

Cover Story



"I just want to say one word to you
just one word Are you listening?....
Plastics. There is a great future in plastics.
Think about it."

— The Graduate, 1967

The Canadian plastics industry grew by 45 per cent between 1986 and 1997 — a growth rate three times that of other manufacturing industries and second only to electronics. With a total capacity of about 3.5-million tonnes of resin per annum, this economic behemoth accounted for \$35.9-billion of economic activity last year.

Plastic is truly ubiquitous; 34 per cent of it is used in packaging, 26 per cent in construction, 18 per cent in the transportation sector, 5 per cent in the electronic goods sector and another 5 per cent is consumed by furniture manufacturers. In the United States, demand for PET bottles and jars has experienced double-digit compound annual growth rates for nearly a decade. This is not surprising when one considers that plastic is a light, flexible, durable and versatile packaging material.

So what's the problem?

The economics of recycling plastic are dismal. Low recovery rates and weak and fluctuating demand continue to undermine the establishment of large-scale, high-throughput recycling operations that could make quality recycled resins cost competitive with their virgin counterparts.

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Recovery and supply

According to figures released by the U.S. EPA in 1998, plastic packaging — once sold — was only recovered at a rate of 9.7 per cent, most of which is attributable to HDPE and PET bottle recovery (see chart 1). Plastics packaging recovery in the U.S. ranked among those materials with the lowest recovery rates, in sharp contrast with packaging materials such as paper and board, glass, aluminum and steel, with respective recovery rates of 55, 29, 44 and 57 per cent. In real terms, total plastic recovery has declined as rates have not kept pace with growth in consumption (see chart 2 and figure 1). While the plastics recycling industry can process about 1 billion pounds (or 454,500 tonnes) of PET and HDPE annually, it doesn't receive nearly as much in supply.

Robin Cotchan, director of the Association of Postconsumer Plastic Recyclers (APR) cites the critically low supply of PET and HDPE: "Some plants that should be running 5 to 7 days per week are running 3.5 days a week. With less recovery, we can't meet demand and we risk losing end-markets for material." Cotchan attributes the decrease in supply largely to the inability of recycling programs to capture enough discarded plastics.

Ontario's curbside collection program — one of the oldest in North America — was founded more than fifteen years ago. Since then almost every province in Canada and nearly 10,000 communities in the United States have implemented curbside or depot recovery programs. In addition, ten U.S. states and eight Canadian provinces operate deposit-return programs for beverage containers. While deposit-return programs yield the highest

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Where Is
**PLASTIC
PACKAGING**
Leading Us?

by Clarissa Morawski

recovery rates for waste plastic bottles, the overall North American recovery of plastics remains very low, because many jurisdictions rely on less effective recovery mechanisms.

The Recycling Council of British Columbia (RCBC) recently administered a baseline study to record the quantities of household rigid plastic containers generated, recovered and discarded in that province. For purposes of the study rigid plastic containers were defined as bottles, jars, tubs and lids used for food, beverages and non-food household applications.

Using a material flow approach (wherever possible) to estimate the generation of plastic from producer to final disposition, the analysis shows that PET plastic beverage containers (the largest category of household plastic containers) have a recovery rate of 66.6 per cent through B.C.'s newly implemented deposit-return program. (It should be noted that the program is less than two years old, which may account for its relatively low recovery rate compared to similar programs in Canada.)

Plastic containers recovered through curbside programs experience lower return rates. HDPE bottles (used for detergents and household cleaners) are recovered at a rate of 13.4 per cent, four-

litre HDPE milk jugs at 62.5 per cent and wide-mouth containers at 33 per cent.

Helen Spiegelman, head of the Society for the Promotion of Environmental Concerns (SPEC), notes, "Containers that are recovered and recycled at the highest rates are those recovered through the industry-run deposit-return program. Also, containers

"This will mean more plastics that are difficult to collect and process, harder to market for recycling and more expensive for whomever is paying for the program."

that are affected by recycled content regulations (in western U.S. states) and designed for recycling (natural HDPE) are in strong demand and are recovered and recycled at higher rates. The weakest performers (all other ridged containers) are being managed at the taxpayer's expense through curbside collection and depot

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recycling with no incentive for recovery, no industry financing and little demand for the material collected.”

The demand problem

The relationship between supply and demand is best characterized by the commercial conundrum facing The Eastman Chemical Company (one of the largest PET recyclers in North America). In a recent press release, Eastman announced



that the new depolymerization recycling trials will only be economical if demand for recycled content increases and bottle makers are willing to pay a premium. While the technology exists, Eastman is shelving it until the economics improve.

Says Chairman Earnest Deavenport, “It’s not commercially feasible to develop that [a depolymerization plant] unless the public demands recycled content.”

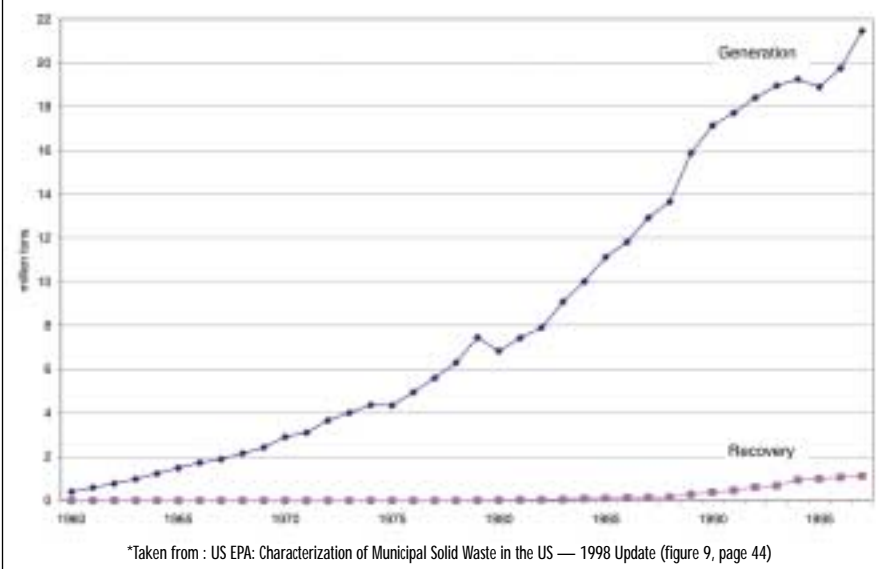
Thomas Smith, vice president of Eastman adds, “The reality is we need something in place better than it is today or somebody is going to legislate something. I don’t know whether that is bottle bills or not, but collectively all of us have to come up with something.” According to Smith, the plastics recycling rate needs to increase.

One option for jump-starting demand is recycled content legislation. As an example of where this has worked, both actual legislation and the threat of legislation on newsprint have driven up the demand for recycled fibre dramatically in Canada and the U.S.

Recycled content legislation for plastics packaging is scarce; California, Oregon and Wisconsin have legislation that mandates 10 to 25 per cent recycled content in plastic containers and California has a regulation that mandates 30 per cent in plastic trash bags. On the surface this may seem like a drop in the bucket, but recyclers from as far as Canada, especially in the West, benefit from the increased demand for post-consumer resin. Last year, SPEC developed a draft provincial recycled-content regulation for B.C. The regulation would see mandatory use of 10 per cent recycled content in household rigid plastic containers used for products (not including food, pharmaceuticals and cosmetics).

According to the Environment and Plastics Industry Council (EPIC), if recycle content is legislated, a number of

U.S. Plastics Generation and Recovery — 1960-1997



important issues need to be addressed. For example, first there’s the question of how far reaching the legislation will be, and how it would affect importers and distributors. EPIC contends that legislation could affect Canada’s ability to compete internationally.

Another issue is whether there exists enough post-consumer material, and how to encourage municipalities to provide it clean and contamination-free. “The fact

remains that industry’s largest players have voluntarily chosen to use post-consumer plastics in those applications where it makes economic and environmental sense,” says Cathy Cirko, director general of EPIC.

In the U.S., the newest waste diversion initiative to hit the public policy scene is a municipal council pushing for recycled content. Last year the City of Los Angeles passed a series of resolutions urging com-

Total Plastics in Containers & Packaging, 1998

US Environmental Protection Agency — Office of Solid Waste

Product Category	Generation	Recovery	Recovery rate
Soft drink bottles			
PET	820	290	35.37%
Milk and water bottles			
HDPE	700	220	31.43%
Other plastic containers			
PET	720	70	9.72%
HDPE	1220	150	12.30%
PVC, LDPE/LLDPE, PP, PS, Other	390	neg.	neg.
Bags, sacks and wraps			
LDPE/LLDPE	2,320	120	5.17%
PVC, HDPE, PP, PS, Other	1,140	30	2.63%
Other plastics packaging			
Includes coatings, closures, caps, trays, shapes etc. (all resins)	2,580	80	3.10%
TOTAL	9,890	960	9.71%
HDPE = High density polyethylene LDPE = Low density polyethylene LLDPE = Linear low density polyethylene PET = Polyethyleneterephthalate PP = Polypropylene PS = Polystyrene PVC = Polyvinyl chloride			

In thousands of tons by resin.

Neg = less than 5,000 tons or less than .5%

Taken from: US EPA: Characterization of Municipal Solid Waste in the US — 1998 Update (from table 7, page 42)

panies like Coca-Cola to “commit to use significant amounts of recycled PET in their bottles for markets, thereby closing the loop and getting the best and highest use out of their bottles as well as returning a measure of profitability to the public and private recycling operations.” A similar motion was carried that concerns the Miller Brewing Company (which recently launched an amber PET beer bottle).



More recently, LA city council passed a unanimous resolution that all future beverage-vending contracts be restricted to those beverages in containers with significant quantities of post-consumer recycled content. San Francisco’s council is considering a similar ordinance.

Earlier this year, Coca-Cola announced that it would commit to 2.5 per cent recycled content in its bottles (10 per cent in 25 per cent of its bottles). But the company warns that it will not be easy to meet its commitment because it is constrained by *availability* of recycled plastic — an ironic statement given Coca-Cola’s staunch opposition to deposit-return systems, which would generally double the amount of resin available.

While there still remain obstacles to recover and recycle common plastics such as PET, the number of complex new plastics in the packaging market continue to increase unabated. At a recycling workshop in Ontario last year, the U.S.-based Graham Packaging Company reported that the global market place will see more single-serve sizes, color-tinted packages and custom-shaped bottles for milk, yogurt, juice and beer. In addition, there will be new polymers and multi-polymer barrier bottles with resin identification code #7 (not acceptable in most recycling programs).

This will mean more plastics that are difficult to collect and process, harder to market for recycling and more expensive for whomever is paying for the program. With the exception of those provinces or states with expanded deposit legislation, the bulk of these containers are collected

Total Plastics in MSW, 1998

US Environmental Protection Agency — Office of Solid Waste

Product Category	Generation	Recovery	Recovery rate
PET	2,230	390	17.49%
HDPE	4,960	440	8.87%
PVC	1,370	neg.	neg.
LDPE/LLDPE	5,340	140	2.62%
PP	2,840	170	5.99%
PS	2,170	20	0.92%
Other resins	3,460	50	1.45%
TOTAL	22,370	1,210	5.4%

HDPE = High density polyethylene
 LDPE = Low density polyethylene
 LLDPE = Linear low density polyethylene
 PET = Polyethyleneterephthalate
 PP = Polypropylene
 PS = Polystyrene
 PVC = Polyvinyl chloride

In thousands of tons by resin.
 Neg = less than 5,000 tons or less than .5%
 Taken from: US EPA: *Characterization of Municipal Solid Waste in the US — 1998 Update* (from table 7, page 42)

for recycling or disposal by municipal governments, where it is the taxpayer who carries the financial burden. These programs provide manufacturers no incentives and no encouragement for innova-

specialized polymers can be mixed with other standard plastics containers.

Consider a March 1999 report by the Ontario Association of Municipal Recycling Coordinators that concludes that,

“But the company warns that it will not be easy to meet its commitment because it is constrained by availability of recycled plastic.”



tive environmentally friendly packaging design.

Dr. Fred Edgcombe of EPIC says, “Containers made with new resins and multi-barriers are primarily used in niche markets for highly specialized applications. These packages are more expensive, so initially the volumes will be small.” With regard to recycling, Dr. Edgcombe maintains that eventually testing will be required to assess whether these new,



“Careful evaluation and consideration is needed before new plastic materials are added to a recycling program,” and, “...collection and processing of more and more plastics is currently a dead end.”

Given current economics, you could say that there isn’t a great future in recycling plastics. For collectors, processors and public policy makers it’s definitely something to think about. ♻️

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