



**Association of Postconsumer  
Plastic Recyclers**



# **2006 UNITED STATES NATIONAL POST- CONSUMER PLASTICS BOTTLE RECYCLING REPORT**

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## **INTRODUCTION**

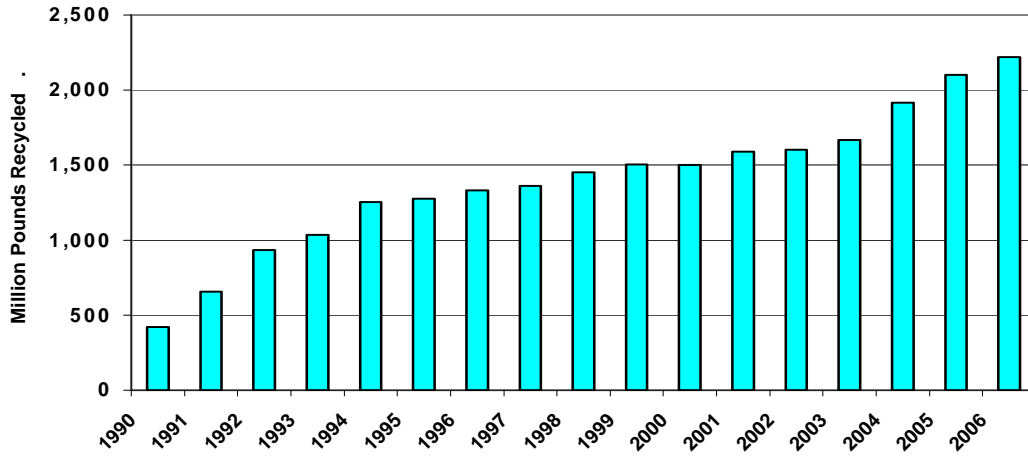
The 2006 edition of the United States National Post-Consumer Plastics Bottle Recycling Report is the 17<sup>th</sup> annual report on plastic bottle recycling. This study is a cooperative effort between the Plastics Division of the American Chemistry Council (ACC) and the Association of Postconsumer Plastics Recyclers (APR), the goal of which is to quantify the amount of high density polyethylene (HDPE) and polypropylene (PP) bottles recycled, as well as the rate of recycling. This study includes postconsumer recycling values for polyethylene terephthalate (PET) developed by the National Association for PET Container Resources (NAPCOR) and the Association of Postconsumer Plastics Recyclers (APR). The reclaimer survey portion of the study was conducted by the engineering consulting company of R.W. Beck, Inc.

## **HIGHLIGHTS/SUMMARY FOR 2006**

### **Plastic Bottle Pounds Collected for Recycling in the United States**

- The total pounds of plastic bottles collected increased by 118 million pounds for 2006.
- The total pounds of plastic bottles recycled reached a record high 2,220 million pounds.
- The annual increase in pounds of plastic bottles recycled was 5.6%.
- PET bottles collected increased by 102 million pounds.
- HDPE bottles collected increased by six million pounds to 928 million pounds, in spite of reduced weight and size of containers due to a move to product concentrates.
- Polypropylene recycling increased to 18 million pounds of bottles.
- Exports of US collected HDPE bottle material rose by 15% to a total of 20% of domestically collected material.

**Figure 1**  
**Growth in Post-Consumer Plastic Bottle Recycling**



Source: R.W. Beck, Inc

**Table 1**  
**Post-Consumer Plastics Bottles Recycled in**  
**Calendar Year 2006 Compared to Calendar Year 2005 Results [1,2,3,4,5,6]**  
(in million of pounds per year)

Plastic Bottle Type	Calendar Year 2005			Calendar Year 2006		
	Plastic Recycled [2]	Resin Sales [3,6]	Recycling Rate	Plastic Recycled [2]	Resin Sales [3,6]	Recycling Rate
HDPE Natural	448.8	1586	28.3%	454.4	1643	27.7%
HDPE Pigmented	473.1	1818	26.0%	473.7	1867	25.4%
<b>Total HDPE Bottles</b>	<b>921.9</b>	<b>3404</b>	<b>27.1%</b>	<b>928.1</b>	<b>3510</b>	<b>26.4%</b>
PVC	[4]	NA	NA	0.8	111	0.7%
LDPE	[4]	NA	NA	0.3	69	0.4%
PP [5]	10.1	185	5.5%	18.4	207	8.9%
PET [6]	1170	5075	23.1%	1272	5424	23.5%
<b>TOTAL BOTTLES</b>	<b>2102</b>	<b>8664</b>	<b>24.3%</b>	<b>2220</b>	<b>9321</b>	<b>23.8%</b>

[1] This data provides a snapshot of plastic bottle recycling trends from the national perspective. The data are particularly useful in identifying national trends and highlighting changes that have occurred from year to year, and may be a useful tool for planning purposes. While national data may be useful as a comparison with local waste characterization and recycling data, significant differences will exist from locality to locality, and from state to state. If communities or states are making decisions where precise knowledge of the amount, composition and disposition of MSW is crucial, e.g., where a solid waste management facility is being designed, or for local or state regulatory enforcement, etc., then local characterization of the quantities of individual components generated, recycled and disposed is essential.

[2] Data is based on surveys performed by R.W. Beck and Moore Recycling Associates, Inc., bale sorts performed by R.W. Beck, and/or mixed bale composition data provided by others.

[3] Based on data provided by the American Chemistry Council's Plastics Industry Producers Statistics Group. HDPE resin sales include both the virgin and recycled plastic pounds used to produce new bottles.

[4] Data were not collected in 2005.

[5] The significant increase shown from 2005 to 2006 reflects new data on material recycled as a minor constituent of other bottle resin streams.








[6] Source: 2006 Report of Post Consumer PET Container Recycling Activity, National Association of PET Container Resources, Sonoma, California

## Plastic Bottle Recycling Overview for 2006

Due to the significant environmental benefits and convenience attributes of plastic packaging, resin sales continued to increase, reflecting the continuing conversion of packages to plastic and natural growth in traditional markets. Many new beverage applications are typically consumed away from the home and the conventional recycling bins. The growth of bottles recycled reflects the following:

- Bale prices for recycled bottles remained high
- Single stream collection of household recyclables continues to grow, generally resulting in higher overall participation rates

The common plastic bottle resins, as identified by their resin identification codes, are:

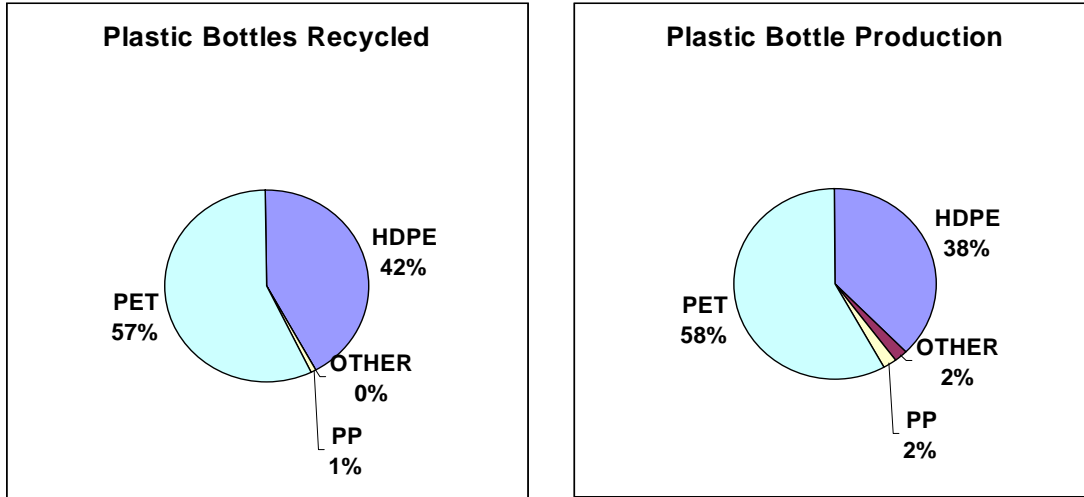
	PETE	Polyethylene Terephthalate, PET
	HDPE	High Density Polyethylene, HDPE
	V	Polyvinyl Chloride, PVC
	LDPE	Low Density Polyethylene, LDPE
	PP	Polypropylene, PP
	PS	Polystyrene, PS
	OTHER	Other

PET and HDPE bottles continue to comprise almost 96% (95.8%) of the plastic bottle market and over 99% (99.1%) of the bottles recycled. The largest market share of the other resins is held by polypropylene at 2.2% of plastic bottles followed by PVC at 1.2% of plastic bottles. Many polypropylene bottles and closures are included with HDPE bottles for recycling. So long as the total polypropylene stays below 5% in batches of HDPE recycle, the inclusion is benign. Much of the PP included as recycled comes from PP recovered from PET and PP bottle recycling and PP included in mixed bales for export. The amount of PP recycled in the HDPE bottle stream was calculated from data derived from a “bale sort” project. In 2006 the market for injection molding grade PP from the closures was strong.

Although the #3 through #7 resins are recyclable, and occasionally are recycled, the actual level of recycling is limited by the continuing challenge to reach a critical mass of readily recognizable bottles for economical collection and processing.

Bottles coded bottles with “#7, Other” are not included in this report as a discrete category. Bottles coded #7 may be HDPE or PET or PP with barrier layer materials. These bottles are often recycled with the primary resins used in each container. Bottles coded #7 may also be made from resins other than those listed above.

**Figure 2**  
**2006 Plastic Bottles Recycled and Plastic Bottle Production by Resin**



Source. R.W. Beck, Inc

### **Barriers to Increased Plastic Bottle Recycling**

As noted for 2005, too many consumers continue to be unaware of the significant usefulness, demand, and value of recycled plastic HDPE and PET. Data and experience show that plastic bottle recycling can be increased through sustained local education campaigns. Municipalities also need to understand that they too can benefit from the high prices being paid for bales of bottles, including through revenue sharing to fund educational programs and other costs of collection.

Another barrier to increased recycling is lack of sufficient access to recycling collection opportunities for products used away from home. Consumer data continues to show that the public wants additional opportunities to be able to recycle at public venues, offices, recreational sites, schools, and retail establishments.

The Association of Postconsumer Plastic Recyclers, with support from the American Chemistry Council, has conducted workshops and webinars for municipal recycling coordinators to educate them on the existing markets for baled bottles, the strong demand for goods, quality considerations, and suggestions for householder education.

### Bottle Resin Sales

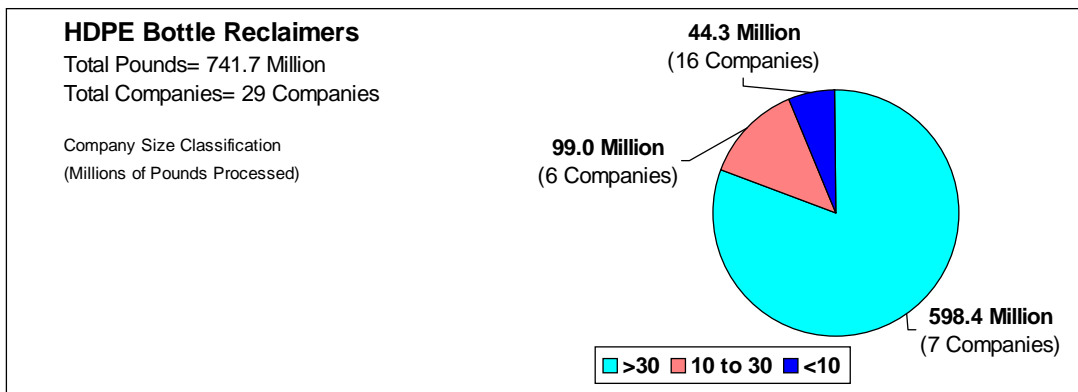
The denominator used to calculate the recycling rate is composed of both virgin resin and recycled resin sold bottle makers.

Plastic bottle light weighting continues. Some HDPE bottle applications are using product concentrates, which mean smaller bottles, or fewer bottles made for the total number of uses, such as laundry loads. Light weighting meets economic and sustainability goals and is a relentless force in bottle making. While lighter bottles are more sustainable, recycling is denominated by weight.

### Reclamation Industry Update

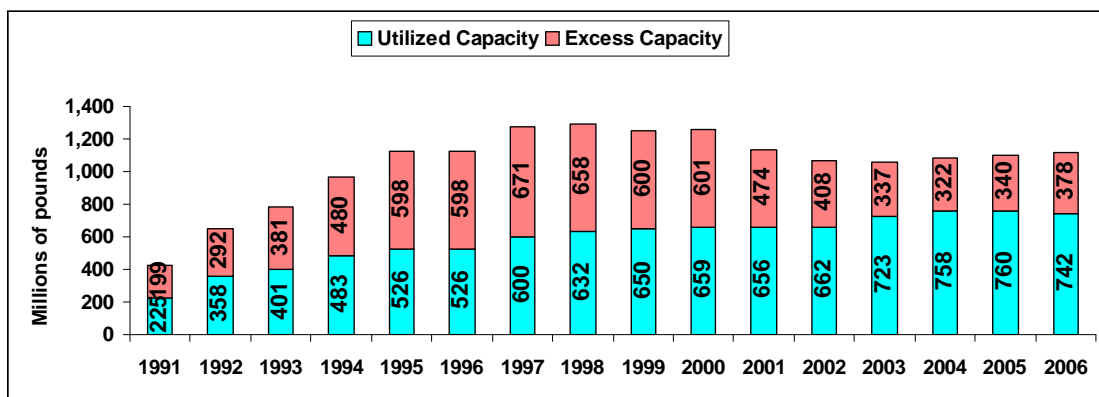
- The number of HDPE reclaimers stayed stable in 2006 as compared to 2005 with 29 companies. The number of smaller companies may vary year-to-year as industrial scrap companies change their business plans and start-ups and acquisitions continue.
- The largest companies, processing over 30 million pounds annually, processed 81% of the HDPE reclaimed.
- For HDPE bottle reclamation, capacity utilization, as defined, fell from 69% in 2005 to 66% in 2006 as the total washing capacity rose slightly (20 million pounds), but the amount processed domestically fell by 18 million pounds.
- As in 2005, the material supply continued to be a major concern for both PET and HDPE reclaimers. The increase in export demand for PET and HDPE material exceeded the increase in supply of bottles, leaving less material available for the North American plastics recycling industry. The growth in domestic supply of baled bottles is insufficient to keep the US plastic reclaimers' plants full.
- The HDPE bottle recycling industry continues, as it has since 1996, to be supply limited

**Figure 3**  
**Size Comparison of Domestic Reclaimers of HDPE Bottles**



Source: R. W. Beck, Inc.

**Figure 4**  
**HDPE Bottle Wash Capacity in the U.S.**



Source: R.W Beck, Inc. The figures shown above are estimates and should not be used for business planning purposes. Utilized capacity includes PCR quantities processed domestically only. Capacity based on 24 hrs./day and 365 days/year. Values for 2005 revised to reflect a correction.

### Export Markets

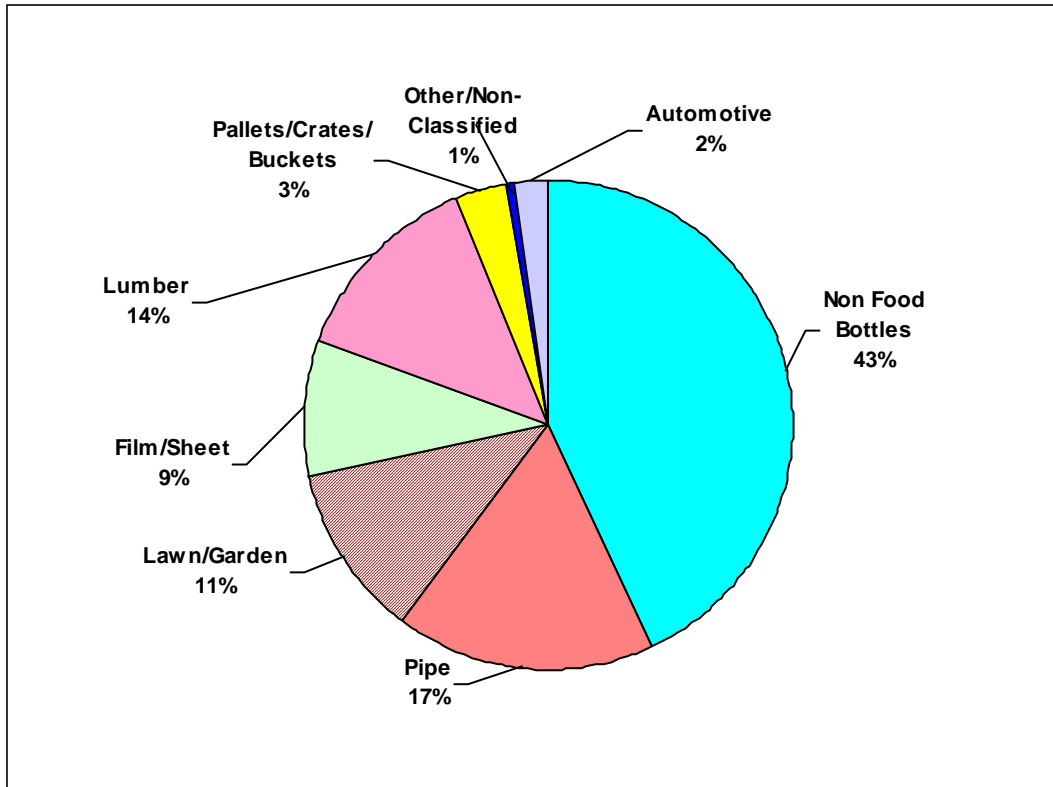
Aggressive buying of United States postconsumer bottles continued in 2006. 186.4 million pounds of US-collected HDPE bottle material were exported, representing 20.1% of the total bottles collected domestically. The growth of exported postconsumer HDPE was 14.8% compared to 2005 exports.

For PET exports totaled 48% of the total bottles available to domestic reclaimers, including domestic collection and imports.

### End Use Markets for Recycled Plastics

- Natural HDPE postconsumer recycled resin's primary markets continued to be for new non-food application bottles, such as for detergent, motor oil, household cleaners, etc.
- Pigmented HDPE postconsumer recycled resin's markets continued to be pipe and lawn and garden products
- Plastic lumber continued to consume a broad range of materials including recycled HDPE, LDPE, mixed rigid containers, and wide-spec virgin resin.

**Figure 5**  
**Domestic Recycled HDPE Bottle End Use**



Source: R. W. Beck, Inc.

### **Additional Information**

ACC offers resources to communities who wish to increase postconsumer plastic collection. Details on the highly successful All Plastic Bottle collection programs can be found at [www.allplasticbottles.org](http://www.allplasticbottles.org). A database for the recycling of clean plastic film and grocery/retail bags is provided at [www.plasticbagrecycling.org](http://www.plasticbagrecycling.org). ACC maintains a database of buyers and sellers of recycled plastic and other valuable information, including school programs and a list of recycled plastic products, at the general website [www.americanchemistry.com/s\\_plastics/index.asp](http://www.americanchemistry.com/s_plastics/index.asp) or by accessing the pulldown menu titled 'environment' near the top of the page.

APR offers resources at its website, [www.plasticsrecycling.org](http://www.plasticsrecycling.org) including lists of buyers and sellers of recycled plastic, market development workshop information, the Kids Zone for educating and involving children in plastics recycling, and technical resource documents to aid in designing recyclable packaging.

APR announces at its website upcoming webinars and workshops to help local recycling coordinators achieve better plastic recycling results.

NAPCOR provides additional information at its website, [www.NAPCOR.com](http://www.NAPCOR.com).

## **Legal Notice**

The 2006 United States National Post Consumer Plastics Bottle Recycling Report has been prepared to provide helpful ideas and information for parties interested in recycling plastics. Facilities developing a recycling process and all entities involved in the chain of collection, processing, distribution, and sale of recycled products have an independent obligation to ascertain that their plans, actions, and practices meet all relevant laws and represent sound business practices for their particular operations. Facilities may vary their approach with respect to particular operations, products, or locations based on specific factual circumstances, the practicality and effectiveness of particular actions and economic and technological feasibilities. This report is not designed or intended to define or create legal rights or obligations. ***ACC and APR do not make any warranty or representation, either express or implied, with respect to the accuracy or completeness of the information contained in this report;*** nor do ACC and APR assume any liability of any kind whatsoever resulting from the use of or reliance upon any information, conclusions, or options contained herein.

The Association of Postconsumer Plastic Recyclers and the Plastics Division of the American Chemistry Council produced this report.

The Post-Consumer Plastics Recycling Report was published by the Association of Postconsumer Plastic Recyclers and the Plastics Division of the American Chemistry Council for 2004 and 2005, and previously by the American Plastics Council, which merged with the American Chemistry Council in 2002. In 2006, the American Plastics Council was renamed the Plastics Division of the American Chemistry Council.

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