

Analysis of Waste Treatment in the European Union

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Abstract:- This paper focuses on the analysis of waste treated within the European Union, for the conditions provided by EUROSTAT for the evaluation of the evolution of the amounts of waste, both hazardous and non-hazardous, in the period 2006-2020. The methodology involves the analysis of key statistical indicators such as minimum, maximum, mean, standard deviation, coefficient of variation and growth rate. The main aim of the work is to identify the countries that have managed the largest volume of waste and to assess their progress in this regard. The findings show a steady increase in the total amount of waste treated in the EU between 2006 and 2017, reaching a peak of 2.11 billion tonnes, slightly falling to 1.97 billion tonnes in 2020. In terms of treated waste, Germany, France and Italy are among the countries with the largest amounts, while for hazardous waste, Germany, Bulgaria and France are in the lead. On the other hand, Malta, Latvia and Cyprus are at the bottom of the ranking in terms of waste management in general.

Keywords:- Waste, Waste Treatment, European Union.

I. INTRODUCTION

Waste management has become a growing concern globally. The European Union has a population of over 450 million inhabitants, which inevitably generates different types of waste such as industrial, agricultural, hazardous (López-Portillo et al., 2021). At the level of the European Union in 2018, the main economic activities that generate the largest amounts of waste are represented by: construction with 35.9%, mining with 26.6%, the manufacturing industry with 10.6%. At the opposite pole is the energy sector with 3.4% of the total waste generated, agriculture, forestry and fishing with 0.9% and wholesale of waste and scrap with 0.5% (Weghmann, 2023).

One of the main problems faced by the European Union consists in how to manage and treat this waste in such a way as to minimize the impact on the environment and the health of the population (Ursu et al., 2023; López-Portillo et al., 2021). Waste treatment differs from one country to another in the operation of the economic, technological, but also cultural conditions of the EU member states. For example, Germany and Austria had high rates of recycling and composting, large investments made in this direction. There are other countries where waste treatment is a major problem (Di Maria et al., 2020).

The European Union has made significant investments in research and development of waste treatment, so that solutions can be identified and different projects have been started to explore new recycling technologies (Angheluță et al., 2020; Dumitru et al., 2023).

An important sector is represented by agriculture, which is a generator of organic waste, packaging, chemical waste (Callao et al., 2019; Iancu et al., 2022). For the treatment of organic waste from agriculture, the methods used are composting and anaerobic digestion (Dumitru et al., 2023, Margini et al., 2020). Transformation composting, a traditional way of transforming organic waste into humus, with the aim of increasing soil fertility, while anaerobic digestion produces biogas that can be used to produce renewable energy, but also digestate that can be used as natural fertilizer (Stanisavljevic et al., 2018; Domingos et al., 2017).

II. RESEARCH METHODOLOGY

The work is based on data on the total treated waste, treated hazardous and non-hazardous waste from EUROSTAT, based on which the main statistical indicators were analyzed: minimum, maximum, average, standard deviation, coefficient of variation and growth rate.

The purpose of the paper is to identify the countries that have treated the largest amounts of waste and that have improved their management.

III. RESEARCH FINDINGS

At the level of the European Union, the total amount of treated waste recorded a steady increase until 2017, when it reached a peak of 2.11 billion tons, followed by a progressive decrease in the following years, reaching in 2020, 1.97 billions of tons.

In 2020, Germany ranked first in the European Union in terms of the amount of waste treated, recording 381.98 million tons, followed by France with 292.53 million tons and Italy with 147.04 million tons. At the opposite pole is Malta with 3.29 million tonnes, followed by Latvia with 2.14 million tonnes and Cyprus with 1.32 million tonnes (Table 1).

Romania ranked fifth in 2020, with a quantity of 137.91 million tons, down by more than 15% compared to the level recorded in 2006 (136.07 million tons).

The most significant differences were observed in the Czech Republic, where the amount of waste treated in 2020 increased by more than 108% compared to 2006 (35.38 million tons compared to 16.98 million tons). Latvia also saw an increase of more than 85% in the amount of waste treated in 2020 (2.14 million tons) compared to the level of 2006 (1.15 million tons), and Belgium saw an increase of 81.78% in 2020 (54.58 million tons), compared to 2006 (30.03 million tons).

Among the countries that recorded decreases in the amount of waste treated in 2020 is Greece, with a reduction of 58.53% compared to the level of 2006, with an amount of 21.65 million tons, compared to 143.89 million tons recorded in 2006. Also, Portugal recorded a decrease of 55.62% in 2020 (10.92 million tons) compared to 2006 (24.6 million tons), and Spain recorded a decrease of 39.94% in the same period, where it recorded the amount of 86.41 million tons in 2020 compared to 143.89 million tons recorded in 2006 (Table 1).

Table 1. Waste treated in total at the level of European Union countries (millions of tons)

Country	2006	2008	2010	2012	2014	2016	2018	2020*	2020/2006 (%)
Germany	358.36	367.26	349.56	353	370.74	383.2	387.77	381.98	6.59
France	292.5	322.64	331.05	315.15	299.66	304.81	325.29	292.53	0.01
Italy	115.96	127.89	127.16	130.46	129.67	136.04	147.41	147.04	26.8
Sweden	90.56	81.35	110.48	151.22	163.29	137.02	131.58	144.47	59.53
Romania	163.07	158.51	199.13	247.55	172.45	175.7	200.03	137.91	-15.43
Poland	170.29	139.52	146.58	160.7	182.44	163	160.33	136.65	-19.75
Netherlands	93.01	97.27	113.72	118.05	130.09	139.88	144.74	121.99	31.17
Finland	65.25	74.85	105.63	90.48	93.25	125.46	125.23	112.83	72.92
Bulgaria	158.32	161.16	159.95	158.75	175.71	116.86	118.63	110.13	-30.44
Spain	143.89	137.69	132.69	108.48	103.4	106.72	121.96	86.41	-39.94
Austria	47.13	48.35	29.75	46.12	53.95	60.03	63.21	66.39	40.88
Belgium	30.03	28.73	33.79	42.24	42.93	43.51	48.92	54.58	81.78
Czech Republic	16.98	18.86	18.25	18.26	19.87	22.91	33.84	35.38	108.34
Greece	52.21	67.52	70.39	71.33	67.05	69.96	42.65	21.65	-58.53
Hungary	14.98	15.96	13.42	12.96	13.68	13.96	16.93	20.63	37.71
Denmark	14.97	14.64	13.65	14.17	17.6	19.06	18.3	17.35	15.91
Estonia	17.66	17.39	17.95	20.61	20.73	19.87	21.77	15.31	-13.31
Portugal	24.6	13.41	9.99	9.79	10.94	9.67	10.35	10.92	-55.62
Slovakia	12.73	9.24	7.69	7.05	7.09	7.92	8.51	10.37	-18.54
Luxembourg	10.24	11.63	12.42	10.3	8.53	11.33	10.42	9.73	-4.99
Slovenia	4.24	5.24	5.64	5.07	5.44	4.81	8.31	7.14	68.6
Lithuania	5.21	5.63	4.55	4.29	4.54	4.84	4.62	4.34	-16.68
Croatia	2.81	3.35	2.58	2.99	3.46	3.68	3.77	4.15	47.39
Malta	2.78	1.95	1.21	1.3	1.29	1.35	2.14	3.29	18.41
Latvia	1.15	1.39	1.01	1.57	1.94	1.84	1.71	2.14	85.53
Cyprus	1.25	1.84	2.37	1.85	1.71	1.95	1.82	1.32	5.81
European Union – 27 countries (as of 2020)	1,932.9	1,949.2	2,030.0	2,111.8	2,111.5	2,097.2	2,172.5	1,970.7	1.96

Source: EUROSTAT data processing, accessed 15.02.2024;

*2020 EU-27;

In terms of hazardous waste treated in the European Union, a total of 74.7 million tonnes was recorded in 2020, representing an increase of 9% compared to 2018, when the highest level of 82.2 million tonnes was reached, and a slight decrease of 0.78% compared to 2006, when the amount was 72.3 million tons.

The largest amounts of hazardous waste treated in 2020 were recorded in Germany, with 21.4 million tons, Bulgaria, with 13.8 million tons, and France, with 8.1 million tons. In contrast, the countries with the lowest amounts of hazardous waste treated in the same year were Latvia, with 30 thousand tons, Cyprus, with 22 thousand tons, and Malta, with one ton.

In 2020, Romania ranked 22nd in the ranking of the amount of hazardous waste treated at the EU level, registering an amount of 375 thousand tons, which represents a significant decrease of 56.8% compared to the amount recorded in 2006, which was 868 thousand tons.

A remarkable aspect is the significant increase registered by Sweden in the year 2020, by 986.41%, reaching 7 million tons of hazardous waste treated, compared to the year 2006, when the amount was 653 thousand tons. Also, Lithuania and Denmark registered significant increases during the same period, of 296% and 193.48% respectively.

In terms of decreases in 2020, Portugal recorded the largest decrease of 87%, reaching 439 thousand tons, compared to the amount in 2006, which was 3.36 million tons. Croatia also recorded a decrease of 83%, reaching 106 thousand tons in 2020, compared to 623 thousand tons in 2006 (Table 2).

Table 2. Hazardous Waste Treated in Total at the Level of European Union Countries (Thousands of Tons)

The country	2006	2008	2010	2012	2014	2016	2018	2020*	2020/2006 (%)
Germany	21,743	23,824	19,047	21,098	20,521	21,499	22,419	21,408	-1.54
Bulgaria	13,475	13,037	13,561	13,390	12,176	13,178	13,558	13,792	2.36
France	6,690	6,853	8,534	8,841	7,605	7,165	9,522	8,119	21.36
Sweden	653	996	770	1,123	1,093	1,332	1,578	6,977	968.41
Netherlands	4,596	4,032	3,800	4,443	4,496	5,306	5,229	4,881	6.21
Italy	2,926	3,277	3,107	3,258	3,574	3,649	4,531	4,413	50.81
Finland	2,172	2,178	1,366	1,411	1,916	2,004	1,724	3,040	39.93
Belgium	1,761	2,200	3,488	1,704	2,102	2,450	2,713	2,284	29.72
Spain	3,723	3,362	2,744	2,421	2,322	2,118	2,310	2,181	-41.42
Poland	2,278	1,625	1,578	1,435	1,877	1,391	2,184	1,617	-29.02
Estonia	6,864	7,709	8,929	9,131	10,315	9,590	10,729	1,475	-78.52
Denmark	376	416	1,073	1,207	1,547	1,885	1,775	1,102	193.48
Czech Republic	572	835	832	753	597	529	616	630	10.01
Greece	187	157	108	108	115	419	500	469	150.92
Portugal	3,364	289	331	444	466	491	614	439	-86.95
Hungary	1,180	450	374	377	373	342	384	421	-64.3
Austria	335	395	401	339	440	449	458	403	20.26
Romania	868	260	431	620	500	348	536	375	-56.8
Slovakia	368	356	224	199	202	171	153	123	-66.64
Lithuania	28	20	49	70	55	61	73	111	296.04
Ireland	191	193	267	69	87	78	115	108	-43.6
Croatia	623	18	69	73	66	76	81	106	-83.06
Luxembourg	130	47	3	2	38	46	56	76	-41.78
Slovenia	87	116	101	74	92	77	77	61	-29.86
Latvia	52	68	54	42	43	20	40	30	-43.12
Cyprus	17	23	31	13	157	142	211	22	34.73
Malta	0	0	0	1	0	0	0	1	96.33
European Union – 27 countries (as of 2020)	75,250	72,740	71,270	72,650	72,770	74,820	82,190	74,660	-0.78

Source: EUROSTAT data processing, accessed 15.02.2024;

*2020 EU-27;

In terms of non-hazardous waste treated in the European Union, in 2020, a total amount of 1.9 billion tons was recorded, increasing by more than 2% compared to the amount recorded in 2006, which was 1.86 billion of tons.

Germany topped the list of countries with the largest amount of non-hazardous waste treated in 2020, with 360.57 million tons, followed by France, with 284.42 million tons, and Italy, with 142.62 million tons. In contrast, the countries with the lowest amounts of non-hazardous waste treated in the same year were: Malta with 3.29 million tonnes, Latvia with 2.11 million tonnes and Cyprus with 1.3 million tonnes.

Romania took the 4th place in the top of the quantity of non-hazardous waste treated in 2020, registering a quantity of 137.53 thousand tons, which represents a decrease of 15.2% compared to the quantity registered in 2006, which was 162 ,2 million tons. It is worth mentioning the significant increase registered by the Czech Republic in 2020, by 111.27%, reaching 34.75 million tons of treated non-hazardous waste, compared to 2006, when the amount was 16.41 million tons (Table 3).

In terms of decreases in 2020, Greece recorded a decrease of 59.3 million tons, reaching 21.18 million tons in 2020, compared to 2006, when the quantity was 52.02 million tons . Portugal also saw a significant decrease of more than 50% in 2020, with 10.48 million tons, compared to

2006, when the amount was 21.23 million tons, and Spain saw a decrease of 39.91% in 2020, with 84.23 million tons,

compared to 2006, when the amount was 140.16 million tons (Table 3).

Table 3. Non-hazardous Waste Treated in Total at the Level of European Union Countries (Million Tons)

Country	2006	2008	2010	2012	2014	2016	2018	2020*	2020/2006 (%)
Germany	336.6	343.4	330.5	331.9	350.2	361.7	365.3	360.6	7.11
France	285.8	315.8	322.5	306.3	292.1	297.6	315.8	284.4	-0.49
Italy	113.0	124.6	124.1	127.2	126.1	132.4	142.9	142.6	26.18
Romania	162.2	158.3	198.7	246.9	171.9	175.3	199.5	137.5	-15.21
Sweden	89.91	80.36	109.7	150.1	162.2	135.7	130	137.5	52.92
Poland	168.0	137.9	145	159.3	180.6	161.6	158.2	135.0	-19.63
Netherlands	88.41	93.24	109.9	113.6	125.6	134.6	139.5	117.1	32.46
Finland	63.08	72.67	104.3	89.07	91.34	123.5	123.5	109.8	74.06
Bulgaria	144.8	148.1	146.4	145.4	163.5	103.7	105.1	96.34	-33.49
Spain	140.2	134.3	129.9	106.1	101.1	104.6	119.6	84.23	-39.91
Austria	46.79	47.96	29.35	45.78	53.51	59.58	62.75	65.99	41.03
Belgium	28.26	26.53	30.31	40.53	40.83	41.06	46.21	52.29	85.02
Czech Republic	16.41	18.03	17.41	17.51	19.27	22.38	33.23	34.75	111.77
Greece	52.02	67.37	70.28	71.23	66.94	69.54	42.15	21.18	-59.28
Hungary	13.8	15.51	13.05	12.59	13.31	13.62	16.54	20.2	46.43
Denmark	14.59	14.22	12.57	12.96	16.05	17.18	16.53	16.25	11.34
Ireland	22.54	16.05	9.15	7.96	9.9	11.69	12.15	13.97	-38
Estonia	10.79	9.68	9.02	11.48	10.42	10.28	11.04	13.83	28.16
Portugal	21.23	13.12	9.65	9.35	10.47	9.18	9.73	10.48	-50.65
Slovakia	12.36	8.89	7.47	6.85	6.89	7.75	8.36	10.25	-17.11
Luxembourg	10.11	11.59	12.42	10.3	8.5	11.28	10.36	9.66	-4.52
Slovenia	4.15	5.13	5.54	4.99	5.35	4.73	8.24	7.08	70.67
Lithuania	5.18	5.61	4.5	4.22	4.49	4.78	4.55	4.23	-18.37
Croatia	2.19	3.33	2.52	2.92	3.39	3.61	3.69	4.04	84.5
Malta	2.78	1.95	1.21	1.3	1.29	1.35	2.14	3.29	18.38
Latvia	1.1	1.32	0.95	1.53	1.9	1.82	1.67	2.11	91.64
Cyprus	1.23	1.82	2.34	1.84	1.55	1.81	1.61	1.3	5.41
European Union – 27 countries (as of 2020)	1,857.6	1,876.79	1,958.78	2,039.13	2,038.68	2,022.34	2,090.33	1,896.05	2.07

Source: EUROSTAT data processing, accessed 15.02.2024;

*2020 EU-27;

In the analysis of the statistical indicators for the total waste treated, the Czech Republic shows the highest positive annual rate of 11.05%, with a standard deviation of 7.36 and a coefficient of variation of 31.93%, which indicates a heterogeneous nature of the data. Latvia also has a positive annual rate of over 9%, a standard deviation of 0.39, and a coefficient of variation of 24.57%, indicating relatively homogeneous data. In the case of Belgium, the standard deviation is 9.1, the annual rate is positive 8.91%, and the coefficient of variation is 22.43%, suggesting a relatively heterogeneous nature of the data. Countries with a positive annual rate also include Finland (8.14%), Sweden (6.9%) and Croatia (5.7%), indicating that these countries have improved their capacity to manage their treated waste over the period analyzed.

In contrast, Greece shows a negative growth rate of 11.82%, with a standard deviation of 17.88 and a coefficient of variation of 30.91%, reflecting the heterogeneity of the data. Portugal also has a negative annual rate of 10.96%, a standard deviation of 5.05, and data heterogeneity according to the coefficient of variation of 40.53%. Spain shows a standard deviation of 19.7, a negative annual rate of 7.03% and a relatively homogeneous character of the data according to the coefficient of variation.

Romania, with a negative rate of 2.37% and a coefficient of variation of 18.48%, shows a relatively homogeneous character of the data, indicating difficulties in waste management. Other countries with a negative growth rate are Bulgaria (5.05%), Estonia (2.02%) and Slovakia (2.89%) (Table 4).

Table 4. Analysis of the Main Statistical Indicators for the Total Waste Treated at Country Level

Country	Minimum	Maximum	Average	Standard Deviation	Coefficient of Variation (%)	Growth Rate (%)
Germany	349.56	387.77	368.98	14.52	3.93	0.92
France	292.5	331.05	310.46	15.15	4.88	0
Italy	115.96	147.41	132.7	10.57	7.96	3.45
Sweden	81.35	163.29	126.25	29.3	23.21	6.9
Romania	137.91	247.55	181.79	33.6	18.48	-2.37
Poland	136.65	182.44	157.44	15.63	9.93	-3.09
Netherlands	93.01	144.74	119.85	18.52	15.45	3.95
Finland	65.25	125.46	99.12	22.2	22.4	8.14
Bulgaria	110.13	175.71	144.94	25.35	17.49	-5.05
Spain	86.41	143.89	117.65	19.7	16.75	-7.03
Austria	29.75	66.39	51.87	11.76	22.67	5.02
Belgium	28.73	54.58	40.59	9.1	22.43	8.91
Czech Republic	16.98	35.38	23.05	7.36	31.93	11.05
Greece	21.65	71.33	57.85	17.88	30.91	-11.82
Hungary	12.96	20.63	15.31	2.53	16.55	4.68
Denmark	13.65	19.06	16.22	2.09	12.87	2.13
Estonia	15.31	21.77	18.91	2.18	11.5	-2.02
Portugal	9.67	24.6	12.46	5.05	40.53	-10.96
Slovakia	7.05	12.73	8.83	1.93	21.9	-2.89
Luxembourg	8.53	12.42	10.58	1.21	11.41	-0.73
Slovenia	4.24	8.31	5.74	1.34	23.3	7.75
Lithuania	4.29	5.63	4.75	0.46	9.65	-2.57
Croatia	2.58	4.15	3.35	0.53	15.7	5.7
Malta	1.21	3.29	1.91	0.78	40.82	2.44
Latvia	1.01	2.14	1.59	0.39	24.57	9.23
Cyprus	1.25	2.37	1.77	0.36	20.16	0.81
European Union – 27 countries (as of 2020) European Union –	1,932.88	2,172.52	2,047.01	88.84	4.34	0.28

Source: EUROSTAT data processing, accessed 15.02.2024;

In the case of treated hazardous waste, the highest positive annual rate is presented by Sweden (40.27%) with a coefficient of variation of 116%, which indicates a heterogeneous nature of the data. Lithuania presents a positive annual rate of 21.73%, a standard deviation of 28.43 and a heterogeneous character of the data according to the coefficient of variation (48.59%). Greece also shows a positive annual rate of 14% and a heterogeneous nature of the data (67.1%). Among the countries showing a positive annual

rate are France (2.8%), Italy (6%), Malta (11.9%), Cyprus (4.35%).

In the case of treated hazardous waste, many countries show a negative annual rate, such as Portugal (25.24%), Croatia (22.4%), Estonia (19.73%), Hungary (13.65%).

Romania also presents a negative annual rate of 11.3% and a heterogeneous character of the data according to the coefficient of variation of 38.5% (Table 5).

Table 5. Analysis of the Main Statistical Indicators for Hazardous Waste Treated at Country Level

Country	Minimum	Maximum	Average	Standard Deviation	Coefficient of Variation (%)	Growth Rate (%)
Germany	19,046.94	23,823.84	21,444.96	1,384.89	6.46	-0.22
Bulgaria	12,176.44	13,791.87	13,270.78	500.69	3.77	0.33
France	6,689.82	9,522.20	7,916.12	1,010.78	12.77	2.8
Sweden	653.05	6,977.21	1,815.29	2,106.14	116.02	40.27
Netherlands	3,799.83	5,305.78	4,597.69	530.57	11.54	0.86
Italy	2,926.16	4,531.20	3,591.93	591.44	16.47	6.04
Finland	1,365.77	3,039.89	1,976.39	530.56	26.84	4.92
Belgium	1,703.62	3,487.67	2,337.55	571.77	24.46	3.79
Spain	2,118.46	3,722.63	2,647.44	591.03	22.32	-7.35
Poland	1,391.43	2,277.78	1,748.04	332.49	19.02	-4.78

Estonia	1,474.56	10,729.23	8,092.79	2,960.85	36.59	-19.73
Denmark	375.56	1,884.93	1,172.50	564.85	48.17	16.63
Czech Republic	529.49	834.80	670.60	119.10	17.76	1.37
Greece	108.10	499.94	257.89	173.04	67.1	14.04
Portugal	289.22	3,363.88	804.83	1,038.72	129.06	-25.24
Hungary	341.66	1,179.86	487.47	281.71	57.79	-13.68
Austria	335.04	458.49	402.53	46.79	11.62	2.67
Romania	259.92	867.60	492.35	189.55	38.5	-11.3
Slovakia	122.69	367.80	224.43	90.42	40.29	-14.52
Lithuania	19.93	111.29	58.52	28.43	48.59	21.73
Ireland	69.11	266.74	138.41	70.48	50.92	-7.86
Croatia	18.36	623.38	138.99	197.22	141.9	-22.4
Luxembourg	1.99	130.19	49.72	41.05	82.56	-7.44
Slovenia	61.23	116.33	85.56	17.38	20.31	-4.94
Latvia	20.49	67.88	43.65	14.75	33.79	-7.74
Cyprus	13.28	210.65	76.98	79.43	103.18	4.35
Malta	0.00	0.64	0.41	0.19	45.61	11.9
European Union – 27 countries (as of 2020)	71,270	82,190	74,544	3,375	4.53	-0.11

Source: EUROSTAT data processing, accessed 15.02.2024;

For treated non-hazardous waste, the Czech Republic has the highest positive annual growth rate of 11.31%, with a standard deviation of 7.4% and a coefficient of variation of 33.07%, indicating a heterogeneous nature of the data. Latvia has a positive annual rate of 9.74%, a standard deviation of 0.4%, and a coefficient of variation of 25.95%, suggesting relatively heterogeneous data. Belgium has a positive annual rate of 9.19%, a standard deviation of 9.11% and a relatively heterogeneous data character (23.81%). Other countries with a positive annual rate include the Netherlands (4.1%), Italy (3.38%), Estonia (3.61%) and Malta (2.44%).

At the opposite pole, Greece has a negative annual rate of 12.05%, with a standard deviation of 18% and presents a

heterogeneous character of the data, according to the coefficient of variation (33.07%). Portugal also presents a negative annual rate of 9.6%, a standard deviation of 4.07% and a heterogeneous nature of the data (34.91%). Ireland has a heterogeneous data character (36.22%), a standard deviation of 4.68% and a negative annual rate of 6.6%.

Romania records a negative annual rate of 2.33% and a relatively homogeneous character of the data, according to the coefficient of variation of 18.5%. Other countries with a negative annual rate include France (0.07%), Bulgaria (5.66%), Slovakia (2.65%) and Lithuania (2.86%) (Table 6).

Table 6. Analysis of the Main Statistical Indicators for Non-Hazardous Waste Treated at Country Level

Country	Minimum	Maximum	Average	Standard Deviation	Coefficient of Variation (%)	Growth Rate (%)
Germany	330.52	365.35	347.54	13.97	4.02	0.99
France	284.42	322.52	302.54	14.67	4.85	-0.07
Italy	113.03	142.88	129.11	10	7.75	3.38
Romania	137.53	246.93	181.3	33.54	18.5	-2.33
Sweden	80.36	162.19	124.43	28.7	23.06	6.26
Poland	135.03	180.56	155.69	15.5	9.95	-3.07
Netherlands	88.41	139.51	115.25	18.16	15.76	4.1
Finland	63.08	123.51	97.15	22.22	22.87	8.24
Bulgaria	96.34	163.53	131.67	25.64	19.48	-5.66
Spain	84.23	140.16	115	19.2	16.69	-7.02
Austria	29.35	65.99	51.46	11.73	22.8	5.03
Belgium	26.53	52.29	38.25	9.11	23.81	9.19
Czech Republic	16.41	34.75	22.37	7.4	33.07	11.31
Greece	21.18	71.23	57.59	18	31.26	-12.05
Hungary	12.59	20.2	14.83	2.54	17.16	5.6
Denmark	12.57	17.18	15.04	1.71	11.39	1.55
Ireland	7.96	22.54	12.93	4.68	36.22	-6.6
Estonia	9.02	13.83	10.82	1.44	13.32	3.61
Portugal	9.18	21.23	11.65	4.07	34.91	-9.6

Slovakia	6.85	12.36	8.6	1.89	21.96	-2.65
Luxembourg	8.5	12.42	10.53	1.22	11.58	-0.66
Slovenia	4.15	8.24	5.65	1.34	23.78	7.94
Lithuania	4.22	5.61	4.69	0.48	10.26	-2.86
Croatia	2.19	4.04	3.21	0.62	19.46	9.14
Malta	1.21	3.29	1.91	0.78	40.83	2.44
Latvia	0.95	2.11	1.55	0.4	25.95	9.74
Cyprus	1.23	2.34	1.69	0.35	20.81	0.76
European Union – 27 countries (as of 2020)	1,857.6	2,090.3	1,972.5	87.49	4.44	0.29

Source: EUROSTAT data processing, accessed 15.02.2024;

IV. CONCLUSSIONS

The European Union shows a constant increase in the total amount of waste treated from 2006 to 2017, when it reached a peak of 2.11 billion tons, and will gradually decrease in the following years, reaching 1.97 billion in 2020 of tons.

In the case of total treated waste and non-hazardous waste, the countries with the largest amounts are represented by Germany, France and Italy, while in the case of the amount of hazardous waste, the first places are represented by Germany, Bulgaria and France. At the opposite pole, both for the total waste treated and for the 2 categories, the last places are occupied by countries such as Malta, Latvia and Cyprus.

An important aspect is the treatment of hazardous waste, which should be a priority both for the member states of the European Union and beyond, due to the potential to cause significant damage. There are European directives, which impose rules for collection, transport, treatment and disposal, and their monitoring remains crucial, as well as transparency to ensure safety.

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