



Post-Consumer Recycled (PCR) PET

*Focusing on Today's Needs with Tomorrow's
Environment in Mind™*



www.pwpindustries.com





1. Recyclable

Vague term that doesn't mean the manufacturer has done anything to the product to make it more environmentally sustainable. It just means that the manufacturer is putting the word "recyclable" on the container, implying that you should recycle it. Keep in mind that in this day and age, almost all glass, aluminum, plastic and paper materials are recyclable. But just because you might see the word "recyclable" on a container doesn't mean it's recyclable in your community. So, in short, when you hear this claim, you should not only disregard it as a claim upon which to make a decision, but it should also alert you that if the manufacturer is making this claim, make sure their other claims do have real environmental impact.

2. Made from Recycled Materials

This is better. It means that some part of that product actually is made of something used already and processed make into this product via recycling. But this claim doesn't specify a percentage, which is important to know when making purchasing decisions.

3. Made from 100% Recycled Materials

Even better. None of this product is made from virgin trees or plastic or whatever materials were used. That means no natural resources needed to be harvested or mined for this product ... AND this product creates a demand for materials to be kept out of landfills.

4. Made from 100% Post-Consumer-Waste Recycled Material

The best. But what is the difference between this item and No. 3 above? This is an important item to know and understand. When you see the term "recycled materials," there are two possible components to it:

- a. Pre-Consumer Waste
- b. Post-Consumer Waste

Source: How Green is Green Packaging? Nov 2008 Restaurant & Institutions



- Post-Consumer Recycled (PCR) PET:
 - 'Post consumer' refers to material that was previously used by consumers and then recycled for use in new products
 - When consumers recycle products with recycled content, sustainability loop becomes stronger
 - Many food packages are made from PET because it is light, shatter-resistant, safe and recyclable





- Location:
 - Davisville, West Virginia
 - Adjacent to existing warehouse
- Building size:
 - Approximately 80,000 sq. ft.
- Equipment and capacity (output):
 - Phase One: 40 million lbs of recycled PET flake/yr





*Resourceful.
Responsible.
Revolutionary!™*



- Recycling PET bottles increases our product range containing post-consumer resin, saves energy, reduces CO₂ emissions and averts plastic in landfills
- Working with Coca-Cola Recycling LLC, a company with a shared commitment to a greener future





- **Environmental Benefits:**
 - Uses less energy and water - 91.6% less energy than virgin PET resin
 - Uses lower greenhouse gas emissions and solid waste*
 - Has 6x the environmental benefit of virgin resin
 - Reduces resin destined for waste stream
 - Reduces amount of new materials being created from earth's resources
 - PET is #1 most-recycled plastic

Source: Hartman Group

Packaged Facts Wharf Research March 1, 2005

* Sustainable Packaging Coalition

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- Based on annual recycling capacity of 40 million lbs of recycled PET flake, PWP's recycling center will:
 - Eliminate 30,000 tons of CO₂ (equivalent to removing 5,000 cars from the roads*)
 - Reduce 148,000 cubic yards of landfill space (28 football fields one yard high)
 - Reduce 390 million kilowatt hours (saving enough energy to power 25,000 homes or Key West, FL for one year*)



Source: www.recyclingfactsguide.com

* Figures from the EPA Greenhouse Gas Equivalencies Calculator. Demographia





- **Guaranteed Supply**
 - First food package thermoformer in North America to build in-house Post-Consumer Recycling Center
 - Agreement with Coca-Cola Recycling LLC provides steady stream of PCR
- **Guaranteed Quality**
 - PET flake is washed/cleaned thoroughly to remove label, cap, tamper-evident neck-band and other debris before polymerized into usable, FDA-compliant materials
 - State-of-the-art processes and quality assurance standards provide high-quality, consistent PCR that can be blended with virgin resin to mimic virgin's appearance and performance
 - With in-house PCR production
 - More internal control of base materials = better quality
 - Overseas PCR has quality issues and may not be FDA-compliant





- Marketing Benefits:
 - Allows for custom label / on-package messages promoting its post-consumer content
 - Offers value-added environmental solution
 - “Green Solutions” required by retailers and consumers

Source: Hartman Group

Packaged Facts Wharf Research March 1, 2005

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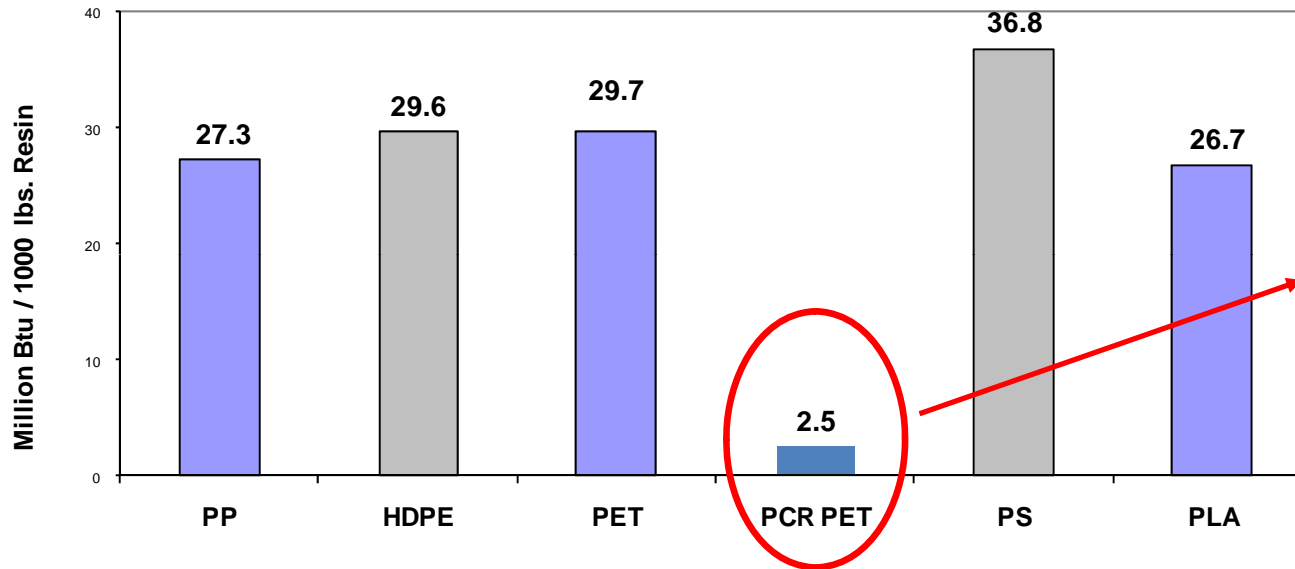




Material Comparison

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**PCR PET
requires
lowest
energy to
produce**

Source: Cradle-to-Gate Life Cycle Inventory report, prepared for ACC by Franklin Associates, 12/07

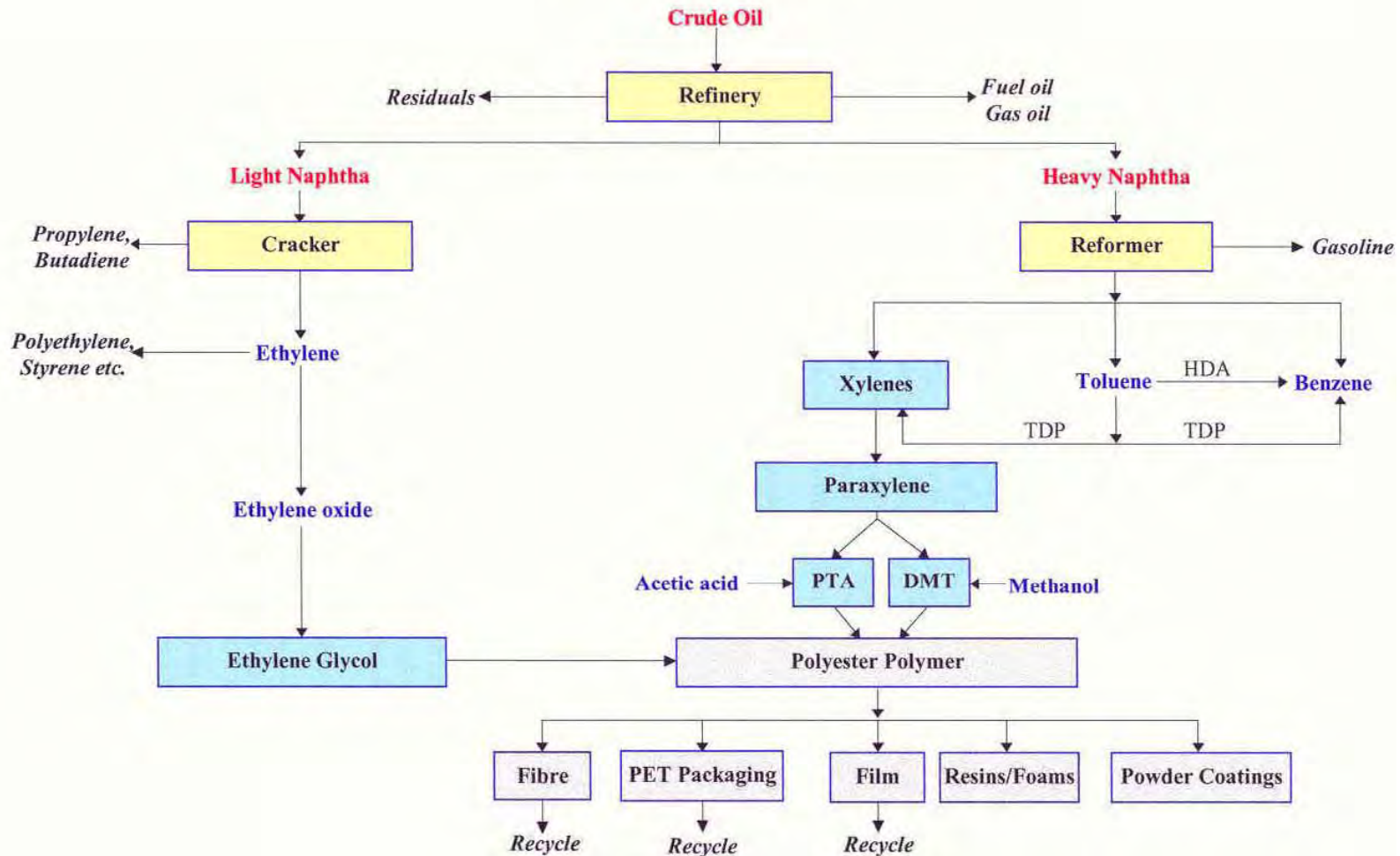
In terms of energy efficiency, PCR PET requires less gross energy to produce than most plastics used for packaging

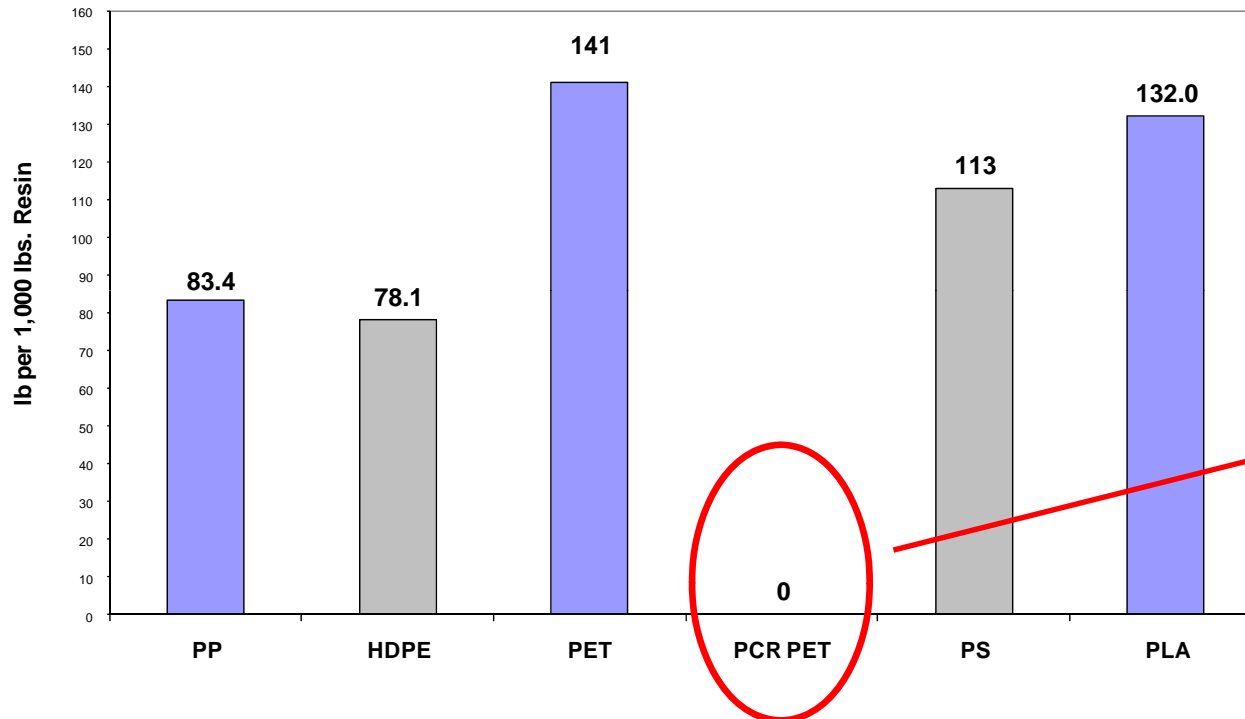




SBA

The Polyester Chain





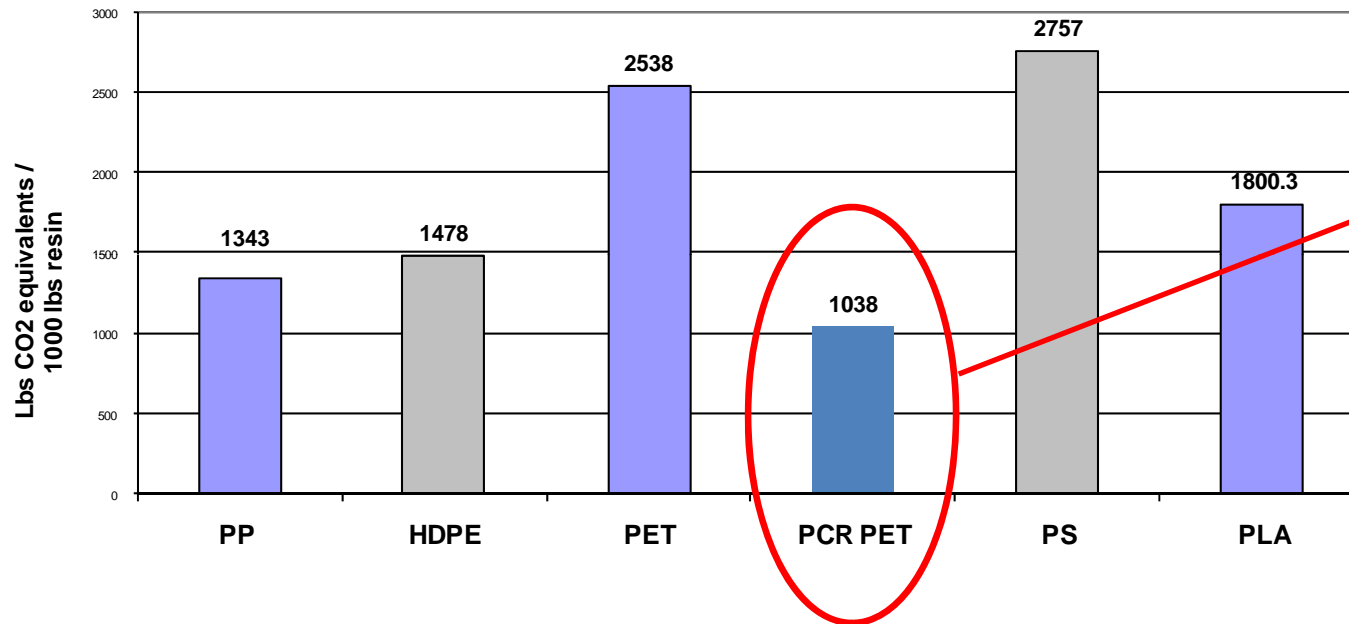
**No Solid Waste
Generated by
PCR PET**

Source: Cradle-to-Gate Life Cycle Inventory report, prepared for ACC by Franklin Associates, 12/07

***Post-Consumer Recycled PET helps keep
plastic materials out of landfills***

PCR PET - THE CHOICE IS CLEAR





**PCR PET is
the lowest
CO₂
Equivalents
producer
by Weight**

Source: Cradle-to-Gate Life Cycle Inventory report, prepared for ACC by Franklin Associates, 12/07

***PCR PET produce significantly less CO₂ equivalents by weight than
PP, HDPE, PET and PS***

PCR PET - THE CHOICE IS CLEAR








- PET is world's most recycled plastic
 - “Closing the Loop”
 - Uses post-consumer (recycled PET) and pre-consumer recycled resin
- Reusable for many applications around the house
- Wal-Mart/Sam's list as preferred plastic material*
- Superior clarity
- Increased durability
- Wide temperature performance (excellent for frozen food applications)
- Excellent strength
- Great barrier characteristics (increases shelf life)
- Minimizes greenhouse gases, energy, water, toxins and emissions

Source: * Sustainability Guide
Going Green, Restaurant Business Feb. 2007





<u>Attribute</u>	<u>PET</u> 	<u>PP</u> 	<u>AgroResin®</u>	<u>* OPS</u> 	<u>* PLA</u> 
<u>High Temperature</u>	Fair	Good	Good	Fair	Poor
<u>Low Temperature</u>	Excellent Frozen, Excellent Refrigerated	Good Frozen, Good Refrigerated	Good Frozen, Good Refrigerated	Poor Frozen, Fair Refrigerated	Poor Frozen, Fair Refrigerated
<u>Clarity</u>	Excellent	Fair	N/A	Excellent	Excellent
<u>Moisture Barrier</u>	Good	Excellent	Excellent	Poor	Poor
<u>Oxygen Barrier</u>	Excellent	Fair	Fair	Very Poor	Poor
<u>Greases/Oils</u>	Fair	Excellent	Good to Excellent	Fair	Poor
<u>Density (g/cc)</u>	1.33	.90	.45 - .75	.96	1.24
<u>Recyclable</u>	Excellent	Good	Compostable, Biodegradable	Fair	Compostable
<u>Microwaveability</u>	Poor	Excellent	Excellent	Poor	Very Poor
<u>Oven Proof</u>	Very Poor	Poor	Poor	Very Poor	Very Poor
<u>Heat Distortion Temp °F</u>	158	200-240	275	170	105

Disclaimer – All information is for reference only. * PWP does not offer.

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Plastic Food Packaging Raw Materials

	Amorphous PET (APET)	Crystalline PET (CPET)	Polypropylene (PP)	AgroResin®	Oriented Polystyrene (OPS)	Expanded Polystyrene Foam	High Impact Polystyrene
Appearance	Clear	Opaque	Moderately Transparent	Natural Brown and Colors Available	Clear	Opaque	Opaque
Heat Resistance	Poor	Excellent	Good	Good	Poor	Good	Poor
Cold Resistance	Excellent	Good	Good	Good	Good	Good	Good
Rigidity	Moderate	Good	Good	Good to Excellent	Excellent	Good	Good
Advantages	<ul style="list-style-type: none"> • Good chemical resistance • Excellent taste and odor properties • Best resin in cold temperatures; crack resistant 	<ul style="list-style-type: none"> • Stable at high temperatures • Good impact strength • Good oxygen and water barrier • Ovenable 	<ul style="list-style-type: none"> • Good resistance to fatigue • High heat resistance 	<ul style="list-style-type: none"> • Biodegradable • Sustainable • Compostable • Can design and combine attributes to meet specific needs 	<ul style="list-style-type: none"> • Easy to process • Easy to print on • Inexpensive 	<ul style="list-style-type: none"> • High heat and cold retention • Strong • Lightweight • Inexpensive 	<ul style="list-style-type: none"> • Inexpensive • Easy to process • Easy to print on

Source: LEK Consulting





- Poor recyclability
 - PLA cannot be recycled along w/ other recyclable plastics
 - PLA is compostable – but, industrial compost sites do not exist
 - Will not biodegrade in landfills
- No available resin supply
- Cracks when frozen
- Does not handle heat well - deforms when exposed to temperatures in excess of 105°F
- Requires refrigerated shipping
- Requires temperature-sensitive storage facility
- Product packaging must be maintained in refrigerated environment
- PLA is more permeable to liquids, food weeping may occur





1. Good for our economy
2. Creates jobs
3. Reduces waste
4. Good for the environment
5. Saves energy

**Resourceful.
Responsible.
Revolutionary!™**

Opening the first in-house plastics recycling facility by a thermoforming company reconfirms PWP's leadership in sustainable business practices. Working with Coca-Cola Recycling LLC, we'll be transforming post-consumer plastic bottles into FDA-compliant resin for food packaging. It's the kind of commitment that has made PWP the go-to company for innovative, environmentally-friendly packaging solutions.

Now *That's* Thinking Beyond Today.

To make PWP a partner in your success, call 877-700-0330 www.pwindustries.com

PWP
PACKAGING WITH PERFECTION®
www.pwindustries.com

Source: National Recycling Coalition

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6. Preserves landfill space
7. Prevents global warming
8. Reduces water pollution
9. Protects wildlife
10. Creates new demand

There's a Message in This Bottle That's Very Green!

As the first thermoforming company to open its own in-house plastics recycling facility, the environmental benefits PWP generates keep adding up. Big energy savings—equivalent to powering 25,000 homes a year. Reduced carbon dioxide emissions—equal to taking 5,000 cars off the road for a year. Less landfill—equal to a full 28 football fields piled one yard high. And a steady stream of FDA-compliant food packaging products, all made from post-consumer plastic bottles.

Now That's Thinking Beyond Today.

To make PWP a partner in your success, call 877-700-0330 or www.pwpindustries.com

PWP
PACKAGING WITH PERFECTION®
AN OGE COMPANY

Source: National Recycling Coalition

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- Sustainable packaging meets the needs of the present without compromising the ability of future generations to meet their own needs
- Sustainable Packaging Coalition (SPC) includes the use of recycled source material in its definition of *sustainable packaging* because of reduction in virgin material and waste

Source: Brundtland Commission UN , SPC

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- **Consumers**

- 89% of consumers interested in “eco-friendly” products and 30% actively look for them *Information Resources Inc. 2007*
- 43% of Americans think they will be extremely “green” in next five years while 11% classify themselves that way now *Wal-Mart Live Better Index 2007*
- More than 75% of US adults show some kind of green motivation. Natural Marketing Institute says that such a percentage makes sustainability a more attractive and imperative option for businesses to engage consumers *Food Navigator USA*
- 82% of Consumers Buying Green Despite Battered Economy *2009 National Green Buying research*
- Consumers may be more willing to ditch convenient packaging for greener packaging, while the food itself should include fresh ingredients and deliver health benefits *Ipsos Marketing July 09*





- Consumers

- Sustainability has evolved from a niche segment into a major factor influencing purchasing and shopping behavior across a sizable consumer base *EarthNow News*
- Survey of more than 23,000 consumers worldwide found that environmental packaging by food companies has emerged as the third most important purchasing factor for North American consumers *Ipsos Marketing*
- 92% of consumers agree with the statement that it is important for the U.S. food industry, both food manufacturers and supermarkets, to be more proactive about addressing environmental concerns *FM-Harris Poll 2007*





- Retailers

- 83% of the top 100 retailers involved in green practices and 62% increased green investments during past two years *BDO Siedman Retail Compass Survey, October 2007*
- 79% of S&P 100 companies have sections on their website dedicated to social/environmental policies and performance (59% in 2005) *Social Investment Research Analysis network.*
- Packaged goods companies that do not implement sustainable environmental strategies could face reduction in earnings of 13% - 31% by 2013 and 19% - 47% in 2018 *World Resources Institute / A.T. Kearney, Inc.*





- **Future Employees**

- A survey of 1,800 Gen Y-ers (ages 13 - 25) in 2006

- 61% agreed they were personally responsible for making a difference in the world
 - 89% stated they were likely or very likely to switch brands based on a strong association with a good cause

Source: Cone and AMP Insights

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- Other Sustainable Drivers
 - Climate change is “driving other drivers”
 - Activist organizations (e.g. Green Peace)
 - State and local governments are taking action
 - Financial Sector
 - Institutions, investors pressing businesses to disclose their risks/opportunities associated with climate change
 - Media
 - Jumping on consumer trends and chronicling corporate reactions
 - Al Gore’s “An Inconvenient Truth”

Source: Brundtland Commission UN

P C R P E T - T H E C H O I C E I S C L E A R





Tamper-Resistant™ Rectangles:

- Better design/better functionality!
 - **Contains a minimum of 25% FDA-compliant Post-Consumer Recycled PET content**
 - Made from PWP's own Post-Consumer material
 - Patented design improves safety by minimizing risk of food tampering
 - No shrink bands or wrap around labels required
 - No loose pieces to throw away
 - Eliminates safety concerns - choking hazards
 - Leak resistant seal / locks-in product freshness
 - Bottom vent slots allow for better cooling and extend shelf life
 - Automation capable
 - Available in 8, 12, 16, 24, & 32 oz sizes. 48 & 64 oz coming soon
 - 3 footprints – 5"x6", 6"x7", 8"x9"



P C R P E T - T H E C H O I C E I S C L E A R





- PWP committed to environmental responsibility
- PWP Recycling Center furthers effort to use FDA-compliant Post-Consumer Resin in products that would otherwise end up in landfills or oceans
- PWP promotes its Eco-Team's® fundamental goals as an integral part of daily business
- PWP can be your partner as the marketplace moves towards more environmentally-friendly packaging solutions

Contributing to a better tomorrow...

