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**The Association of Postconsumer
Plastic Recyclers**

www.plasticsrecycling.org



**2009 REPORT ON POST CONSUMER
PET CONTAINER RECYCLING ACTIVITY**

FINAL REPORT

INTRODUCTION

2009 marks the fifteenth year that the National Association for PET Container Resources (NAPCOR) has issued this report in its current format, and the fifth year that NAPCOR and The Association of Postconsumer Plastic Recyclers (APR) have worked together to produce it.¹ Without the APR's support and the cooperation of its members, this report would not be possible. As such, it is intended to provide the reader with a detailed overview of the recycling of injection stretch blow molded PET containers in the United States during 2009. Information contained in this report was obtained through surveys conducted by HDR Inc. and Moore Recycling Associates, combined with data generated internally by NAPCOR, the PET Resin Association (PETRA), and the International Bottled Water Association (IBWA). In order to present as accurate a picture of these activities as possible, additional data and information were obtained through discussions with individual collectors, intermediate processors, reclaimers, converters, brokers, exporters, resin producers, bottle manufacturers, public recycling officials, consultants, and key industry members. Reports for previous years and additional information on PET bottle recycling can be found at www.napcor.com.

PET BOTTLES AVAILABLE FOR COLLECTION

The negative growth in PET bottles and jars sold in the United States (U.S.), first seen in 2008, continued through 2009. The same "perfect storm" conditions reported in 2008 were in play again in 2009; poor weather, the weak economy, and dietary concerns all contributed to significant loss of sales in the beverage category, particularly in the isotonic drinks segment. These market conditions, combined with ongoing light-weighting initiatives, reduced the amount of PET resin used in bottles and jars by about 4% from 2008. Despite the bad news, there was strong continued interest on the part of brand owners in converting food and non-food containers to PET from other materials based on PET's recyclability, and the suitability of recycled PET (RPET) for use in new packaging. In fact, use of RPET in food, beverage, and non-food PET containers increased 37% from 2008 to 2009. This strong interest in PET seems likely to contribute to future industry growth as pressure continues for environmentally sound packaging, the economy recovers, and consumer spending increases.

NAPCOR determined that the total number of pounds of PET bottles and jars available in the United States for recycling in 2009 was 5.149 billion. This number reflects the total amount of PET bottle resin used by US bottle manufacturers from U.S., foreign, and recycled sources, less scrap generated and not reused, exported bottles and pre-forms, 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.

¹ It has become cumbersome to continue to provide all of the historical data so this report will generally show data for only the last 10 years. Those who are interested in previous reports can access them at www.napcor.com/PET/pet_reports.html.

POST CONSUMER PET BOTTLE PURCHASES

The amount of post consumer PET bottles collected for recycling and sold in the United States was 1.444 billion pounds in 2009. The breakdown of categories in millions of pounds (MMlbs) is as follows:

641.8	- Purchased by U.S. Reclaimers
779.7	- Purchased by Export Markets
22.7	- PET bottle component of mixed bales exported
1,444.2	- Total Amount of Post Consumer Bottles (MMlbs)

For the sixth straight year, the post-consumer PET bottle recycling rate has increased. As in 2008, the increase can be partially attributed to a number of factors, including:

- A decrease in the denominator;
- A 16.3 MMlb increase in California collections;
- Over 46 new collection programs, 6 major program expansions and 52 program expansions / conversions to single stream affecting over 3.7 million households;²
- Additional new commercial recovery efforts.

U.S. reclaimers were able to bring their total purchases of US bottles back to 2007 levels, while Canadian buyers purchased 54 MMlbs in the U.S., a 23% reduction from the previous year. The remaining material was purchased mostly by Chinese traders, either as PET bottle bales, 725.7 MMlbs, or as a component of mixed plastic bales, 22.7 MMlbs.

U.S. reclaimers continued to supplement their domestic purchases by importing 98.5 MMlbs of post consumer bottles, predominantly from Canada, Mexico, South and Central America. Domestic reclaimers also reported buying 33.2 MMlbs of alternative feedstock, including pre-consumer bottles, post consumer strapping, and other unprocessed industrial scrap. All total, U.S. reclaimers purchased a total of 773.5 MMlbs of scrap material, an increase of 45 MMlbs from 2008.

In 2009, PET bottles were again exported as part of mixed plastic bottle bale and mixed rigid plastic packaging bale shipments. PET bottles made up different fractions of mixed bottle or mixed rigid bales; totals are calculated accordingly and contributed to about 22.7 MMlbs of PET bottles sold in these forms. The small amount of dirty PET flake, used directly in applications without being cleaned, was included this year in the U.S. reclaimer purchases total.

² Resource Recycling magazine, 2008 & 2009 issues

POST CONSUMER BOTTLES											
<i>Gross Weight Purchases (MMlbs)</i>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
A. Purchased by U.S. Reclaimers	588	599	600	522	520	631	681	619	641	615	642
B. Purchased by Exporters *	183	170	234	275	321	372	489	653	755	836	802
C. Total U.S. Material Recycled (A+B)	771	769	834	797	841	1,003	1,170	1,272	1,396	1,451	1,444
D. Post Consumer Bottle Imports	60	69	70	57	62	106	109	97	100	98	98
E. Total Post Consumer Bottles used by U.S. Reclaimers (A+D)	648	668	670	579	582	737	790	716	741	713	740

* As of 2005, this number includes the amount of PET sold in mixed bottle bale shipments.

2009 GROSS RECYCLING RATE

Total U.S. Bottles Collected and Sold for Recycling = 1,444 MMlbs. **= 28%**

Total U.S. Bottles Available for Recycling = 5,149 MMlbs.

Year	Total U.S. Bottles Collected (MMlbs.)	Bottles on U.S. Shelves (MMlbs.)	Gross Recycling Rate
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%
2005	1,170	5,075	23.1%
2006	1,272	5,424	23.5%
2007	1,396	5,683	24.6%
2008	1,451	5,366	27.0%
2009	1,444	5,149	28.0%

PET BOTTLE BALE MARKETS

The sluggish bale demand that drove prices down at the end of 2008 was still evident early in 2009, but prices climbed back to historic averages of \$.08 - .13 per pound (East Coast) during the rest of the year. Several forces were at work and combined to keep prices stable despite increased demand for RPET for food grade packaging applications. By July of 2009, Chinese buyers had taken a passive market position on the East Coast and a more competitive stance out west. Also, demand from new reclaimers, and increased demand from existing merchant operations, were offset by greatly reduced demand from vertically integrated strapping and carpet manufacturers. The net result was adequate supply reflected by stable pricing for most of the year. West Coast pricing also remained fairly stable at \$.16 - .20 per pound FAS, with an occasional price spike.

As always, good quality, dirty granulate continued to be in high demand and short supply, and commanded a premium of at least \$.10 per pound over bales.

EAST COAST, NON-DEPOSIT PET BOTTLE BALE PRICES

(Picked Up, Truckload Quantities, Seller's Dock)

2009	LOW	HIGH
JANUARY	\$.02/LB	\$.09/LB
FEBRUARY	.06	.11
MARCH	.09	.14
APRIL	.08	.12
MAY	.09	.13
JUNE	.10	.13
JULY	.10	.13
AUGUST	.09	.12
SEPTEMBER	.09	.12
OCTOBER	.09	.12
NOVEMBER	.09	.12
DECEMBER	.10	.13

RECLAMATION CAPACITY

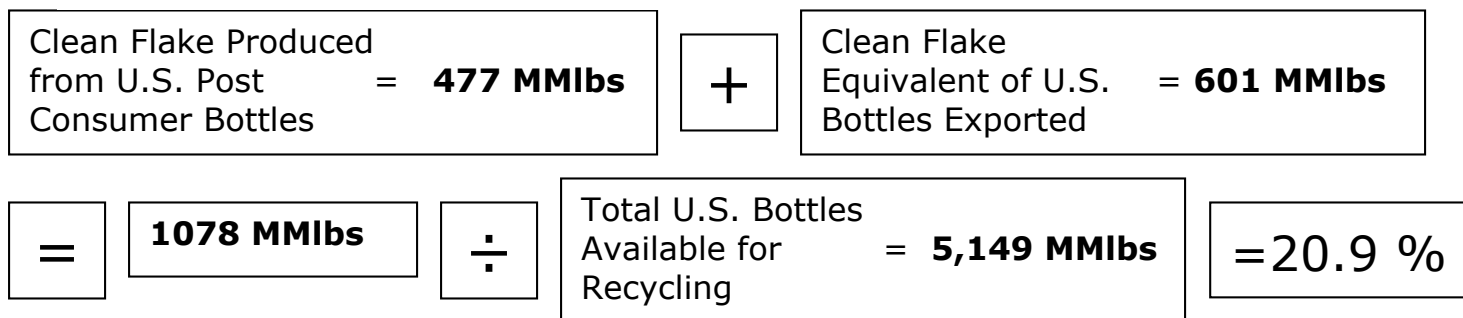
2009 began with 19 plants operating in the U.S. - although six were running only sporadically - and three plants in Canada, reflecting a wide range of capacity and technology. Total capacity of the plants in the U.S. was estimated to be 1,029 MMlbs gross weight in. At the end of the year, there were 18 reclamation plants producing

clean or dirty flake from post consumer bottles in the United States, with a total capacity of 1,247 MMlbs gross weight in. By the close of 2009, ten of these plants had the capacity to produce Food and Drug Administration (FDA) Letter of No Objection (LNO) direct contact recyclate suitable for food and beverage contact. In addition, three new plants were under construction, estimated to contribute a combined 285 MMlbs of wash capacity to the market in 2010.

The reclamation plant utilization rate for U.S. reclaimers, based on the use of all feedstock, was around 76% for the year. This takes into account plants that were semi-operational, those that were shut down, and new plants that were operational for any portion of the year.

Recycled PET (RPET) Production Summary (MMlbs.)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
A. RPET Produced by U.S. Reclaimers from U.S. Bottles	476	476	401	412	505	558	523	496	477	477
B. RPET Produced by U.S. Reclaimers from Imported Bottles	51	44	46	49	83	85	69	82	87	84
C. Total RPET Production U.S. Reclaimers (A+B)	527	520	447	461	588	643	592	578	564	561
D. Clean Flake Equivalent from U.S. Bottles Exported	143	184	212	255	298	401	529	583	647	601
E. Total Clean Flake from U.S. Bottles (A+D)	619	660	613	667	803	959	1,052	1,079	1,124	1,078

PET UTILIZATION RATE



The utilization rate measures the sum of clean flake produced by U.S. reclaimers, plus the equivalent amount of clean flake expected to be produced from exported bottles, taken as portion of total U.S. bottles available for recycling. Reclaimers reported yield losses ranging from 17% for deposit to 25.7% for curbside. This is consistent with what was heard from reclaimers throughout the year regarding higher contamination levels, and has put them under more pressure to recover value from the by-products wherever possible. Reclaimers increased their marketing of both non-PET by-products as well as PET by-products such as fines and “kick-out.” These volumes are included in the “other” end use category (see table, page 8). The average yield loss on exported PET was estimated at 25%, which takes into account the difference between the curbside, CA CRV, and traditional deposit streams. As a result, the clean flake equivalent for the 802 MMlbs of bottles exported was determined to be 601.5 MMlbs. As calculated above, the resulting utilization rate was 20.9%, the same as the 2008 rate.

Year	Clean Flake Equivalent <i>(MMlbs)</i>	Bottles on U.S. Shelves <i>(MMlbs)</i>	Utilization Rates
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%
2005	959	5,075	18.9%
2006	1,052	5,424	19.4%
2007	1,079	5,683	19.0%
2008	1,124	5,366	20.9%
2009	1,078	5,149	20.9%

2009 RPET MARKET

Historically, the data reported in the end use categories indicated U.S. converter consumption totals only, however in 2009 it's estimated that no less than 6% of the total consumption was RPET purchased by Canadian converters. This percentage is likely to increase based on increased RPET use in Canada, particularly in bottles. The use of RPET in the primary conversion categories in the U.S. and Canada totaled 895 MMlbs for 2009. U.S. and Canadian reclaimers also sold 42 MMlbs to secondary ("Other") markets, including export. Total RPET end use consumption was 937 MMlbs, the highest converter consumption figure to date. U.S. and Canadian reclaimers supplied about 720.3 MMlbs of flake and pellet produced from all sources of feedstock, in addition to the 42 MMlbs of secondary material. The remaining 174.7 MMlbs was imported from reclaimers in countries all over the world, including France, Italy, India, Israel, Taiwan, China, Mexico, Brazil, Peru, and other Central and South American countries.

The poor economic conditions of 2009 were best reflected in the reduction of RPET consumed by the strapping and carpet industries. This was offset by the increased use in all packaging applications, both due to brand owners stipulating content use in more package applications, and to the increased percentages of RPET content in some package types. Combined, this resulted in a startling 44% increase in the use of RPET in food and beverage bottles, and a 22% increase overall in RPET use in packaging applications.

The "Other" category, as previously mentioned, mainly reflects the increased sale of PET by-products, although it also includes shipments made to other converters, as well as a small quantity of exported material. Some PET thermoformed containers, sorted by reclaimers, also found their way to export markets, although these containers are not included in these totals. (PET Thermoform recycling is discussed in more detail in the addendum on page 11.)

RPET Product Categories
RPET used (MMlbs)

Product Category	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fiber	452	435	344	296	479	463	422	383	391	344
Sheet & Film	65	37	18	32	58	71	74	128	153	159
Strapping	101	82	83	77	116	131	132	144	137	114
Engineered Resin	27	24	10	10	12	8	9	11	7	10
Food & Beverage Bottles	54	77	86	106	126	115	139	136	141	203
Non-Food Bottles	40	44	43	24	63	63	49	60	55	65
Other	5	2	4	7	24	13	30	38	31	42
TOTAL CONVERTER CONSUMPTION	744	701	588	552	878	864	855	900	915	937

2009 YEAR END SUMMARY

The year contained few surprises for the post consumer PET recycling industry. Negative market growth first seen in 2008 continued in 2009 for much the same reasons: light-weighting and reduced sales. The good news was that renewed interest in recycling – driven both by the business sector’s embracing of the sustainability ethic, and by the public’s concern about the environment – led to the creation of more container recycling collection opportunities, both residential and away-from-home. These additional collection efforts helped offset the reduced volume of PET bottles and jars available for collection.

Less aggressive buying by export markets on the East Coast allowed U.S. reclaimers to access baled bottles at fairly stable prices throughout the year, while the West Coast continued to be dominated by Asian buyers.

The long-anticipated investments in both new plants and expansions resulted in additional reclamation capacity in 2009. Most notable were the expansion of the NURRC plant in Spartanburg, South Carolina, and the new plant built by PWP in Davisville, West Virginia, both of which are utilizing new or upgraded technologies. While there were some plant closures, their volumes were more than compensated for by other plants that were expanded or re-opened, and the year ended with a net increase of over 200 MMlbs in reclamation capacity. Announcements made during the year regarding additional reclamation investments indicated that reclamation capacity would be nearly at equilibrium with anticipated bottle collection volumes in 2010. Truly supporting such a balance, however, would require all collected bottles to stay in the country and to be reclaimed domestically.

As previously mentioned, the economy continued to negatively impact some vertically integrated reclaimers, particularly those in the strapping and carpet industries, but demand for recycled content from the packaging sector more than compensated for these losses. The use of RPET in all packaging segments increased and was limited only by quality and availability. In fact, this lack of availability drove additional investments in both reclamation and conversion technologies by companies that have not been able to secure steady and adequate sources of supply; this trend looks likely to continue through 2010. These companies have determined that they need better access to recycled material on a long-term basis. Not all of these investments are focused on the packaging sector; significant new capacity for PET fiber applications, utilizing both virgin and recycled PET, is also being added, again with much of the RPET usage and projected usage being driven by customer demand, not necessarily by competitive pricing. Ultimately, this combination of high demand and inadequate supply means higher pricing is likely to come, possibly in excess of virgin alternatives. This will invariably lead some end users to question how deep their commitments to

RPET run. An adequate supply of post consumer bottles is that which is sufficient to support not only the existing reclamation infrastructure, but will also allow for the additional investments necessary to provide the market with the RPET it needs at sustainable pricing, both now and in the future. It would appear that to achieve this level of supply, the recycling rate will need to increase to at least twice what it is this year.

ADDENDUM: PET THERMOFORM RECYCLING

The dramatic growth in PET thermoformed packaging has resulted in pressures from environmentalists, brand owners, policy makers, recycling program operators, and most importantly, consumers, for a recycling end-of-life option. Although additional post-consumer RPET supply is arguably the most critical issue facing the industry, a variety of technical issues have prevented existing PET bottle reclaimers from including PET thermoforms in the bottle stream. As a result, the potential value of this growing PET packaging segment is not being successfully realized.

NAPCOR has made recycling of PET thermoforms its highest priority and to that end, has been working with collectors, intermediate processors, reclaimers and end markets to identify and clearly define these technical issues, and to eliminate the barriers to successful recycling. These barriers include: look-alike packages made from OPS, PLA, OPP and PVC that require advanced autosort technology; certain adhesives used for paper labels on PET thermoforms; package geometry; and wide variability in intrinsic viscosity.

In 2009, NAPCOR facilitated the shipment of almost one million pounds of PET thermoforms to various reclaimers and end markets in an effort to better understand and remedy these barriers. As a result of this work, it is anticipated that there will be various market options for this material in the near future. This expectation is based on both planned retrofits to existing plants to enable them to handle the variety of shapes and sizes associated with PET thermoforms; new plants being designed to accommodate PET thermoforms; and further work with the PET thermoform manufacturers to establish common adhesive and other “design for recycling” guidelines to address technical barriers to recycling. NAPCOR is committed to working on this issue until PET thermoforms can be labeled “recyclable” in the truest sense of the word (see <http://www.napcor.com/PET/positions.html> for the NAPCOR position statement on Use of the Term Recyclable), and is optimistic that its efforts will be successful.

NAPCOR acknowledges the strong support of this effort by Stewardship Ontario, Waste Diversion Ontario, The Association of Postconsumer Plastic Recyclers (APR), and the Canadian Plastic Industry Association (CPIA), without whose collective assistance we would not have made nearly the progress achieved to date.