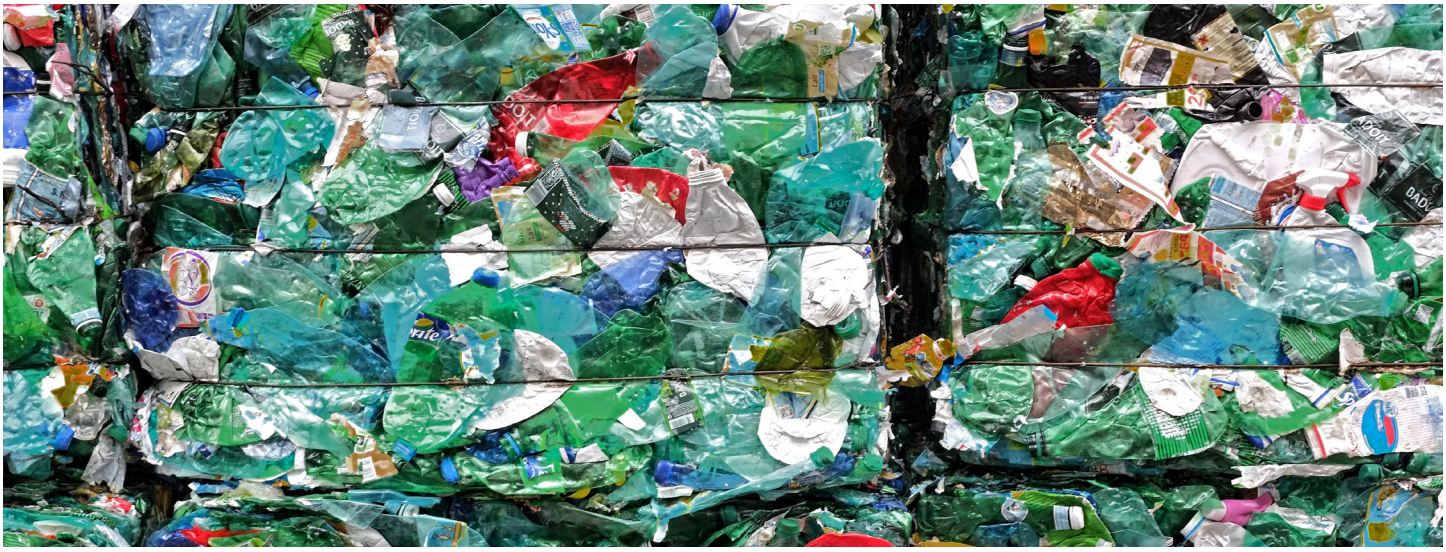
CANADA'S **ECOFISCAL** COMMISSION
Practical solutions for growing prosperity

CUTTING THE WASTE

How to save money while improving our solid waste systems

October 2018



CANADA'S ECOFISCAL COMMISSION

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A group of independent, policy-minded Canadian economists working together to align Canada's economic and environmental aspirations. We believe this is both possible and critical for our country's continuing prosperity. Our Advisory Board comprises prominent Canadian leaders from across the political spectrum.

We represent different regions, philosophies, and perspectives from across the country. But on this we agree: ecofiscal solutions are essential to Canada's future.

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A thriving economy underpinned by clean air, land, and water for the benefit of all Canadians, now and in the future.

OUR MISSION

To identify and promote practical fiscal solutions for Canada that spark the innovation required for increased economic and environmental prosperity.

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EXECUTIVE SUMMARY

Improving how Canadian communities manage their solid waste may not seem like an urgent issue. Every week or two, we put our garbage, organics, and recyclables out for collection and it disappears, never to be seen again. We quickly forget about it and move on with our busy lives, until the next time we do it all over again. But how we manage our solid waste *does* matter.

Solid waste management matters for cities, people, and the environment

The more waste we produce, the costlier it is to manage—particularly for local governments and taxpayers that fund these services. Finding sites for new landfills is also a lengthy and contentious process: nobody wants a landfill near their backyard.

Our solid waste also imposes environmental costs that cannot be ignored. Solid waste can contain toxic or hazardous substances that cause environmental damage as they degrade in landfills or are incinerated. Landfills emit roughly 20% of all Canadian methane emissions and are a significant contributor to global climate change. When our waste ends up as litter, it accumulates in our forests, waterways, and oceans where it pollutes and degrades fragile ecosystems.

Canadian communities can clearly improve how they manage their solid waste. On average, each Canadian throws out about 400 kilograms of solid waste each year, most of which ends up in landfills. When factoring in commercial waste, this figure rises to nearly one tonne of waste generated for each Canadian—nearly double the amount of waste generated by those in other high-income countries. Canadians make up 0.5% of the world's population yet produce about 2% of the world's municipal solid waste.

Ultimately, we must improve the *efficiency* of our waste management systems

Given this performance, it is perhaps unsurprising that municipal and provincial waste management policies have focused on *diverting* more waste—through organics and recycling programs—and *disposing* less. Indeed, municipal and provincial waste diversion targets have become a central, driving force of policy development.

Yet the economics of waste management are complex. Increasing diversion is important but is not always the best or only solution. Depending on the local context and existing service levels, diversion can be expensive: some recycled materials have a low value relative to the cost of collecting, sorting, and processing them. In other cases, recycling technologies that sort and process materials are still developing and are costly to deploy. Diversion systems also have an environmental footprint, albeit typically smaller than waste disposal systems.

Preventing waste from being generated in the first place is another key solution. However, there are limits to how much waste consumers and producers are willing or able to eliminate. Measuring progress on waste prevention is also far more challenging than measuring progress on disposal and diversion.

This report argues that we should reframe our waste management objectives. Rather than simply seeking to reduce waste disposal (or increase diversion), we should seek to improve

the efficiency of our waste systems. Creating efficient waste management systems is about achieving a socially optimal balance between waste disposal, diversion, and prevention—a balance that delivers greater benefits at lower costs. Critically, this includes assessing all costs and benefits in waste systems, including both financial and environmental factors.

But there is no single model of an efficient waste management system: describing efficiency in practice is challenging. An efficient balance between waste disposal, diversion, and prevention depends on many factors, including local context, current states of technologies, and even international markets for recyclable materials.

In practice, we argue that the best way to improve efficiency is to make waste management systems work more like well-functioning markets.

Addressing six distinct—but interrelated—problems provides a map to making waste systems more efficient

As we find in this report, however, waste management markets are *not* normal, well-functioning markets. Prices for waste management—where they exist—do not reflect the true costs and benefits associated with waste management services and materials.

We identify six interconnected problems that cascade throughout solid waste markets. Each of these issues make waste management systems inefficient:

1. Most Canadian households do not pay directly for waste management

Households typically pay for waste collection through property taxes or as a monthly fee. In other words, the amount residents or businesses pay for waste management has—in many cases—no connection with the quantity or composition of solid waste they generate.

As a result, people tend to generate and dispose more solid waste than they otherwise would if they paid directly for the service. Low waste disposal prices also weaken the incentive to divert waste through recycling or composting.

2. Landfills do not charge large waste generators the full cost of disposal

Waste disposal prices are more transparent for the commercial sector, including businesses, large buildings, institutions, and industry. Commercial waste is typically hauled directly to landfills, where waste generators pay a fee to dump their waste based on the weight or type of waste being tipped.

In many cases in Canada, however, the fee for disposing every tonne of garbage is less than the full cost, encouraging waste generators to landfill more waste than they would otherwise. Fees in Canada often do not reflect the long-term costs of landfilling—that is, the future costs of building new landfill sites when existing ones reach capacity. Similarly, fees often exclude some of the environmental and social costs of landfilling, such as environmental risks to water and soil, greenhouse gas emissions, and impacts on local property values due to odour and unsightliness.

3. The porous boundaries of solid waste management systems make it difficult for municipalities to price waste disposal at its full cost

The boundaries of solid waste management systems are porous. Unlike municipal water and wastewater systems, where municipalities have near complete control over treatment and distribution infrastructure, solid waste systems—and the flows of waste within them—are more decentralized. These porous boundaries can make it difficult for municipalities to charge the full cost of waste disposal and can undermine environmental performance.

First, even though municipalities may want to set tipping fees that reflect the full cost of service, doing so can encourage waste haulers to "export" their waste to jurisdictions where tipping fees are much lower. In Metro Vancouver, for example, where waste disposal fees are relatively high, waste shipments to the U.S. doubled between 2012 and 2015.

Considering that tipping-fee revenues are the primary way to pay for waste disposal systems, waste exports can undermine a municipality's ability to recover its costs. Building, maintaining, and closing landfills is capital intensive, meaning that a large portion of disposal costs is fixed. If waste exports increase, municipalities generate less revenue to cover these fixed costs. This can also undermine environmental outcomes if waste is exported to landfills that are less secure or to waste systems that put less emphasis on waste diversion and resource recovery.

Second, raising the price of waste disposal can encourage an increase in illegal dumping. Most communities already struggle with illegal dumping—in alleys, parks, and forests—which poses a health and environmental risk and is costly to clean up. Without appropriate policies in place, increasing the price of waste management can make illegal dumping worse.

4. Markets alone may provide inadequate waste diversion opportunities for some materials

Municipal governments play an integral role in providing waste diversion infrastructure, particularly for the residential sector. Most municipalities provide curbside recycling, and a growing number now provide curbside organics collection.

Box 1: Improving Waste Management in Calgary, Alberta

To explore the challenges of waste management in practice, and to illustrate the broader ideas laid out in this report, we develop a detailed case study on the City of Calgary, Alberta. It considers the progress that Calgary has made so far, the policies that Calgary plans to implement in the near future, and opportunities for further policies in Calgary and Alberta.

Calgary has made considerable progress over the past two decades. It increased tipping fees at its three landfills to better reflect the cost of service. It also implemented an organics collection program to help divert a significant quantity of waste from its landfills. Finally, Calgary is considering a pay-as-you-throw program for household garbage collection, strengthening the link between how much waste people produce and how much they pay.

Progress at the provincial level, however, has been slower. Most notably, Alberta is the only province that does not have legislated extended producer responsibility (EPR) programs and is falling behind in its commitments under the Canada-wide Action Plan for EPR. If Alberta were to follow the lead of other provinces, such as B.C., and implement full EPR programs, it would make producers financially and physically responsible for managing the waste generated from their products. Such policies could also strengthen waste diversion infrastructure and increase the quantity and quality of waste diversion. An EPR program for residential recycling would also remove the financial burden from municipalities.

Overall, our case study provides a framework for how municipalities (and provinces) can systematically assess their waste management systems. This framework can help governments assess the efficiency of waste management systems and support the development of new policies to further improve those systems, throughout the lifecycle of municipal waste.

But why do governments provide these services or require that industry provide them? If recovering and selling the resources embedded in waste can generate benefits, why does the private sector not provide more opportunities for households and the commercial sector to recycle and compost?

Issues #1, #2, and #3 are a big part of the problem: waste disposal prices are artificially low and increasing them can be difficult. Disposal prices set the benchmark for other types of waste management. Low disposal prices inadvertently discourage the private sector from capitalizing on new waste management opportunities.

Yet even if waste disposal were priced according to its true cost, the private sector would not necessarily provide adequate diversion alternatives. Collection and management systems for waste disposal and diversion often make financial sense only when operated on a broader scale. Achieving this scale can be difficult, particularly in small, rural, and northern communities.

Another reason is that providers of waste diversion services have limited control over how residents and businesses sort and manage their waste before it enters the solid waste collection system. Municipal recycling and organics programs, for example, rely on residents to sort their waste according to the local requirements. This lack of control causes persistent contamination issues at recycling and composting facilities, which can increase processing costs and make the end product less valuable. As a result, contamination can deter the private sector from providing more waste diversion services.

5. Municipal pricing policies have limited effect on goods manufacturers

If waste management services were priced according to their full cost—in all jurisdictions—consumers would have clear incentives to purchase goods made with fewer materials or materials that are easier to recycle or compost. Producers, in turn, would have incentives to design and manufacture goods that generate less waste.

But even if *individual* municipalities charged residents directly for waste disposal, and even if these prices approached the full cost of

the service, prices would have a negligible impact on the decisions of upstream producers. Waste is priced locally, and municipalities are too small to affect the decisions of manufacturers in other provinces or countries. Only disposal pricing in a large number of municipalities, globally, would increase demand for goods with less disposable waste.

6. Extracting and processing natural resources generate negative environmental externalities further upstream

The majority of materials and consumer goods produced in the economy use virgin materials, extracted and processed from the natural environment. These processes, however, can cause significant environmental damages that are unpriced or underpriced in markets. In other words, the firms extracting and processing these materials do not pay the full cost associated with these upstream processes.

Underpricing upstream environmental damages effectively subsidizes the use of virgin materials and distorts markets further downstream for recycling, reuse, and prevention. Firms have an incentive to use more virgin materials and fewer recycled and reused materials in their manufacturing processes.

This last issue, however, is unlike the other five. It refers to a problem that ultimately *affects* waste but is not fundamentally about waste management systems. Other policies—such as carbon pricing or improved financial assurance for resource development projects—are better suited to address these upstream issues.

We make five recommendations for improving waste management in Canada

These issues represent a significant opportunity for municipal and provincial policy-makers. Policies that address the six problems can improve the overall efficiency of waste management systems by allowing our waste systems to rely more on market forces. These six problems—along with recommended solutions—are illustrated in the report's detailed case study on the City of Calgary (see Box 1).

RECOMMENDATION #1
Municipalities should charge tipping fees that reflect the full costs of disposal, including environmental costs

Creating more efficient waste management systems starts with smarter disposal pricing. ***Tipping fees*** are the most common way to price waste disposal both in Canada and internationally. They are the fees that landfills charge on waste brought to landfills—typically from non-residential waste generators. They can vary, based on the type, volume, or weight of the material. Fees can be set by private landfill operators or municipal governments.

Tipping fees that cover the full costs of waste disposal have several main advantages.

First, and most importantly, they can drive waste reduction at a lower cost. Governments cannot know the optimal or lowest-cost waste management options for the thousands or millions of residents and businesses. Tipping fees allow each waste generator to determine the least expensive way of managing their waste. Some waste generators, for example, might spend more time diverting their waste to avoid paying more in tipping fees. Others may be willing to pay the tipping fee and continue to landfill the same amount of material, because the costs of waste diversion are greater than the tipping fee.

Second, tipping fees generate revenues that pay for the service and recover costs. These revenues ensure that waste disposal infrastructure is properly built, monitored, and maintained. They ensure that landfills have the funds to provide the service, and they also help reduce environmental costs. Revenues, for example, ensure that landfills have the required technologies to collect and treat leachate, capture GHG emissions, cap facilities after they close, and regularly monitor operations during and after their lifetime.

Third, aligning tipping fees with the full cost of waste disposal is a fairer way to pay for our waste management systems. Those that dispose of more material, or materials that are costlier to manage, should pay more.

Provinces play a key role in ensuring that landfills charge tipping fees that reflect the full environmental cost of waste disposal. Regulations and standards can require landfills and incineration operations to reduce their environmental impacts, both during operation and after the site has been closed. Waste disposal sites can then pass on the costs of complying with these policies in the form of tipping fees consistent with the full cost of disposal.

RECOMMENDATION #2
Municipalities should implement *pay-as-you-throw* programs and charge households directly for waste disposal

Municipal ***pay-as-you-throw (PAYT) programs*** charge households directly for garbage collection services. They might charge for collection based on volume, weight, or the number of bags put out for collection. Each approach shares a common principle: households that generate less waste pay less. As a result, households have a continuous incentive to dispose of less waste.

PAYT programs can generate several benefits:

- First, less waste disposal in response to higher prices can allow municipalities to defer future landfill costs. Savings can be significant in communities that have limited landfill capacity or that ship waste to neighbouring communities.

- Second, PAYT programs can reduce operating collection costs if residents put out less garbage at the curb (though these savings may be offset by higher collection and processing costs for diverted materials).
- Third, the revenues generated from PAYT programs reduce or eliminate the need to cross-subsidize disposal services through property taxes or other revenue sources.
- Finally, at a broader scale, increased waste diversion can create environmental benefits if greater resource recovery leads to decreased use of virgin materials.

RECOMMENDATION #3
Provincial governments should expand, reform, and harmonize extended producer responsibility programs

Disposal pricing—covered in the two recommendations above—is a necessary but not sufficient step toward efficient waste management systems. Given the set of interrelated challenges described in this report, multiple policies are necessary.

Of the complementary policies considered, we identified ***extended producer responsibility (EPR) policies*** as a key part of efficient waste management systems. EPR programs make producers financially and physically liable for the ultimate management of the materials in the products they produce. These programs, in other words, can ensure that producers have a clear price incentive to improve the way their goods are managed after their useful life. If designed well, EPR programs can also encourage manufacturers to make their goods with fewer materials or materials that are easier to recycle and compost.

Some provincial governments are already making good progress on expanding and reforming EPR programs. British Columbia became the first province to have "full EPR" for all of its programs, making producers fully responsible for managing the waste from their products. Notably, it is the only province that has a full EPR program for its municipal curbside recycling programs, which shifts the financial burden of operating these programs from municipalities to manufacturers.

Progress in other provinces, however, has been slow. Alberta remains the only province without any regulated EPR programs; the Atlantic Provinces have adopted limited EPR programs but have not reached their commitments under the Canadian Council of Ministers of the Environment (CCME) Canada-wide Action Plan for EPR.

Harmonizing EPR programs across provinces should be a long-term objective. EPR programs are administratively complex, especially considering the patchwork of programs across Canada that have developed over time. Streamlining these regulations across Canada can reduce costs, provide a more unified pricing signal for manufacturers, and make these programs more transparent and easier to evaluate.

RECOMMENDATION #4
Provincial and municipal governments should implement policies that improve how organic waste is separated and managed, designed according to their own context

While EPR programs can ensure that manufacturers have incentives to improve how recyclables are managed, extending these programs to organic waste is difficult. As a result, municipalities and provinces may also need policies that specifically target and improve how organics are collected and managed. Generalizing about the best approach to do so, however, is challenging. Specific policies should be chosen according to local context and on a comprehensive analysis of costs and benefits.

For many municipalities, implementing municipal collection programs for organic waste might be a good starting point. Far fewer Canadians have access to curbside organics collection compared to recycling programs, indicating that more progress could be made. The accompanying processing facilities could be built based on community or regional needs, using technologies that range from sophisticated and capital intensive to basic and lower cost. Still, for smaller communities, limited economies of scale could mean that organic collection programs are too expensive. Other initiatives, such as incentives for backyard composting, may be more appropriate and cost-effective.

Provinces can also play an important role. They could, for example, provide targeted and temporary funding for municipal initiatives that cost-effectively divert organics. They could also take a more direct approach by banning all organic waste from landfills, forcing municipalities and landfills to provide alternatives. However, because disposal bans are less flexible than pricing policies, they tend to be a costlier way to divert waste. Such policies should be considered only if provinces can demonstrate that bans can improve overall efficiency.

RECOMMENDATION #5

To improve the evaluation, assessment, and transparency of waste management policies, federal and provincial governments should expand and standardize data-collection methods and make these data more available to the public

The lack of data on waste management in Canada is a big roadblock to improving waste management systems. Limited and inconsistent data make it impossible to answer important questions, such as:

- How many active and inactive landfills exist in Canada?
- What types of environmental protections do Canadian landfills have in place?
- What is the composition of waste being disposed at landfills?
- What is the average tipping fee charged at landfills?
- How many Canadian municipalities use PAYT programs?
- What are the economic and environmental impacts of EPR programs, and how do they compare across provinces?

Some provinces are ahead of others on some of these key areas of data collection. However, all governments in Canada can improve their data resources, especially when it comes to standardizing methods across jurisdictions.

Improving data access and availability is critical for two reasons. First it allows governments and researchers to assess the extent to which our current systems are efficiently managing waste (or not). Improving data, in other words, can help make our performance on waste management more transparent. Second, it helps evaluate the performance of new policies and approaches over time. It can help policy-makers determine how policy changes have affected waste flows and system efficiency, and subsequently to adjust and adapt policies to further improve performance. Better data can also assist with harmonizing policies across Canada.

Ultimately, the case for improving our waste management systems is an economic one. Updates to municipal and provincial solid waste policies can improve the efficiency of our systems, reducing costs and increasing benefits for municipalities, taxpayers, and the environment. See the full report for more details.