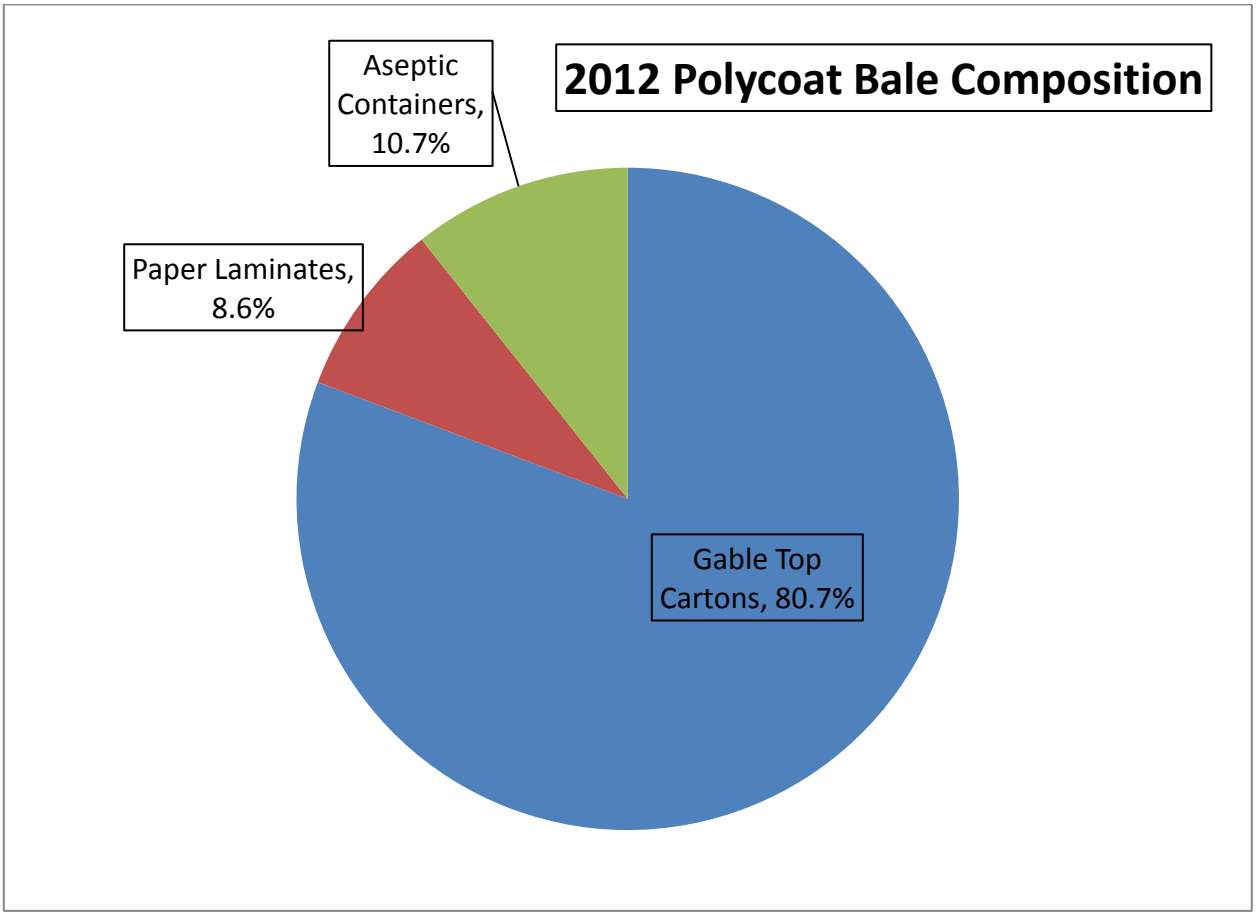
This category can include all possible fibre materials and depends on the sorting done at each MRF. In this year's study, mixed fibre bales contained newsprint, magazines and catalogues, telephone books, other printed paper, corrugated cardboard, boxboard, gable top cartons, paper laminates, and aseptic containers.

In general, single-stream MRFs had a higher proportion of newsprint in mixed fibre bales at 66.5 per cent, whereas multi-stream MRFs were more spread out among different fibre types: newsprint at 34.5 per cent, corrugated cardboard at 22.8 per cent, and boxboard at 19.3 per cent.



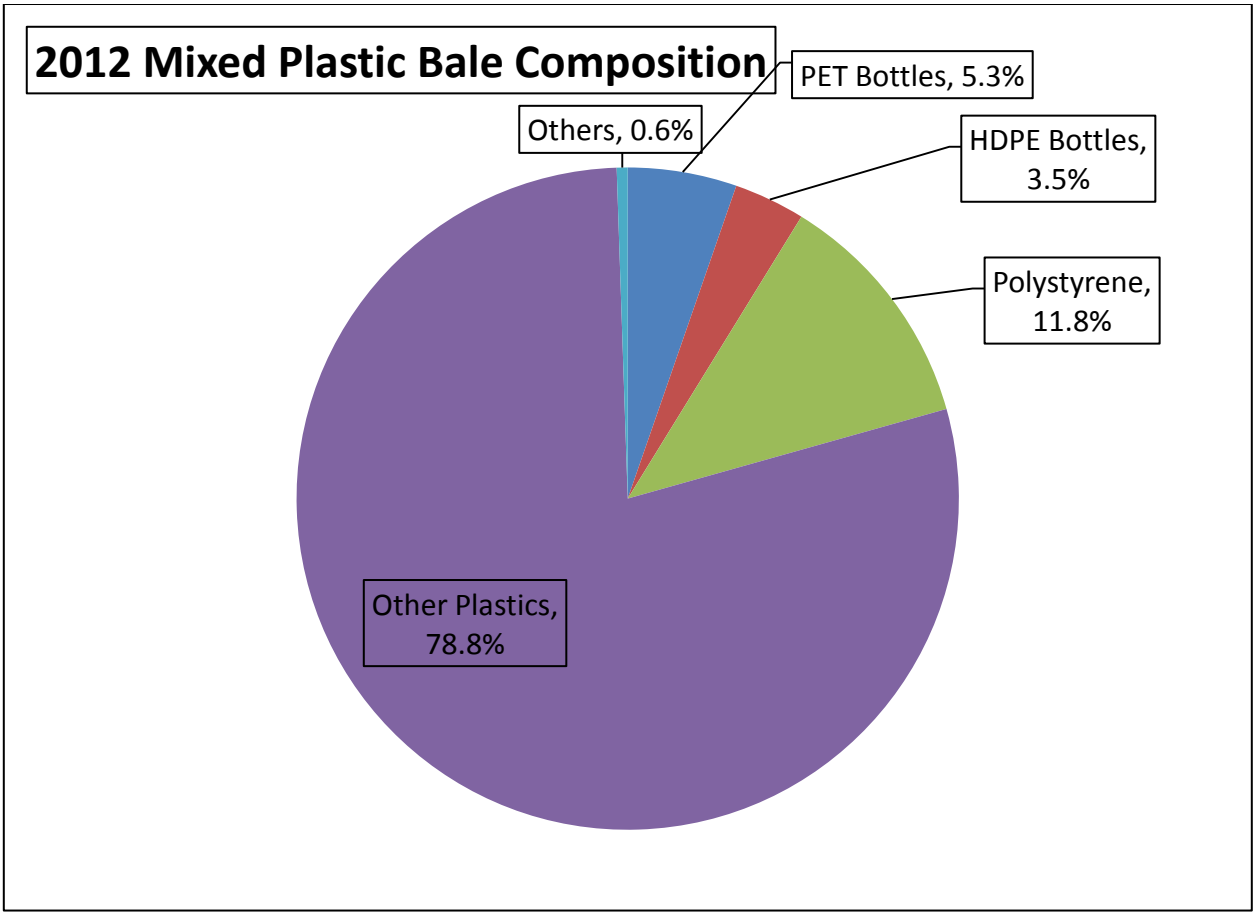
Polycoat

Polycoat bales mainly consist of gable top containers (for milk and milk substitutes and other beverage containers for products such as fruit juice). They also include other polycoat materials depending on the materials targeted for collection and relative quantities generated. The bales studied this year again reflected this, with gable top containers making up over 80 per cent of the bale's contents. Other materials found in the bale included hot drink polycoat cups and aseptic containers. Both single-stream and multi-stream MRFs were similar in their composition.



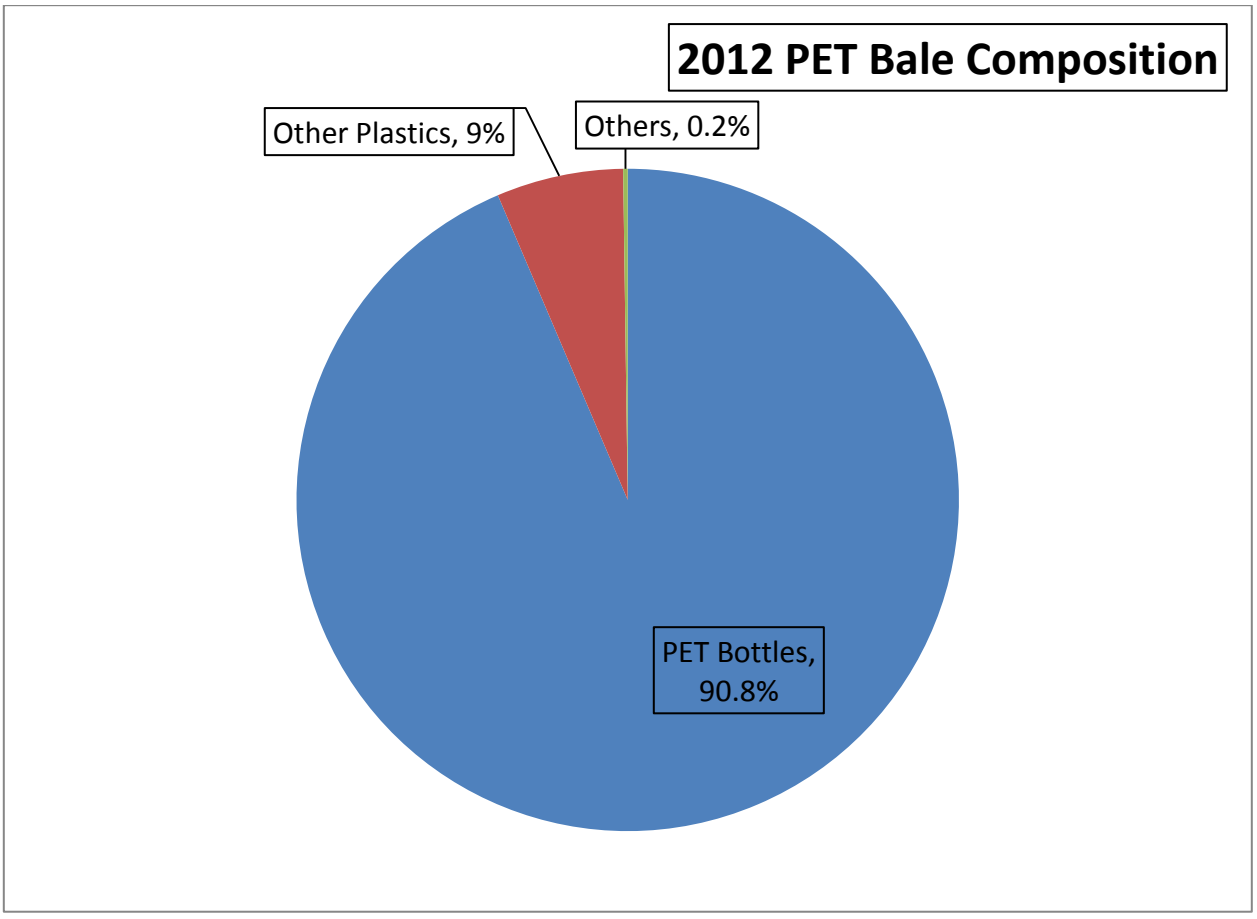
Mixed Plastics

Mixed plastics bales generally include all types of plastics, including those that are also sorted into single material bales e.g. PET bottles, HDPE and film. The relative quantities depend on the materials targeted for collection by each municipality and the relative quantities generated. In this year's study, most of the mixed plastics bales contained a variety of tubs and lids, rigid plastics, PET thermoform and PET bottles.



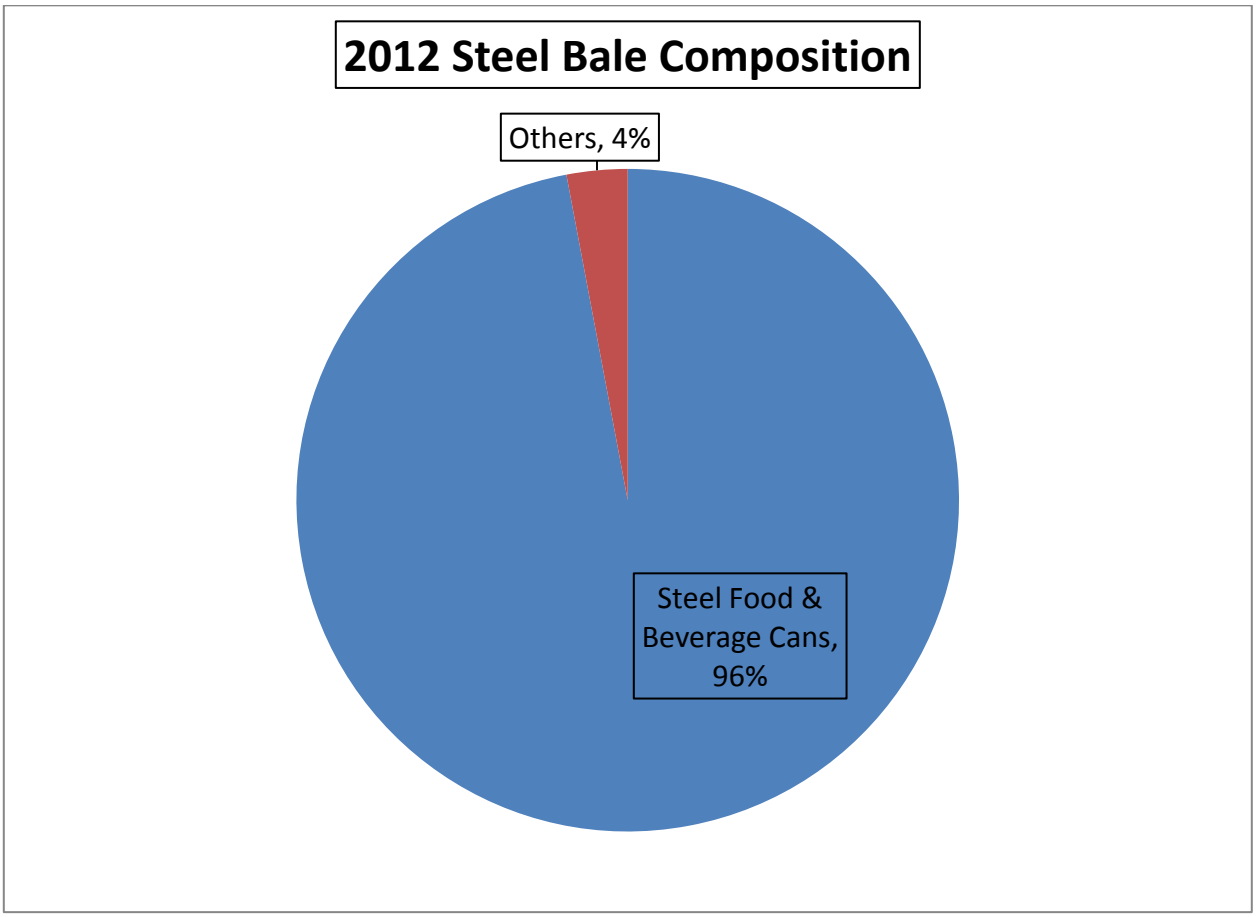
PET bottles

PET bales typically contain mostly PET bottles. However, depending on the materials targeted for collection by each municipality and the sorting at the MRF according to the end markets, other PET products may also be included intentionally. PET bottles and jars made up 86.3 per cent of the contents of single-stream bales, which also contained 13.5 per cent of other accepted plastic recyclables. Multi-stream MRF bales contained 93.6 per cent of PET.



Steel

Steel bales typically contain steel food and beverage cans with some spiral wound containers, aerosol cans and in some cases empty paint cans. The MRF Material Composition Study this year showed steel food and beverage cans were the largest component, followed by other materials that didn't fall into a specific category. The major difference between single-stream and multi-stream MRFs was the higher content of steel food and beverage cans in multi-stream MRFs at 97 per cent compared to 94.2 per cent in single-stream MRFs.



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Comparison to previous MRF Material Composition Studies

There were some differences in this year's study results compared to past studies carried out in 2009 through 2011.

- Newsprint volumes in single stream MRFs increased by 17 per cent while other printed paper volumes decreased by 28.8 per cent in 2012.
- Newsprint volumes in multi-stream MRFs decreased by 15 per cent while boxboard volumes increased by about 39 per cent.
- Corrugated cardboard volumes showed an overall increase of 62 per cent against past studies, especially in single-stream MRFs where it was 113 per cent.
- Magazine and catalogue volumes notably decreased overall since the past study by 21 per cent.
- For mixed fibre bales, more newsprint was found at single-stream MRFs while less of it was found in mixed fibre bales at multi-stream MRFs. At multi-stream MRFs, boxboard volumes increased 53.2 per cent in this bale.
- For mixed plastic bales, other plastics, i.e., tubs, lids, pouches etc, make up over 78 per cent of the composition. At multi-stream MRFs, there was noticeably more polystyrene found in these bales as well at 11.8 per cent.
- For PET bottle bales found in single-stream MRFs, there was generally more PET bottles found than in the past, at 86.3 per cent vs 69.7 per cent in 2011.