

Closing the Loop

Reducing Greenhouse Gas Emissions and Creating Green Jobs Through Zero Waste in BC

SUMMARY

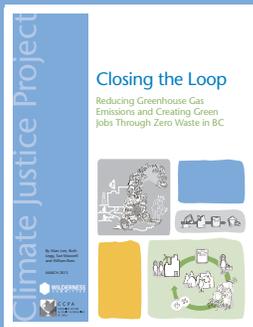
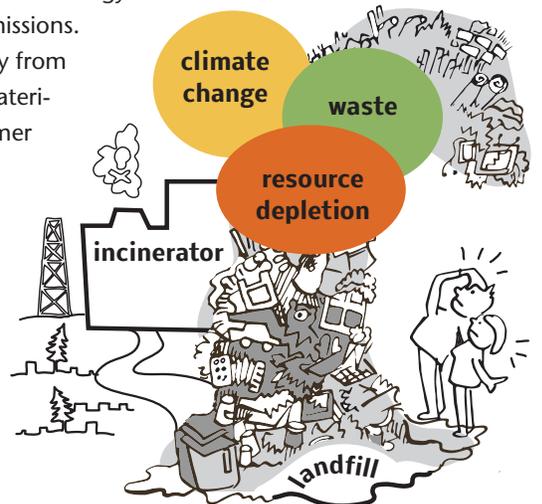
MOST PEOPLE ARE FAMILIAR with the idea that we need to “reduce, reuse, and recycle” to protect our environment. Over the last few decades, waste management programs have made good progress in diverting solid waste from landfills through recycling and composting. But success has been lacking in reducing the amount of waste that is created in the first place, and in re-using materials (like bottles and packaging) before recycling.

This study aims to address the core problem: a culture of consumption and an economic system that is wasteful and that contributes to climate change. It looks at the possibilities for reducing both solid waste and greenhouse gas emissions while maintaining a high quality of life from the products and services we use.

Zero waste policies emphasize upstream, proactive solutions—aggressive materials reduction, re-design, and re-use before recycling and composting. The object is dramatic reductions in the volume of materials that flow through the economy, and therefore reduced energy consumption and greenhouse gas emissions.

Closing the loop refers to the shift away from a linear economic model—where materials are extracted, made into consumer goods, then trashed—and towards a resource recovery model where materials cycle through the economy.

Our culture of consumption is extremely wasteful and contributes to climate change.



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WILDERNESS
COMMITTEE

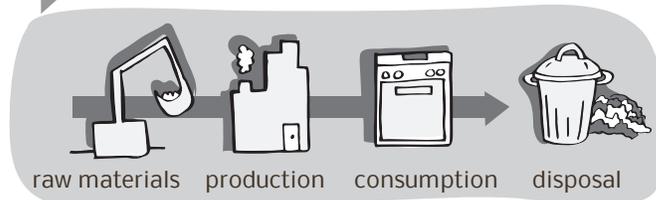


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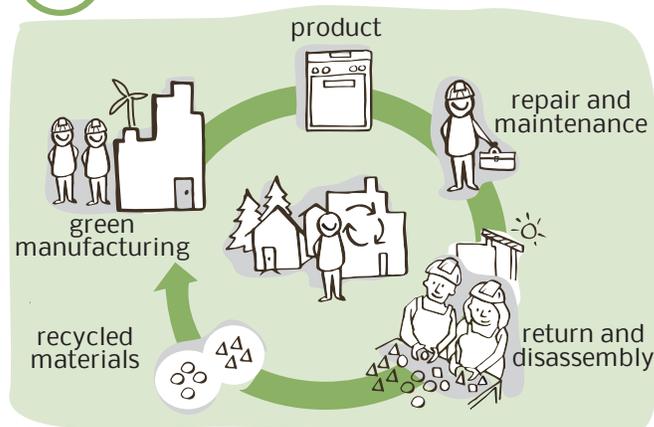
Well-designed policies can also support local economic development and the creation of new green jobs by increasing domestic capacity to manage and add value to the materials that are recovered.

Zero waste policies shift

from linear systems



to closed loop systems



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LANDFILLS, INCINERATION AND GREENHOUSE GAS EMISSIONS

Carbon dioxide is BC's single largest waste by weight—more than 49 million tonnes in 2010, compared to 5 million tonnes of solid waste generated—even though carbon pollution goes into the atmosphere, not a landfill. From a solid waste management perspective, both landfills and incineration pose challenges due to greenhouse gases.

In the case of landfills, methane, a more potent greenhouse gas than carbon dioxide, is released when organic material does not decompose properly:

- Official estimates of BC landfill emissions are about 4 million tonnes of carbon dioxide equivalent (Mt CO₂e) per year—however, our analysis suggests they are likely to be much higher, around 13 to 19 Mt per year.
- More than one quarter of waste going to landfill is compostable organic material. Composting programs, and initiatives like Metro Vancouver's plan to ban organics from disposal by 2015, are recognizing and starting to address this problem.
- Landfill gas can be captured in some cases, and used for energy, but this should be viewed as a short-term measure.

Incineration gives the impression of making waste disappear, but it merely transforms solid waste into ash, gases, heavy metals and toxic compounds. While billed as “waste-to-energy” (WTE), incineration, in fact, wastes the embodied energy that was used in making a product—the energy required for resource extraction and processing, product manufacture and transportation.

BC has one major incinerator in Burnaby, a waste-to-energy facility that processes about 280,000 tonnes of waste per year (about 28% of waste disposed in Metro Vancouver). A planned new incineration facility for Metro Vancouver would handle up to 370,000 tonnes of waste per year. This growing reliance on incineration needs to be rethought:

- Incineration produces the greenhouse gases carbon dioxide and nitrous oxide.
- Official estimates of GHG emissions from incineration in BC (84,000 tonnes CO₂e) are dramatically understated because they do not include emissions from combusting organic materials.
- In terms of GHG emissions per unit of energy produced, incineration is worse than any fossil fuel generation, including coal.
- Incineration often competes with or hinders more progressive solutions like recycling.

REDUCING EMISSIONS BY REDUCING WASTE

Clearly, there are major opportunities for diverting waste from landfill and incineration. Recycling and composting far exceed other forms of waste disposal in terms of mitigating the environmental impacts of solid waste. But there are physical limits to recycling, and plastics, in particular, can be challenging. Only 10% of plastic in BC is recycled, and most of it is “down-cycled” into lesser-grade materials. But far more attention needs to be paid to reducing the amount of waste produced in the first place. Reduction and re-use strategies go beyond recycling by displacing the need for new emissions-intensive manufacturing and transportation.

- Large parts of consumer waste could be transformed by re-use and better product design, from soft drinks to product packaging to food containers to electronic components. Banning single-use containers would also help.
- Requiring extended warranties on durable products and consumer electronics would push manufacturers to provide repair and maintenance, and re-use components.
- Collaborative consumption or sharing has been around for a long time, with public libraries being a good example—some communities are building on this idea with toy or tool “libraries” that decrease resource consumption while building community
- Growth of the Internet has also enabled dematerialization—digital music, video, books and magazines are the most obvious examples—a pure reduction in materials while allowing essentially the same consumption.



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Zero Waste

emphasizes upstream, proactive **SOLUTIONS**



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BUILDING A RESOURCE RECOVERY ECONOMY

For economies like BC, closing the loop is no small task. BC's resource-based economic model has been subsidized through tax credits, low royalty rates, cheap electricity and publicly-funded infrastructure. In addition, some costs of production have been externalized: for example, costs like pollution and climate change are borne by people in general and by the environment, not by the specific producer or consumer.

Many of the materials collected from BC recycling programs are not processed locally, but are treated like just another commodity that BC exports to the US or Asia.

Changes in economic incentives to capture externalized costs like pollution can develop robust local markets and support a resource recovery economy:

- Shift away from encouraging the extraction of raw resources and toward supporting the use of recycled materials and fostering local manufacturing.
- Drive market demand for recycling by addressing key barriers such as a lack of domestic capacity in areas such as carpet, non-refundable glass, and paper.
- Disposal bans or increasing tipping fees for disposal in landfills or incinerators would help drive incentives for recycling.
- Ensure demand for recycled materials through public procurement policies and requirements for minimum amounts of recycled content.
- Encourage the diffusion of business models based on renting and leasing, rather than owning.
- Support cooperative economies and collaborative consumption approaches.

The overall framework for managing how materials flow through the economy may eventually resemble supply management systems like those that currently exist in agriculture, and could be supported by public investments or a Crown corporation if necessary.

Making collection easy for households and businesses should be a priority. Extended producer responsibility (EPR, also known as “stewardship” or “take back”) programs put the onus on producers for post-consumer recycling, but can be confusing for consumers. New requirements for EPR programs can encourage reductions in waste generated by:

- Including higher targets for recovery, consumer awareness and access, and goals for reducing, re-using and repair.
- Requiring better labelling for products.
- Establishing deposit and return systems for containers, packaging and other products.
- Guarding against contamination that makes materials less valuable (most waste experts caution against cheaper “single stream” collection efforts for this reason).
- Tailoring collection systems (curbside pickup, on-street bins, retail return points, or designated depots) to meet the particular circumstances of the product and the regional district or municipality.



DEVELOPING A GREEN JOBS AGENDA

Managing waste for resource recovery has the potential to create green jobs in BC. Repair, servicing and maintenance, and re-using bottles and containers, all create decent work. Sophisticated collection and sorting systems, and redirecting recovered material from export markets toward domestic re-use, re-manufacturing and recycling activities will also support new employment in BC.

Based on research carried out in the US, UK and Europe, we estimate that 100% recycling of BC’s waste, with all sourcing and processing done locally, would support 12,300 direct jobs. With an existing provincial diversion rate of 43%, this would mean about 7,000 new direct jobs. In addition to these, there are also potential jobs gains in the more labour-intensive repair and refurbishment of products.

Because there may be job losses from reduced resource extraction and landfilling and incineration practices, “just transition” programs will be needed that facilitate new skills development. On balance, it is anticipated that job creation impacts would be larger than losses, but policy should actively seek to create those jobs by developing the sectors cited above. Promoting and supporting unionized workforces would push green jobs to ensure decent wages and working conditions.

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BEYOND RECYCLING: NEXT STEPS FOR BC

We consider both reductions in generation (reducing) as well as increases in diversion rates (recycling and composting) in order to model scenarios for 2020 and 2040. We assume a commitment by governments to implement new programs, standards and regulations, most of which are in place by 2020. Changes in product design and robust substitutes for existing products will take longer to phase in, as well as new norms for society's behaviour around conserving materials.

- We estimate a 13% reduction in waste generation by 2020, and a 45% reduction by 2040—a major shift toward decreasing materials and energy throughput in the economy.
- Changes in materials, and source-separated collection systems, push the economy close to 100% recycling of materials by 2040.
- By 2020, reduced generation and more aggressive recycling and composting lead to 4.9 million tonnes CO₂e savings by displacing organics from disposal and reducing the need for energy-intensive extraction and processing activities.
- By 2040 this rises to 6.2 million tonnes.



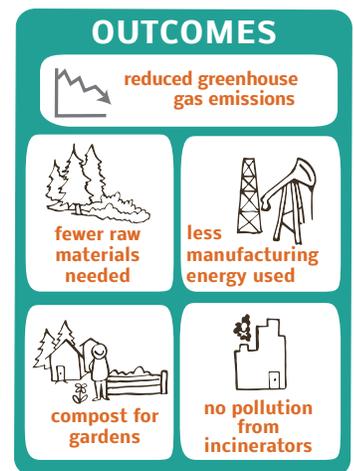
Following the directions laid out in this paper, the next generation of zero waste policy has great potential to help reduce GHG emissions and create green jobs through “closing the loop” on production in BC.

RECOMMENDATIONS

- **INTEGRATE GHG EMISSIONS INTO WASTE MANAGEMENT PLANNING**—BC should establish formal targets for reductions in waste generation as well as increased diversion, and these plans should fully account for GHG implications in concert with climate action. The province should require that regional districts re-draft solid waste management plans in line with zero waste objectives.
- **DO NOT EXPAND INCINERATION (WASTE-TO-ENERGY) CAPACITY**—Incineration has adverse consequences for health and GHG emissions, and requires a steady stream of waste that is inconsistent with zero waste objectives. Even if energy is produced from incineration, it is uneconomic energy as it destroys useful materials that are costly to replace from virgin sources.
- **REQUIRE PROVINCE-WIDE COMPOSTING**—Banning organics from landfills is a top priority in terms of GHG emissions, and will take effect in Metro Vancouver as of 2015. Similar requirements should be applied across BC.
- **PHASE OUT SINGLE USE PRODUCTS AND PACKAGING**—BC should implement deposit and return systems in support of re-use mandates (all beverage containers, including milk and soft drinks; food containers and cutlery) and require that stores take back containers and packaging for any product they sell. Other single-use items should be phased out, such as junk mail, telephone directories, disposable plates, cutlery and food containers, and plastic bags.

- **MOVE CAUTIOUSLY ON A NEW BC FRAMEWORK FOR PACKAGING AND PRINTED PAPER**—Potential moves toward “integrated resource management” that mix more types of waste together, instead of maintaining multiple streams of materials, are problematic. A new framework must also respect municipal government and social enterprise investments and existing labour contracts, push producers up the pollution prevention hierarchy, and be rolled out for the industrial, commercial and institutional sector, as well as residential.
- **ESTABLISH MINIMUM RECYCLED CONTENT REQUIREMENTS**—BC should implement re-use requirements and minimum recycled content requirements for a wide range of products. Public sector procurement should also strongly support keeping material flows in BC rather than exporting.
- **INVEST IN CAPACITY TO MOVE UP VALUE CHAIN**—BC will need to make public investments in support of a shift away from landfills and incinerators, and toward waste reduction, re-use, repair and maintenance, and finally, recycling and composting.
- **DEVELOP A GREEN JOBS AND JUST TRANSITION FRAMEWORK**—Policies are needed to help create well-paid, decent green jobs in the resource recovery sector, including policy to support retraining and job transitions from status quo operations. A sector-wide approach that includes collective bargaining and a commitment to decent wages and working conditions is important to this end.
- **SUPPORT RESEARCH AND INNOVATION AIMED AT REDUCING THE AMOUNT OF MATERIALS FLOWING THROUGH THE ECONOMY**—Research funding should target resource recovery with an emphasis on efficient design, product durability and service economies that dramatically reduce material throughput. In addition, funds to support pilots and start-ups, innovative business models (such as leasing), re-use centres, dematerialization, and other sharing/cooperative projects would accelerate the transition to lower waste generation.
- **BAN OR TIGHTLY REGULATE MATERIALS THAT ARE TOXIC OR NON-RECYCLABLE**—Materials flowing through the economy should be safe for human, plant and animal health. The “precautionary principle,” which puts the onus on producers to demonstrate their products are safe, should be the bedrock of materials regulation in the economy.
- **SHIFT INCENTIVES THROUGH PRICING AND REGULATION**—Ecological fiscal reform should include reforming the royalty regime for resource extraction, which would make recycling more competitive. Fees for disposal to landfill and incineration should be steadily increased.

Following the directions laid out in this paper, the next generation of zero waste policy has great potential to help reduce GHG emissions and create green jobs through “closing the loop” on production in BC. Furthermore, a provincial policy mandate for zero waste creates an important opportunity to develop a localized economy better positioned to weather global changes—climate change, market volatility and resource scarcity—that are gathering on the horizon.



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THE CLIMATE JUSTICE PROJECT

The Climate Justice Project is a multi-year initiative led by CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The project connects the two great "inconvenient truths" of our time: climate change and rising inequality. Its overarching aim is to develop a concrete policy strategy that would see BC meet its targets for reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable.

www.climatejustice.ca

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