

Energy Recovery Potential from Food Waste and Yard Waste in New York and Montréal

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Abstract : Landfilling of organic waste is still the predominant waste management method in the USA and Canada. Strategic plans for waste diversion from landfills are needed to increase material recovery and energy generation from waste. In this paper, we carried out a statistical survey on waste flow in the two cities New York and Montréal and estimated the energy recovery potential for each case. Data collection and analysis of the organic waste (food waste, yard waste, etc.), paper and cardboard, metal, glass, plastic, carton, textile, electronic products and other materials were done based on the reports published by the Department of Sanitation in New York and Service de l'Environnement in Montréal. In order to calculate the gas generation potential of organic waste, Buswell equation was used in which the molar mass of the elements was calculated based on their atomic weight and the amount of organic waste in New York and Montréal. Also, the higher and lower calorific value of the organic waste (solid base) and biogas (gas base) were calculated. According to the results, only 19% (598 kt) and 45% (415 kt) of New York and Montréal waste were diverted from landfills in 2017, respectively. The biogas generation potential of the generated food waste and yard waste amounted to 631 million m^3 in New York and 173 million m^3 in Montréal. The higher and lower calorific value of food waste were 3482 and 2792 GWh in New York and 441 and 354 GWh in Montréal, respectively. In case of yard waste, they were 816 and 681 GWh in New York and 636 and 531 GWh in Montréal, respectively. Considering the higher calorific value, this amount would mean a contribution of around 2.5% energy in these cities.

Keywords : energy recovery, organic waste, urban energy modelling with INSEL, waste flow

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