

ENVIRONMENT STATISTICS

RESIDUALS REPORT 2024



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LIST OF ACRONYMS

CH ₄	Methane
CO ₂	Carbon Dioxide
EMA	Environment Management Agency
FREL	Forest Reference Emission Level
Gg	Gigagram
GHG	Greenhouse Gas
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land Use, Land-Use Change, and Forestry
Mt CO _{2e}	Metric Tons of Carbon Dioxide equivalent
N ₂ O	Nitrous Oxide
PFCs	Perfluorocarbons
MSW	Municipal Solid Waste
SOC	Soil Organic Carbon
SWD	Solid Waste Disposal
ZSG	

1. INTRODUCTION

This Statistical Report provides an insight of waste and emissions statistics. Waste, if not properly managed, significantly contributes to environmental pollution as all residual solids or liquids end up being waste disposed into the environment. The report presents statistics on waste generation, waste management and greenhouse gas emissions. Information contained is key for informed decisions regarding environmental protection for sustainable economic development. The statistics were compiled using data obtained from Ministry of Local Government, Public Works and National Housing, Public Works and National Housing, United Nations Climate Change, Environment Management Agency and Ministry of Environment, Climate and Wildlife.

2. WASTE

Waste Generation

The amount of waste generated in the country is estimated using the amount of waste collected for disposal. In Figure 1 are the estimates of urban solid waste (intones) that were regularly collected and discharged¹.

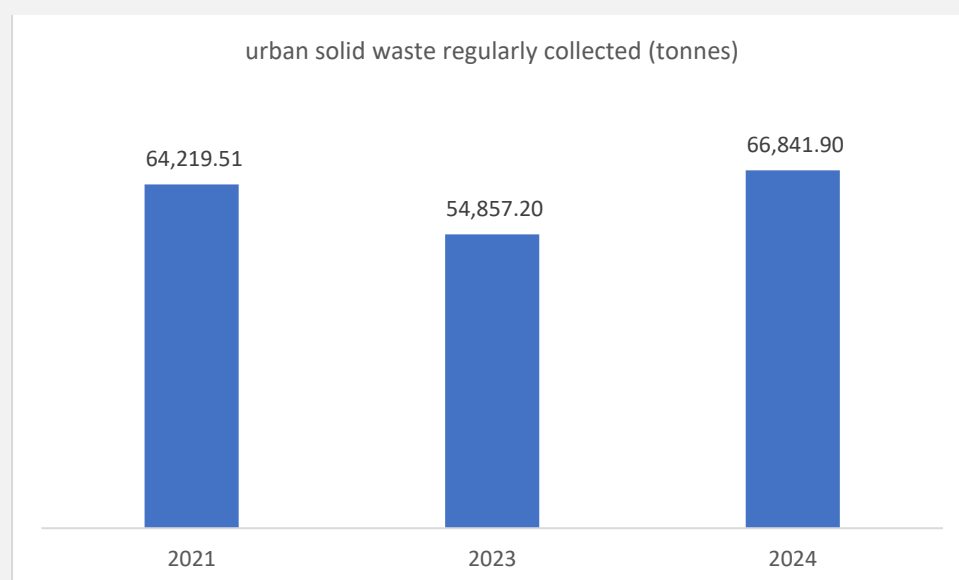


Figure 1: Urban solid waste (tonnes) regularly collected and discharged, 2021, 2023 and 2024.

Source: Ministry of Local Government, Public Works and National Housing

¹ Regularly collected waste, in this context, denotes waste that is officially collected through municipal waste collection services, typically by municipal trucks.

In Figure 2 are the results of a National Solid Waste Survey carried out by EMA in 2023 to determine the amount of solid waste generated in urban areas, presented in proportions. The results showed that food waste (other types)² constituted the highest proportion (29.55%) of the generated solid waste, followed by ash (9.16%) and garden waste (9.02%). Diapers were among the top five contributors with 6.15 percent.

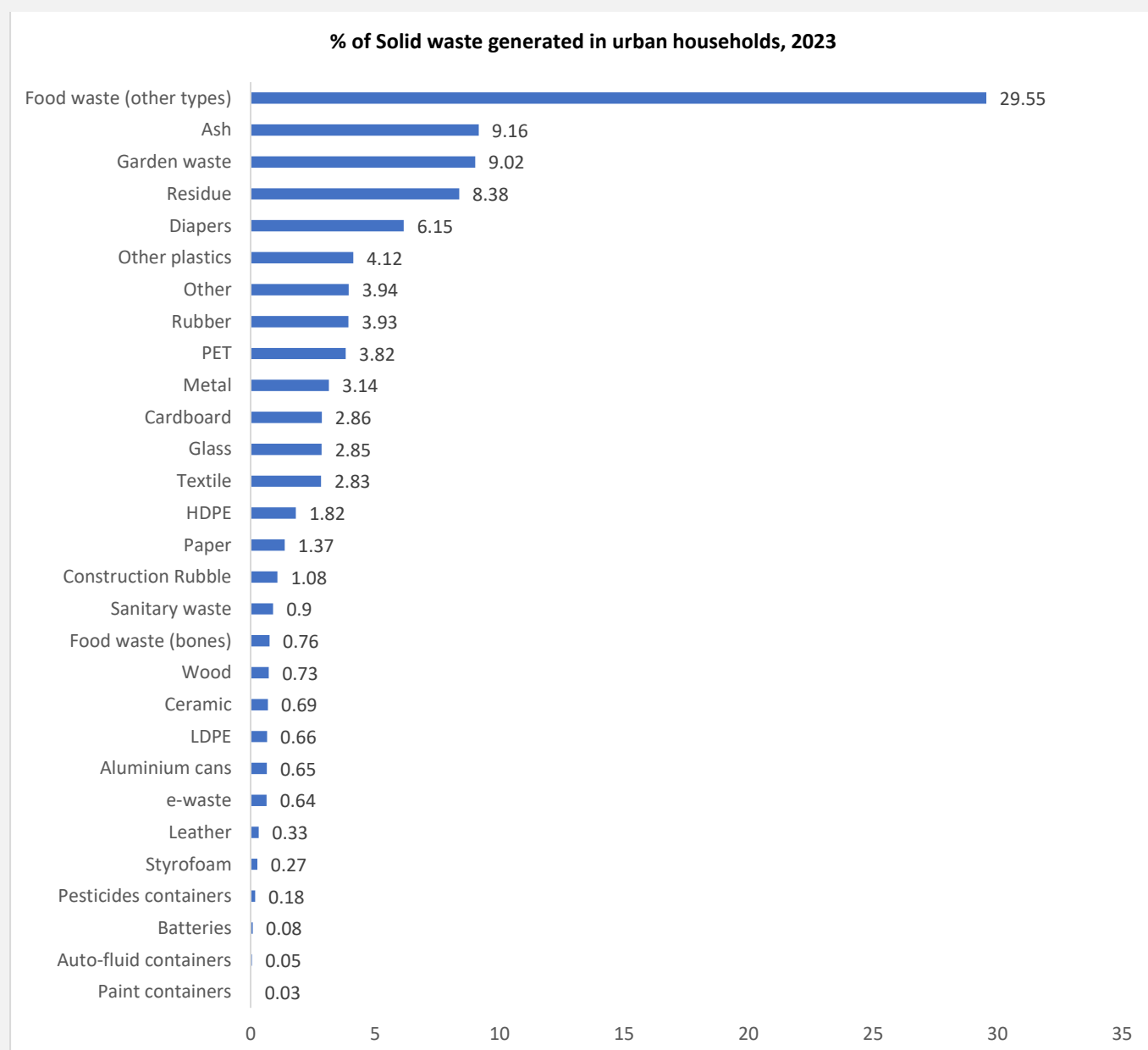


Figure 2: Solid waste generation in urban households, 2023.

Source: Environment Management Agency

NB: Collective plastic waste was 10.42 %.

² Food waste (other types) refers to all kinds of food waste excluding bones

Food waste (other types) also comprised the highest proportion of solid waste generated in the commercial sector³ in urban areas, followed by cardboard (15.6%) and other plastics (14.08%), Figure 3.

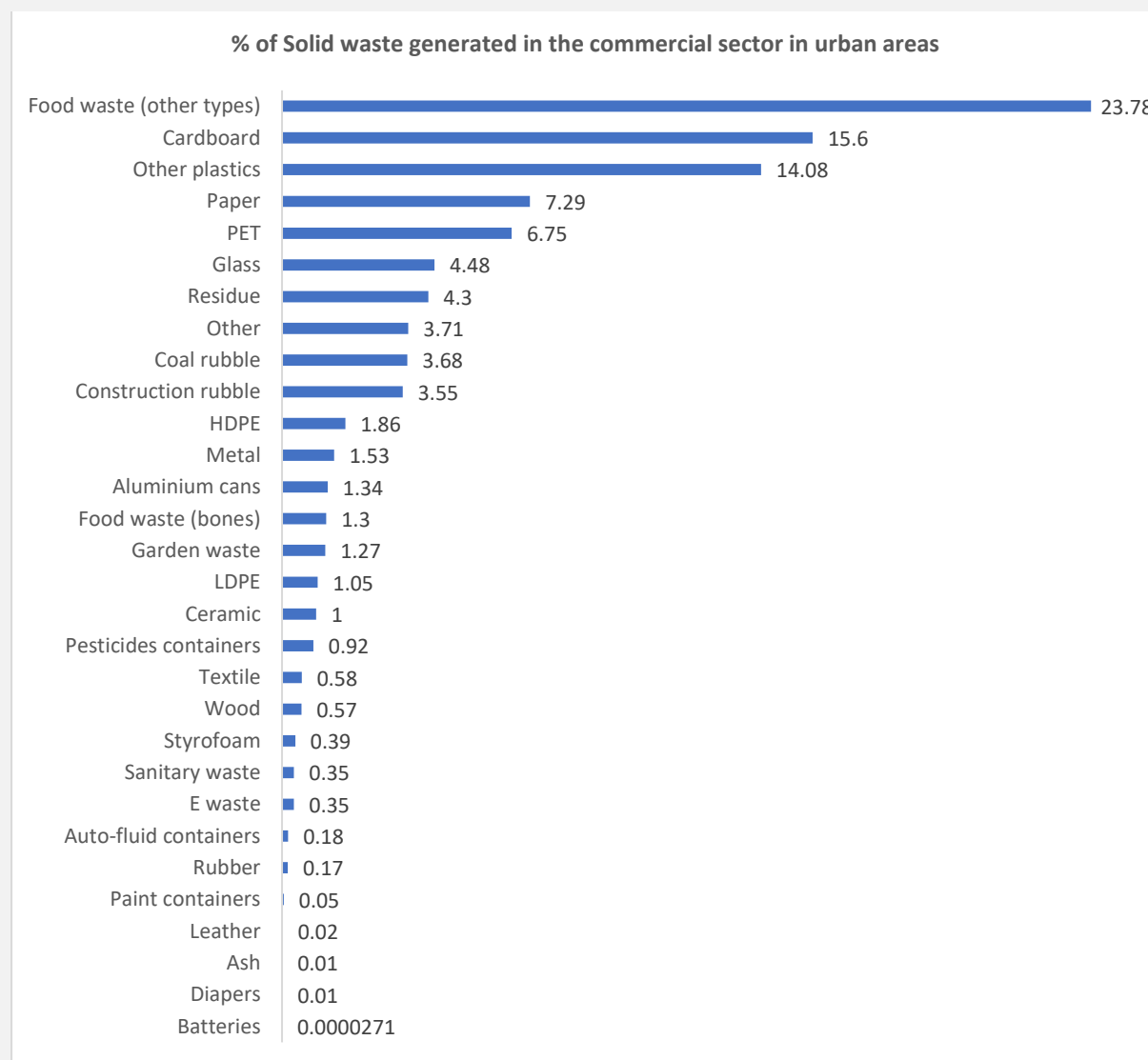


Figure 3: Solid waste generation in the commercial sector in urban areas, 2023

Source: Environment Management Agency

³ Commercial sector refers to areas where businesses operate, such as shops, offices, restaurants, and other service or trade establishments.

The top five contributors to generated solid waste in the industrial sector in urban areas were food waste (other types) at 15.51%, Metal (12.9%), Rubber (9.62%), PET (8.1%) and construction rubble (6.54%), Figure 4.

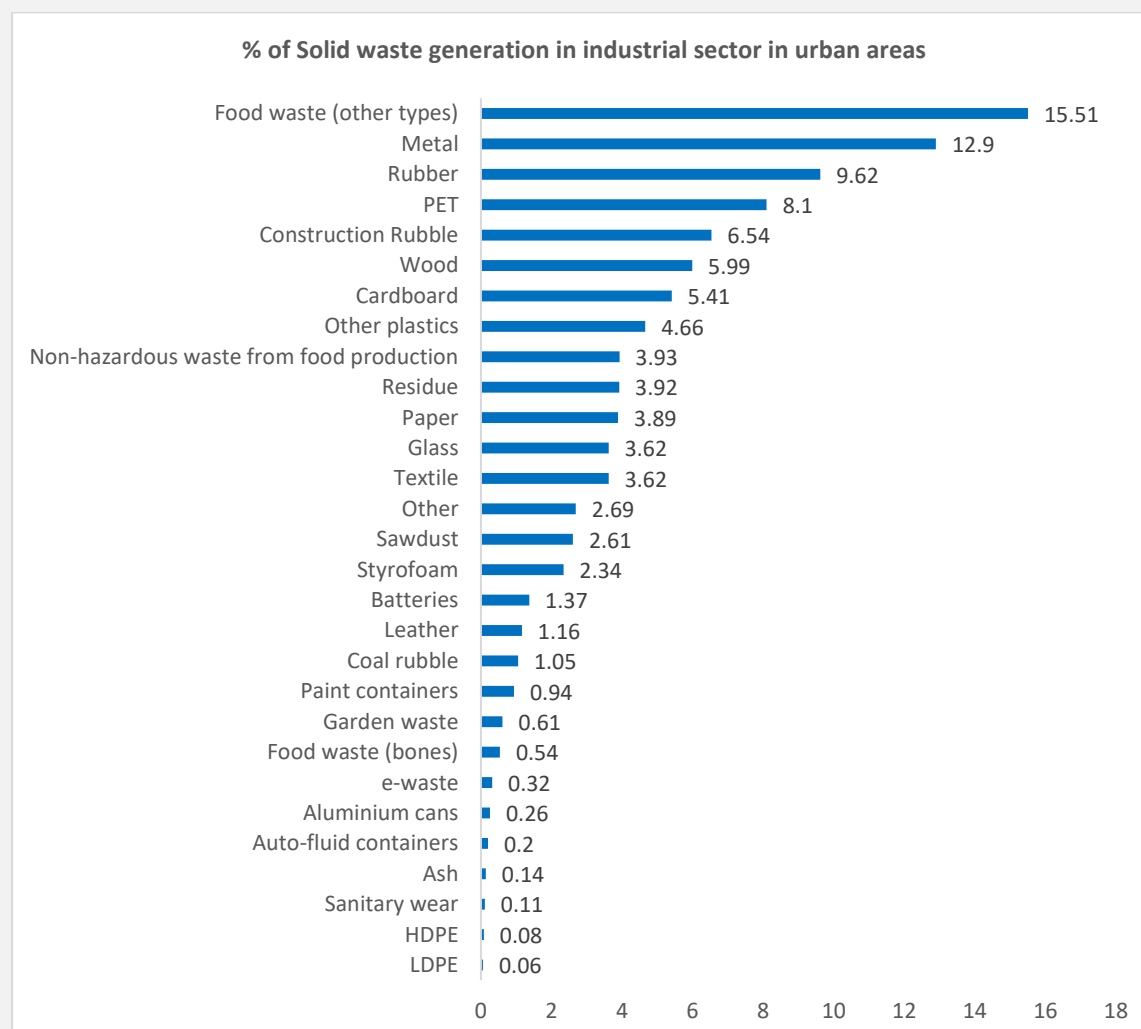


Figure 4: Solid waste generation in the industrial sector in urban areas, 2023

Source: Environment Management Agency

⁴For the medical sector in urban areas, the top five contributors generated solid waste comprised cardboard (20.78%), sanitary wear (19.23%), rubber (12.46%), other plastics (11.88%) and food waste (other types) at 8.15 percent, Figure 5.

⁴ PET refers to Polyethylene Terephthalate, which is the type of plastic commonly used to make plastic bottles

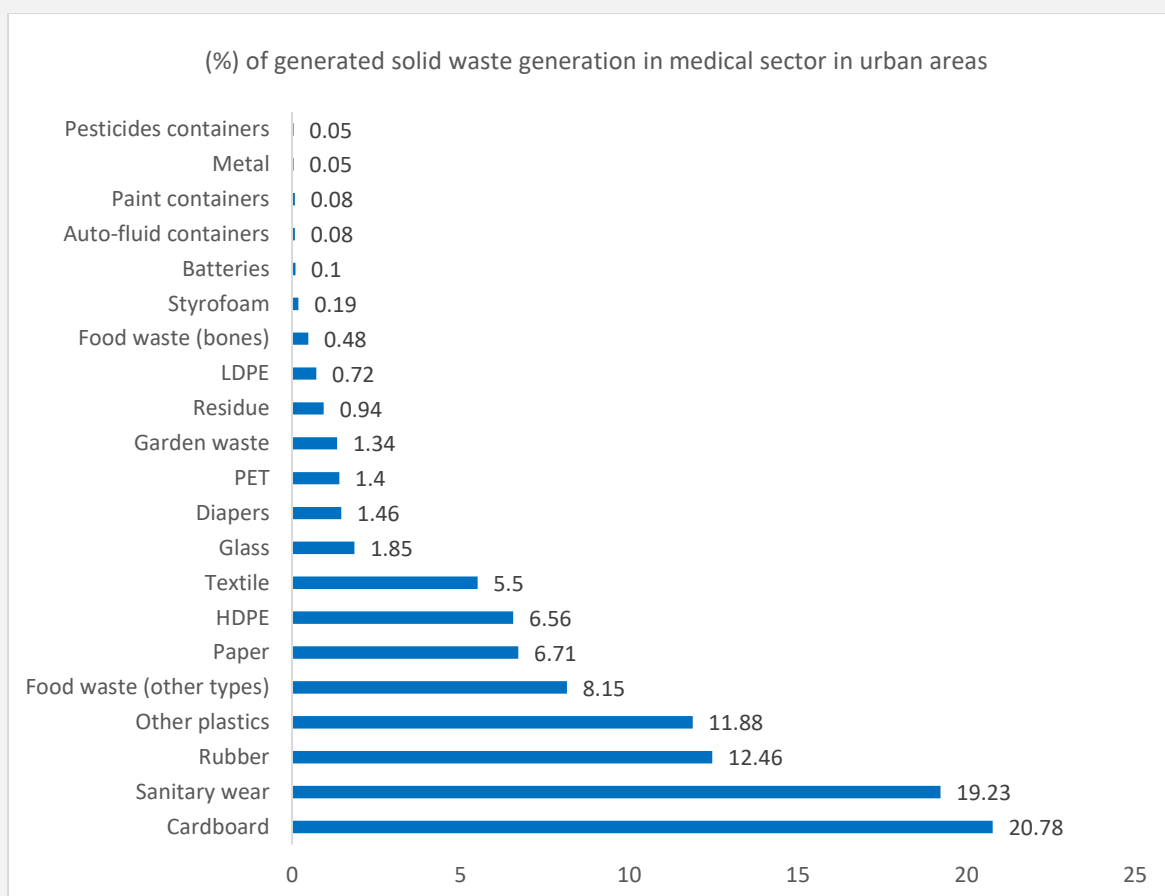


Figure 5: Non-regulated solid waste generation in the medical sector in urban areas, 2023

Source: Environmental Management Agency

The composition of regulated solid waste generated by the medical sector in urban areas shows infectious waste constituting the largest share (40.04%) of all regulated medical waste, followed by pharmaceutical waste (29.60%) and sharps waste such needles and surgical instruments accounting for 16.68% of the total. (Table 1)

Table 1: Regulated solid waste generation in the medical sector in urban areas, 2023

Solid Waste Category	Amount Generated as Percentage (%)
Infectious waste	40.04
Pharmaceuticals	29.6
Sharps	16.68
Pathological waste	6.62
Radioactive waste	2.56
Genotoxic waste	2.49
Chemical	2.00

Source: Environment Management Agency

Waste Management

Table 3 presents the prevalence of waste burning among urban households in different residential areas. High and medium density areas had at least half of the households burning waste, with proportions of 50.13% and 51.24%, respectively. (Table 2)

Table 2: Waste burning in urban residential areas, 2023

Residential Area	Households burning waste (%)	Households not burning waste (%)
High density	50.13	49.87
Medium density	51.24	47.73
Low density	46.77	53.23

Source: Environment Management Agency.

3. EMISSIONS

Table 3 presents composted waste emissions in tonnes for the years 2020 to 2022, while in Table 4 is the estimated emissions reduction for the same years.

Table 3: Composted waste emissions, 2020-2022

YEAR	WASTE COMPOSTED (TONNES)
2020	100
2021	109
2022	143
Total	352

Source: National Adaptation Plan 2024

Table 4: Estimated emissions reduction

Year	Amount Composted (Tonnes)	Emissions from SWDs in (Gg)	Composting Emissions	Emission Reduction
2020	100	0.062297	0.0004	0.06189
2021	109	0.067936	0.000436	0.0675
2022	143	0.089	0.000572	0.088248

Source: National Adaptation Plan 2024

The amount of estimated waste disposal emissions for the period 1990 to 2022 is presented in Figure 6. The graph reflects a continual increase in greenhouse gas emissions from 2008 to 2022. In Figure 7, both CH₄ and N₂O emissions were on the increase from 1990 to 2022. Figure 8 on incineration and open burning of solid waste also shows a general increase in CO₂, CH₄ and N₂O emissions during the same period.



Figure 6: Waste Disposal Emissions 1990 -2022
Source: National Adaptation Plan 2024

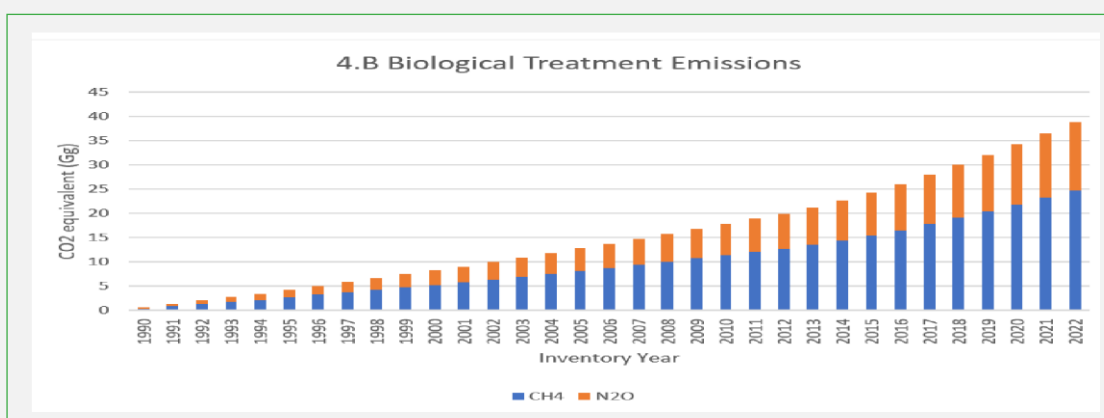


Figure 7: Emissions from Treatment of Waste
Source: National Adaptation Plan 2024.

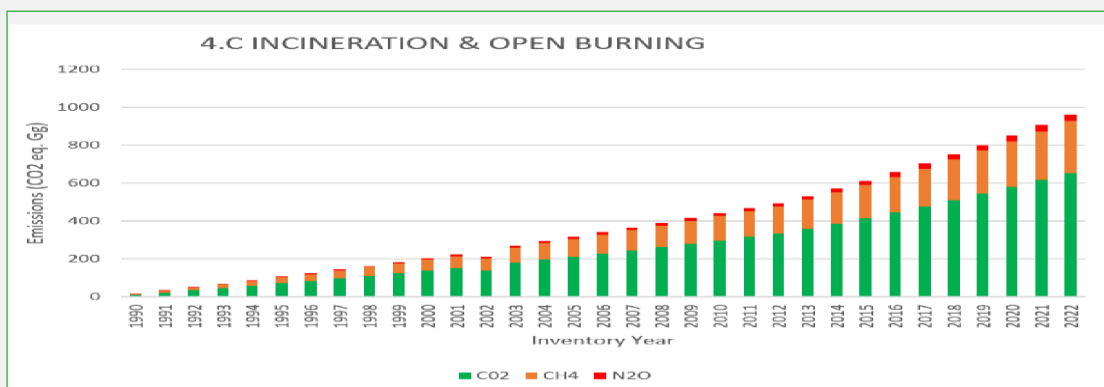


Figure 8: Incineration and Open Burning of Solid Waste
Source: National Adaptation Plan 2024

Greenhouse Gas Emissions from Solid Waste Disposal

Figure 9 presents estimated Greenhouse Gas GHG emissions from various solid waste disposal sites, while waste sector emissions from 1990 to 2022 are in Figure 10.

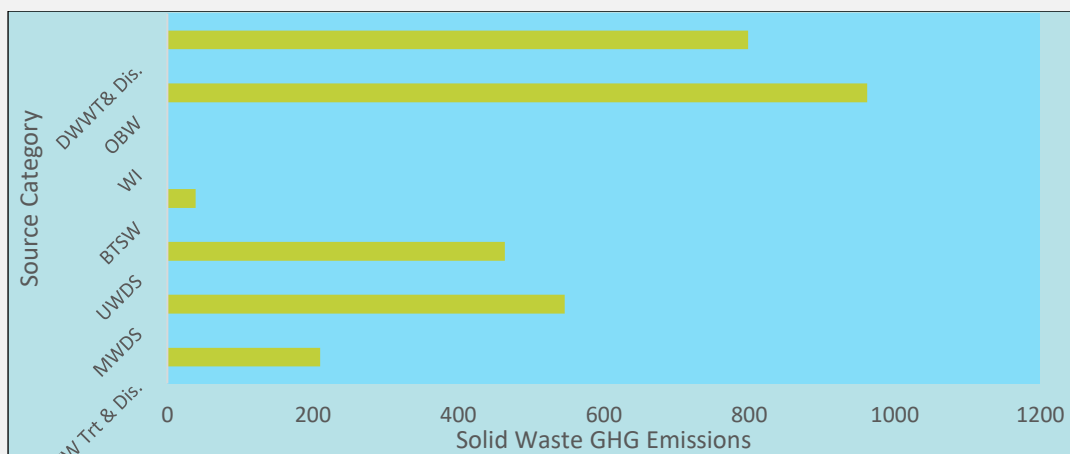


Figure 9: GHG Emissions by solid Waste Disposal Sites.

Source: National Adaptation Plan 2024.

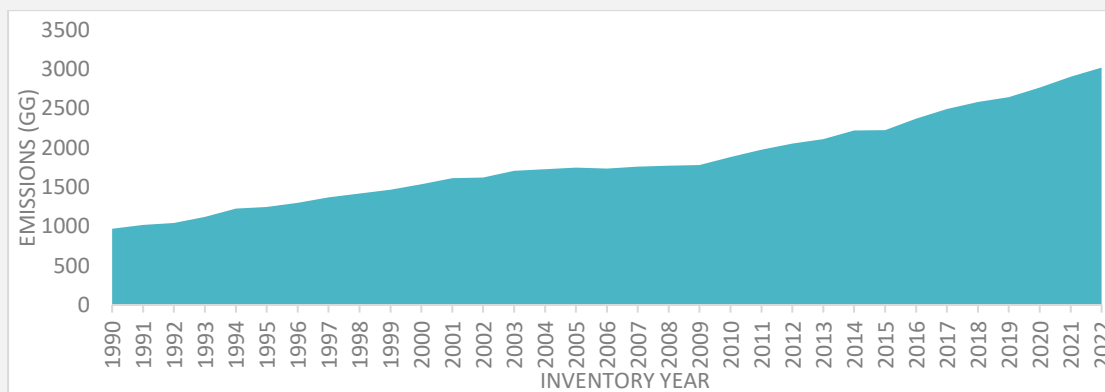


Figure 10: Waste sector emissions 1990 to 2022

Source: National Adaptation Plan 2024

Municipal Managed Solid Waste Disposal

In Figure 11 are CH₄ (methane) emissions from Municipal Solid Waste (MSW) for the period 1995 to 2015.



Figure 11: Municipal Solid Waste Methane Emissions, 1995-2015

Source: National Adaptation Plan 2024

Table 5 shows the soil organic carbon (soc) stock change over the years, while forest emission levels are presented in Table 6.

Table 5: Soil organic carbon (soc) stock change, 2000-2015

Land Conversion		SOC Stock Change					
From	To	Net area change (km ²)	Initial stock (t/ha)	Final stock (t/ha)	Initial stock total (t)	Final stock total (t)	stock change (t)
Croplands	Tree covered areas	3 149	43 .8	48 .1	13 800 230	15 136 103	1 335 873
Tree-covered areas	Grasslands	2 020	43 .5	43 .5	8 789 516	8 789 516	0
Grasslands	Tree covered areas	3 497	44 .7	44 .7	15 622 521	15 622 378	-143
Grasslands	Croplands	4 921	26 .8	23 .3	13 201 459	11 462 270	-1 739 189

Source: National Adaptation Plan 2024

Table 6: Zimbabwe forest reference emission level

Activity	Emissions (tCO ₂ e)	Uncertainty @ 95 % CI
Forest to Cropland	21 645 513.20	31.0%
Forest to Settlement	2 211 111.70	66.0%
Forest to Other	1 674 870.10	48.6%
Total FREL	25 531 495.00	27.1%

Source: National Adaptation Plan 2024

Greenhouse gas emissions by source are presented in Table 7, by sector in Table 8 and from fugitives (underground and surface mines, charcoal & bio-charcoal production and coke production) in Table 9.

Table 7: Greenhouse gas emissions by source, 1990-2022.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Carbon Dioxide Emissions (Mio. Tonnes)	16.5	18.3	18.5	17.1	16	15.5	14.9	13.8	14.1	15.8	13.7	13.9	12.5	10.2	9.8	10.5	9.8	9.8	7.6	7.8	9.6	11.4	12.0	12.3	12.1	12.4	11.0	10.3	12.4	11.8	-	-	-
Carbon Dioxide Emissions Per Capita (Tonnes)	1.6	2.2	2.2	7	3.3	3.4	4	4.1	3.9	4	3.4	3.3	3.4	3.2	3	2.9	2.9	3	2.8	2.5	2.8	2.7	2.4	2.7	3.2	3.3	2.9	2.8	3.0	3.0	2.5	2.8	3.5
Carbon Dioxide (CO2) Emissions excluding LULUCF	8.1	8.3	8	8.7	9.1	9.5	9.5	9.4	9.3	10	8.8	10	11.2	7.8	8.4	9.1	8.7	8.9	7.9	7.2	8.5	10.5	9.3	12.0	11.9	11.6	10.5	10.7	11.9	10.9	9.2	10.4	12.2
Carbon dioxide (CO2) emissions from Industrial Combustion (Energy), (Mt CO2e)	7.8	8.1	7.7	8.6	8.9	9.2	9.1	9.1	8.7	9.7	7.4	8.9	10.3	6.7	7.6	8.1	8	8.1	7.1	6.4	7.6	9.5	8.1	11.0	10.6	10.6	9.6	9.4	10.6	9.9	8.2	9.3	11.2
Carbon dioxide (CO2) emissions from Industrial Processes (Mt CO2e)	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.4	0.4	1.2	1.1	1	1	0.9	0.9	0.6	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.8	0.6	0.4	0.8	0.8	0.6	0.5	0.6	0.6
Carbon dioxide (CO2) emissions from Power Industry (Energy) (Mt CO2e)	5.4	5.6	5	6	6.2	5.7	5.9	5.9	5.7	5.4	4.3	6.3	5.9	4.3	5	5.1	3.5	3.1	2.5	2.3	3.9	5.5	2.9	6.5	5.4	6.2	5.6	5.1	5.4	5.4	4.2	4.5	5.7
Carbon dioxide (CO2) emissions from Transport (Energy) (Mt CO2e)	1.4	1.1	1.7	1.5	1.7	2.2	2.1	2.1	2.3	3	2.1	1.7	3.1	1.5	1.2	1.3	1.2	3.1	3.1	3.1	1.4	2.3	2.6	2.9	2.6	2.4	1.8	1.9	2.6	2.1	1.4	1.6	1.4
Carbon dioxide (CO2) net fluxes from LULUCF - Deforestation (Mt CO2e)	-	-	-	-	-	-	-	-	-	-	3.3	3	4.6	5.8	3.8	2.3	3.3	4.6	2.8	1.1	3.2	0.6	-0.3	2.0	8.5	10.0	7.8	5.3	8.5	11.3	7.0	-	-
Carbon dioxide emissions from fuel combustion, mill. (tonnes)	-	-	-	-	-	-	-	-	-	-	7.4	8.9	10.3	6.7	7.5	8.1	7.9	8.1	7.1	6.4	7.6	9.5	8.1	11.0	10.6	10.6	9.6	9.4	10.6	9.9	8.2	9.3	11.2

Source: Zimbabwe Biennial Transparency Report1,2024.

Table 8: Greenhouse gas emissions (gg) by sector.

Year	Energy	Manufacturing and Construction	Transport	Other Sectors	Solid Fuels Fugitive Emissions	Total
1990	0.06	0.07	0.24	37.83	0.57	38.78
1991	0.06	0.09	0.27	38.61	0.57	39.6
1992	0.06	0.07	0.38	39.35	0.57	40.42
1993	0.07	0.07	0.31	40.04	0.57	41.05
1994	0.07	0.07	0.32	40.78	0.57	41.8
1995	0.06	0.07	0.51	41.13	0.57	42.34
1996	0.06	0.07	0.5	41.61	0.57	42.81
1997	0.06	0.07	0.5	42.15	0.57	43.35
1998	0.06	0.07	0.5	42.96	0.57	44.16
1999	0.07	0.08	0.63	43.74	0.57	45.07
2000	0.05	0.07	0.45	44.56	0.57	45.7
2001	0.07	0.07	0.36	45.23	0.57	46.29
2002	0.06	0.07	0.34	45.93	0.57	46.98
2003	0.05	0.07	0.31	46.6	0.57	47.59
2004	0.05	0.07	0.28	48.57	0.6	49.57
2005	0.05	0.07	0.24	46.49	0.6	47.46
2006	0.04	0.12	0.23	56.04	0.56	56.99
2007	0.03	0.14	0.23	57.21	0.52	58.13
2008	0.03	0.1	0.19	57.32	0.38	58.01
2009	0.03	0.04	0.21	58.74	0.38	59.41
2010	0.04	0.08	0.25	57.16	0.39	57.92
2011	0.07	0.1	0.43	55.74	0.38	56.73
2012	0.05	0.12	0.5	56.12	0.39	57.17
2013	0.08	0.06	0.56	56.6	0.39	57.69
2014	0.09	0.07	0.48	57.74	0.4	58.77
2015	0.08	0.07	0.44	58.52	0.39	59.51
2016	0.07	0.07	0.37	59.52	0.39	60.44
2017	0.06	0.08	0.38	60.64	0.39	61.55
2018	0.07	0.07	0.53	61.41	0.41	62.5
2019	0.09	0.07	0.39	61.99	0.41	62.96
2020	0.06	0.07	0.3	62.72	0.43	63.58
2021	0.07	0.07	0.32	66.69	0.48	67.64
2022	0.12	0.07	0.32	47.36	0.44	48.31
Change 1990-2022						
	92%	8%	31%	25%	-23%	25%

Source: Zimbabwe Biennial Transparency Report1,2024.

Table 9: GHG emissions from fugitives, 1990-2022

Year	Underground Mines	Surface Mines	Charcoal and Bio Charcoal Production	Coke Production	Total
1990	0.07	0.04	17.22	-	17.33
1991	0.07	0.04	17.22	-	17.33
1992	0.07	0.04	17.22	-	17.34
1993	0.07	0.04	17.22	-	17.34
1994	0.08	0.05	17.22	-	17.35
1995	0.08	0.05	17.22	-	17.35
1996	0.08	0.05	17.22	-	17.35
1997	0.08	0.05	17.22	-	17.36
1998	0.09	0.05	17.22	-	17.36
1999	0.09	0.05	17.22	-	17.36
2000	0.09	0.05	17.22	-	17.37
2001	0.09	0.05	17.22	-	17.37
2002	0.09	0.06	17.22	-	17.37
2003	0.1	0.06	17.22	-	17.38
2004	0.09	0.06	17.22	0.85	18.22
2005	0.11	0.06	17.22	0.95	18.34
2006	0.1	0.06	15.99	0.92	17.07
2007	0.1	0.06	14.76	0.88	15.8
2008	0.08	0.05	11.07	0.4	11.61
2009	0.09	0.05	11.07	0.45	11.67
2010	0.09	0.05	11.07	0.52	11.74
2011	11.62	0.09	0.06	11.07	0.4
2012	11.76	0.1	0.06	11.07	0.53
2013	11.77	0.1	0.06	11.07	0.54
2014	12.05	0.23	0.14	11.07	0.61
2015	11.94	0.16	0.09	11.07	0.61
2016	12	0.09	0.05	11.3	0.55
2017	12.02	0.11	0.06	11.53	0.32
2018	12.34	0.12	0.07	11.76	0.39
2019	12.58	0.1	0.06	12	0.41
2020	12.99	0.11	0.06	12.24	0.58
2021	14.55	0.13	0.08	12.24	2.1
2022	13.31	0.16	0.1	12.24	0.81

Source: Zimbabwe Biennial Transparency Report, 2024

Table 10: Key categories of greenhouse gas emissions without LULUCF

IPCC CODE	IPCC CATEGORY	GHG	LEVEL WITH LULUCF	% CONTRIBUTION	CUM.% TOTAL
3.A.1	Enteric Fermentation	CH4	9,067.03	23.29	23.29
3.C.1	Burning	CH4	5,800.69	14.90	38.20
1.A.1	Energy Industries - Solid Fuels	CO2	3,810.64	9.79	47.99
2.F.1	Refrigeration and Air Conditioning	HFCs, PFCs	3,081.62	7.92	55.90
1.A.4	Other Sectors - Liquid Fuels	CO2	2,875.48	7.39	63.29
3.C.1	Burning	N2O	2,068.80	5.31	68.61
1.A.1	Energy Industries - Liquid Fuels	CO2	1,861.34	4.78	73.39
1.A.4	Other Sectors - Biomass - solid	CH4	1,296.91	3.33	76.72
1.A.3.b	Road Transportation - Liquid Fuels	CO2	1,105.42	2.84	79.56
4.A	Solid Waste Disposal	CH4	1,010.10	2.60	82.15
3.C.4	Direct N2O Emissions from managed soils	N2O	916.54	2.35	84.51
4.D	Wastewater Treatment and Discharge	CH4	834.80	2.14	86.65
3.A.2	Manure Management	N2O	679.96	1.75	88.40
4.C	Incineration and Open Burning of Waste	CO2	655.15	1.68	90.08
1.A.2	Manufacturing Industries and Construction - Solid Fuels	CO2	554.05	1.42	91.51
3.C.5	Indirect N2O Emissions from managed soils	N2O	484.74	1.25	92.75
1.A.2	Manufacturing Industries and Construction - Liquid Fuels	CO2	404.68	1.04	93.79
2.A.1	Cement production	CO2	363.11	0.93	94.72
1.A.3.c	Railways - Liquid Fuels	CO2	286.77	0.74	95.46

Source: Zimbabwe Biennial Transparency Report 1, 2024.

