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2004 REPORT ON POST CONSUMER PET CONTAINER RECYCLING ACTIVITY

FINAL REPORT

INTRODUCTION

This report is intended to give the reader an overview of the recycling of injection stretch blow molded PET containers in the United States. Information contained in this report was obtained through surveys conducted by the Association of Postconsumer Plastic Recyclers (APR), R.W. Beck, Moore Recycling Associates, US Department of Commerce, and data generated internally by the National Association for PET Container Resources (NAPCOR). In order to present as accurate a picture of these activities as possible, additional data and information was obtained through discussions with individual collectors, intermediate processors, reclaimers, converters, brokers, exporters, resin producers, bottle manufacturers, public recycling officials, consultants and key industry members.

PET BOTTLES AVAILABLE FOR COLLECTION

The growth rate of PET bottles and jars for 2004 was a surprisingly strong 8% over 2003. This was a result of continued double digit growth in bottles for water and isotonic beverages, and to a lesser degree the introduction of 12 oz carbonated soft drink bottles and an array of single-serve size, shelf-stable juice bottles. Steady, if not spectacular, growth was observed in the beer and dairy markets, as well as in a wide array of specialty containers: more brand owners are introducing proprietary shapes and colors to differentiate not only their product, but varieties of the same product. The very successful Downey Fabric Softener conversion to PET in 2004 is a good example of this trend.

NAPCOR determined that the total number of pounds of PET bottles and jars available in the United States for recycling in 2004 was 4.637 billion pounds. This number reflects the total amount of PET bottle resin used by U.S. bottle manufacturers from U.S., foreign and recycled sources, less scrap generated and not reused, exported bottles and preforms, and bottles less than eight ounces in size. This number is used in this report as the denominator in determining both the recycling and utilization rates.

POST CONSUMER PET BOTTLE PURCHASES

The amount of post consumer PET bottles collected for recycling and sold in the U.S. was 1.003 billion pounds in 2004. The breakdown of buyers in millions of pounds is as follows:

628	- Purchased by U.S. Reclaimers
372	- Purchased by Export Markets
3	- Composite Applications (other)
1,003	- Total Amount of Post Consumer Bottles (mmlbs)

US and Canadian reclamation companies reported dramatic increases in the purchase of PET bottles from US collectors and processors. While US reclaimers were able to purchase 110 mmlbs more than in 2003, Canadian reclaimers almost doubled their purchases from 22.5 mmlbs in 2003 to 39.4 mmlbs in 2004. Chinese exports also increased significantly, from 298 mmlbs in 2003 to 333 mmlbs in 2004. Overall collection volumes increased 19% over 2003 with about 88% being sold in bales and the remainder as dirty flake.

2004 also saw the largest volumes ever of post consumer PET bottles imported to the USA for recycling with the total amount exceeding 106 mmlbs. Mexico replaced Canada as the largest foreign supplier followed by Europe, and Central and South America. In addition, US reclaimers reported purchasing 57.5 mmlbs of alternative feedstock including preconsumer bottles, post consumer strapping, and other unprocessed industrial scrap. All total, US reclaimers purchased an impressive 791.5 mmlbs of scrap in 2004.

POST CONSUMER BOTTLES Gross Weight Purchases (mmlbs.)	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
A. Purchased by U.S. Reclaimers and Other	605	549	580	656	588	599	600	522	520	631
B. Purchased by Exporters	170	148	111	89	183	170	234	275	321	372
C. Total U.S. Material Recycled (A+B)	**775**	**697**	**691**	**745**	**771**	**769**	**834**	**797**	**841**	**1,003**
D. Post Consumer Bottle Imports	46	87	66	101	60	69	70	57	62	106
E. Total Post Consumer Bottles used by U.S. Reclaimers (A+D)	**651**	**636**	**646**	**757**	**648**	**668**	**670**	**579**	**582**	**737**

2004 GROSS RECYCLING RATE

$$\frac{\text{Total U.S. Bottles Collected and Sold for Recycling} = 1{,}003 \text{ mmlbs.}}{\text{Total U.S. Bottles Available for Recycling} = 4{,}637 \text{ mmlbs.}} = \mathbf{21.6\%}$$

Year	Total U.S. Bottles Collected (mmlbs.)	Bottles on U.S. Shelves (mmlbs.)	Gross Recycling Rate
1995	775	1,950	39.7%
1996	697	2,198	31.7%
1997	691	2,551	27.1%
1998	745	3,006	24.8%
1999	771	3,250	23.7%
2000	769	3,445	22.3%
2001	834	3,768	22.1%
2002	797	4,007	19.9%
2003	841	4,292	19.6%
2004	1,003	4,637	21.6%

PET BOTTLE BALE MARKETS

Prices for post consumer bottle bales were stable for the entire year with domestic buyers paying $.13 - .18 per pound throughout 2004. However, underlying market conditions were very different during the first two quarters than they were during the remainder of 2004. Export buyers set the price levels nationally for the first two months and provided stable, but not aggressively priced markets for western US suppliers for the remainder of the year.

This was due in no small part to the Chinese government aggressively enforcing the prohibition on the import of baled post consumer plastics. While the law has been on the books since 1996, it had only been sporadically enforced until March of 2004. This consistent enforcement compelled many Chinese buyers to granulate the bottles, either in the US or elsewhere, prior to delivery to Chinese reclamation plants. So, while early in 2004 many domestic reclaimers were forced to match unsustainable export pricing, the situation improved through a combination of factors: the China crackdown resulting in stable but less aggressive pricing, and the increased value of clean flake (due to increased virgin material costs), allowing reclaimers to afford higher bale prices.

NON DEPOSIT PET BOTTLE BALE PRICES

(Picked up, Truckload quantities, Sellers dock)

	LOW	HIGH
JANUARY	$.15/LB	$.18/LB
FEBRUARY	.14	.18
MARCH	.13	.17
APRIL	.13	.17
MAY	.13	.18
JUNE	.13	.17
JULY	.13	.16
AUGUST	.13	.16
SEPTEMBER	.12	.15
OCTOBER	.13	.16
NOVEMBER	.14	.17
DECEMBER	.16	.19

RECLAMATION CAPACITY

At the end of 2003, there were 14 reclamation plants producing clean flake from post consumer bottles in the United States with a total capacity of 877 mmlbs gross weight in. By the end of 2004, there were 13 plants operating with a total capacity of 937 mmlbs. This was the result of the Amcor plant shutting down at the end of the second quarter, two plant expansions, and several significant de-bottlenecking projects. In addition, all three Canadian reclamation plants expanded their capacity to a total of 150 mmlbs. US reclaimers consumed 790.5 mmlbs of feedstock for a utilization rate of 84.4%. Five plants were vertically integrated back to end products (1 bottle, 2 carpet, 2 strapping) and accounted for about 58% of capacity. Even with the loss of the Amcor plant, six plants have technologies that have received letters of non-objection (LNO) from the Food and Drug Administration, allowing the RPET produced to be used in direct contact with food and beverage products.

RPET Production Summary (mmlbs.)	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
A. RPET Produced by U.S. Reclaimers from U.S. Bottles	496	438	486	513	457	476	476	401	412	505
B. RPET Produced by U.S. Reclaimers from Imported Bottles	38	70	55	75	47	51	44	46	49	83
C. Total RPET Production U.S. Reclaimers (A+B)	**534**	**508**	**541**	**588**	**504**	**527**	**520**	**447**	**461**	**588**
D. Clean Flake Equivalent from U.S. Bottles Exported	153	134	92	75	154	143	184	212	255	298
E. Total Clean Flake from U.S. Bottles (A+D)	**622**	**572**	**578**	**588**	**611**	**619**	**660**	**613**	**667**	**803**

PET UTILIZATION RATE

Clean Flake Produced from U.S. Post Consumer Bottles **505 mmlbs**	+	Clean Flake Equivalent of U.S. Bottles Exported **298 mmlbs**	=	**803 mmlbs**	÷	Total U.S. Bottles Available for Recycling **4,637 mmlbs**	= 17.3%

The utilization rate measures the amount of clean flake produced by US reclaimers and the equivalent amount of clean flake expected to be produced from exported. Yield losses reported in 2004 averaged 19% for US bottles and 21% for imports reflecting the large increase in the use of Mexican bottles that are generally much dirtier. Assuming an average yield loss of 20% for the bottles exported in 2004 results in a clean flake equivalent of 298 mmlbs.

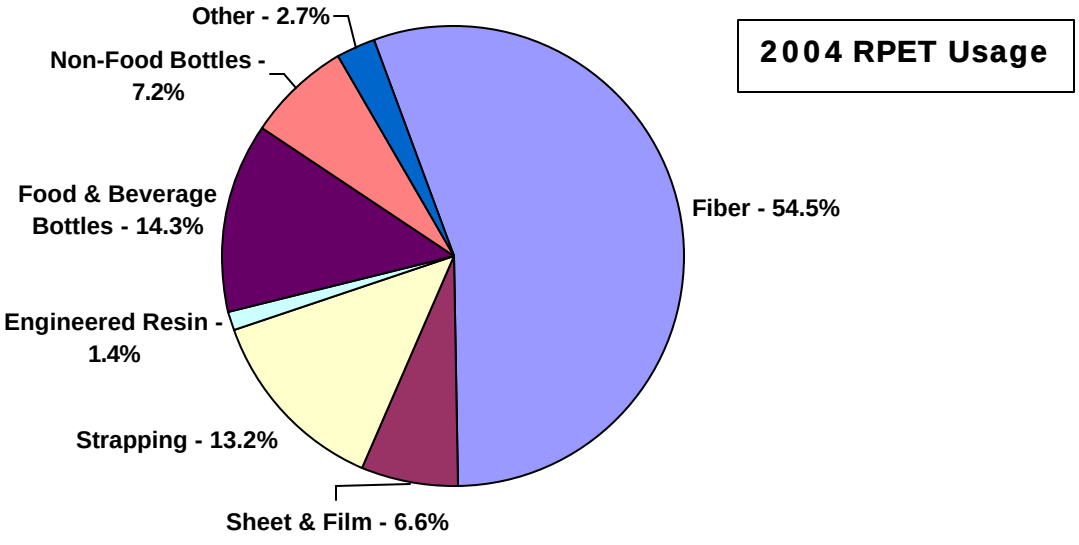
Year	Clean Flake Equivalent (mmlbs.)	Bottles on U.S. Shelves (mmlbs.)	Utilization Rates
1995	622	1,950	31.9%
1996	572	2,198	26.0%
1997	578	2,551	22.7%
1998	588	3,006	19.6%
1999	611	3,250	18.8%
2000	619	3,445	18.0%
2001	660	3,768	17.5%
2002	613	4,007	15.3%
2003	667	4,292	15.5%
2004	803	4,637	17.3%

2004 RPET MARKET

The use of RPET by US converters hit an all time high in 2004 of 878 mmlbs, a 59% increase from 2003. This reflects material purchased and used from all sources, including carryover inventory. Of this total, US reclaimers supplied 588 mmlbs or 67% of the total demand. Canadian reclaimers supplied 105 mmlbs and the balance came from Mexican, European, Brazilian and other South American reclaimers in that order. This dramatic increase reflected strong growth in the polyester carpet industry, enforcement of the California post consumer content requirements, and a better competitive position to virgin PET (VPET) during the second half of the year.

Fiber applications continued to dominate the use of RPET material with about 55% of the total, of which more than 65% went into the production of residential and automotive carpet. This was in no small part due to many of the large home improvement stores not only carrying but featuring polyester carpet lines.

The use of RPET in industrial strapping and food/beverage bottle applications was about the same, each category using more than 13% of the total. Both are also expected to see strong growth in 2005, due to new plants and to expansions to existing strapping plants planned for 2005, and to Coke and Pepsi's stated intention to be using 10% content in their bottles by the end of the year.



The almost tripling in the use of RPET in non-food containers was a direct result of California enforcing its Rigid Plastics Packaging Container Law (RPPCL) that requires the use of 25% post consumer resin content in all rigid plastic packaging of non-food products. This also had a ripple effect in the use of RPET to produce sheet for non-food

thermoformed containers, i.e. clamshells, etc. The fact that RPET offered significant cost savings during the second half of the year didn't hurt either. Non-food Container and Sheet categories both used about 7% of the total.

While the use of RPET in engineered resins saw a 20% increase in 2004, its total demand is a minor factor in the market and has never quite achieved what at one time was considered an RPET market with major upside potential.

The increase in the "Other" category reflects a wide range of new technologies as well as innovative approaches to using byproducts of the PET reclamation process that may have been previously disposed. This is reflected in the improved yields reported for 2004.

RPET Product Categories
RPET used (mmlbs)

	1996	1997	1998	1999	2000	2001	2002	2003	2004
Fiber	292	320	415	417	452	435	344	296	479
Sheet & Film	69	71	89	68	65	37	18	32	58
Strapping	66	58	67	80	101	82	83	77	116
Engineered Resin	24	26	30	26	27	24	10	10	12
Food & Beverage Bottles	24	41	52	68	54	77	86	106	126
Non-Food Bottles	71	53	47	50	40	44	43	24	63
Other	1	1	7	9	5	2	4	7	24
Total U.S. Converter Consumption	**547**	**570**	**707**	**718**	**744**	**701**	**588**	**552**	**878**

SUMMARY

2004 was a tumultuous year for the PET container and recycling industries. The surprisingly strong growth in bottle sales took place without any major new introduction. Rather, strong increases in existing categories (water and isotonics), a number of smaller introductions, and much better weather than 2003, was the formula for about 8% growth. The deflated pricing for virgin resins that reflected over capacity during the first two quarters disappeared as global demand overwhelmed the availability of raw materials, particularly Monoethylene Glycol (MEG).

The big story, however, was the large increase in post consumer bottles collected. After years of small incremental increases that did not keep pace with PET bottle market growth, more than 160 mmlbs of post consumer bottles were reported purchased in 2004. This resulted in a jump in the recycling rate of two percentage points to 21.6%. This can be attributed to the following factors:

- NYC returning to full service plastic collection
- The installation of no less than 21 auto sort units at intermediate processing plants
- The increase in California Redemption Value
- The incremental increase from additional PET bottle sales
- Previously unreported export volumes that were sold domestically in 2004
- New commercial volumes reflecting the increase in scrap values

Of these, the most significant in terms of long term impact are the plastic bottle auto sort installations. These technologies not only replaced a manual task that had great difficulty maintaining consistent quality, but recaptured the growing yield losses that were seen as the size of the bottles in the PET stream shrank. This equipment was installed in all regions of the country and used by single stream and dual stream MRF operators on their container lines, as well as on the fiber lines of single stream plants. These units are documented to dramatically increase the recovery of plastic bottles while eliminating labor. This, combined with high scrap values, has produced a very quick return on investment and prompted many private MRF operators to evaluate a retrofit. Publicly owned and operated MRFs have been slower to react to this new technology.

For US reclaimers, 2004 was quite literally the worst of times and the best of times. While the first half of 2004 saw the worst two quarters in their history for most reclaimers, the second half of the year saw their best. As previously mentioned, US reclaimers were forced to keep pace with export pricing for bales at unsustainable levels

during the first part of 2004. Later in the year, the increase in bottles collected combined with Chinese buyers backing away from east coast markets provided reclaimers with adequate feedstock at stable pricing and the value of their cleaned material surged with virgin pricing.

While US and Canadian reclaimers produced RPET at record levels they could still not keep pace with the appetite of US converters who reported purchasing 878 mmlbs in 2004, an increase of 134 mmlbs over their previous high total in 2000. With converters purchasing the balance from various RPET producers around the world, including places such as India and Paraguay, it demonstrates the depth and sophistication of the US end use markets for RPET. This is the result of legislated RPET usage; voluntary but specified usage on the part of many brand owners for products like strapping, automotive parts and furniture as well as packaging; and focused investment on the part of vertically integrated end users that allow them to achieve significant cost savings by using RPET as their primary raw material. 2004 once again demonstrated that when RPET is priced competitively there remains a huge potential demand before any discussion of saturation levels should take place.

Moving forward in 2005, there appears to be better market dynamics for PET recycling than have been seen in quite some time. Virgin supply is thought to be in balance, if not a little tight, with prices holding at levels that allow RPET a potential cost advantage. Chinese buyers continue to provide a mostly stable market for west coast suppliers. Even so, a number of reclamation plants, spurred mostly by California Department of Conservation grants, seem likely to be built and will provide more domestic alternatives.

RPET market demand continues to increase with the strapping industry poised for growth that may ultimately challenge the polyester carpet segment for industry leadership. However, the quantity and quality of the post consumer bottle stream continues to be a concern. Even with the increases posted in 2004, supply remains inadequate to supply all end use applications at their desired levels. In addition, the effects of performance enhancing technologies continue to be seen impacting some applications more than others, an issue further exacerbated by inadequate supply. Efforts initiated by both individual companies and industry associations to address these issues are making some headway. We are hopeful the progress seen in 2004 will continue in 2005.