

Sustainable Packaging

First Steps

Bob Kerr

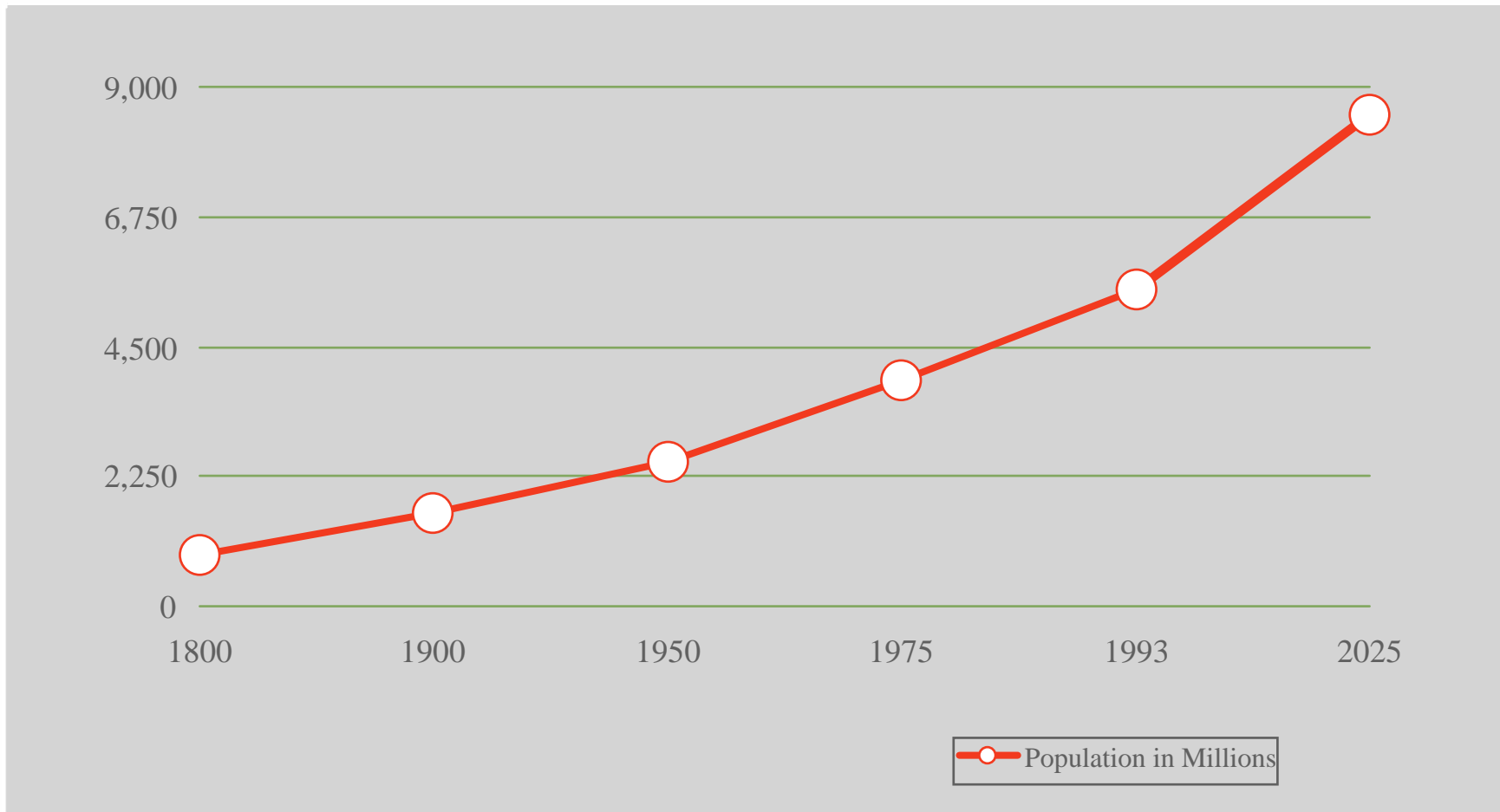
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STRATEGIES

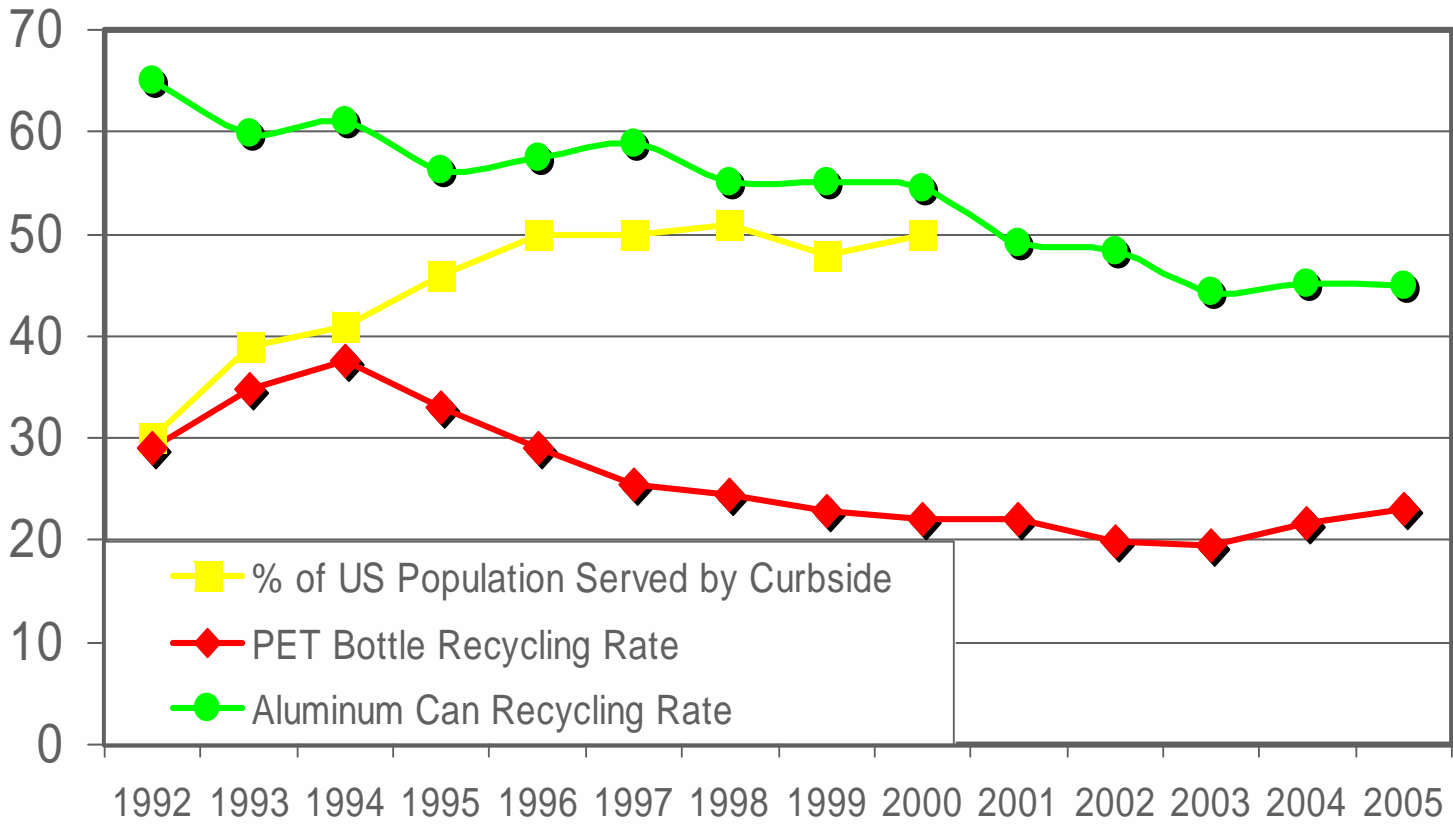
SOLUTIONS FOR A SUSTAINABLE FUTURE



World Population Growth

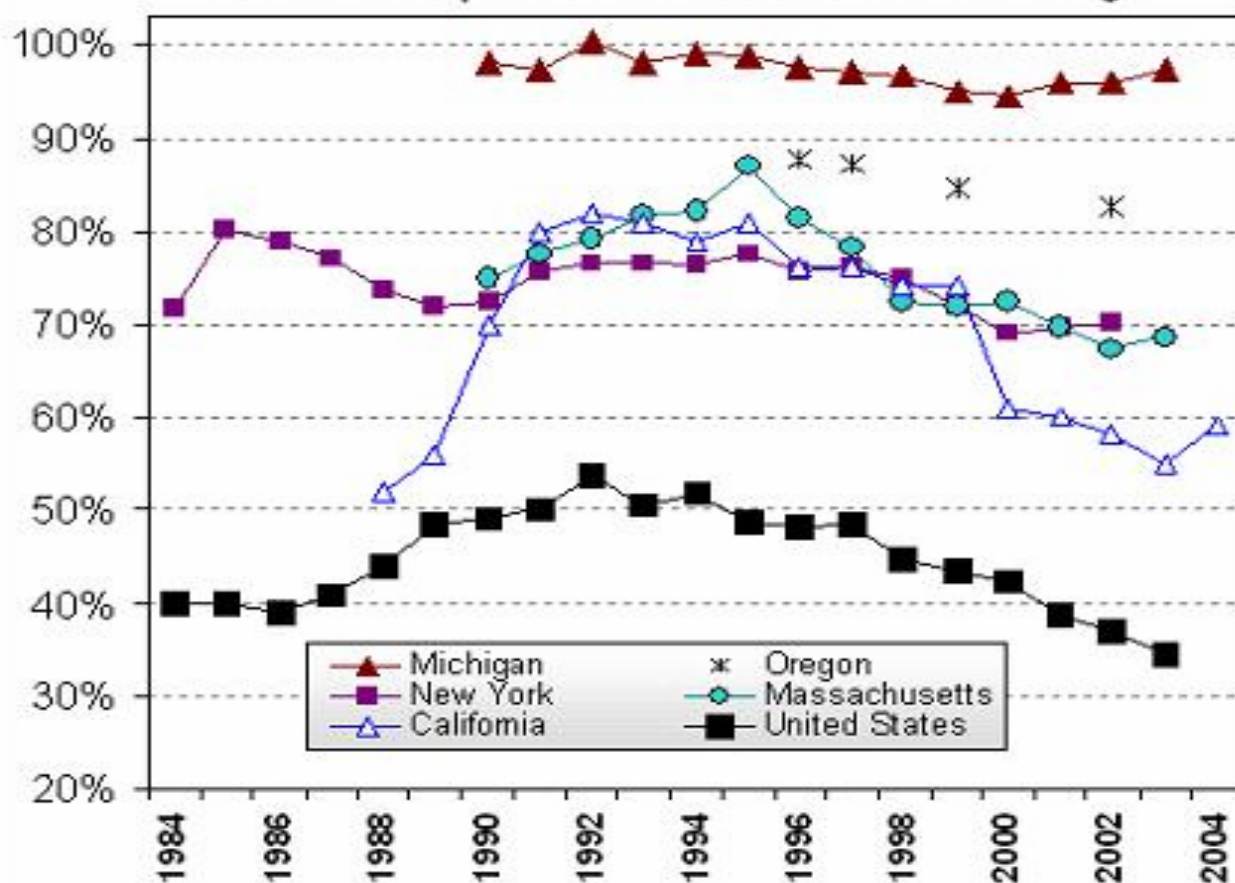
1990
 2,711 curbside programs
 37 million people served
 15% of U.S. population

2002
 8,875 curbside programs
 139 million people served
 49% of U.S. population



Source: Container Recycling Institute

Beverage Container Redemption Rates in Selected Deposit States, vs. the U.S. Average

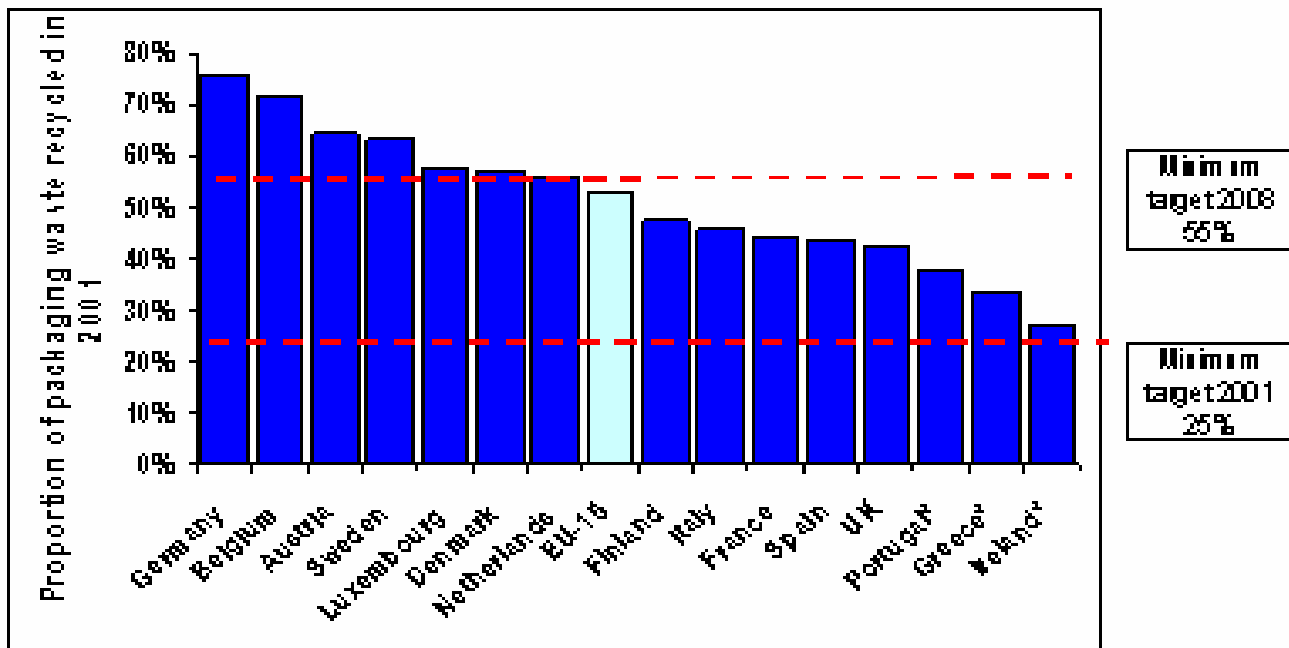


(© Container Recycling Institute, 2005)

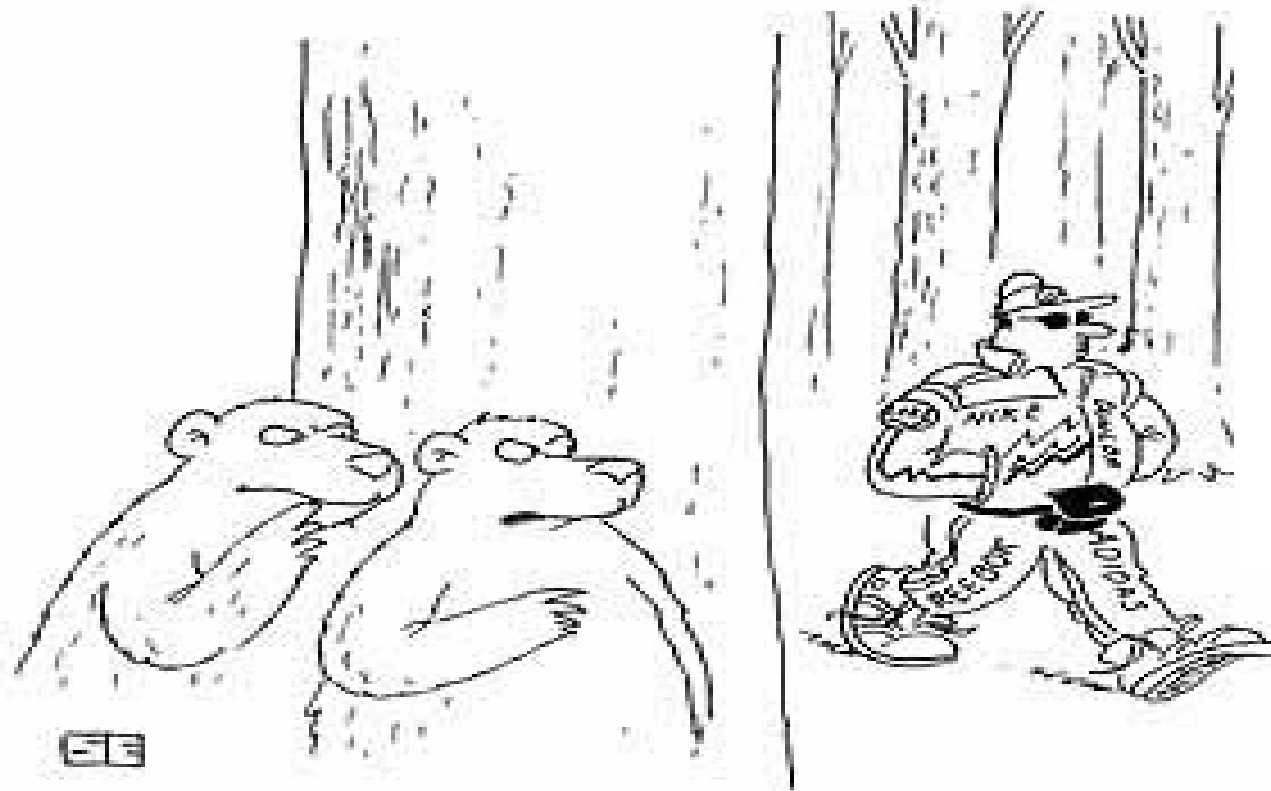
Figure 1.4: Container Recycling Institute. "States with Deposit Laws." 2006. <<http://www.bottlebill.org/legislation/usa.htm>> (16 October 2006)

EU Packaging Requirement for Extended Producer Responsibility

Germany	Belgium	Austria	Sweden	Luxembourg	Denmark	Netherlands	EU-15	Finland	Italy	France	Spain	UK	Portugal*	Greece*	Ireland*
76%	71%	64%	63%	57%	57%	56%	53%	47%	46%	44%	44%	42%	38%	33%	27%



Remak: * Derogation



"I hate the amount of packaging that food comes wrapped in these days"

Everybody has their packaging problems

10 Strategies for the Journey



1. Dematerialize
2. Use Recycled Content
3. Eliminate toxics
4. Review the entire packaging system
5. Design for Recyclability
6. Use the Plastics Hierarchy
7. Minimize where possible
8. Design for Reuse
9. Design for Compostability
10. Eliminate unnecessary packaging

#1: Dematerialize



- ▶ Less mass = less impact
- ▶ Less mass = less cost
 - ▶ Raw material
 - ▶ Transportation
 - ▶ Manufacturing (component assembly)
- ▶ Examples
 - ▶ Private-label: cereal box elimination
 - ▶ Unilever: Reduced cap weight by 20% through use of advanced manufacturing technology



#2: Use Recycled Content



- ▶ Reduce consumption of virgin materials
- ▶ Reduce energy use
- ▶ Create markets for recovery of post consumer wastes



Energy Benefits of Using PCR Materials



Material	Recycled (MJ)	Virgin (MJ)	Energy Savings
Newsprint	31.8	51.2	38%
Corrugated board (unbleached)	27.1	35.5	24%
Steel slab	6.6	34.6	81%
Aluminum ingot	14.1	208	93%
HDPE	18.4	74.9	75%
PET	20.4	76.4	73%
PVC	15	58	75%
Glass	10.7	22.5	52%

Elegantly Simple



Light Elements

- First 100% PCR - HDPE jar
- Use of PP tool to run PCR - HDPE
- Bottles 100% PCR PET and 80% PCR PE



Brilliant Re-launch

- Light weighted
- 100% PCR



#3: Eliminate Toxics



- ▶ Heavy metals
 - ▶ Cadmium
 - ▶ Hexavalent Chromium
 - ▶ Lead
 - ▶ Mercury
- ▶ Endocrine Disruptors
 - ▶ Certain Phthalates (in PVC)
 - ▶ Bisphenol-a (polycarbonate)
- ▶ Chlorine bleaching (paper, linerboard, corrugated)
 - ▶ changing from bleached to unbleached paper or paperboard reduces energy consumption and organo-halide pollution.

#4: Examine the packaging system



- ▶ The Packaging System:
- ▶ Primary (bottle & cap), secondary (corrugated), tertiary materials (stretch wrap)
- ▶ Energy use & equipment to package product
- ▶ Transportation

- ▶ Stonyfield Farm example
Optimizing the entire product delivery system





“We’re encouraging people to become involved in their own rescue.”

#5: Design for Recyclability



Simple design choices affect recycling efficiency and product quality

Use of base attachments on PET soda bottles reduces yields 10-20%

	Use	Avoid
Paper	water-based adhesives vegetable based inks aqueous varnishes	UV varnishes thermography plastic laminates
Corrugated	oil-based barriers uncoated top layer	waxed corrugated Coated top layers



Plastic: APR Design Guidelines



The Association of Postconsumer Plastic Recyclers



	PET	HDPE	Pigmented HDPE	Polypropylene	PVC
PVC/PET Attachments					
	No PVC	No PVC	No PVC	No PVC	No PET
Closures/Closure liners Attachments					
Preferred	PP; HDPE & EVA with plastic			HDPE, LDPE or PP; unpigmented or same color as bottle; No liners, no residual rings, no attachments	
Undesirable	PVC and Aluminum; EVA with plastic			Metal closures	
Basecups/Adhesives					
Preferred	No Basecups			N/A	N/A
If Basecup is used	Water-soluble adhesives or ones dispersible at temperatures between 140° and 180°F			N/A	N/A
	Unfilled HDPE or clear PET				

- ▶ Sleeves & Safety Seals
- ▶ Labels & Adhesives
- ▶ Direct Printing
- ▶ Inks & Adhesives
- ▶ Layers & Coatings
- ▶ Non-detaching components

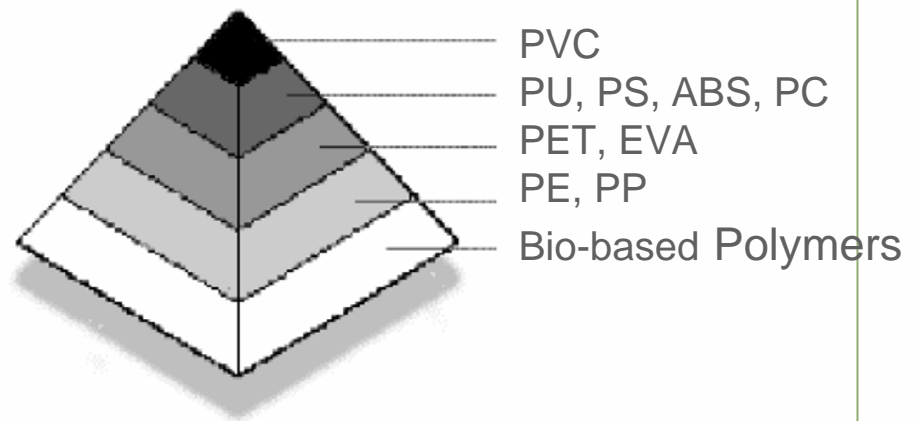
www.plasticsrecycling.org

#6: Use the Plastics Hierarchy



Aveda's Preferred Plastics Hierarchy

Most Preferred	High Density Polyethylene (HDPE) Low Density Polyethylene (LDPE)
Acceptable	Polyethylene Terephthalate (PET) Ethylene Vinyl Acetate (EVA) Polypropylene (PP)
Least Preferred	Polyurethane (PS) Acrylonitrile Butadiene Styrene (ABS) Polycarbonates (PC) Acrylic
Prohibited	Polyvinyl Chloride (PVC)



Eliminate PS & PVC – they only serve as contaminants to PET

#7: Minimize Where Possible



Strategy	% in total energy
25% recycled HPDE plastic bottle	6
25% consumer recycling	7
Triple-concentrate (3x) in existing container	67
Single strength (1x) product in soft pouch (PET and LDPE laminate)	32
Triple-concentrate (3x) product in soft pouch (PET and LDPE laminate)	77
Triple-concentrate (3x) product in paper gable top carton (paperboard/LDPE)	72



#8: Reusable Packaging

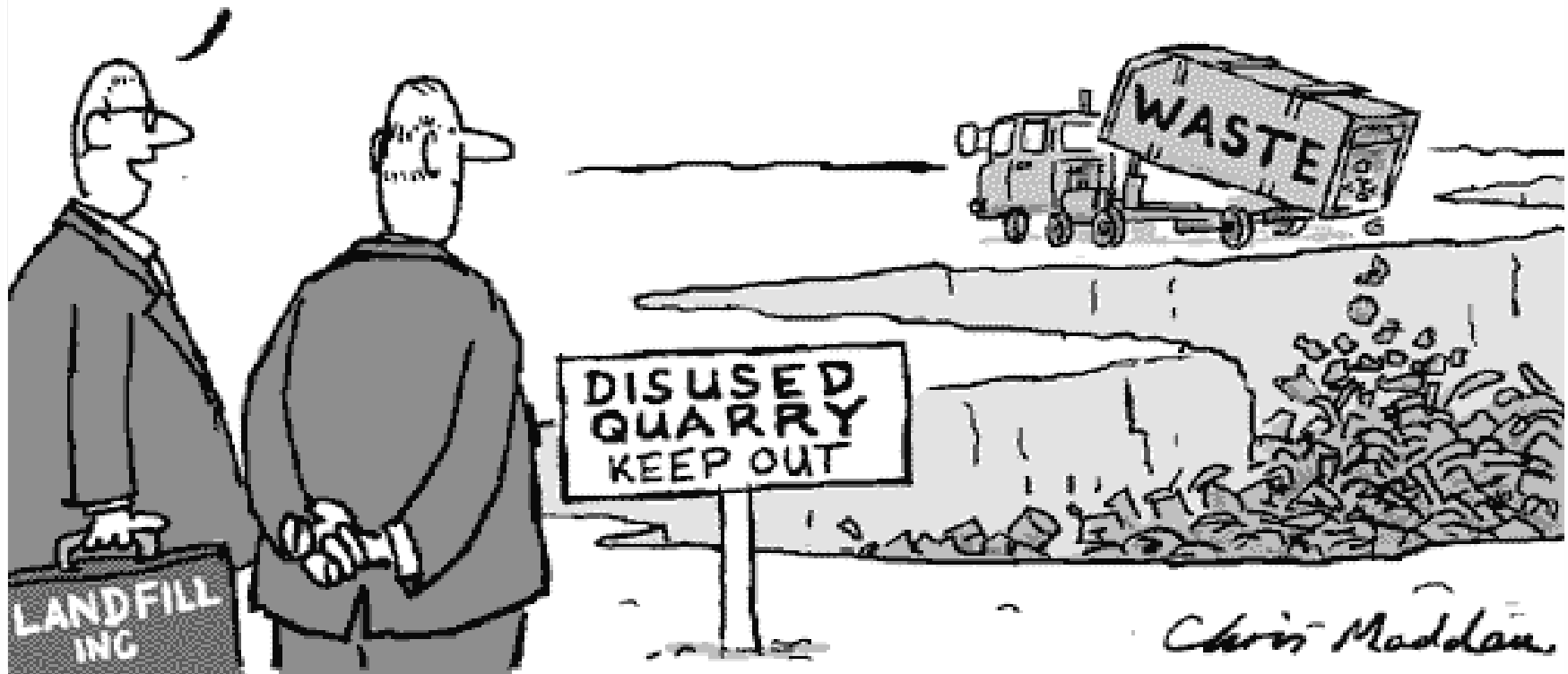


- ▶ 1/3 of soft drink packaging for mineral water and wine in the European Union is refillable.
- ▶ 90% of glass and PET beverage bottles in Denmark, Finland, Germany and Sweden are refilled.



Source: Container Recycling Institute

The original inhabitants of this land had a saying -
'Every time you take something from the Earth,
you must give something back.'



Misinterpretation

#9: Design for Compostability



Day

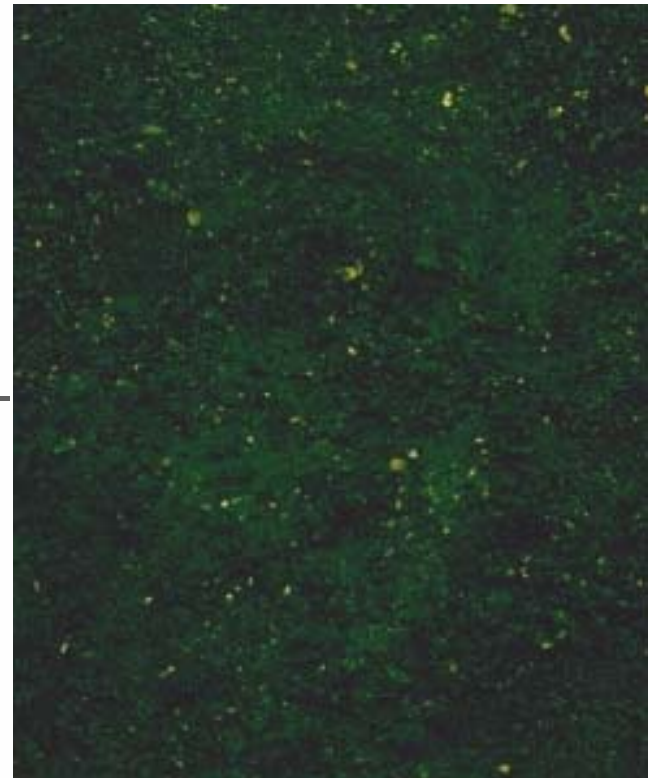
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PLA: Requires high temperature and moisture found in municipal compost systems

Meets composting standards: DIN 54900-1; EN 13432; ASTM D 6400, GreenPLA



Biodegradable packaging tape
Bioflex 219-F



#10: Reduce Unnecessary Packaging



Moving Forward



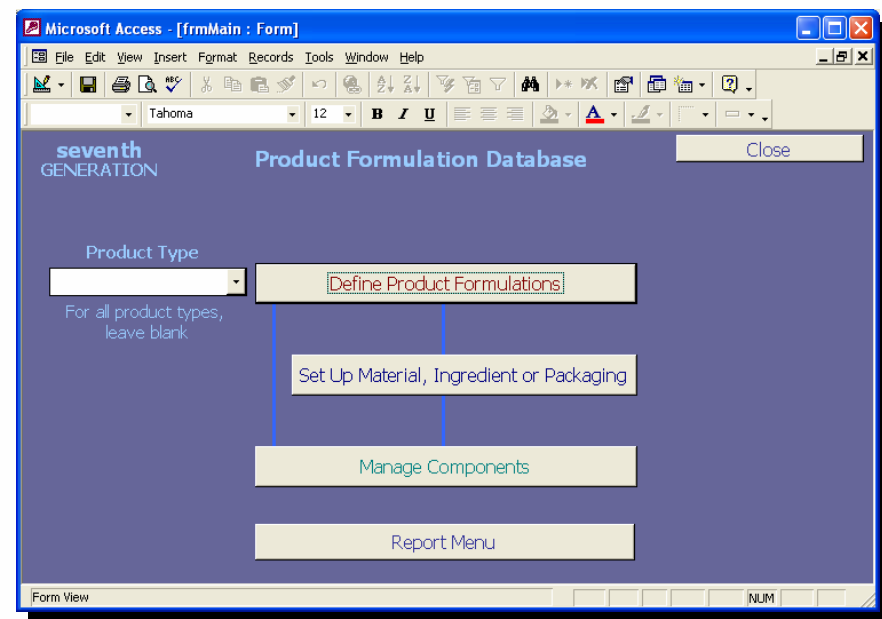
► Know thy packaging

- All packaging materials
- Weights & dimensions
- Supplemental: Inks, attachments

► Partner with Packaging Suppliers

► Near term improvements

- Eliminate unnecessary packaging
- Increasing recycled content
- Eliminating chlorine bleached components
- Adhesives, inks and finishes to upcycle at the end of life
- Review APR Design Guidelines with packaging supplier



Forward Moving



- ▶ Long term redesign opportunities
 - ▶ New packaging design, bottle molds
 - ▶ Product reformulation to concentrate product
 - ▶ More sustainable plastic choices

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Resources



- Sustainable Packaging Coalition
www.sustainablepackaging.org
- ▶ Association of Postconsumer Plastic Recyclers
www.plasticsrecycling.org
- ▶ APR Design for Recyclability Guidelines
http://www.plasticsrecycling.org/technical_resources/design_for_recyclability_guidelines/index.asp
- ▶ Sustainable Packaging Alliance
www.cfd.rmit.edu.au/programs/sustainable_products/sustainable_packaging_alliance

“It took Britain
half the resources of the planet
to achieve its prosperity;

how many planets will a
country like India require...?”

Mahatma Gandhi

[when asked if, after independence,
India would attain British standards of
living]





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