Cutting Food Waste and Greenhouse Gas Emissions

A comprehensive strategy to manage food waste, including an aggressive campaign to prevent food waste, would help close the gap between Canada's existing plan to reduce greenhouse gases and its 2030 target.

The current plan, the Pan-Canadian Framework on Clean Growth and Climate Change, would achieve annual emission reductions of 175 million tonnes of carbon dioxide equivalent (CO_2e) by 2030. But this achievement would still fall 44 million tonnes short of Canada's target of a 30 per cent cut from the emissions in 2005 – a commitment in the Paris Climate Accord.

A new report by Boston Consulting and Tetra Tech found a broad approach to reducing food waste along with more sustainable waste management, would cut direct greenhouse gas (GHG) emissions from landfills by 2.6 million tonnes of CO_2e, or six per cent of Canada's reduction shortfall. Beyond these direct reductions from landfills, life cycle analysis identifies a total reduction of eight million tonnes of greenhouse gases. Half of this reduction would come from reduced GHGs in transporting and processing food that would otherwise have been discarded as waste.

The study was commissioned by Canada's National Zero Waste Council to assess the greenhouse gas reduction potential of implementing the Council's National Food Waste Reduction Strategy. The Strategy has a broad range of initiatives for cutting waste along the full supply chain – from food production through to retail and disposal as garbage. This study, because it was focused on the link between reducing food waste and GHG emissions, focuses on the three elements of the strategy with the highest potential for emission reductions: food waste prevention, diversion of organics from landfills, and adopting sustainable waste management practices and technologies.
Using data from ten rural and urban Canadian municipalities and regions, along with similar diverse sources across the US, the report authors developed a methodology to estimate total emissions of greenhouse gases in Canada. For 2015, they found emissions were equivalent to about 4 million tonnes of CO_2e. They then modelled the impact on these emissions from three initiatives: food waste prevention in households and businesses including behaviour change strategies, diversion of organic materials from landfills to composting, and better management of landfills to capture the methane generated from the anaerobic decomposition of food.

Using conservative assumptions about intensifying existing best practices, the authors estimate that by 2030, emissions from food waste could be reduced by over 60%.

Prevention of waste in the first place would generate almost half of the emission reductions. The study estimates it is feasible to reduce the waste of food at the retail and consumer level by 40 per cent, and by 10 per cent from other parts of the supply chain. This would amount to a reduction of 20 per cent of all food waste, with a saving of 1.1 million tonnes of CO_2e annually.

An additional 1.5 million tonnes of CO_2e would be saved by diverting 40 per cent of the remaining organic waste from landfills to centralized composting, up from the current level of 25 per cent, and by improving practices in landfills so that only ten per cent of the remaining food waste would go to facilities without methane capture, down from the current 49 per cent.

These management practices are all accepted, cost-effective approaches already deployed at local scales across the country. The study assumes a realistic mix and timing of the phase-in of best practices that takes into account appropriate types of infrastructure by urban region, and sufficient time for policy development, capitalization and infrastructure development.

The study's estimate of emission cuts come largely from reducing the release of methane from the anaerobic decomposition of food waste in landfills. They do not include consideration of the full lifecycle of emission reductions that would result from these initiatives. The study's initial lifecycle analysis of the 2015 base year and the 2030 future reveal much more dramatic reductions of 8.1 million tonnes. A large share of these reductions would be from avoided energy use in processing and transportation in the agriculture and agri-food sectors, including a modest share from beyond Canada's borders associated with avoided waste of imported food.

In summary, this new study shows that a comprehensive plan to reduce food waste in Canada could help address the gap between the nation's greenhouse gas reduction target for 2030 and the projected reductions associated with the implementation of the Pan Canadian Framework on Climate Change and Clean Growth. In addition to contributing to positive actions on climate change, as the Council's National Food Waste Reduction Strategy points out, reducing food waste will result in other environmental, social and economic benefits.