

The whole package?

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Advocates of EPR for curbside materials have noted the producer-funding approach encourages recycle-friendly design and system efficiency. But one academic researcher in Canada calls those points into question.

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Extended producer responsibility remains a highly contentious yet misunderstood topic, particularly as it pertains to packaging materials.

EPR schemes task producers (or first importers) of a good with the physical and financial responsibility for managing that material at end of life. While EPR can take multiple forms and arrangements, the overarching objective is to focus on the end-of-life treatment of consumer products, with the aim to increase the amount of product recovery while simultaneously minimizing the environmental impact of waste.

EPR frameworks exist for a range of waste streams and are largely seen as the preferred policy option for jurisdictions across Canada and in some nations abroad. Increasingly, a number of policymakers, producers and even the public have come to accept that EPR is an inevitability. And to many, it is perceived as a welcomed change.

However, the impact of EPR – in economic, environmental and social terms – is very much contingent on how a program is implemented and how we choose to define the goal of a waste management system. When we look objectively at goals, outcomes and different waste streams, we start to see EPR may not always be the wisest approach.

The intentions of EPR

When it comes to EPR for printed paper and packaging, programs tend to promote “recycling based” outcomes. In other words, they are generally geared toward maximizing recovery of products to move material back into the manufacturing pipeline. This is the packaging recovery model adopted by both Ontario and British Columbia (the latter of which has been championed as a “best practice” model for EPR across North America).

Before continuing though, let’s pause for a moment to better understand what EPR is intended to do:

Encourage design for the environment: By forcing producers to bear the end-of-life management costs and meet recycled-content quotas, the expectation is that producers will design their packaging in such a way that will make it more readily recyclable given existing infrastructure.

Contain costs: By shifting end-of-life management costs onto producers, EPR aims to incentivize those producers to use more readily recyclable material – but to do so in a way that minimizes material management costs. If producers are obligated to “foot the bill” of the entire system, then they have a greater incentive to reduce costs than they would in a model where municipalities pay. This “steward lead” EPR model is what is used in British Columbia’s Recycle BC system, and what is being considered for implementation in Ontario.

Invest in recycling infrastructure to more efficiently capture and recycle lightweight materials: Under a full producer responsibility model, producers are tasked with the responsibility of operating the entire system, which not only includes a financial obligation, but a physical one. Previously, municipalities have traditionally served as the waste management operator, providing collection and sorting services. A full EPR model expects producers to invest and develop infrastructure that allows them to meet their legislative responsibility, which in turn will result in investments in collection and sorting infrastructure to better handle problematic materials.

Develop robust markets for composite and lightweight packaging materials: Despite the increased proliferation of lightweight packaging, there remain few viable end markets for these materials. As such, if an EPR model is implemented that obliges producers to recycle their packaging, they will have to develop new and innovative ways to use these materials.

With the above in mind, it’s clear why EPR has gained traction among policymakers and others wanting to improve end-of-life management of packaging materials at a time when recycling economics have been facing unprecedented pressures. More recyclable packaging, innovations in waste management infrastructure, all at a reduced cost to taxpayers. It seems like an easy choice.

Unfortunately, if we carefully examine each of the aforementioned objectives and use data to determine whether producer responsibility helps achieve them, we find EPR in its current form actually tends to achieve the exact opposite.

Recycling at all costs

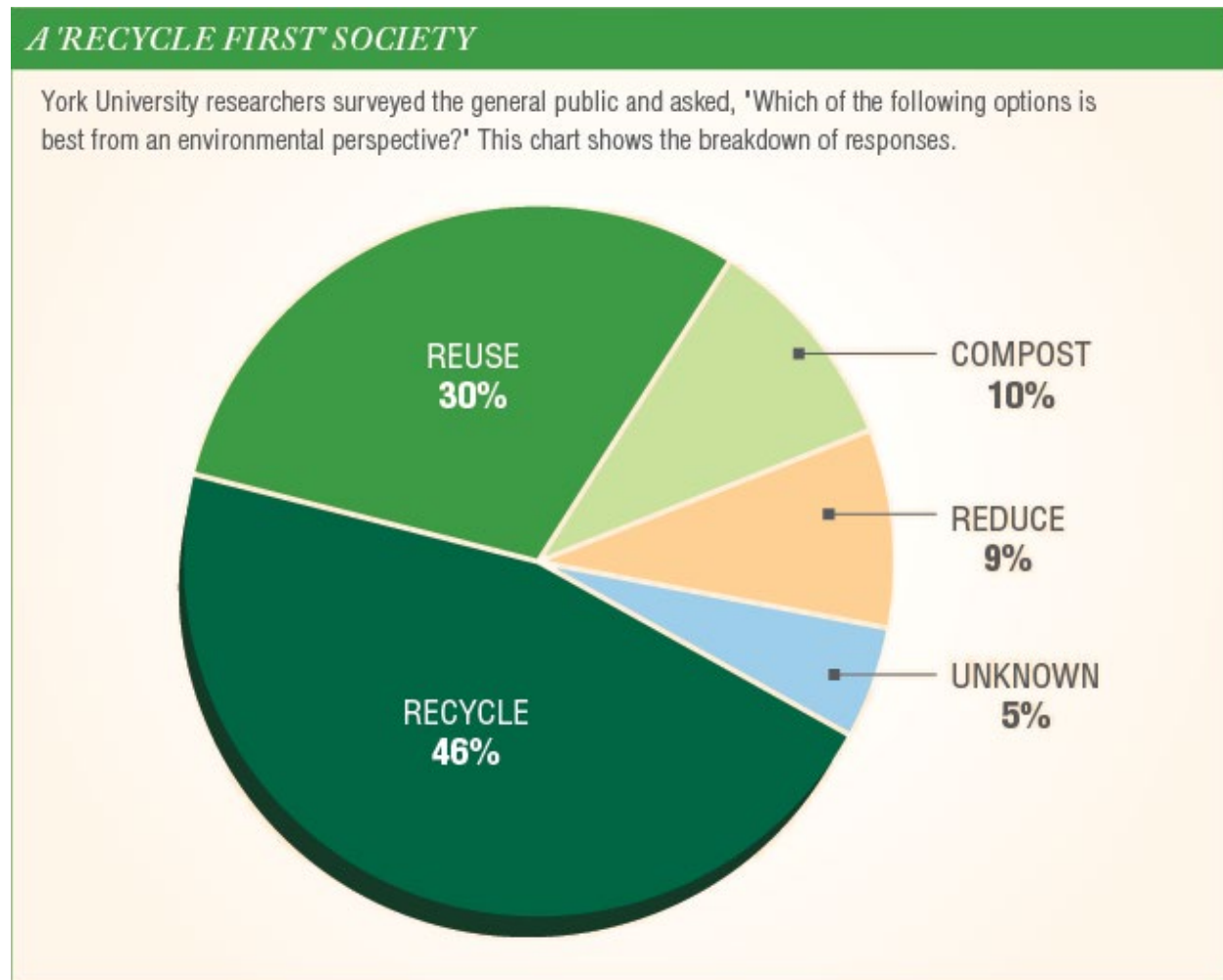
For much of the past three decades, waste management in Canada has largely been defined by our recycling programs, with the blue box at the curb seen as an international symbol of our leading approach to sustainability.

However, in many ways, we have become a victim of our own success: **Both households and policymakers now conflate recycling with sustainability**. When discussing the “waste” problem, we often hear statements about how only 9% of plastics are recycled. When we talk about goals, we often hear about a collective desire to create more recyclable packaging, encourage households and industry to recycle, and hit higher recycling rates.

The premise of our EPR programs for packaging waste emphasize “recycling” as being the desired outcome for end-of-life materials. Ultimately, if it can’t be recycled, it is characterized as being “bad” for the environment.

That viewpoint is now the norm among the general population. During the summer of 2019, York University conducted a study to ascertain what the public thought about various waste management initiatives. Participants were asked to rank, from best to worse, which end-of-life scenario resulted in the greatest environmental impact. The results can be seen in the chart below.

Recycling emerged as the “best” approach among respondents, followed by reuse, and then composting. In last place was waste reduction.



Interestingly, this value hierarchy among respondents runs contrast to the waste hierarchy put forth by the U.S. EPA and others. “Reduce, reuse, recycle” isn’t just a catchy phrase – it is the order in which we are supposed to do things. Recycling should be the third option.

Our fixation on recycling, as both consumers and policymakers, is what makes our waste management system unsustainable. EPR programs premised on recycling-based outcomes have not and will not reach their multifaceted goals.

We can look to the packaging EPR program in British Columbia for a telling example of this reality.

The Recycle BC program is often touted as a pioneer on EPR for packaging. Because of its perceived success, it is seen as a potential model to be replicated in Ontario and other jurisdictions across the United States.

Late last year, York University undertook a detailed study examining the economic and environmental performance of Recycle BC recycling program for printed paper and packaging waste, comparing it to Ontario’s Blue Box program.

It’s important to stress that this study used publicly available from Recycle BC’s annual reports. There was no data manipulation – the research team merely organized the data in a way to facilitate year-over-year comparisons or to calculate correlation coefficients. Our requests for additional data, or clarity surrounding existing data, were not returned by Recycle BC.

In the study, we examined the following:

- Historical recycling performance (weight collected, recovery rate, recovery rate per capita and more).
- Service coverage and cost (including an examination of revenue, fee revenue, investment income and material management costs by activity type).
- The relationship between recovery rates, gross expenditure, service rates and other economic points.
- The types of items being recovered (material mix) and the subsequent environmental impact.

Our findings show that British Columbia program costs have increased by approximately 26% from program inception in 2015 to 2018 while program performance (measured as the percent waste tonnages diverted) has increased by 1%. The most significant driver of cost increases was an increase in per-ton material management costs (measured as the percentage of waste tonnages diverted). Due to the lack of granularity in Recycle BC’s annual reports, the study could not attribute this cost increase to a particular activity, such as collection or processing.

In addition, the rate of year-over-year cost increases between 2015 and 2018 has been greater in British Columbia (26.5%) than in Ontario (18.25%). This was a surprising result, given that the narrative surrounding the efficacy of EPR models is that Ontario is a laggard relative to British Columbia.

In many ways, in fact, British Columbia’s performance is actually strikingly similar to that of Ontario. Most jurisdictions have an equilibrium point, which can best be characterized as the recycling rate a given area is likely to achieve independent of major programmatic change or policy intervention. In

Ontario, it is roughly 60% while in British Columbia it appears to be around 75%. While the reasons for this difference are difficult to isolate, possible explanations include demographic and infrastructural differences between the two provinces (Ontario has a greater proportion of multi-family households, which on average, tend to have lower levels of recycling participation relative to single family households). Anything above this equilibrium point is likely to require significant investments in both infrastructure and outreach, often coming at an extremely high marginal cost. In the case of British Columbia, for every 1% increase in the recovery rate, program costs are expected to increase by \$5.4 million (this and all dollar amounts below are Canadian).

By all available metrics, 2015 was actually the best performing year of the British Columbia program, with an average net cost per tonne of \$334 and a systemwide recovery rate of 78% (compared to 2018, which had a net cost per tonne of \$423 and a system wide recover rate that remained unchanged). Despite the program having time to grow and solidify after 2015, the year of inception has been the most successful (unless you measure it in terms of service coverage).

Lastly, a significant percentage of year-over-year increases in material diversion in British Columbia can be attributed to the recovery of glass. This fact moves into some important discussion around the nuances of recycling's holistic environmental benefits.

While bottle-to-bottle glass recycling (particularly under programs such as deposit return) can result in significant carbon emissions savings relative to virgin production, glass cullet recycling often results in both questionable economic and environmental outcomes.

Increasingly, end markets for recycled cullet are deteriorating while the emissions impacts of cullet recycling can sometimes actually exceed those of virgin production (depending on energy grid mix, recycling process utilized and other variables). It should be noted that due to a lack of available diversion data by detailed material type, it is extremely difficult to quantify the carbon footprint of the Recycle BC program with a great degree of accuracy. At present, the Recycle BC annual reports contain information about only broad "umbrella" categories, such as newsprint, metals, glass and plastics.

However, our preliminary findings suggest that the carbon impact has potentially decreased year over year, given the types of materials being recovered. For instance, the fall in the recovery of metals (a 4% year-over-year decrease between 2017 and 2018 and a 7% decrease overall since program inception) results in a lower overall carbon impact from recycling, despite the increased recovery of glass cullet.

This brings us to a critical insight: The total amount being recycled matters less than what is actually recycled.

Diving into lightweight packaging

One of the greatest challenges facing the waste management industry today is the issue of "the evolving ton." Increasingly, producers of packaging are switching into lightweight and composite materials that historically cannot be readily managed in the existing recycling system.

Many of these lightweight materials are more difficult to collect, sort and process, and they have proven virtually impossible to sell. At present, there are very few end markets or applications for composite and lightweight materials. Simply put, the waste management system was not built for these materials.

This is one of the issues that EPR intends to address. As noted earlier, the feeling among policy supporters is that producers, in an attempt to meet legislative requirements obliging them to recycle, will develop the requisite technology and infrastructure to do so. Producers will be able to develop new markets for these materials, leading to both technological and economic innovation.

While this all sounds wonderful in theory, it has not been borne out in reality.

Why a producer makes the packaging decisions they do is largely a function of economics and safety. Product designers are considering realities around material transport, product protection, maximized shelf life, brand recognition, and more.

All things being equal, the recyclability of a package has historically ranked as a relatively low priority for producers. But that fact doesn't mean the environmental component is being blatantly disregarded. When taking a life cycle approach, the environmental impact of lightweight and composite packaging can actually result in superior environmental outcomes when compared to conventional recyclable packaging.

In a 2019 study conducted by York University examining the life cycle impacts of various food storage mediums, products such as cling wrap, sandwich bags and freezer bags (all made up of difficult to recycle LDPE) abated 10 times more carbon as a result of avoided food waste, relative to a scenario where avoidable food waste was landfilled. This is in spite of the fact that none of the food storage mediums could be recycled in conventional recycling systems and did not contain any recycled content.

Other studies have shown that in some instances, lighter weight materials that are not readily recyclable achieve a lower environmental footprint than their recyclable counterparts. This may seem counterintuitive, but upstream benefits (such as packaging reduction, logistical efficiencies when transporting materials, avoided food waste/spoilage and discretionary consumption) outweigh whatever you lose from not recycling that material.

Our fixation on recycling (and increasing recycling rates) has left us unable to give proper attention to environmental-based outcomes.

Who should foot the bill?

Attempting to recycle the materials in our evolving stream comes at an enormous cost to municipalities, producers and the public. In Ontario alone, the annual costs of the Blue Box program exceed \$300 million, with program costs more than doubling in 12 years.

Year-over-year percentage increases in the cost of managing recyclables are in the double digits (in both Ontario and British Columbia), and any attempts to contain costs have been met with abject failure.

A contention made by municipalities in the past is that the increases observed in the cost of operating the recycling program were a direct result of producers developing packaging that was incompatible with the existing recycling infrastructure. Municipalities have felt that they are “subsidizing” the packaging decisions made by manufacturers, and as a result, producers should bear most, if not all, of the cost for their packaging choices.

Such concerns are valid, but the question remains: Does handing system implementation over to producers actually result in wider benefits? The data shows British Columbia’s program is not as successful as some advocates might suggest. **There is no evidence to suggest that a steward-run EPR model (focused on recycling) is effective in either economic or environmental terms.**

And that makes sense. It’s curious to come to the conclusion that a consumer packaged goods company can run a waste management system more effectively than a municipality. Building a really nifty cookie container, after all, is fundamentally different than identifying efficiencies in waste collection.

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