## **APPENDIX A**

## Waste Generation (tonnes per year) and Projections by Country or Economy

			0	riginal year reported	d	
Country or economy	Region	Income	MSW generation	Population	Year	Source
Afghanistan	SAR	LIC	5,628,525	34,656,032	2016	World Bank 2016b, 18
Albania	ECA	UMIC	1,142,964	2,880,703	2015	Albania, INSTAT 2016, 2
Algeria	MENA	UMIC	12,378,740	40,606,052	2016	Ouamane 2017
American Samoa	EAP	UMIC	18,989	55,599	2016	SPREP 2016, 21
Andorra	ECA	HIC	43,000	82,431	2012	UNSD 2016
Angola	SSA	LMIC	4,213,644	25,096,150	2012	Angola, Ministry of Environment 2012, 6
Antigua and Barbuda	LAC	HIC	136,720	98,875	2009	Caribbean Communit Secretariat 2013, 147; Francis et al. 2015

Argentina	LAC	UMIC	17,910,550	42,981,515	2014	World Bank 2015b, 35
Armenia	ECA	LMIC	492,800	2,906,220	2014	Armenia, National Statistical Service 2017
Aruba	LAC	HIC	88,132	103,187	2013	Pricewaterhouse Coopers Aruba 2014, 11
Australia	EAP	HIC	13,345,000	23,789,338	2015	OECD 2018
Austria	ECA	HIC	4,836,000	8,633,169	2015	Eurostat 2017
Azerbaijan	ECA	UMIC	2,930,349	9,649,341	2015	Azerbaijan, Ministry of Economy 2017, 80 (table 4.5)

	2016 adjusted		2030 pr	ojected	2050 projected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
1 (Kabul, 0.7 kg/ person/day)	5,628,525	34,656	7,979,843	46,700	12,887,446	61,928
	1,178,111	2,926	1,320,644	2,933	1,392,409	2,664
2	12,378,740	40,606	16,319,973	48,822	21,171,891	57,437
1 (urban, 1 kg/person/day; rural regional average, 0.5 kg/person/day)	18,989	56	21,468	57	25,433	57
3	43,594	77	45,675	78	49,509	77
4 (0.46 kg/person/day)	4,829,098	28,813	7,668,976	44,712	13,468,138	76,046
Municipal waste collected from HH and deposited in the landfill is 22,700 tonnes in 2009. HH generation is adjusted for the amount of uncollected household waste by dividing HH waste generation by the fraction of households with waste collection in 2011 (0.9861). Municipal waste collected from other origins is added (113,700 tonnes) from 2009.	33,239	101	64,920	115	79,530	125
4 (49.07 tonnes/day)	18,184,606	43,847	23,740,083	49,323	31,086,051	55,229
	501,528	2,925	590,607	2,907	661,744	2,700
4 (2.34 kg/person/day)	111,189	105	152,814	109	166,977	107
	13,601,628	24,126	16,972,554	28,235	21,377,002	33,187
	4,887,032	8,712	5,351,594	8,946	5,805,911	8,878
The National Solid Waste Management Strategy plan covers only 77.5 percent of Azerbaijan, excluding occupied territory (20 percent) and the Greater Baku Area (2.5 percent). The total amount generated in these areas is 964,427 tonnes/year; value is calculated from the amount generated in these areas (964,427 tonnes/year) and in the Baku area (1,965,922 tonnes/year).	2,900,944	9,725	3,329,963	10,680	3,617,967	11,039

			0		d	
Country or economy	Region	Income	MSW generation	Population	u Year	Source
Bahamas, The	LAC	HIC	264,000	386,838	2015	SIDS DOCK 2015, 10
Bahrain	MENA	HIC	951,943	1,425,171	2016	Idrees and McDonnell 2016
Bangladesh	SAR	LMIC	14,778,497	155,727,053	2012	BMDF 2012
Belarus	ECA	UMIC	4,280,000	9,489,616	2015	Belarus, National Statistical Committee 2017
Belgium	ECA	HIC	4,708,000	11,274,196	2015	Eurostat 2017
Belize	LAC	UMIC	101,379	359,288	2015	IDB 2015, 3
Benin	SSA	LIC	685,936	5,521,763	1993	Achankeng 2003, 11
Bermuda	NA	HIC	82,000	64,798	2012	UNSD 2016
Bhutan	SAR	LMIC	111,314	686,958	2007	Phuntsho et al. 2007
Bolivia	LAC	LMIC	2,219,052	10,724,705	2015	Bolivia, DGGIRS 2016

	<b>2016</b> a	djusted	2030 pr	ojected	2050 pr	2050 projected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)	
5; Residential waste accounts for 70 percent of the waste collected and commercial waste accounts for 30 percent. About 77 percent of this amount is generated in New Providence.	263,946	391	317,600	440	373,151	475	
4 (1.83 kg/person/day)	951,943	1,425	1,423,838	2,013	1,785,605	2,327	
4 (0.29 kg/person/day)	16,380,103	162,952	22,138,475	185,585	31,162,100	201,927	
Includes only mixed MSW (collected curbside in bags or containers that can be picked up by hand) entering the landfill with estimated collection coverage of 90 percent; includes cardboard, coconut husks, green waste, pellets and lumber, paper, plastic, shingles, and tires; excludes C&D waste.	178,767	285	200,673	290	223,677	280	
2	4,227,784	9,480	4,935,505	9,163	5,451,248	8,571	
	4,759,760	11,358	5,349,712	12,002	6,164,189	12,488	
1 (urban, 1.07 kg/person/day)	102,440	367	144,792	473	223,778	592	
1 (Porto Novo, 0.5 kg/person/ day)	1,401,386	10,872	2,166,407	15,628	4,202,189	23,930	
3	102,261	62	104,677	59	100,274	53	
1 (urban, 0.53 kg/person/ day)	152,647	798	249,472	914	367,260	994	
Includes domestic waste and waste from public areas and markets; excludes slaughterhouse and hospital waste (together totaling 144,155.6 tonnes/year); data estimated based on population from census projections and per capita generation estimates from in-country studies in sample cities and reference values in the region for cities of similar size and rural areas	2,276,967	10,888	3,288,932	13,158	5,214,928	15,903	

			0	riginal year reported	d	
Country or			MSW	-ganar your reporter	-	_
economy	Region	Income	generation	Population	Year	Source
Bosnia and Herzegovina	ECA	UMIC	1,248,718	3,535,961	2015	Bosnia and Herzegovina, BHAS 2016, 1
Botswana	SSA	UMIC	210,854	2,014,866	2010	Seanama Conservation 2012; Botswana, Statistics Botswana 2011
Brazil	LAC	UMIC	79,889,010	205,962,108	2015	ABRELPE 2015, 19
British Virgin Islands	LAC	HIC	21,099	20,645	2000	Treasure n.d., 3
Brunei Darussalam	EAP	HIC	216,253	423,196	2016	Brunei, Department of Environment, Parks and Recreation 2015
Bulgaria	ECA	UMIC	3,011,000	7,177,991	2015	Eurostat 2017
Burkina Faso	SSA	LIC	2,575,251	18,110,624	2015	Cissé 2015
Burundi	SSA	LIC	1,872,016	6,741,569	2002	UNECA-UNEP-UNIDO- ARSCP 2011
Cabo Verde	SSA	LMIC	132,555	513,979	2012	de Carvalho 2013, 15
Cambodia	EAP	LMIC	1,089,000	15,270,790	2014	Modak et al. 2017, 214
Cameroon	SSA	LMIC	3,270,617	21,655,715	2013	Mbue, Bitondo, and Balgah 2015
Canada	NA	HIC	25,103,034	35,544,564	2014	Canada, Statistics Canada 2016
Cayman Islands	LAC	HIC	60,000	59,172	2014	Amec Foster Wheeler 2016
Central African Republic	SSA	LIC	1,105,983	4,515,392	2014	UN OCHA 2014; UN DESA 2014b
Chad	SSA	LIC	1,358,851	11,887,202	2010	Simos and de Leeuw 2017, 94; UN DESA 2014b
Channel Islands	ECA	HIC	178,933	164,541	2016	States of Guernsey 2017; States of Jersey 2018
Chile	LAC	HIC	7,530,879	17,910,000	2009	Chile, CONAMA 2010, 12
China	EAP	UMIC	220,402,706	1,403,500	2015	Ji et al. 2016, 2
Colombia	LAC	UMIC	13,475,241	48,653,000	2011	IDB 2012, 11 and 25
Comoros	SSA	LIC	93,134	796,000	2015	World Bank 2015a
Congo, Dem. Rep.	SSA	LIC	14,385,226	78,736,153	2016	Tshitala Kalula 2016; UN DESA 2014b
Congo, Rep.	SSA	LMIC	894,237	5,126,000	1993	Achankeng 2003, 11
Costa Rica	LAC	UMIC	1,525,982	4,857,274	2014	Costa Rica, Ministry of Health 2016, 13

	2016 ac	ljusted	2030 pr	ojected	2050 projected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
3; and percentage of population using municipal services across various municipalities.	1,261,143	3,517	1,457,111	3,405	1,588,584	3,058
1 (Gaborone, 85 tonnes/ month)	252,462	2,250	363,790	2,800	516,517	3,421
4 (218,874 tonnes/day)	79,081,401	207,653	96,693,974	225,472	114,304,745	232,688
4 (2.8 kg/person/day)	41,960	31	63,605	35	75,942	38
4 (1.4 kg/person/day)	216,253	423	262,788	490	307,979	537
	3,049,324	7,131	3,306,089	6,431	3,295,494	5,424
1 (big cities, 0.7 kg/person/ day; small cities, 0.5 kg/ person/day; average used); 2	2,659,191	18,646	4,265,523	27,382	8,807,490	43,207
1 (Bujumbura, 511 kg/person/year)	2,950,090	10,524	4,228,365	15,799	8,367,259	25,762
	139,864	540	191,675	635	274,533	734
	1,159,859	15,762	1,702,523	18,798	2,641,058	22,019
1 (Douala, 0.54 kg/person/day)	3,621,758	23,439	5,862,357	32,980	11,858,301	49,817
Value represents waste disposed of from residential and nonresidential sources.	25,666,127	36,290	30,384,216	40,618	36,171,524	44,949
5	76,141	61	117,277	71	150,789	81
1 (Bangui, 750 tonnes/day)	1,107,218	4,595	1,377,932	6,124	2,366,704	8,851
1 (N'Djamena, 533 tonnes/day)	1,645,769	14,453	2,564,763	21,460	5,237,093	33,636
	178,933	165	207,125	174	235,743	181
	7,530,879	17,910	9,359,890	19,637	11,403,108	20,718
	220,402,706	1,403,500	295,035,224	1,441,182	335,791,732	1,364,457
4 (33,288 tonnes/day) Data represents 1,102 out of 1,120 municipalities.	13,475,241	48,653	16,435,975	53,134	20,091,306	54,733
	93,134	796	131,021	1,062	234,683	1,463
1 (Kinshasa, 7,000 tonnes/day)	14,385,226	78,736	21,491,194	120,443	44,389,132	197,404
1 (Brazzaville, 0.6 kg/person/ day)	894,237	5,126	1,533,286	7,319	3,193,587	11,510
4 (4,000 tonnes/day)	1,525,982	4,857	1,933,590	5,417	2,389,760	5,774

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Country or economy	Region	Income	MSW generation	Population	Year	Source
Côte d'Ivoire	SSA	LMIC	4,440,814	20,401,331	2010	Ludington 2015; UN DESA 2014b
Croatia	ECA	UMIC	1,654,000	4,203,604	2015	Eurostat 2017
Cuba	LAC	UMIC	2,692,692	11,303,687	2007	Rebelde 2007

Curaçao	LAC	HIC	24,704	153,822	2013	PricewaterhouseCoopers Aruba 2014, 11
Cyprus	ECA	HIC	541,000	1,160,985	2015	Eurostat 2017
Czech Republic	ECA	HIC	3,337,000	10,546,059	2015	Eurostat 2017
Denmark	ECA	HIC	4,485,000	5,683,483	2015	Eurostat 2017
Djibouti	MENA	LMIC	114,997	746,221	2002	IMF 2004
Dominica	LAC	UMIC	13,176	72,400	2013	World Bank 2017a, 5

Dominican Republic	LAC	UMIC	4,063,910	10,528,394	2015	Dominican Republic, Ministry of the Environment and Natural Resources 2017, 16
Ecuador	LAC	UMIC	5,297,211	16,144,368	2015	Ecuador, Ministry of Environment 2018
Egypt, Arab Rep.	MENA	LMIC	21,000,000	87,813,257	2012	GIZ and SWEEP-Net 2014a, 10
El Salvador	LAC	LMIC	1,648,996	6,164,626	2010	IDB-AIDIS-PAHO 2011, 104
Equatorial Guinea	SSA	UMIC	198,443	1,221,490	2016	Calculated (See box 1.1)
Eritrea	SSA	LIC	726,957	4,474,690	2011	Calculated (See box 1.1)
Estonia	ECA	HIC	473,000	1,315,407	2015	Eurostat 2017
Eswatini	SSA	LMIC	218,199	1,343,098	2016	Calculated (See box 2.1)

	2016 a	djusted	2030 pr	ojected	2050 pr	ojected
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
1 (Abidjan, 290 kg/person/ year)	5,525,029	23,696	9,817,371	33,337	22,186,836	51,375
	1,684,219	4,213	1,703,139	3,896	1,670,840	3,461
1 (Havana, 0.7 kg/person/ day; rural, 0.5 kg/person/ day); excludes bulky, industrial, and medical waste; likely also excludes commercial waste, but this cannot be confirmed.	2,818,053	11,476	3,253,115	11,496	3,647,101	10,823
4 (0.44 kg/person/day)	31,787	159	45,230	172	53,398	181
	551,614	1,170	624,277	1,282	715,657	1,383
	3,389,662	10,611	3,848,146	10,528	4,245,312	10,054
	4,527,726	5,712	4,982,841	6,025	5,640,297	6,314
1 (Djibouti City, 240 kg/day)	152,359	942	217,297	1,133	332,342	1,308
5; total waste (urban and rural) collected, including household (67 percent), commercial (17 percent), institutional (5 percent), industrial (6 percent), and other (6 percent), is 12,385 tonnes per year; uncollected waste was included by using the collection coverage (94 percent).	13,542	74	17,555	78	20,671	77
4 (11,134 tonnes/day)	4,202,756	10,649	5,412,538	12,098	6,905,740	13,265
2; 9 (12,829.41 tonnes/day collected and a collection rate of 88.5 percent)	5,307,241	16,385	7,157,795	19,555	10,225,146	22,968
	23,366,729	95,689	34,213,851	119,746	55,163,107	153,433
1 (urban, 0.89 kg/ person/day)	1,786,871	6,345	2,162,742	6,786	2,771,792	6,997
6	198,443	1,221	319,272	1,871	557,175	2,845
6	774,249	4,955	1,084,661	6,718	1,991,475	9,607
	475,808	1,312	523,237	1,254	553,719	1,145
6	218,199	1,343	276,577	1,666	407,836	2,081

			C	riginal year reporte		
Country or economy	Region	Income	MSW generation	Population	Year	Source
Ethiopia	SSA	LIC	6,532,787	99,873,033	2015	GIZ 2015 (Awadai, Bale Robe, Burie Town, Dilla, Dire Dawa, Jijiga, Jimma, Waliso, Wolkite, Wuqro); Artelia Ville et Transport 2014 (Addis Ababa); WaterAid 2015a (Adigrat, Axum, Bahir Dar, Bule Hora, Yirgachefe, Injibara, Finoteselam); WaterAid 2015b (Ambo, Hosanna, Bishoftu, Fitche, Gerbe Guracha, Holeta, Yirgalem); Anon 2015 (Adola Woyu, Weldiya, Tepi, Maichew, Halaba Kulito Town, Dembi Dolo, Debre Tabor, Bati)
Faroe Islands	ECA	HIC	61,000	48,842	2014	Nordic Competition Authorities 2016, 57
Fiji	EAP	UMIC	189,390	867,086	2011	Fiji, Department of Environment 2011, 13
Finland	ECA	HIC	2,738,000	5,479,531	2015	Eurostat 2017
France	ECA	HIC	33,399,000	66,624,068	2015	Eurostat 2017
French Polynesia	EAP	HIC	147,000	273,528	2013	French Polynesia, DIREN 2017, 223
Gabon	SSA	UMIC	238,102	1,086,137	1995	Mombo and Edou 2005, 90
Gambia, The	SSA	LIC	193,441	1,311,349	2002	Sanneh et al. 2011, 3; UN DESA 2014b
Georgia	ECA	LMIC	800,000	3,717,100	2015	Particip 2015, 8
Germany	ECA	HIC	51,046,000	81,686,611	2015	Eurostat 2017
Ghana	SSA	LMIC	3,538,275	21,542,009	2005	Puopiel 2010, 21
Gibraltar	ECA	HIC	16,954	33,623	2012	Gibraltar, Ministry for the Environment 2017, 30
Greece	ECA	HIC	5,477,424	10,892,413	2014	Greece, ELSTAT 2017
Greenland	ECA	HIC	50,000	56,905	2010	Eisted and Christensen 2011, 1
Grenada	LAC	UMIC	29,536	105,481	2012	Caribbean Development Bank 2014

	<b>2016</b> a	djusted	2030 pr	ojected	2050 projected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
1 (various cities, 0.30 kg/ person/day)	6,727,941	102,403	10,040,763	139,620	18,102,122	190,870
	65.882	49	72.356	52	83.920	55
	00,002		, 2,000	02	00,020	
1 (urban, 0.78 kg/person/ day; rural, 0.4 kg/person/ day)	206,277	899	242,350	970	298,039	998
	2,769,576	5,503	3,079,571	5,739	3,449,266	5,866
	32,544,914	64,721	36,021,363	67,894	40,862,922	70,609
5	139,585	280	174,067	307	199,138	326
1 (Libreville, 0.685 kg/ person/day)	403,931	1,980	578,036	2,594	924,679	3,516
1 (Banjul, 0.54 kg/person/ day)	301,751	2,039	503,966	3,001	1,078,463	4,562
3	854,577	3,925	998,425	3,748	1,136,220	3,394
	51,410,863	81,915	54,399,513	82,187	57,050,957	79,238
4 (0.45 kg/person/day); 5	5,287,958	28,207	8,142,202	37,294	14,272,518	51,270
Value represents MSW, excluding mattresses and nonhazardous bulky waste.	18,761	34	20,279	36	22,973	37
· · ·	5,636,374	11,184	5,966,360	10,784	6,379,219	9,982
5	53,601	56	56,336	57	58,128	54
Value includes HH (20,818 tonnes/year), institutional (1,017 tonnes/year), and commercial (5,560 tonnes/ year) waste disposed of in Perserverance Landfill and all the waste in Dumfries Landfill (1,639 tonnes/year) totaling 29,034 tonnes/year) totaling 29,034 tonnes/year. This value is then adjusted by the collection rate of 98.3 percent; C&D, shipping,	32,359	107	37,194	112	43,325	110

		d				
Country or economy	Region	Income	MSW generation	Population	Year	Source
Guam	EAP	HIC	141,500	159,973	2012	Guam 2013, 10
Guatemala	LAC	LMIC	2,756,741	16,252,429	2015	IDB 2015, 3
Guinea	SSA	LIC	596,911	8,132,552	1996	Barry 2002; UN DESA 2014b
Guinea- Bissau	SSA	LIC	289,514	1,770,526	2015	Ferrari et al. 2016, 2
Guyana	LAC	UMIC	179,252	746,556	2010	Guyana, Ministry of Communities n.d., 11 (Table 2)
Haiti	LAC	LIC	2,309,852	10,847,334	2015	SWANA Haiti Response Team 2010, 4; Naquin 2016, 12
Honduras	LAC	LMIC	2,162,028	9,112,867	2016	Honduras, DGA 2017
Hong Kong SAR, China	EAP	HIC	5,679,816	7,305,700	2015	Hong Kong, Environmental Protection Department 2016
Hungary	ECA	HIC	3,712,000	9,843,028	2015	Eurostat 2017
lceland	ECA	HIC	525,000	330,815	2015	Iceland, Statistics Iceland 2015, 429

	2016 a	djusted	2030 pr	ojected	2050 pr	ojected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)	
Reported as a range of 129,000–154,000 tonnes/ year (average used).	134,551	163	170,308	181	195,298	193	
1 (urban, 0.61 kg/ person/day)	2,824,598	16,582	3,990,278	21,203	6,307,100	26,968	
1 (Conakry, 0.31 kg/ person/day)	941,169	12,396	1,757,060	17,631	4,102,204	26,852	
1 (Bissau, 0.6 kg/ person/day)	297,640	1,816	441,963	2,493	894,814	3,603	
4 (491.1 tonnes/day); includes HH and commercial waste; 491.1 tonnes/day is a weighted average of waste generation in 10 regions; per capita waste generation (0.73 kg/person/day) was measured for the most populous region, Region 4, while remainder used assumptions based on reference values.	202,463	773	244,517	825	293,510	822	
1 (Port au Prince metro area, 0.7 kg/person/day; rural, 0.41 kg/person/day); rural rate is for Cap-Haïtien data, which is representative of the rest of the country and involves both rural and urban populations; Port au Prince data are from 2010 and Cap-Haïtien's from 2016.	2,309,852	10,847	2,975,484	12,544	4,693,120	14,041	
4 (0.65 kg/person/day); 7; based on 62 percent of the population in Honduras.	2,162,028	9,113	3,050,449	11,147	4,787,863	13,249	
4 (2.13 kg/person/day); 1.39 kg/person/day is the rate of 65 percent of MSW disposed of at landfill; when 35 percent of recovered MSW is factored in, value increases to 2.13 kg/person/ day.	5,710,414	7,303	6,858,836	7,987	7,637,326	8,253	
	3,715,742	9,753	3,885,730	9,235	3,989,253	8,279	
5	539,686	332	637,438	366	755,434	390	

			(	Driginal year repor	ted		
Country or economy	Region	Income	MSW generation	Population	Year	Source	
India	SAR	LMIC	168,403,240	1,071,477,855	2001	UNICEF-India, Ministry of Rural Development 2008; India, Ministry of Home Affairs 2001; Kumar et al. 2009	
Indonesia	EAP	LMIC	65,200,000	261,115,456	2016	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016. 4	
Indonesia Iran, Islamic Rep.	EAP	LMIC	65,200,000	261,115,456 80,277,428	2016	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017	
Indonesia Iran, Islamic Rep. Iraq	EAP MENA MENA	LMIC UMIC UMIC	65,200,000 17,885,000 13,140,000	261,115,456 80,277,428 36,115,649	2016 2017 2015	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017 Iraq, Ministry of Environment 2015	
Indonesia Iran, Islamic Rep. Iraq Ireland	EAP MENA MENA ECA	LMIC UMIC UMIC HIC	65,200,000 17,885,000 13,140,000 2,692,537	261,115,456 80,277,428 36,115,649 4,586,897	2016 2017 2015 2012	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017 Iraq, Ministry of Environment 2015 Ireland, EPA 2014, 1	
Indonesia Iran, Islamic Rep. Iraq Ireland Isle of Man	EAP MENA MENA ECA ECA	LMIC UMIC UMIC HIC	65,200,000 17,885,000 13,140,000 2,692,537 50,551	261,115,456 80,277,428 36,115,649 4,586,897 80,759	2016 2017 2015 2012 2011	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017 Iraq, Ministry of Environment 2015 Ireland, EPA 2014, 1 Isle of Man, Department of Infrastructure n.d., 10	
Indonesia Iran, Islamic Rep. Iraq Ireland Isle of Man Israel	EAP MENA MENA ECA ECA MENA	LMIC UMIC UMIC HIC HIC	65,200,000 17,885,000 13,140,000 2,692,537 50,551 5,400,000	261,115,456 80,277,428 36,115,649 4,586,897 80,759 8,380,100	2016 2017 2015 2012 2011 2015	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017 Iraq, Ministry of Environment 2015 Ireland, EPA 2014, 1 Isle of Man, Department of Infrastructure n.d., 10 Israel, Ministry of Environmental Protection 2016	
Indonesia Iran, Islamic Rep. Iraq Ireland Isle of Man Israel Israel	EAP MENA MENA ECA ECA MENA	LMIC UMIC UMIC HIC HIC HIC	65,200,000 17,885,000 13,140,000 2,692,537 50,551 5,400,000 29,524,000	261,115,456 80,277,428 36,115,649 4,586,897 80,759 8,380,100 60,730,582	2016 2017 2015 2012 2011 2015 2015 2015	Indonesia, Ministry of Environment and Forestry and Ministry of Industry 2016, 4 Abedini 2017 Iraq, Ministry of Environment 2015 Ireland, EPA 2014, 1 Isle of Man, Department of Infrastructure n.d., 10 Israel, Ministry of Environmental Protection 2016 Eurostat 2017	

MSW	Population	140144			
generation	(′000s)	generation	Population ('000s)	MSW generation	Population ('000s)
277,136,133	1,324,171	387,770,524	1,512,985	543,277,457	1,658,978
65,200,000	261,115	87,958,248	295,595	118,551,290	321,551
17,653,936	80,277	21,303,899	88,863	25,597,026	93,553
13,967,851	37,203	21,053,906	53,298	34,328,393	81,490
3,157,225	4,726	3,692,571	5,220	4,322,409	5,801
56,476	84	63,371	91	74,679	97
5,322,248	8,192	7,108,848	9,984	10,038,606	12,577
29,009,742	59,430	29,855,267	58,110	30,839,601	55,093
1,051,695	2,881	1,156,300	2,933	1,271,212	2,704
	65,200,000 17,653,936 13,967,851 3,157,225 56,476 5,322,248 29,009,742 1,051,695	65,200,000       261,115         17,653,936       80,277         13,967,851       37,203         3,157,225       4,726         56,476       84         5,322,248       8,192         29,009,742       59,430         1,051,695       2,881	65,200,000         261,115         87,958,248           17,653,936         80,277         21,303,899           13,967,851         37,203         21,053,906           3,157,225         4,726         3,692,571           56,476         84         63,371           5,322,248         8,192         7,108,848           29,009,742         59,430         29,855,267           1,051,695         2,881         1,156,300	65,200,000         261,115         87,958,248         295,595           17,653,936         80,277         21,303,899         88,863           13,967,851         37,203         21,053,906         53,298           3,157,225         4,726         3,692,571         5,220           56,476         84         63,371         91           5,322,248         8,192         7,108,848         9,984           29,009,742         59,430         29,855,267         58,110           1,051,695         2,881         1,156,300         2,933	65,200,000         261,115         87,958,248         295,595         118,551,290           17,653,936         80,277         21,303,899         88,863         25,597,026           13,967,851         37,203         21,053,906         53,298         34,328,393           3,157,225         4,726         3,692,571         5,220         4,322,409           56,476         84         63,371         91         74,679           5,322,248         8,192         7,108,848         9,984         10,038,606           29,009,742         59,430         29,855,267         58,110         30,839,601           1,051,695         2,881         1,156,300         2,933         1,271,212

			0	riginal year reporte	d		
Country or economy	Region	Income	MSW generation	Population	Year	Source	
Japan	EAP	HIC	43,981,000	127,141,000	2015	Japan, Ministry of the Environment 2015	
Jordan	MENA	LMIC	2,529,997	8,413,464	2013	Al-Jayyousi 2015, 22	
Kazakhstan	ECA	UMIC	4,659,740	16,791,425	2012	World Bank n.d., 42	
Kenya	SSA	LMIC	5,595,099	41,350,152	2010	Okot-Okumu 2012, 4	
Kiribati	EAP	LMIC	35,724	114,395	2016	SPREP 2016, 21	
Korea, Rep.	EAP	HIC	18,218,975	50,746,659	2014	Kho and Lee 2016, 23	
Kosovo	ECA	LMIC	319,000	1,801,800	2015	Eurostat 2017	
Kuwait	MENA	HIC	1,750,000	2,998,083	2010	Kuwait, Partnerships Technical Bureau 2014, 4	
Kyrgyz Republic	ECA	LMIC	1,113,300	5,956,900	2015	Kyrgyzstan, NSC 2016, 62 (Table 5.9)	
Lao PDR	EAP	LMIC	351,900	6,663,967	2015	Keohanam 2017	
Latvia	ECA	HIC	857,000	1,977,527	2015	Eurostat 2017	
Lebanon	MENA	UMIC	2,040,000	5,603,279	2014	GIZ and SWEEP-Net	

Lesotho	SSA	LMIC	73,457	1,965,662	2006	Lesotho, Bureau of Statistics 2013; Lesotho, Bureau of Statistics 2006
Liberia	SSA	LIC	564,467	3,512,932	2007	UNEP 2007; UN DESA 2014b
Libya	MENA	UMIC	2,147,596	6,193,501	2011	Omran, Altawati, and Davis 2017, 5
Liechtenstein	ECA	HIC	32,382	36,545	2015	Liechtenstein, Office of Statistics 2018, 7
Lithuania	ECA	HIC	1,300,000	2,904,910	2015	Eurostat 2017
Luxembourg	ECA	HIC	356,000	569,604	2015	Eurostat 2017
Macao SAR, China	EAP	HIC	377,942	612,167	2016	Macao SAR, China, DSEC 2017
Macedonia, FYR	ECA	UMIC	796,585	2,081,206	2016	Macedonia, MAKStat 2017
Madagascar	SSA	LIC	3,768,759	24,894,551	2016	World Bank 2016a, 5
Malawi	SSA	LIC	1,297,844	16,577,147	2013	Barré 2014; UN DESA 2014a

	<b>2016</b> a	djusted	2030 pr	ojected	2050 projected	
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
Excludes disaster waste.	44,374,189	127,749	45,019,046	121,581	43,315,197	108,794
	2,793,380	9,456	3,825,435	11,122	6,351,694	14,188
9 (3,588,000 tonnes/year collected and a collection rate of 77 percent)	5,126,019	17,988	6,850,097	20,301	8,512,123	22,959
1 (Nairobi, 0.6 kg/ person/day)	6,844,079	48,462	10,513,071	66,960	19,033,007	95,467
8	35,724	114	70,876	142	115,089	178
4 (49,915 tonnes/day)	18,576,898	50,792	22,435,453	52,702	24,624,834	50,457
	323,281	1,802	484,974	1,802	645,955	1,802
	2,290,389	4,053	2,894,529	4,874	3,613,973	5,644
	1,120,523	5,956	1,566,360	6,997	2,475,253	8,113
2	364,463	6,758	522,053	8,049	748,378	9,163
	864,936	1,971	881,848	1,747	861,239	1,517
UNDP 2014 estimates that the incremental daily quantity of MSW attributed to refugees is expected to reach 324,568 tonnes/year by 2014; this value is significant and is equivalent to about 15.7 percent of the waste generated by Lebanese residents before the crisis.	2,148,803	6,007	2,302,862	2,303	2,862,432	5,412
1 (Maseru City, 60 kg/ person/year)	87,981	2,204	117,518	2,608	193,270	3,203
1 (Monrovia, 780 tonnes/ day)	722,949	4,614	988,354	6,495	1,910,290	9,804
4 (0.95 kg/person/day)	2,419,759	6,293	3,631,710	7,342	4,617,447	8,124
Value represents total urban waste only.	35,486	38	39,939	41	46,168	43
	1,320,616	2,908	1,382,158	2,718	1,363,525	2,407
	360,964	576	433,768	675	524,875	796
Value includes domestic waste and waste produced by businesses.	377,942	612	481,342	746	575,184	876
	796,585	2,081	933,411	2,076	1,056,395	1,931
1 (Antananarivo, 0.61 kg/ person/day); 5	3,768,759	24,895	5,587,354	35,592	10,522,518	53,803
1 (Lilongwe and Blantyre, 0.37 kg/person/day)	1,415,204	18,092	2,117,841	26,578	4,081,844	41,705

			(	Driginal year reporte	ed	
Country or			MSW			_
economy	Region	Income	generation	Population	Year	Source
Malaysia	EAP	UMIC	12,982,685	30,228,017	2014	UNCRD and IGES 2017, xii
Maldives	SAR	UMIC	211,506	409,163	2015	Maldives, WMPDC and MEE 2017
Mali	SSA	LIC	1,937,354	16,006,670	2012	World Bank 2014, 66
Molto			260.000	421 974	2015	Europtot 2017
Marahall			269,000	431,874 	2015	Pattla Dalamana Partnana
Islands	EAF	OIVIIC	0,014	52,795	2013	2015, 17
Mauritania	SSA	LMIC	454,000	3,506,288	2009	GIZ and SWEEP-Net 2010a
Mauritius	SSA	UMIC	438,000	1,263,473	2016	Mauritius, Ministry of Social Security, National Solidarity, and Environment and Sustainable Development 2017
Mexico	LAC	UMIC	53,100,000	125,890,949	2015	Mexico, SEMARNAT 2016, 434
Micronesia, Fed. Sts.	EAP	LMIC	26,040	104,937	2016	SPREP 2016, 21
Moldova	ECA	LMIC	3,981,200	3,554,108	2015	Moldova, Statistica Moldovei 2016
Monaco	ECA	HIC	46,000	37,783	2012	UNSD 2016
Mongolia	EAP	LMIC	2,900,000	3,027,398	2016	Delgerbayar 2016, 4
Montenegro	ECA	UMIC	332,000	622,159	2015	Eurostat 2017
Morocco	MENA	LMIC	6,852,000	34,318,082	2014	GIZ and SWEEP-Net 2014c, 7
Mozambique	SSA	LIC	2,500,000	27,212,382	2014	Tas and Belon 2014, 9
Myanmar	EAP	LMIC	4,677,307	46,095,462	2000	Thein 2010, 6
Namibia	SSA	UMIC	256,729	1,559,983	1993	Achankeng 2003, 11
Nauru	EAP	UMIC	6,192	13,049	2016	SPREP 2016, 21
Nepal	SAR	LIC	1,768,977	28,982,771	2016	Nepal, SWMTSC 2017; ADB 2013
Netherlands	ECA	HIC	8,855,000	16,939,923	2015	Eurostat 2017

	<b>2016</b> a	djusted	2030 pr	ojected	2050 pr	ojected
Comment	MSW generation	Population (′000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
	13,723,342	31,187	18,235,817	36,815	23,733,545	41,729
2; based on Maldives Ministry of Environment and Energy data for households in Male (1.7 kg/person/day), other islands (0.8 kg/person/ day), and resorts, hotels, and guest houses (3.5 kg/ bed/day).	224,663	428	300,525	512	393,328	576
1 (Sikasso, 46,770 tonnes/ year)	2,207,589	17,995	3,515,355	27,057	7,084,361	44,020
	270,442	429	303,995	440	324,623	419
4 (23.6 tonnes/day)	8666	53	14,195	56	20,046	66
	572,992	4,301	919,925	6,077	1,771,918	8,965
4 (1,200 tonnes/day)	437,535	1,262	518,359	1,287	571,593	1,221
	54,151,287	127,540	69,638,974	147,540	90,440,574	164,279
8	129,821	523	207,574	589	298,646	656
5; legislation does not clearly differentiate between industrial and municipal waste. Existing law defines waste from production and consumption; hence, waste statistics include both types of waste.	4,622,874	4,060	5,636,646	3,844	6,588,017	3,293
3	50,685	38	56,417	41	68,391	46
5	2,900,000	3,027	4,337,475	3,561	6,295,598	4,075
	339,542	629	368,880	625	399,240	588
	7,126,270	35,277	10,160,132	40,874	15,157,504	45,660
	2,644,873	28,829	4,124,044	42,439	8,750,664	67,775
4 (0.278 kg/person/day)	7,451,835	52,885	9,315,917	58,916	11,207,310	62,359
1 (Windhoek, 0.7 kg/person/ day)	501,797	2,480	738,810	3,246	1,205,787	4,339
8; Nauru is 100 percent urban according to source	5,384	11	5,200	11	6,139	11
60 additional municipalities were newly formed recently; the two sources provide waste generation for 58 cities and the additional 60 cities, respectively; average waste generated per day for 118 cities is estimated to be 1,854 tonnes/day.	1,768,977	28,983	2,205,525	33,168	2,968,223	36,107
	8,936,530	16,987	9,816,231	17,594	10,677,957	17,518

			(	Original year reporte	d	
Country or economy	Region	Income	MSW generation	Population	Year	Source
New Caledonia	EAP	HIC	108,157	278,000	2016	SPREP 2016
New Zealand	EAP	HIC	3,405,000	4,692,700	2016	OECD 2018
Nicaragua	LAC	LMIC	1,528,816	5,737,723	2010	IDB-AIDIS-PAHO 2011
Niger	SSA	LIC	1,865,646	8,842,415	1993	Achankeng 2003, 11
Nigeria	SSA	LMIC	27,614,830	154,402,181	2009	Oguntoyinbo 2012, 1
Northern Mariana Islands	EAP	HIC	32,761	54,036	2013	Mohee et al. 2015
Norway	ECA	HIC	2,187,000	5,188,607	2015	Eurostat 2017
Oman	MENA	HIC	1,734,885	3,960,925	2014	Be'ah 2016, 13
Pakistan	SAR	LMIC	30,760,000	193,203,476	2017	Korai, Mahar, and Uqaili 2017
Palau	EAP	HIC	9,427	21,503	2016	SPREP 2016, 21
Panama	LAC	UMIC	1,472,262	3,969,249	2015	IDB 2015, 3
Papua New Guinea	EAP	LMIC	1,000,000	7,755,785	2014	ADB 2014a, 1
Paraguay	LAC	UMIC	1,818,501	6,639,119	2015	IDB-AIDIS-PAHO 2011, 104
Peru	LAC	UMIC	8,356,711	30,973,354	2014	Peru, Ministry of Environment 2016, 20; Peru, Ministry of

Environment 2014, 33

Philippines	EAP	LMIC	14,631,923	103,320,222	2016	Philippines, NSWMC 2017
Poland	ECA	HIC	10,863,000	37,986,412	2015	Eurostat 2017
Portugal	ECA	HIC	4,710,000	10,401,062	2014	Eurostat 2017
Puerto Rico	LAC	HIC	4,170,953	3,473,181	2015	Energy Answers 2012, 41
Qatar	MENA	HIC	1,000,990	2,109,568	2012	Qatar, MDPS 2014, 92
Romania	ECA	UMIC	4,895,000	19,815,481	2015	Eurostat 2017

	2016 ad	djusted	2030 pr	ojected	2050 projected		
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)	
8	106,086	273	132,841	321	168,274	378	
	3,381,877	4,661	3,971,657	5,213	4,789,174	5,711	
4 (0.73 kg/person/day); 7	1,787,370	6,150	2,363,847	7,046	3,502,392	7,876	
1 (Niamey, 1 kg/person/day)	4,281,415	20,673	7,164,740	34,994	16,015,498	68,454	
4 (0.49 kg/person/day)	34,572,968	185,990	54,806,190	264,068	107,077,289	410,638	
1 (Saipan, 1.81 kg/person/ day; average regional rural, 0.5 kg/person/day)	30,922	55	36,345	57	36,190	52	
	2,216,799	5,255	2,593,368	5,959	3,070,182	6,802	
4 (1.2 kg/person/day)	1,928,958	4,425	2,710,244	5,897	3,385,564	6,757	
	30,352,981	193,203	42,427,624	244,248	66,377,808	306,940	
8	9,427	22	19,117	25	22,944	28	
1 (urban, 1.22 kg/person/day)	1,516,612	4,034	2,194,682	4,884	3,074,132	5,827	
Reported as more than 1 million tonnes/year.	1,052,408	8,085	1,595,910	10,487	2,844,877	13,871	
1 (urban, 0.94 kg/person/ day)	1,862,514	6,725	2,484,878	7,845	3,595,736	8,897	
Calculated from urban (7,497,482 tonnes/year) and rural (859,229.13 tonnes/year) waste generation; urban value reported in Plan Nacional as 64 percent (4,798,388 tonnes/year) generated by HH and 26 percent (1,949,345 tonnes/year) by non-HH sources; rural value is calculated by World Bank team using an estimate of 0.35 kg/person/day based on reporting for all urban districts multiplied by the rural population in Peru in 2014.	8,737,853	31,774	12,466,705	36,807	17,441,927	41,620	
4 (40,087.46 tonnes/day)	14,631,923	103,320	20,039,044	125,372	29,275,773	151,293	
	11,059,953	38,224	12,000,866	36,616	11,941,493	32,390	
	4,776,650	10,372	4,890,090	9,877	4,941,153	8,995	
Value is a projection based on historical waste generation.	4,392,515	3,668	4,607,101	3,593	4,619,340	3,282	
4 (1.30 kg/person/day); if bulky waste and tires are included, the per capita MSW generation rate	1,195,225	2,570	1,592,401	3,232	1,864,992	3,773	
day.							

			C	Driginal year reporte	d	
Country or economy	Region	Income	MSW generation	Population	Year	Source
Russian Federation	ECA	UMIC	60,000,000	143,201,676	2012	Tekes 2013, 11
Rwanda	SSA	LIC	4,384,969	11,917,508	2016	Isugi and Niu 2016
Saint Martin (French part)	LAC	HIC	15,480	30,959	2012	Sterviinou n.d.
Samoa	EAP	UMIC	27,399	187,665	2011	SPREP 2016, 21
San Marino	ECA	HIC	17,175	33,203	2016	San Marino, AASS 2016
São Tomé and Príncipe	SSA	LMIC	25,587	191,266	2014	Dias, Vaz, and Carvalho 2014
Saudi Arabia	MENA	HIC	16,125,701	31,557,144	2015	Nizami 2015
Senegal	SSA	LIC	2,454,059	15,411,614	2016	Senegal, UCG 2016, 23
Serbia	ECA	UMIC	1,840,000	7,095,383	2015	Eurostat 2017

Seychelles	SSA	HIC	48,000	88,303	2012	Talma and Martin 2013, 5
Sierra Leone	SSA	LIC	610,222	5,439,695	2004	Gogra et al. 2010, 2
Singapore	EAP	HIC	7,704,300	5,607,283	2017	Singapore, NEA 2017
Slovak Republic	ECA	HIC	1,784,000	5,423,801	2015	Eurostat 2017
Slovenia	ECA	HIC	926,000	2,063,531	2015	Eurostat 2017
Solomon Islands	EAP	LMIC	179,972	563,513	2013	ADB 2014b, 1
Somalia	SSA	LIC	2,326,099	14,317,996	2016	Calculated (See box 1.1)
South Africa	SSA	UMIC	18,457,232	51,729,345	2011	South Africa, Department of Environmental Affairs 2012
South Sudan	SSA	LIC	2,680,681	11,177,490	2013	UNEP 2013, 18
Spain	ECA	HIC	20,151,000	46,447,697	2015	Eurostat 2017
Sri Lanka	SAR	LMIC	2,631,650	21,203,000	2016	Sri Lanka, Ministry of Mahaweli Development and Environment 2016, v
St. Kitts and Nevis	LAC	HIC	32,892	54,288	2015	SIDS DOCK 2015, 15

	2016 a	djusted	2030 pr	ojected	2050 pr	ojected
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
	59,585,899	143,965	67,001,631	140,543	71,574,530	132,731
1 (Kigali, reported as a range of 1.8–2.0 kg/person/day; average used)	4,384,969	11,918	6,555,912	16,024	11,586,425	21,886
4 (500 kg/person/year)	19,322	31	25,450	31	28,535	31
4 (0.4 kg/person/day); 7	28,964	195	35,111	212	49,216	243
	17,175	33	17,018	35	18,686	35
4 (70.1 tonnes/day)	26,999	200	35,319	268	64,173	380
4 (1.4 kg/person/day)	16,455,464	32,276	20,986,707	39,480	25,183,676	45,056
4 (6,723.45 tonnes/day)	2,454,059	15,412	3,957,017	22,123	8,059,355	34,031
A new methodology to collect MSW generation data was introduced in 2010, which requires public utility companies to report collected waste amounts and MSW composition. In 2013, data were delivered by 106 of 168 companies; data reported by some companies are still based on estimates.	2,319,171	8,820	2,408,682	8,355	2,392,222	7,447
5	53,921	94	58,271	98	72,626	97
1 (Freetown, 0.45 kg/person/ day)	829,206	7,396	1,157,579	9,720	1,998,055	12,972
5	7,629,509	5,622	9,284,685	6,342	9,989,340	6,575
	1,813,640	5,444	2,024,455	5,387	2,132,309	4,965
	943,902	2,078	1,029,557	2,059	1,090,649	1,942
4 (reported a range of 0.75–1.0 kg/person/day, average used)	192,172	599	291,573	773	535,497	1,033
6	2,326,099	14,318	3,411,381	21,535	7,291,620	35,852
Includes municipal, commercial, and industrial waste; excludes C&D, hazardous, and inert waste.	20,102,994	56,015	27,094,596	64,466	36,766,292	72,755
1 (Juba, 1.11 kg/person/day)	2,854,926	12,231	3,989,661	17,254	7,530,449	25,366
	20,361,483	46,348	21,226,169	46,115	21,829,247	44,395
4 (7,210 tonnes/day). The data are for 22 out of 25 districts in Sri Lanka and exclude approximately one-quarter of the population.	2,581,444	20,798	3,168,447	21,475	3,746,891	20,792
4 (St. Kitts: 2.08 kg/person/ day and Nevis: 1.52 kg/ person/day)	33,380	55	59,629	61	69,926	63

			C	Driginal year reporte	Original year reported			
Country or economy	Region	Income	MSW generation	Population	Year	Source		
St. Lucia	LAC	UMIC	77,616	177,206	2015	St. Lucia, SLSWMA 2015, 47		
St. Vincent and the Grenadines	LAC	UMIC	31,561	109,455	2015	SIDS DOCK 2015, 15		
Sudan	SSA	LMIC	2,831,291	38,647,803	2015	Elbaroudi, Ahmed, and Adam 2015, 9		
Suriname	LAC	UMIC	78,620	526,103	2010	IDB 2010; Zuilen 2006		
Sweden	ECA	HIC	4,377,000	9,799,186	2015	Eurostat 2017		
Switzerland	ECA	HIC	6,056,000	8,372,098	2016	OECD 2018		
Syrian Arab Republic	MENA	LMIC	4,500,000	20,824,893	2009	GIZ and SWEEP-Net 2010b, 5		
Taiwan, China	EAP	HIC	7,336,000	23,434,000	2015	Chen 2016		
Tajikistan	ECA	LMIC	1,787,400	8,177,809	2013	Tajikistan, Tajstat 2017		
Tanzania	SSA	LIC	9,276,995	49,082,997	2012	Tanzania, NBS and OCG 2014		
Thailand	EAP	UMIC	26,853,366	68,657,600	2015	Thailand, PCD 2015, 74		
Timor-Leste	EAP	LMIC	63,875	1,268,671	2016	Timor-Leste, Ministry of Commerce, Industry and the Environment 2016, 1		
Тодо	SSA	LIC	1,109,030	7,228,915	2014	CCAC n.d.		
Tonga	FAP	UMIC	17.238	104.951	2012	ADB 2014c		

	<b>2016</b> a	djusted	2030 pr	ojected	2050 pr	ojected
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
4 (1.2 kg/person/day); Deglos Sanitary Landfill received 51,661 tonnes and the Vieux Fort Solid Waste Management Facility received 20,228 tonnes. The total generation was accounted for by dividing by the collection efficiency.	78,361	178	91,811	186	106,930	182
4 (0.79 kg/person/day)	31,761	110	39,210	112	45,567	109
1 (Khartoum, 0.2–0.4 kg/ person/day; average used)	2,922,225	39,579	4,492,595	54,842	8,214,056	80,386
1 (urban, 0.47 kg/person/day, based on Paramaribo data; rural, 0.29 kg/person/day, based on data from other districts); 7	82,609	558	104,605	617	133,249	648
	4,426,933	9,838	5,122,838	10,712	6,019,418	11,626
	6,077,441	8,402	6,945,435	9,204	8,039,954	9,880
	3,849,718	18,430	6,594,549	26,608	11,170,733	34,021
28 percent of total waste (26,200,000 tonnes/year) comprises MSW; remaining is IW.	6,884,963	23,557	8,040,360	24,151	8,168,078	22,771
	1,968,475	8,735	3,091,105	11,194	5,633,844	14,521
Calculated based on summing amount of waste collected by company or authority, burned, dumped on roadside, buried, and other (bush, open space).	10,860,140	55,572	18,545,453	83,702	39,824,577	138,082
	27,268,302	68,864	32,484,794	69,626	37,342,182	65,372
4 (175 tonnes/day)	63,875	1,269	91,347	1,704	161,765	2,421
1 (Lome, 220 kg/person/ year)	1,169,455	7,606	1,702,085	10,507	3,083,704	15,298
4 (0.5 kg/person/day); 7	17,849	107	27,763	121	38,277	140

Country or			MCW	Original year reporte	-	
economy	Region	Income	generation	Population	Year	Source
Trinidad and Tobago	LAC	HIC	727,874	1,328,100	2010	Trinidad and Tobago, EMA n.d., 54
Tunisia	MENA	IMIC	2 700 000	11 1/2 908	2014	Brahim 2017 2
Tuttisia	MENA	LIVIIC	2,700,000	11,143,500	2014	Brahim 2017, 2
Turkey	ECA	UMIC	31,283,000	78,271,472	2015	Eurostat 2017
Turkmenistan	ECA	UMIC	500,000	5,366,277	2013	Zoï Environment Network 2013, 25
Tuvalu	EAP	UMIC	3,989	11,097	2016	SPREP 2016, 21
Uganda	SSA	LIC	7,045,050	35,093,648	2011	Okot-Okumu and Nyenje 2011
Ukraine	ECA	LMIC	15,242,025	45,004,645	2016	Ukraine, SSC 2017
United Arab Emirates	MENA	HIC	5,413,453	9,269,612	2016	Idrees and McDonnell 2016
United Kingdom	ECA	HIC	31,567,000	65,128,861	2015	Eurostat 2017
United States	NA	HIC	258,000,000	318,563,456	2014	U.S. EPA 2014, 2
Uruguay	LAC	HIC	1,260,140	3,431,552	2015	IDB 2015, 3
Uzbekistan	ECA	LMIC	4,000,000	29,774,500	2012	ADB 2012, 1
Vanuatu	EAP	LMIC	70,225	270,402	2016	SPREP 2016, 21
Venezuela, RB	LAC	UMIC	9,779,093	29,893,080	2012	Venezuela, INE 2013, 5
Vietnam	EAP	LMIC	9,570,300	86,932,500	2010	Nguyen, Heaven, and Banks 2014, 366
Virgin Islands (U.S.)	LAC	HIC	146,500	105,784	2011	Davis, Haase, and Warren 2011, 9

	2016 ac	ljusted	2030 pr	ojected	2050 pr	ojected
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)
Value is an extrapolated number from 2009 (650,000 tonnes), which used estimates of waste going into major landfills and assumed an amount for the rest of the landfills. "Of this figure, about one third of the waste was generated from ICI sources whilst the majority of two thirds from household sources. Based on Trinidad's population, it is further estimated that 0.54 tonnes of waste is generated per capita per year amounting to 1.50 kilograms per person per day."	731,213	1,365	805,080	1,374	848,091	1,295
Reported as about 2.7 million tonnes/year.	2,762,239	11,403	3,881,898	12,842	5,399,358	13,884
	31,983,841	79,512	39,975,974	88,417	48,783,058	95,627
Reported as almost 500,000 tonnes/year of municipal waste generated, including HW.	566,202	5,663	884,585	6,767	1,252,664	7,888
8	3,989	11	9,038	13	11,933	15
4 (0.55 kg/person/day)	8,375,073	41,488	14,103,192	63,842	30,856,601	105,698
9 (11,562,600 tonnes/year collected in 2016 and a collection rate of 75.86 percent in 2012)	15,050,327	44,439	17,542,698	41,200	19,940,300	36,416
4 (1.6 kg/person/day)	5,413,453	9,270	6,802,059	11,055	8,571,552	13,164
	32,037,871	65,789	36,720,437	70,579	42,820,633	75,381
	263,726,732	322,180	311,039,297	354,712	359,887,136	389,592
1 (urban, 1.03 kg/person/day)	1,271,646	3,444	1,521,565	3,594	1,804,592	3,662
Reported as more than 4 million tonnes/year of MSW generated.	4,622,615	31,447	6,594,881	36,712	9,407,851	40,950
8	70,225	270	109,807	354	210,239	475
3; country reports 100 percent collection coverage.	10,093,925	31,568	11,693,608	36,750	15,756,898	41,585
4 (26,220 tonnes/day)	11,562,740	94,569	15,922,186	106,284	21,961,818	114,630
Calculated from waste generated in St. Thomas (65,000 tonnes/year) and in St. Croix (81,500 tonnes/ year).	170,720	105	218,451	102	213,661	89

			0	riginal year reported		
Country or economy	Region	Income	MSW generation	Population	Year	Source
West Bank and Gaza	MENA	LMIC	1,387,000	4,046,901	2012	GIZ and SWEEP-Net 2014d, 11
Yemen, Rep.	MENA	LMIC	4,836,820	27,584,213	2016	Al-Eryani 2017
Zambia	SSA	LMIC	2,608,268	14,264,756	2011	Edema, Sichamba, and Ntengwe 2012; Zambia, Central Statistical Office 2013
Zimbabwe	SSA	LIC	1,449,752	12,500,525	2002	GIZ 2013a, 2013b, 2013c, 2013d, 2014

Note: Year refers to year of data, unless otherwise specified.

Population for original year of data from the World Bank (2017b), except for Taiwan, China. Population for Taiwan, China, is from the Taiwan National Development Council (2015). Population for 2016 adjusted waste generation and 2030 and 2050 projected waste generation from UN DESA (2017).

For projection methodology, see box 2.1.

C&D = construction and demolition; EAP = East Asia and Pacific; ECA = Europe and Central Asia; HH = household; HIC = high-income country; HW = hazardous waste; ICI = institutional, commercial, and industrial; IW = industrial waste; kg = kilogram; LAC = Latin America and the Caribbean; LIC = low-income country; LMIC = lower-middle-income country; MENA = Middle East and North Africa; MSW = municipal solid waste; NA = North America; SAR = South Asia; SSA = Sub-Saharan Africa; UMIC = upper-middle-income country.

1. Calculated using an urban or city-specific daily or monthly MSW generation rate as a proxy for national urban generation; rural MSW generation is assumed to be 50 percent of urban or city rate; urban or city and value denoted in parentheses.

2. Personal communication.

- 3. Value represents amount collected.
- 4. Calculated using an average national MSW generation rate; value denoted in parentheses.
- 5. Value represents total solid waste generated, not only MSW.

 One out of four countries in Sub-Saharan Africa for which no data were available at the country or city level. A regional estimate of waste generation per capita was calculated for the 44 other Sub-Saharan Africa countries; this regional per capita estimate was used to estimate total MSW generated for each of these four countries.
 Value represents household waste only.

- 8. Calculated based on an urban regional per capita average of 1.3 kg/person/day and rural regional per capita average of 0.5 kg/person/day.
- 9. Calculated based on the amount of MSW collected and percentage of collection.

	<b>2016</b> a	djusted	2030 pr	ojected	2050 projected		
Comment	MSW generation	Population ('000s)	MSW generation	Population ('000s)	MSW generation	Population ('000s)	
	1,628,920	4,791	2,768,338	6,739	5,618,921	9,704	
1 (urban, 0.55–0.65 kg/ person/day; rural 0.3–0.4 kg/ person/day; averages used); 2	4,836,820	27,584	6,903,335	36,815	12,057,526	48,304	
1 (Lusaka and Ndola, 0.72 kg/person/day)	3,114,269	16,591	5,239,016	24,859	11,185,099	41,001	
1 (Chinhoyi, Gweru, Kariba, Kadoma, and Norton, 0.27 kg/nerson/day)	1,799,140	16,150	2,484,974	21,527	4,189,544	29,659	

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## **APPENDIX B**

## Waste Treatment and Disposal by Country or Economy

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Algeria	MENA	UMIC			2.0	89.0	8.0	1.0		
Andorra	ECA	HIC								52.1
Antigua and Barbuda	LAC	HIC			98.7			0.1		
Argentina	LAC	UMIC	22.6		8.9	62.5	6.0			
Aruba	LAC	HIC					11.0			
Australia	EAP	HIC		48.9			42.1			9.8
Austria	ECA	HIC		3.0			25.7	31.2		37.9
Azerbaijan	ECA	UMIC	100.0							
Bahrain	MENA	HIC		92.0			8.0			
Bangladesh	SAR	LMIC						5.3		

Advanced thermal	Water-		Un- accounted			
treatment	ways	Other	for	Year(s)	Source	Comment
				2016, 2013	CLF, SLF: Ismail 2017 RE, CM: GIZ and SWEEP-Net 2014a	1
			47.9	2012	UNSD 2016	<b>UA</b> : Does not include landfilling, recycling, or composting, as values for those are 0.
	0.1		1.1	2014, 2011	CLF: Gore-Francis 2013 CM, UA, WW: Antigua and Barbuda, Statistics Division 2014, 36	<ul> <li>CLF: Cooks Sanitary Landfill and Civic Amenities Site is referred to as a "sanitary landfill"; however, based on the performance audit report by the National Solid Waste Management Authority, 2013, i is run as a CLF; CLF estimated by subtractii uncollected waste (composted or thrown ir waterways) from 100 percent of the waste.</li> <li>CM: Calculated by the population composting compared with total populatio disposing of garbage by various means fro questionnaire on Population by Parish by Waste Disposal Method.</li> <li>WW: Calculated by the population dumping waste in river, sea, or pond compared with total population disposing of garbage by various means from questionnaire on Population by Parish by Waste Disposal Method.</li> <li>UA: Calculated by the population burning (0.23 percent), burying (0.04 percent), not stated (0.56 percent), and other</li> <li>(0.31 percent) compared with total population disposing of garbage by variou means from questionnaire on Population Population by Parish by Waste Disposal Method.</li> </ul>
				2010	Argentina SIDSA 2015, 80	
				2012	UNSD 2016	New sanitary landfills are being constructe as of 2018.
			89.0	2013	Pricewaterhouse- Coopers Aruba 2014	
				2015	Australia, Department of the Environment and Energy 2017, vii	LF: Calculated based on amount of MSW disposed of compared with amount generated. RE: Calculated based on amount of MSW recycled compared with amount generated IN: Calculated based on amount of MSW recovered for energy compared with amou generated.
			2.2	2015	Eurostat 2017	<b>CM</b> : 2
				2015	Azerbaijan, Ministry of Economy 2017, 105	Based on the statement "All of Azerbaijan's disposal sites, other than the new systems within the Baku metropolitan area, is by open dumping."
				2012	Al Sabbagh et al. 2012	<b>RE:</b> Value for recycling and material recovery rate.
			94.8	2011	<b>OD</b> : Enayetullah, Sinha, and Khan 2005 <b>CM</b> : ADB 2011	<b>OD</b> : Most common method of waste disposal in Bangladesh.
						(Table continues on next page

HIC UMIC 7.1 HIC UMIC 66.0	90.0 76.9 0.9	34.0	9.0			
UMIC 7.1 HIC UMIC 66.0	0.9	34.0	16.0			
HIC UMIC 66.0	0.9	34.0	24.0			
HIC UMIC 66.0	0.9	34.0	24.2			
UMIC 66.0		34.0	34.3	19.1		43.4
LIC			25.0			
HIC	12.2		2.0	18.3		67.6
LMIC	98.0		0.9	1.4		
LMIC 55.5	0.0	31.9	12.1	0.4		
UMIC 41.8	8.6	24.1				
UMIC			1.0			
UMIC 15.6	21.9	53.3	1.4	0.2		
	VIIC 41.8 VIIC 15.6	VIIC 41.8 8.6 VIIC VIIC 15.6 21.9	VIIC 41.8 8.6 24.1 VIIC VIIC 15.6 21.9 53.3	VIIC 41.8 8.6 24.1 VIIC 1.0 VIIC 15.6 21.9 53.3 1.4	VIIC 41.8 8.6 24.1 VIIC 1.0 VIIC 15.6 21.9 53.3 1.4 0.2	VIIC 41.8 8.6 24.1 VIIC 1.0 VIIC 15.6 21.9 53.3 1.4 0.2

thermal treatment	Water- ways	Other	accounted for	Year(s)	Source	Comment
			1.0	2012, 2015	Riquelme, Méndez, and Smith 2016	CLF: Estimated based on total generation minus the amount uncollected; the main landfill in use is the Mangrove facility, which is considered a CLF. <b>RE</b> : Represents only a portion of waste that is recycled by the Sustainable Barbados Recycling Centre; the actual amount of HH waste that is finally recycled is not known. <b>CM</b> : 3. <b>UA</b> : Calculated based on difference between total waste generation and sum of waste landfilled and recycled.
				2016	OD, CLF: Belarus, Ministry of Housing and Utility 2017b RE: Belarus, Ministry of Housing and Utility 2017a	1
			2.3	2015	Eurostat 2017	<b>CM</b> : 2
				2012	OD, SLF: IDB 2015 CM: IDB 2013, 18	CM: 3 RE: 4 OD: Reported as "inadequate disposal of waste" in source, which includes open dumps, open burning, and other forms of final disposal (bodies of water, animal feed, and so on), of which most is assumed to be openly dumped.
			75.0	2005	AFED 2008, 18	
		•		2012	UNSD 2016	CLF: 5 IN: Value represents IN and ATT.
				2016	Bhutan, National Environment Commission 2016	<b>CLF:</b> Majority of waste is dumped at a Memelakha controlled landfill in Thimphu; it has soil cover and compaction of waste on a regular basis.
				2015	Bolivia, MMAyA/ VAPSB/DGGIRS 2016	OD: Includes remainder of waste not processed through formal collection or informal recycling. CLF, SLF: SLF includes those constructed as such and in good operation; CLF are those constructed as SLF but not operating well; abandoned landfills excluded. RE: Includes informal recycling based on estimates and formal recycling based on inventory of existing plants. CM: Based on inventory of existing plants.
		0.0	25.6	2015	Bosnia and Herzegovina, BHAS 2016, 1	<b>CLF:</b> Reported as controlled landfill because there is no landfill gas management. <b>Other:</b> 6
			99.0	2005	AFED 2008, 18	
			7.6	2015, 2014	OD, CLF, SLF: ABRELPE 2015, 23 IN: ABRELPE 2015, 69 RE: UFPE 2014, 84 CM: Brazil SNIS 2017, 145	<b>CM</b> : Data refer to percentage of waste sent to open dumps, sanitary landfills, compost, and sorting plants in participating municipalities.

		-								
Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary landfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
British Virgin Islands	LAC	HIC								80.3
Brunei Darussalam	EAP	HIC				70.0		2.0		
Bulgaria	ECA	UMIC		66.2			19.0	10.3		2.8
Burkina Faso	SSA	LIC	59.0	17.0			12.0			
Cambodia	EAP	LMIC								-
Cameroon	SSA	LMIC	80.3			19.3	0.4			
Canada	NA	HIC		72.3			20.6	4.1		3.0
Cayman Islands	LAC	HIC					21.0			
Channel Islands	ECA	HIC			39.2		28.4	15.9		16.4
Chile	LAC	HIC	8.4		85.3		0.4	0.4		0.1
China	EAP	UMIC	8.2	60.2				3.0		29.8
Colombia	LAC	UMIC	4.0			89.0	17.2			
Congo, Dem. Rep.	SSA	LIC					4.9			

Advanced thermal	Water-		Un- accounted			
treatment	ways	Other	for	Year(s)	Source	Comment
			19.7	2005	UNSD 2016	
			28.0	2014	Shams, Juani, and Guo 2014	
			1.7	2015	Eurostat 2017	
			12.0	2009, 2005	OD, LF, UA: IMF 2012 CM, AD: Cissé 2015 RE: AFED 2008, 18	CM: 3 AD: 7 (There is a small-scale biogas facility in Ouagadougou). UA: Includes some open burning.
		17.5	82.5	2004	Patriamby and Tanaka 2014, 82	8 OD: 9 SLF: There is a sanitary landfill in Phnom Penh. Other: Includes open burning (15 percent) and other unspecified methods in urban areas (2.5 percent); other methods (unspecified) in suburban areas is 15 percent (not included in figure).
				2012	OD, SLF: UNFCCC 2014 CM, Other: Armel 2017 RE: UNSD 2016	CM: 3 OD: Proportion of waste that is not landfilled or recycled is dumped. Other: 10
			-	2008, 2007	LF, RE, IN: Canada, Statistics Canada 2012 CM: van der Werf and Cant 2007	<ul> <li>LF: In total, 25,871,310 tonnes are disposed of by landfill and incineration, amounting to 75.3 percent of waste; 3 percent is incinerated, so total landfill amount is 72.3 percent.</li> <li>RE: In total, 8,473,257 tonnes were diverted to recycling and composting. According to a 2007 article, 17 percent of organic waste is composted, which in total is about 4.1 percent of waste; thus total recycled is approximately 20.6 percent.</li> <li>CM: 17 percent of organic waste is composted, which in total is about 4.1 percent of waste.</li> <li>IN: Seven municipal incineration plants in Canada.</li> </ul>
			79.0	2013	LF: Amec Foster Wheeler 2016 RE: Pricewaterhouse- Coopers Aruba 2014	LF: 11 (3 landfills).
				2016	States of Guernsey 2017	
		0.0	5.3	2009	Chile, CONAMA 2010, 59	14 IN: Includes both with and without energy recovery.
				2014, 2011	<b>OD, LF, IN</b> : Modak et al. 2017, 215 <b>CM</b> : Takeda, Wang, and Takaoka 2014, 35	<b>CM</b> : Includes biological treatment and other treatment technologies. Informal recycling is estimated to be 15.8% nationally based on a World Bank 2011 study.
				2011	<b>OD, SLF</b> : IDB 2012, 28 <b>RE</b> : IDB 2015, 3	
			95.1	2005	RE: AFED 2008, 18 Other: Kalula 2016	<b>SLF</b> : 12
						(Table continues on next page)

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eratior
Congo, Rep.	SSA	LMIC					26.2			
Costa Rica	LAC	UMIC	9.1	<u>.</u>	23.5	67.5	1.3			
0.00										
Cote d'Ivoire	SSA ECA			70.9			3.0	17		
Cittatia	LUA	OIVIC		75.0			10.5	1.7		
Сира	LAC	UMIC	42.2		30.7		9.5			
Curaçao	LAC	HIC					2.0			
Cyprus	ECA	HIC		74.5			13.3	4.6		
Czech Republic	ECA	HIC		52.6			25.5	4.2		17.7
Denmark	ECA	HIC		1.1			27.3	19.0		52.6
Dominica	LAC	UMIC			94.0					
Dominican Republic	LAC	UMIC	72.6			0.1	8.2			

Advanced	Mater		Un-			
thermal	Water- ways	Other	accounted for	Year(s)	Source	Comment
			73.8	2005	<b>OD, CM</b> : Guillaume, Château, and Tsitsikalis 2015 <b>RE</b> : AFED 2008, 18	CM: 3 OD: 9
			-	2010, 2014	OD, CLF, SLF: IDB-AIDIS-PAHO 2011, 132 <b>RE</b> : Costa Rica, Division of Operational and Evaluative Inspection 2016, 2, 22, 23, and 26	LF: 11 OD: 9 (Waste from 9.1 percent of covered population is dumped.) CLF: Waste from 23.5 percent of covered population goes to CLF. RE: 13 SLF: 12 (Waste from 67.5 percent of covered population goes to SLF.)
			97.0	2005	AFED 2008, 18	
			2.2	2015	Eurostat 2017	CM: 2 UA: 14
			17.6	2015	OD, RE, UA: Cuba ONEI 2016 CLF: Cuba, ONEI 2017 (population); Anon n.d. (waste disposed in landfills); Rebelde 2007 (generation rates)	OD: Calculated based on remainder of waste that was collected but not recycled or put in CLF in Havana. CLF: Calculated based on estimate of total waste received at unengineered landfills in Havana Province only divided by MSW generated nationwide; no information available on landfills outside of Havana; MSW generation estimates do not include bulky waste, industrial, or medical waste; also likely does not include commercial, but this cannot be confirmed. RE: Calculated based on estimates of waste recycled or composted compared with total generation. UA: Calculated based on waste produced by population without collection service, primarily in rural areas.
			98.0	2013	Pricewaterhouse- Coopers Aruba 2014	
			7.6	2015	Eurostat 2017	
			0.0	2015	Eurostat 2017	CM: 2
			0.0	2015	Eurostat 2017	<b>CM</b> : 2
			6.0	2005	UNSD 2013	CLF: Estimated based on population with access to formal collection services; likely that actual value is higher; value is supported by World Bank site visits. UA: 6 (Actual figure may be lower.)
			19.1	2017, 2015	OD, RE: Dominican Republic, Ministry of Environment and Natural Resources 2014 SLF: Dominican Republic, Ministry of Environment and Natural Resources and Ministry of Economy 2017	<ul> <li>OD: Calculated based on the sum of other treatment and disposal options subtracted from total waste generated.</li> <li>SLF: 1 (Estimated based on the amount of waste taken to one sanitary landfill in Las Placetas, San Jose de las Matas.)</li> <li>RE: Includes all exported recyclables (metals paper, carton, plastics, and glass); does not include items recycled in country.</li> <li>Other: Calculated based on the amount of waste from HH without collection services compared with total waste generation.</li> </ul>
						(Table continues on next page

A LMIC LMIC HIC HIC	22.3 84.0 13.8 43.0	7.0	7.4	78.2	12.9 12.5 24.7 67.0	7.0		51.4
A LMIC LMIC HIC LIC HIC	84.0 13.8 43.0	7.0	7.4	78.2	12.5 24.7 67.0	7.0		51.4
LMIC HIC LIC HIC	43.0		7.4	78.2	24.7	3.6		51.4
HIC LIC HIC	43.0		7.4	78.2	24.7 67.0	3.6		51.4
HIC LIC HIC	43.0		7.4		24.7 67.0	3.6		51.4
LIC HIC	43.0				67.0			
HIC					67.0			
UMIC		52.0			5.5			
HIC		11.5			28.1	12.5		47.9
HIC		25.8			22.3	17.3		34.7
HIC					39.0			
HIC		0.2			47.8	18.2		31.7
HIC		80.0			19.0			
HIC		60.0						40.0
	HIC HIC HIC	HIC HIC HIC	HIC 0.2 HIC 80.0 HIC 60.0	HIC 0.2 HIC 80.0 HIC 60.0	HIC 0.2 HIC 80.0 HIC 60.0	HIC     0.2     47.8       HIC     80.0     19.0       HIC     60.0	HIC       0.2       47.8       18.2         HIC       80.0       19.0         HIC       60.0       19.0	HIC     0.2     47.8     18.2       HIC     80.0     19.0

Advanced thermal	Water-		Un- accounted			
treatment	ways	Other	for	Year(s)	Source	Comment
			11.6	2015	Ecuador, Ministry of Environment 2018	1 OD: Calculated assuming that 29.5 percent of all collected waste (88.4 percent) that is not recycled is dumped. SLF: Calculated based on percentage of people with collection service for this disposal method times the percent of total collection coverage. RE: 14 UA: 6
				2013	GIZ and SWEEP-Net 2014b	OD: Reported as 80–88 percent in source (average used). RE: Reported as 10–15 percent in source (average used).
		7.9	0.1	2010	IDB-AIDIS-PAHO 2011, 132	<b>Other</b> : Includes open burning (7.3 percent) and waste disposed as cattle feed, dumped in WW, and so on.
			12.9	2015	Eurostat 2017	CM: 2
			57.0	2011	Global Methane Initiative 2011	
			33.0	2012	RE: Nordic Competition Authorities 2016, 59 IN: Frane, Stenmarck, and Gislason 2014	<b>RE</b> : Recovery includes incineration with recovery, CM, AD, RE, other recovery, and hazardous materials exported for treatment; mineral waste that is inert is usually landfilled or used for land reclamation. <b>IN</b> : Some incineration occurs but exact percentage unknown.
			42.6	2011, 2013	LF: Fiji, Department of Environment 2011 RE: Patriamby and Tanaka 2014, 274	LF: Calculated based on the amount of waste landfilled or dumped in 2010 compared with the amount of waste generated in 2011. RE: Average recycling rate derived from the recycling rates of Lautoka City (8.1 percent) and Nadi Town (2.8 percent).
			0.0	2015	Eurostat 2017	<b>CM</b> : 2
			0.0	2015	Eurostat 2017	
			61.0	2013	SPREP 2016	OD: 9 LF: 11 SLF: 12 (99 waste disposal sites, of which 5 are SLF, 3 are controlled dumps, 8 are authorized open dumps, and 80 are temporary unregulated dumps.) CM: 3 (1 large-scale compost program in Tahiti.)
			2.0	2015	Eurostat 2017	
		1.0		2014, 2011	Greece, Ministry of Environment and Energy 2015, 17	LF: Reported as disposed of. RE: Reported as recovered (recycling and composting). Other: Reported as unregistered management.
				2010	Eisted and Christensen 2011	LF: Calculated based on the amount of waste landfilled compared with amount generated (average used). IN: Calculated based on the amount of waste incinerated compared with amount generated.
						(Table continues on next page

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Grenada	LAC	UMIC	·		98.3			0.2		
Guam	EAP	HIC				64.0	17.9			
Guatemala	LAC	LMIC	69.8		9.6	15.4				
Guinea	SSA	LIC		•			5.0			
Guyana	LAC	UMIC		61.4			0.5			
Haiti	LAC	LIC			9.9					
Honduras	LAC	LMIC	15.0		59.9	11.3				
Hong Kong SAR, China	EAP	HIC		66.0			34.0			
Hungary	ECA	HIC		53.6			25.9	6.2		14.1
lceland	ECA	HIC		30.3			55.8	2.9		1.9
India	SAR	LMIC	77.0				5.0	18.0		

Advanced thermal treatment	Water- ways	Other	Un- accounted for	Year(s)	Source	Comment
		1.5		2011	Grenada, Population and Housing Census 2011, 35	CLF: The two landfills are controlled landfills they are being upgraded as part of a Caribbean Development Bank project. CM: Represents an approximate value of waste composted in HH. Other: Includes open burning (0.7 percent), dumping (0.2 percent), dumping on land (0.4 percent), burying (0.1 percent), and othe unspecified (0.1 percent).
			18.2	2012, 2011	SLF, RE: Guam 2013 CM: SPREP 2016	<b>SLF</b> : Calculated based on amount disposed of in Layon Landfill and amount of waste generated.
			5.2	2010	IDB-AIDIS-PAHO 2011, 132	<b>UA</b> : 15
			95.0	2005	AFED 2008, 18	
			38.1	2011, 2010	Guyana, Ministry of Communities n.d.	<b>UA</b> : Refers to remainder of waste not disposed of in landfill or recycled, which is mainly disposed of in CLF and ODs; a small portion is recycled through glass and scrap metal recycling programs.
			90.1	2012	IHSI, IRD, Dial, Nopoor, ANR 2014 (coverage); IHSI 2015 (population); SWANA Haiti Response Team 2010 (generation - Port au Prince); Naquin 2016 (generation per capita urban and rural areas – Cap-Haïtien)	<b>CLF</b> : Calculated assuming that total waste collected in the metropolitan area of Port au Prince is disposed of in the Trutier landfill as a percentage of the total waste generated countrywide. <b>UA</b> : Includes all waste collected from other urban and rural areas.
			13.8	2010	IDB-AIDIS-PAHO 2011, 132	UA: 15 and all other disposal methods.
				2016	Hong Kong, Environmental Protection Department, Statistics Unit 2017	
			0.1	2015	Eurostat 2017	
		9.1		2013	Iceland, Statistics Iceland 2015, 429	Calculated based on actual values provided. Other: Includes other recovery (8.38 percent) other disposal (0.38 percent), and hazardous waste exported for treatment (0.38 percent).
				2016, 2013	OD, CM: India CPCB 2017 RE: Mahapatra 2013	1 <b>OD</b> : Assuming 100 percent of rural waste is dumped; 77.96 percent of urban waste is dumped based on CPCB data, less amount recycled. <b>RE</b> : Based on estimate that 15,342 tonnes of plastic is disposed of every day, 60 percent of which is recycled. <b>CM</b> : Value refers to total amount of waste processed from composting, RDF, and biogas.

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eratior
Indonesia	EAP	LMIC	10.0	69.0			7.0			
Iran, Islamic Rep.	MENA	UMIC	72.0		10.0		5.0	12.0	0.3	0.4
Iraq	MENA	UMIC	100.0							
Ireland	ECA	HIC			41.0		33.0	6.0		17.0
Isle of Man	ECA	HIC		25.0			50.0			25.0
Israel	MENA	HIC		75.0			25.0			
Italy	ECA	HIC		26.5			25.9	17.6		19.0
Jamaica	LAC	UMIC			64.0					
Japan	EAP	HIC			1.1		4.9	0.4	0.1	80.2
Jordan	MENA	LMIC	45.0	48.0			7.0			
Kazakhstan	ECA	UMIC	60.1				2.9			
Kenya	SSA	LMIC					8.0			
Korea, Rep.	EAP	HIC		16.0			58.0	1.0		25.0
Kosovo	ECA	LMIC	33.6		66.4					

Advanced thermal treatment	Water- ways	Other	Un- accounted for	Year(s)	Source	Comment
		14.0		2016	Damanhuri 2017, 3	RE: 13 OD: Referred to as "illegal dumping" in source. Other: Includes disposal in rivers, on streets, gardens, and so on (9 percent) and open burning (5 percent).
			0.3	2017	Abedini 2017	1 RE: Value for material segregated in sorting plants. AD: There is only one facility in Tehran with capacity of 150 tonnes/day. IN: There is only one facility in Tehran with capacity of 200 tonnes/day.
		•		2015	Iraq, Ministry of Environment 2015	
		2.0	1.0	2012	Ireland, EPA 2014, 1	CM: 2 Other: 34 percent of MSW managed in Ireland was exported for energy recovery and recycling.
				2011	Isle of Man, Department of Infrastructure n.d., 12	
		·		2017	Israel, Ministry of Environmental Protection 2017	LF, RE: Reported as, "Some 75 percent of the waste in the country is buried in landfills while only about 25 percent is recycled."
			11.0	2015	Eurostat 2017	CM: 2 UA: 14
		29.0	7.0	2016, 2011	CLF: Jamaica NSWMA 2016 Other: Jamaica 2011	CLF: 14 Other: Calculated based on the amount treated or disposed of compared with the amount generated [burned (34.58 percent), buried (0.60 percent), and WW (0.82 percent)].
	·	13.3	-	2015	Japan, Ministry of the Environment 2015	SLF: 12 (2 out of 1,718 facilities.) IN: Includes ATT.
				2014	GIZ and SWEEP-Net 2014c, 7	
			37.0	2012	World Bank n.d., 42	OD: Calculated based on the amount of waste disposed of in dumpsites or landfills compared with the amount of MSW generated. RE: Calculated based on the amount of waste recycled and processed compared with the amount of MSW generated.
			92.0	2009	UNECA 2009, 24	8 <b>RE</b> : 13
				2014	OECD 2017	
				2010	Kosovo, Ministry of Environment and Spatial Planning 2013, 27	

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Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Kuwait	MENA	HIC	100.0							
Kyrgyz Republic	ECA	LMIC	100.0	·						
Lao PDR	EAP	LMIC	60.0		30.0		10.0			
Latvia	ECA	HIC		57.6			21.2	5.5		
Lebanon	MENA	UMIC	29.0	·	48.0		8.0	15.0		
Liechtenstein	ECA	HIC	·				64.6	-		·
Lithuania	ECA	HIC		54.0			22.9	10.2		11.5
Luxembourg	ECA	HIC		17.7			28.4	19.7		34.0
Macao SAR, China	EAP	HIC					20.0			
Macedonia, FYR	ECA	UMIC		99.7			0.2	0.1		
Madagascar	SSA	LIC	96.7	-				3.5		
Malaysia	EAP	UMIC		71.5		10.0	17.5	1.0		
Maldives	SAR	UMIC	. <u></u>					7.0		6.0
Malta	MENA	HIC				89.6	6.7	<u>.</u>		0.4
Marshall Islands	EAP	UMIC					30.8	6.0		
Mauritania	SSA	LMIC	54.7		37.3		8.0			·
Mauritius	SSA	UMIC			-	91.0		9.0		
Mexico	LAC	UMIC	21.0			74.5	5.0			
Moldova	ECA	LMIC	35.1				15.3			

Advanced thermal	Water-		Un- accounted			
treatment	ways	Other	for	Year(s)	Source	Comment
				2014	Alsulaili et al. 2014	
				2010	Barieva 2012	Calculated based on amount of domestic waste disposed of compared with total amount of domestic waste generated.
				2015	CLF: Keohanam 2017 RE: CCAC n.d.(b)	
			15.7	2015	Eurostat 2017	<b>CM</b> : 2
				2014	GIZ and SWEEP-Net 2014d, 8	
			35.4	2015	<b>RE</b> : Liechtenstein, Office of Statistics 2018, 7	<b>RE</b> : Value is for urban waste.
			1.4	2015	Eurostat 2017	
			0.3	2015	Eurostat 2017	<b>CM</b> : 2
			80.0	2014	RE: Macao SAR, China 2014 IN: Macao SAR China, DSEC 2017	RE: Includes plastics, rubber, paper, metal, and other recoverable waste; approximated from figure in source. IN: Some incineration occurs at Macao Refuse Incineration Plant, which treats domestic and ICI waste, but exact percentage unknown.
				2013	LF, RE, CM: Macedonia, FYR, Ministry of Environment and Physical Planning 2014, 92 IN: Dimishkovska and Dimishkovski 2012, 264	
				2007	UNSD 2016	
				2017, 2016	UNCRD 2017	
	63.0	24.0		2016	Maldives, MEE 2017, 173	All values are specifically for kitchen waste disposal. <b>Other:</b> Includes bury (17 percent) and open burning (7 percent).
			3.4	2015	Eurostat 2017	<b>SLF:</b> Uncontrolled landfills were replaced with two major engineered landfills in 2004 and 2006.
			63.2	2007	UNSD 2016	
			-	2009	GIZ and SWEEP-Net 2010a	
				2012	UNSD 2016	
				2013	Mexico, SEMARNAT 2016, 444–45	AD: 16 IN: Only for hazardous waste and health care waste.
			49.6	2015	Moldova, Statistica Moldovei 2016, 58	OD: Calculated based on the amount deposited compared with the amount of waste generated. RE: Calculated based on the amount recycle compared with the amount of waste generated.
						(Table continues on next page

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recyclina	Com- posting	Anaerobic digestion	Incin- eration
Monaco	ECA	HIC					5.4			85.0
Mongolia	EAP	LMIC	93.5		. <u></u>					
Montenegro	ECA	UMIC	91.6				5.4			
Morocco	MENA	LMIC	52.0			37.0	8.0	1.0		
Mozambique	SSA	LIC	99.0				1.0			
Myanmar	EAP	LMIC			<u></u>					
Namibia	SSA	UMIC					4.5			
Nepal	SAR	LIC		37.0				2.9		
Netherlands	ECA	HIC		1.4			24.6	27.1		47.4
New Zealand	EAP	HIC		100.0						
Nicaragua	LAC	LMIC	59.3	19.6						
Niger	SSA	LIC	64.0	-			4.0			-
Nigeria	SSA	LMIC		40.0						
Northern Mariana Islands	EAP	HIC					36.0			
Norway	ECA	HIC				3.4	26.2	16.7		52.4
Oman	MENA	HIC	100.0		0.0					
Pakistan	SAR	LMIC	50.0	40.0			8.0	2.0		
Panama	LAC	UMIC	23.4		16.0	41.7				
Papua New Guinea	EAP	LMIC			62.0		2.0			
Paraguay	LAC	UMIC	23.4		40.2	36.4				
Peru	LAC	UMIC	56.4		15.6	24.0	4.0			

Advanced	Mater		Un-			
treatment	ways	Other	for	Year(s)	Source	Comment
			9.6	2012,	RE: UNSD 2016	IN: Calculated based on 39,000 tonnes from
				2013	IN: Monaco, Directorate of Environment 2013	the principality (including sewage sludge) that is incinerated; actual incineration rate is higher as waste is imported.
			6.5	2016	Delgerbayar 2016	
			3.0	2016	<b>OD, RE, UA</b> : Eurostat 2017 <b>SLF</b> : ZWMNE 2016	<b>SLF</b> : 12 [2 SLF in Podgorica (Livade) and Mozura.]
		2.0		2014	GIZ and SWEEP-Net 2014e, 7	<b>CM</b> : Value is given as <1 percent in source.
				2014	Tas and Belon 2014	<b>RE</b> : < 1 percent of waste recycled (estimated); waste that is not recycled is either dumped or buried.
		8.0	92.0	2010	Thein 2010	<b>OD:</b> 9 <b>Other:</b> Value refers to open burning.
			95.5	2005	AFED 2008, 18	
			60.1	2013	ADB 2013	LF: Source says disposed of in sanitary landfills, but not in a sanitary manner. CM: Value for all composting not known. UA: Value represents uncollected waste.
				2015	Eurostat 2017	<b>CM</b> : 2
				2015	UNSD 2016	
		21.1		2010	IDB-AIDIS-PAHO 2011, 132	Other: Includes open burning (7.5 percent).
		12.0	20.0	2005	UNSD 2016	Other: Refers to open burning.
		60.0		1995	<b>OD, RE:</b> Ayuba et al. 2013 <b>LF, Other:</b> IPCC 2006, 17	RE: 4 OD: 9
			64.0	2016	US EPA 2016	
			1.4	2015	OECD 2017	
				2017	Ouda 2017	1; 8
				2017	Korai, Mahar, and Uqaili 2017, 348	
		18.9		2010	IDB-AIDIS-PAHO 2011, 132	Other: 15 and open burning (4.7 percent).
		37.0		2016	Papua New Guinea, NCDC 2016, 45	RE: Recycling is limited to cans, plastic, glas containers, and food for piggeries. Other: Includes illegal dumping and open burning.
				2010	IDB-AIDIS-PAHO 2011, 132	
				2014, 2012	OD, CLF, SLF: Peru, Ministry of Environment 2016, 21 RE: Peru, Ministry of Environment 2013, 3	<b>OD</b> : Waste not disposed of in SLF was disposed of inadequately. <b>SLF</b> : 14
						(Table continues on next page

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Philippines	EAP	LMIC					28.0			
Poland	ECA	HIC		44.3			26.4	16.1		13.2
Portugal	ECA	HIC		49.0			16.2	14.1		20.7
Puerto Rico	LAC	HIC		66.5			14.0			
Qatar	MENA	HIC		93.0			3.0			4.0
Romania	ECA	UMIC		72.0			5.7	7.5		2.4
Russian Federation	ECA	UMIC	95.0				4.5			
Samoa	EAP	UMIC			31.0		36.0			
San Marino	ECA	HIC					45.1			
Saudi Arabia	MENA	HIC			85.0		15.0			<u></u>
Senegal	SSA	LIC	43.8		5.1					
Serbia	ECA	UMIC		73.9			0.8			
Singapore	EAP	HIC		2.0			61.0			37.0
Slovak Republic	ECA	HIC		68.7			7.6	7.3		10.7
Slovenia	ECA	HIC		22.7			46.4	7.7		17.1
Solomon Islands	EAP	LMIC								
South	SSA	UMIC			72.0		28.0			

Advanced			Un-			
thermal	Water-	Other	accounted	Manufal	0	0
reatment	ways	Other	72.0	2014	Modak et al. 2017, 235	Comment
				2015	Eurostat 2017	<b>CM</b> : 2
				2014	Eurostat 2017	CM: 2
			19.5	2007, 2013	LF: Energy Answers 2012, 2 RE: Pricewaterhouse- Coopers Aruba 2014	<b>LF</b> : 14 (Assumed disposed of in landfill, as there are 29 operating landfills.)
				2014	Ayoub, Musharavati, and Gabbar 2014, 96	
			12.5	2015	Eurostat 2017	LF: Refers to waste disposal in general as there is no information on the type of disposal; in Romania there is a combination of controlled and sanitary landfills with landfill gas recovery. UA: 14
			0.5	2012	<b>OD</b> : IFC 2012, 5 <b>RE</b> : Russia, Ministry of Natural Resources and Ecology 2012, 7	<b>RE</b> : Source provides a range of 4–5 percent (average used).
			33.0	2013	SPREP 2016	CLF: 14 [Semi-aerobic landfill (Fukuoka method).] RE: Refers to amount exported or recycled o reused locally.
			55.0	2016	San Marino, AASS 2016	<b>RE</b> : Value refers to amount of waste that is collected separately; all of this waste is recovered in some form.
				2015	Saudi Arabia n.d.	CLF: Value based on personal knowledge and the difference between total disposal (100 percent) and amount recycled (15 percent). RE: Includes recycling and treatment.
		4.7	46.4	2014	OD, CLF, Other: ANSD 2014 RE, CM: Gret-LVIA- Pacte 2006	OD: Includes dumping (42.2 percent) and informal burial (1.6 percent). RE: Most households engage in recycling activities; there are various societies devote to the recycling of plastic (PROPLAST), pape (PRONAT), and aluminum (SELMEG). Other: Includes open burning (3.5 percent).
		·	25.3	2015	<b>OD</b> : Anthouli et al. 2013, 27 <b>LF, RE</b> : Eurostat 2017	<b>OD</b> : There are 3,582 identified landfills, of which 165 are municipality landfills, 5 are SLF, and the rest are dumps.
				2015	Singapore, Ministry of the Environment and Water Resources 2017	
			5.7	2015	Eurostat 2017	
			6.2	2015	Eurostat 2017	<b>CM</b> : 2
	81.0		19.0	2015	Solomon Islands, MECDM 2015	8
				2011	South Africa, Department of Environmental Affairs 2012	<b>CLF, RE:</b> Include MSW and C&I waste; excludes C&D, hazardous, and inert waste.
						(Table continues on next pag

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Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Spain	ECA	HIC		55.1			16.8	16.5		11.6
Sri Lanka	SAR	LMIC	85.0				12.8	5.0		
St. Kitts and Nevis	LAC	HIC			100.0					
St. Lucia	LAC	UMIC			96.8			0.1		
St. Vincent and the Grenadines	LAC	UMIC		99.9				0.1		
Sudan	SSA	I MIC		82.0						
Suriname	LAC	UMIC	63.0							
Sweden	ECA	HIC		0.8			32.4	15.6		51.2
Switzerland	ECA	HIC	<u>.</u>				32.0	21.0		47.0
Syrian Arab Republic	MENA	LMIC	80.0	20.0	-		2.5	1.5		
Taiwan, China	EAP	HIC		34.8						64.2

Advanced			Un-			
thermal treatment	Water- ways	Other	accounted	Year(s)	Source	Comment
				2015	Eurostat 2017	CM: 2
				2016	Sri Lanka, Ministry of Mahaweli Development and Environment 2016	<b>OD:</b> Reported as more than 85 percent of waste dumped unscientifically.
				2017	SIDS DOCK 2015, 14	
		2.6	0.5	2010	St. Lucia Government Statistics Department 2011	Other: Includes open burning (1.5 percent); dumping on land (0.6 percent); dumping in river, sea, or pond (0.4 percent); and buryin (0.1 percent). UA: Includes other (0.2 percent) and not stated (0.3 percent).
		3.6		2012	<b>LF, CM</b> : St. Vincent and the Grenadines, Statistical Office 2012, 45 <b>Other</b> : St. Vincent and the Grenadines, Statistical Office n.d.	<ul> <li>LF: Five landfills are operational; MSW either is sent to landfills or composted.</li> <li>CM: Includes that which is composted after collection and at HH level (0.1 percent of households compost as their major form of disposal).</li> <li>Other: Includes burning (2.6 percent); burial (0.2 percent); open dumping (0.4 percent); dumping in river, sea, or pond (0.2 percent); values are for percentage of HH undertaking wasted disposal.</li> </ul>
		18.0		2003	IPCC 2006, 17	
			37.0	2013	Viren 2013	<b>OD</b> : Open dumping is the main waste disposal method for the country; the largest dump that is most similar to a formal landfi still has fires, leachate management deficiencies, and animals on site; formally collected waste is sent to a dump. <b>UA</b> : 6, which is managed by households in a variety of ways, but is most likely dumped.
				2015	Eurostat 2017	<b>CM</b> : 2
				2015	OECD 2017	LF: There are no landfills for MSW, but they exist for inert materials, stabilized residues, and bioreactor landfills.
				2010	GIZ and SWEEP-Net 2010b	OD: Source provides a value of about 80 percent. LF: Source provides a value of about 20 percent landfilled. RE: Source provides a range of 2–3 percent (average used). CM: Source provides a range of 1–2 percent (average used).
		1.0		2002	Tsai and Chou 2006	IN: Primary method of disposal. Other: Value includes composting and

Country or			Open	Landfill	Controlled	Sanitary		Com-	Anaerobic	Incin-
economy	Region	Income	dump	unspecified	landfill	landfill	Recycling	posting	digestion	eration
Tajikistan	ECA	LMIC	100.0							
Tanzania	SSA	LIC	69.0							
Thailand	EAP	UMIC	53.5	27.0			19.1			0.4
Тодо	SSA	LIC	96.2				2.0	1.8		
Tonga	EAP	UMIC		40.0						
Trinidad and Tobago	LAC	HIC	84.0		12.0			0.8		
Tunisia	MENA	LMIC	21.0	70.0			4.0	5.0		
Turkey	ECA	UMIC	44.0			54.0		1.0		
Turkmenistan	ECA	UMIC		100.0						
Tuvalu	EAP	UMIC	14.5				15.0			
Uganda	SSA	LIC	87.0	-		7.0	6.0			

Advanced thermal	Water-		Un- accounted			
treatment	ways	Other	for	Year(s)	Source	Comment
				2015	OD: Boboeva 2015, 2 RE: UNECE 2017	8 OD: MSW is neither sorted nor treated; uncontrolled dumping is widespread. <b>RE</b> : The country generally lacks recycling infrastructure, except for scrap metals and paper; collection of waste paper, glass, and other recyclables is primarily done by the informal sector.
		22.6	8.5	2012	Tanzania, NBS and OCGS 2014	<ul> <li>OD: Includes informally disposed of in pits or buried (36.2 percent).</li> <li>Other: Value refers to open burning.</li> <li>UA: Amount is collected by company or authority but disposal mechanism is unspecified.</li> </ul>
				2012	Intharathirat and Salam 2015, 35	<b>OD:</b> Reported as "disposed improperly." <b>LF</b> : Reported as "disposed properly."
			-	2014, 2012	<b>OD</b> : CCAC n.d.(a) <b>RE, CM</b> : UNSD 2016	<b>OD</b> : All waste is disposed of in an "open landfill" (dump) that is not sorted and precollected.
		•	60.0	2012	ADB 2014	Calculated based on the amount collected compared with the amount generated; all collected waste is landfilled.
			3.2	2011	Trinidad and Tobago, EMA n.d.	All values calculated based on National Census 2011. <b>CM</b> : 1.17 percent of HH waste is composted by HH and HH waste makes up two-thirds of all waste generation. <b>UA</b> : 4.5 percent of HH waste is not collected or composted; includes waterways. (0.1 percent) and burning (2.2 percent).
				2014	GIZ and SWEEP-Net 2014g	
			1.0	2015	OD, SLF, UA: Bakas and Milios 2013, 5 CM: OECD 2017	<b>UA</b> : Consists of biological treatment or disposal by other methods.
				2013	Zoï Environment Network 2013, 25	LF: Reported as "almost all" going to landfills.
			70.5	2013	SPREP 2016	CM: 3 OD: Calculated based on the amount landfilled or dumped compared with the amount of waste generated; there are 9 authorized dumps in Tuvalu.
				2017	<b>OD, RE, SLF</b> : KCCA-IFC 2017 <b>CM</b> : Okot-Okumu 2012, 7	RE: 4 OD, SLF, RE: Estimate based on total waste generated and report that Kampala has the only SLF receiving 1,300 tonnes/day; an estimated 6 percent of waste is removed from the waste stream for recycling; waste in other areas is dumped. CM: 8 (Composting is being practiced in more than 11 urban councils of Uganda under the Clean Development Mechanism under the Kyoto Protocol pilot project promoted by the World Bank, but no actual values available.)
						(Table continues on next page

Country or economy	Region	Income	Open dump	Landfill unspecified	Controlled landfill	Sanitary Iandfill	Recycling	Com- posting	Anaerobic digestion	Incin- eration
Ukraine	ECA	LMIC		94.1			3.2			2.7
United Arab Emirates	MENA	HIC	62.0	9.0			20.0	9.0		
United Kingdom	ECA	HIC	•	22.6			27.3	16.2		31.4
United States	NA	HIC		52.6			34.6			12.8
Uruguay	LAC	HIC	17.5		61.7	10.5	8.0			
Uzbekistan	ECA	LMIC	60.0							
Vanuatu	EAP	LMIC	11.3				37.0			
Vietnam	EAP	LMIC	<u> </u>				23.0	15.0		
West Bank and Gaza	MENA	LMIC	67.0		33.0		0.5	0.5		
Yemen, Rep.	MENA	LMIC	25.0		12.0		8.0			
Zimbabwe	SSA	LIC					16.0			

AD = anaerobic digestion; ATT = advanced thermal treatment; C&D = construction and demolition; C&I = commercial and institutional; CLF = controlled landfill; CM = composting; CPCB = Central Pollution Control Board (Government of India); EAP = East Asia and the Pacific; ECA = Europe and Central Asia; HH = household; HIC = high-income country; ICI = institutional, commercial, and industrial; IN = incineration; LAC = Latin America and the Caribbean; LF = landfill unspecified; LIC = low-income country; LMIC = lower-middle-income country; MENA = Middle East and North Africa; MSW = municipal solid waste; NA = North America; OD = open dumping; RDF = refuse-derived fuel; RE = recycling; SAR = South Asia; SLF = sanitary landfill; SSA = Sub-Saharan Africa; UA = unaccounted for; UMIC = upper-middle-income country; WW = waterways.

- 1. Personal communication.
- 2. Value includes composting and anaerobic digestion.
- 3. Composting occurs but exact percentage is unknown.
- 4. Recycling occurs but exact percentage is unknown.
- 5. Value for MSW only.
- 6. Value refers to uncollected waste.
- 7. Anaerobic digestion occurs but exact percentage is unknown.
- 8. Year refers to year of publication.
- 9. Open dumping occurs but exact percentage is unknown.
- 10. Open burning occurs but exact percentage is unknown.
- 11. Some landfilling occurs but exact percentage is unknown.
- 12. Some sanitary landfilling occurs but exact percentage is unknown.
- 13. Value includes recycling and composting.
- 14. Calculated based on the amount treated or disposed of compared with the amount generated, which is reported in appendix A.
- 15. Value includes dumping in waterways and usage as animal feed.
- 16. According to source, being established but exact status unknown.
| Advanced<br>thermal<br>treatment | Water-<br>ways | Other | Un-<br>accounted<br>for | Year(s)       | Source   | Comment  |
|----------------------------------|----------------|-------|-------------------------|---------------|--|--|
|                                  |                |       |                         | 2015          | Business Sweden,<br>The Swedish Trade<br>and Invest Council<br>2016, 5   | LF: 6,000 landfills, of which 31 percent are not certified or licensed.  |
|                                  |                |       |                         | 2015          | Abu Dhabi SCAD<br>2016   | <b>OD</b> : 5; reported as dumpsite and other; all values for Abu Dhabi emirate only.  |
|                                  |                |       | 2.6                     | 2015          | Eurostat 2017  | CM: 2  |
|                                  |                |       |                         | 2014          | US EPA 2014  | <b>RE</b> : 13   |
|                                  |                |       | 2.3                     | 2013,<br>2011 | OD, CLF, SLF: CSI<br>Ingenieros 2011;<br>Anon n.d.(d); LKSur<br>2013, 8<br><b>RE</b> : Oriental Republic<br>of Uruguay 2004, 9;<br>CSI Ingenieros 2011 | OD, CLF, SLF: Calculated based on amount<br>disposed of at type of facility and coverage<br>rate.<br>RE: Calculated based on values available<br>from formal recycling programs; does not<br>include informal recycling or other formal<br>recycling activities. |
|                                  |                |       | 40.0                    | 2011          | CER 2011, 28   | <b>OD</b> : According to the State Committee for<br>Nature Protection, there are 178 registered<br>dumps and several hundred additional<br>unregistered dumps.   |
|                                  |                |       | 51.7                    | 2013          | SPREP 2016   | Calculated based on the amount landfilled or dumped compared with the amount of waste generated.   |
|                                  |                |       | 62.0                    | 2014,<br>2013 | <b>RE</b> : Patriamby and<br>Tanaka 2014, 364<br><b>CM</b> : Vietnam WENID<br>2013   | <b>RE</b> : Reported as a range of 18–28 percent (average used).   |
|                                  |                |       |                         | 2013          | GIZ and SWEEP-Net 2014f  | <b>RE, CM</b> : Value in source given as < 0.5 percent.  |
|                                  | 8.0            |       | 47.0                    | 2016          | Al-Eryani 2017   | 1  |
|                                  |                |       | 84.0                    | 2005          | AFED 2008, 18  |  |
|                                  |                |       |                         |               |  |  |

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## ECO-AUDIT Environmental Benefits Statement

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olid waste management affects every person in the world. By 2050, the world is expected to nearly double the amount of waste it is generating, from 2.10 billion tonnes of waste in 2016 to 3.76 billion tonnes of waste annually. Individuals and governments make decisions about consumption and waste management that affect the daily health, productivity, and cleanliness of communities. Poorly managed waste is contaminating the world's oceans, clogging drains and causing flooding, transmitting diseases, increasing respiratory problems, harming animals that consume waste unknowingly, and affecting economic development. Unmanaged and improperly managed waste from decades of economic growth requires urgent action at all levels of society.

What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 aggregates extensive solid waste data at the national and urban levels. It estimates and projects waste generation to 2030 and 2050. Beyond the core data metrics from waste generation to disposal, the report provides information on waste management costs, revenues, and tariffs; special wastes; regulations; public communication; administrative and operational models; and the informal sector.

Solid waste management accounts for approximately 20 percent of municipal budgets in low-income countries and 10 percent of municipal budgets in middle-income countries, on average. Waste management is often under the jurisdiction of local authorities facing competing priorities and limited resources and capacities in planning, contract management, and operational monitoring. These factors make sustainable waste management a complicated proposition; most low- and middle-income countries, and their respective cities, are struggling to address these challenges.

Waste management data are critical to creating policy and planning for local contexts. Understanding how much waste is generated—especially with rapid urbanization and population growth—as well as the types of waste generated helps local governments to select appropriate management methods and plan for future demand. It allows governments to design a system with a suitable number of vehicles, establish efficient routes, set targets for diversion of waste, track progress, and adapt as consumption patterns change. With accurate data, governments can realistically allocate resources, assess relevant technologies, and consider strategic partners for service provision, such as the private sector or nongovernmental organizations.

What a *Waste 2.0: A Global Snapshot of Solid Waste Management to 2050* provides the most up-to-date information available to empower citizens and governments around the world to effectively address the pressing global crisis of waste. Additional information is available at http://www.worldbank.org/what-a-waste.



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