



Foresight

Smart Policy Series

INCENTIVIZING LOW CARBON PATHWAYS FOR WASTE

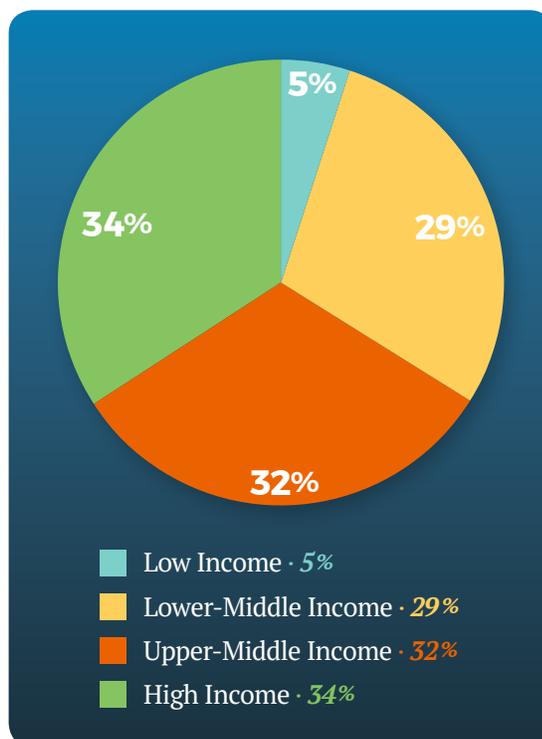




INCENTIVIZING LOW-CARBON PATHWAYS FOR WASTE

Global patterns of production, consumption and trade yield waste, and lots of it. According to the World Bank report Waste 2.0, global waste generation in 2016 was estimated to have reached **2.01 billion tonnes**.¹ Upper middle- and high-income countries generate 66% of this waste (see chart 1) compared to lower income countries. However, this trend is anticipated to change. Economic growth combined with rapid urbanization in lower incomes economies will lead to greater scales of waste overall.

CHART 1
Percentage Share of Waste Generated by Income Level from Waste 2.0



What's more, the majority of global waste disposal practices is causing significant harm to the environment. About 37% of waste is disposed of in some type of landfill, 33% is openly dumped, 19% undergoes materials recovery through recycling and composting and

11% is treated through modern incineration.² News reports from cities in [Russia](#)³ and [India](#)⁴ are showing the consequences of bad landfill and dumping management ranging from water contamination to air pollution. Combine this with the fact that some waste products take longer to degrade such plastic or that landfills emit dangerous air toxins such as methane and we have a serious and complex waste management challenges to solve.

Good waste management is necessary to prevent environmental and health hazards, and ultimately [contributes to a circular economy](#).⁵ This leads us to question what can be done in the short and medium term to prevent waste going to landfill and being openly burned? How can we reduce, reuse and recycle effectively? With Canada being one of the countries that generates the highest amount of waste per capita at 2.21 kilograms per day, what can we learn from cleantech solutions and countries policy mechanisms to rapidly reduce this number.

POLICY & MARKET INCENTIVES

Countries use a variety of policy instruments and programmes to divert waste from landfill or burning. In 2018, the European Union (EU) updated their targets for recycling, packaging and landfilling, as part of the [Circular Economy Action Plan](#).⁶ For example, by 2035 the amount of municipal waste landfilled must be reduced to 10% or less of the total amount of [municipal waste generated](#).⁷ As a means of an incentive to divert waste from landfills, most of the EU Member States apply a form of [landfill tax and/or a landfill ban](#).⁸

EU member governments integrate targets into national policy and prioritize an agenda. It's often the responsibility of local

government to focus on implementation by working together with waste management companies to engage residents, schools and businesses to reduce, reuse, recycle effectively and achieve targets. In the UK, for example, an organization called Wrap leads on sustainable waste management across a number of sectors including food and drink, textiles and electronics working with industry and government. By understanding the systematic problem, they engage necessary stakeholders and use design thinking to implement programmes. Wrap works extensively with local governments on implementation, for example, they've supported efforts in changing consumer behavior to increase recycling rate of plastic bottles from **5% in 2000 to 48% in 2011**.⁹

In low-income countries, there is effort to bring in management and implementation measures early before waste becomes a larger problem than it already is. The World Bank finances a number of policy-strengthening and infrastructure projects in countries such as **Philippines, Vietnam, Pakistan and others**.¹⁰ In Indonesia, a \$100 million loan is supporting a \$1 billion national program to reform waste management practices for around 70 participating cities, impacting around 50 million people. This loan supports local policy development, closure and rehabilitation of old and informal dumpsites, and installation of sustainable disposal sites including landfill gas collection mechanisms.

Up until recently, China was one of the main buyers of recycled paper, plastic and other recoverable materials **from the EU and Canada**¹¹ and would process these materials back into goods to sell to other countries. However, the Chinese government put strict limits on imports of foreign waste this year, forcing export countries to devise a new plan to find **buyers for their recycling waste**.¹² Impacts of this ban will be interesting to follow over the coming years.

WHAT'S HAPPENING IN CANADA?

In Canada, a significant amount of solid waste is **sent to landfill**¹³ which has consequences for the environment. Canadian landfills account for 20% of national methane emissions, a GHG gas 25 times more potent than CO₂ in terms of global warming. It doesn't help that across the country, the amount of solid waste is increasing, by **11% between 2002 and 2014**.¹⁴

Similar to other countries, it appears that local government is at the forefront of sustainable waste management, in 2014 they collectively spent **\$3.3 billion dollars on programmes**.¹⁵ British Columbia has set provincial waste disposal targets with a long-term goal of lowering the municipal solid waste disposal rate to 350 kg per person by 2020. They also plan to recover as much waste as possible upstream and downstream diverting from landfill. Incentives such as the environmental policy 'Extended Producer Responsibility' encourage producers to reduce environmental impact and manage the product across the whole life cycle, from selection of materials and **design to its end-of-life**.¹⁶ The City of Vancouver has initiated a zero-waste policy across the city by 2040 and is adopting a circular economy approach to achieve this target.

CLEAN TECHNOLOGY SOLUTIONS

Business innovation, including cleantech, will help to shift from our current model of linear production to a closed loop model that is circular by design and creates new forms of value. There are a number of companies taking this innovative approach and incorporate resource efficiency into their business model:

- **Biobean**, a company in the UK, has industrialized the process of recycling waste coffee grounds into advanced biofuels, biomass pellets and, in the near future biodiesel.¹⁷

- **Solvay, a chemical group in Belgium**, recycles rare earth minerals to be re-used for cleantech applications.¹⁸
- **Gpak, a Vancouver-based company** developed and patented the first ever 100% biodegradable and compostable coffee pod solution.¹⁹
- **Votechnik in Ireland** automate the safe removal of hazardous waste materials from LCD flat screen panels and monitors.²⁰
- **Anaconda Waste Management Systems**, a Vancouver company, manage and treat organic waste at scale to make compost.²¹

Dealing with non-recyclable waste is a more challenging and requires larger infrastructure in the form of waste-to-energy (WTE) plants. These plants burn household and similar waste that could not be prevented or recycled and in turn generate energy in the form of steam, electricity or hot water. Despite the appearances of ‘burning’ this is a hygienic method of treating waste and should be part of an integrated management plan. A number of plants are **in operation in Europe**.²² However, waste-to-energy would not be required if all products were recoverable through recycling or reuse in their product life cycle. WTE is effective as short to medium term strategy and part of an integrated plan for waste management.

It’s becoming apparent effective management of waste requires require clean technology, business model change and product innovation integrating circular economy principles. This applies to all countries, either high income or low income. These practices will fundamentally transform perception of waste as a problem to waste-as-a-resource.

SPOTLIGHT ON PLASTICS

Awareness of enormous swathes of plastic in oceans, landfills and waterways is causing alarm because of its long-term impact on environment, wildlife and humans.

Countries are beginning to step-up and design policy and targets to prevent further harm. As a member of the G7, the Canadian government committed to the Ocean Plastics Charter in 2018, this includes resolving to take a lifecycle approach to plastics stewardship on land and at sea, aiming to avoid unnecessary use of plastics and prevent waste, and to ensure that plastics are designed for recovery, reuse, recycling and end-of-life management to prevent waste through **various policy measures**.²³ In January 2018, the EU adopted a new **strategy focused on plastics**²⁴ with the hope that this will transform the way plastic products are designed, used, produced and recycled in the EU. In the UK, Wrap is leading **the Plastics Pact**.²⁵ This first of it’s kind programme tackles plastic waste through the supply chain. Their engagement with 68 organizations, including industry, are responsible for up to 80% of plastic packaging sold in U.K. supermarkets.



Endnotes

- ¹ openknowledge.worldbank.org/bitstream/handle/10986/30317/9781464813290.pdf
- ² openknowledge.worldbank.org/bitstream/handle/10986/30317/9781464813290.pdf
- ³ bbc.com/news/av/world-europe-43630798/russians-protest-over-toxic-landfill-near-moscow
- ⁴ newyorker.com/tech/annals-of-technology/the-burning-garbage-heap-that-choked-mumbai
- ⁵ reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/
- ⁶ ec.europa.eu/environment/waste/target_review.htm
- ⁷ europarl.europa.eu/news/en/press-room/20180411IPR01518/circular-economy-more-recycling-of-household-waste-less-landfilling
- ⁸ ec.europa.eu/environment/waste/landfill_index.htm
- ⁹ wrap.org.uk/content/how-wrap-supports-circular-economy
- ¹⁰ worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management
- ¹¹ theglobeandmail.com/news/national/chinese-ban-on-foreign-recyclables-leaving-some-canadian-cities-in-the-lurch/article37536117/
- ¹² politico.eu/article/europe-recycling-china-trash-ban-forces-europe-to-confront-its-waste-problem/
- ¹³ canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html
- ¹⁴ canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html
- ¹⁵ www150.statcan.gc.ca/n1/daily-quotidien/170324/dq170324c-eng.htm
- ¹⁶ www2.gov.bc.ca/gov/content/environment/waste-management/recycling/product-stewardship
- ¹⁷ bio-bean.com/
- ¹⁸ solway.com/en/innovation/open-innovation/european-life-projects/loop-life-project
- ¹⁹ g-pak.com/pages/about-us
- ²⁰ votechnik.com/
- ²¹ anacondasystems.ca/
- ²² cewep.eu/wp-content/uploads/2018/10/EU-Map-2016.pdf
- ²³ g7.gc.ca/wp-content/uploads/2018/06/OceanPlasticsCharter.pdf
- ²⁴ ec.europa.eu/environment/waste/plastic_waste.htm
- ²⁵ wrap.org.uk/content/the-uk-plastics-pact-roadmap-2025%20