The Caloric Value of Municipal Solid Waste Generated in Georgia for Energy Recovery

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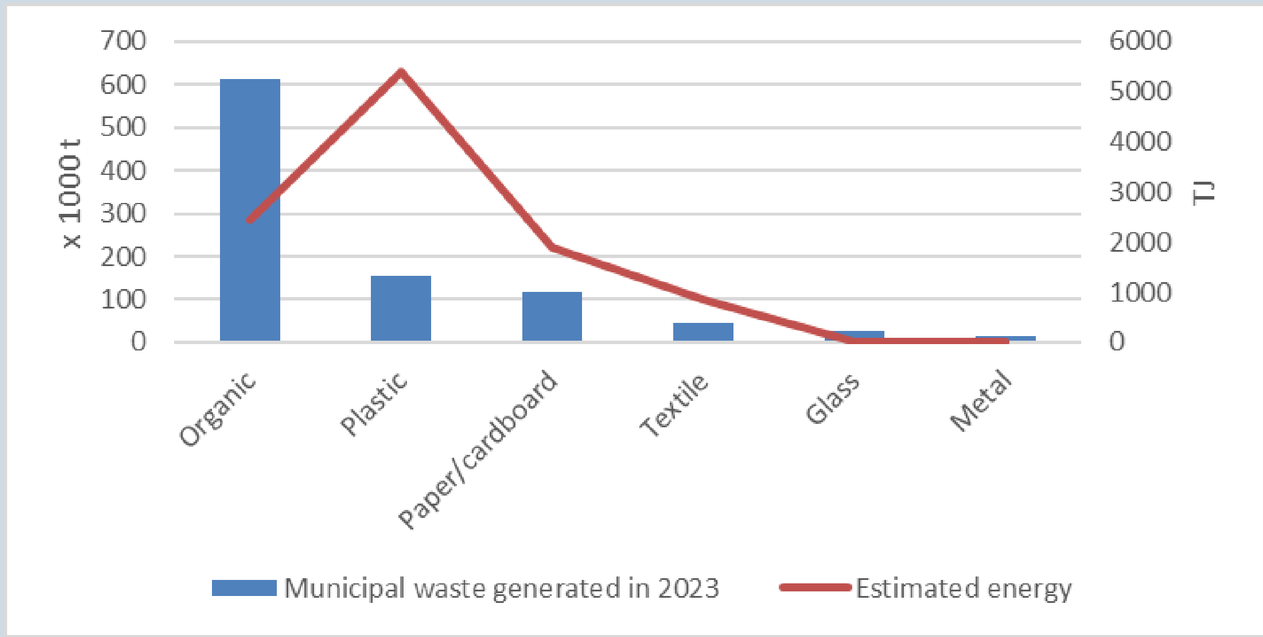
Energy recovery approaches are still not used in Georgia. Energy recovery is the recommended waste treatment for residual household and similar waste that remains after waste prevention, recycling, and organic waste treatment

Plastic wastes such as PP, HDPE, and PET, as well as paper/cardboard, have the highest energy potential for energy extraction. However, these types of waste is a very important material for recycling technologies.

The introduction of Waste-to-Energy methods for non-recyclable municipal waste that should be landfilled will avoid pollution caused by landfills and, more importantly, emissions of methane as a greenhouse gas.

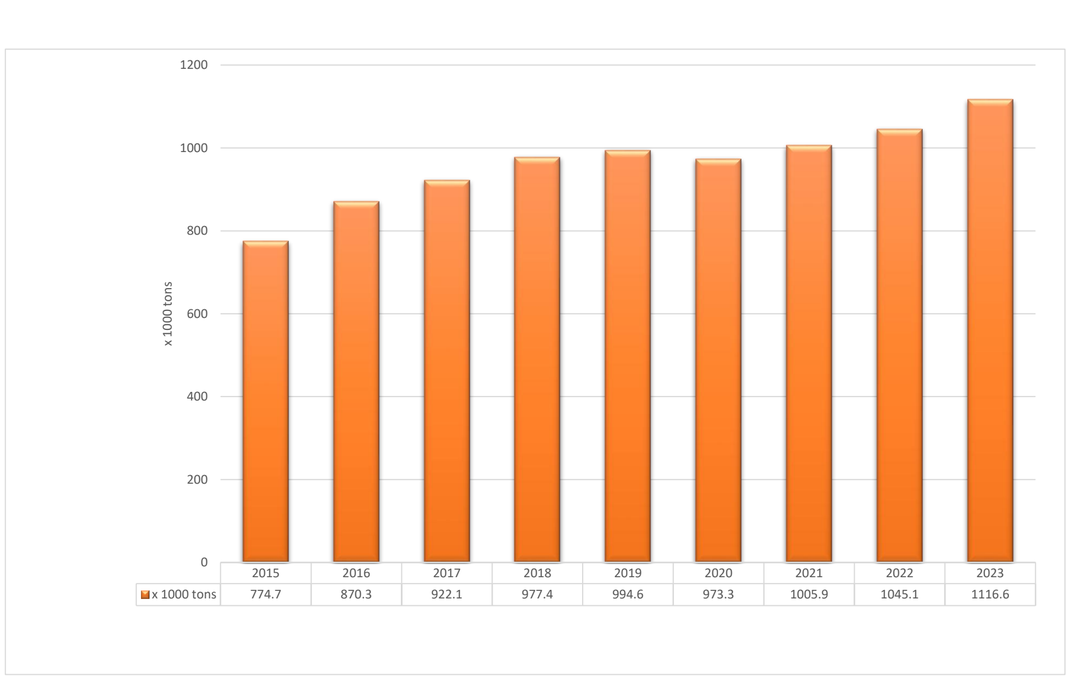


Estimated energy recovery potential from MSW, Georgia, 2023

Introduction

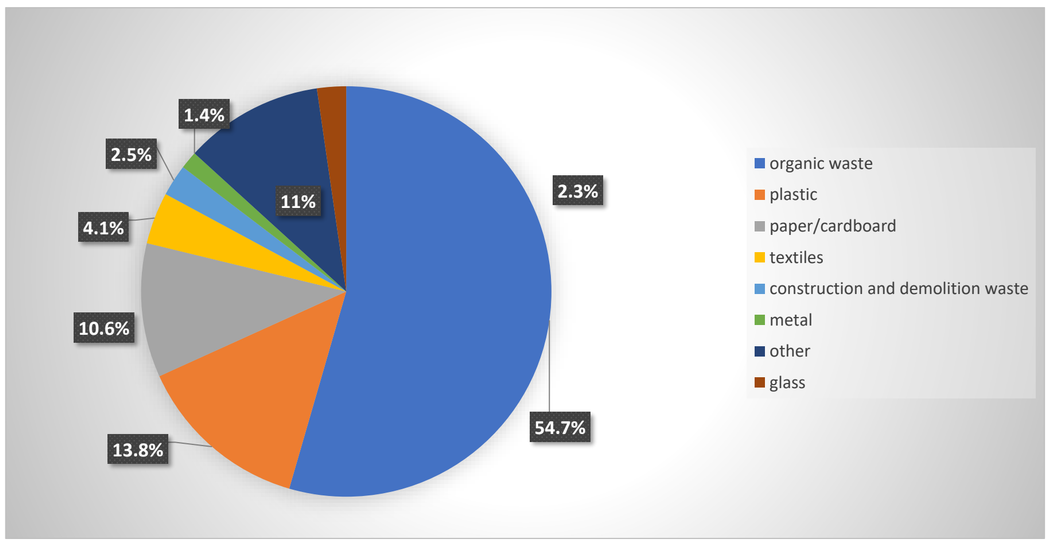
1. **The waste management sector of Georgia is one of the key contributors to GHG emissions**. The contribution of waste to greenhouse gas emissions has been steadily increasing, and by 2022, it amounted to 1,995.9 Gg of CO_2 equivalent, which accounts for approximately 9.9% of total emissions for the 2022. For reference, the composition of greenhouse gases was as follows (2022): CO_2 - 63.9%, CH_4 - 29.4%, N_2O - 4.4%

2. **Municipal waste generation in Georgia has growing dynamics.** According to the National Statistics Office of Georgia, in 2023, municipal waste generation amounted to more than 1,116 thousand tons, up 6.4% from the previous year, 2022, and 30.6% higher compared with the data from 2015



Municipal waste generation in Georgia, 2015-2023

Results



Waste Composition totally generated in Georgia

Estimated energy potential from MSW

Fraction	%	Weight	Calorific value	Estimated energy
		t	MJ/kg	TJ
Plastic	13.8	154090.8	35	5393.18
Paper/cardboard	10.6	118359.6	16	1893.75
Organic	54.7	610780.2	4	2443.12
Metal	1.4	15632.4	0	0
Glass	2.3	25681.8	0	0
Textiles	4.1	45780	19	869.83

The highest estimated energy potential is found in the plastic waste with 5393.18 TJ, which is primarily due to the high calorific value of plastic (35 MJ/kg). However, it is known that different types of plastic have different calorific values. In this regard, plastic types such as Polypropylene PP, Polyethylene HDPE, and Polyethylene Terephthalate PET have a high calorific value.