



EUROPEAN FREE TRADE ASSOCIATION

EFTA Statistical Office Publication:

## Waste production and waste treatment in the EEA

### Summary

Total waste generation in the European Economic Area (EEA) has remained almost unchanged over the years 2004 – 2016. The three biggest economies in terms of GDP – Germany, the United Kingdom and France – have the highest generation of waste in absolute figures. There is however no clear-cut relationship between the size of economies and the amount of waste generated, as indicated by the high amount of waste generated in smaller economies like Bulgaria and Romania.

Waste recovery in the EEA in the form of recycling and backfilling increased from 34 percent to 43 percent of total waste between 2004 and 2016, while waste disposal in the form of landfill and incineration went down from 44 to 36 percent. These trends are a clear indication that the situation is slowly changing towards increased reuse of resources contained in waste and hence towards more sustainable waste treatment.

### Introduction

Since the early days of the industrial era, resources extracted in order to produce goods for consumption and investment have typically ended up, after a certain time, as disposal waste. In the past, waste treatment consisted mainly of disposing waste in landfills or incineration. Hence, production and consumption resembled a *linear process* in which neither the sustainability of the input “resources”, nor the treatment of “waste” as the result of consumption received much attention (“take-make-consume-throw away” pattern).

Due to the increasing environmental impact of this production/consumption/disposal mode in recent years, this pattern has been repeatedly criticised. Awareness of the scarcity and limited regeneration of natural resources, as well as the environmental impact and related costs of rapidly growing amounts of waste and its handling have led to calls for political measures aimed at waste reduction. Nowadays more efforts aim at avoiding waste on the one hand, while separating and reusing certain waste materials as input resources into the production process on the other hand. In this sense, economies shift away from *linear* production processes towards becoming *circular economies*, reducing the amount of waste wherever possible and reusing resources entailed in “waste”.

Figures on waste generation and treatment of waste (disposal and recycling) reflect two aspects that concern the actual transition process towards a circular economy.<sup>1</sup> Waste statistics play an important role in understanding and monitoring respective changes in the production/consumption processes towards more sustainable solutions, as political decision-makers urge for a transformation in economic production processes.<sup>2</sup>

This article addresses the topic of waste production and disposal within the European Economic Area (EEA), with a focus on EEA EFTA Member States (Iceland, Liechtenstein and Norway) in the area of waste generation. It uses data freely available through Eurostat's reference database.<sup>3</sup> Due to the commonly agreed data production cycle, data is updated every two years with a delay of 18 months. Hence, the latest data in Eurostat's database refer to 2016 and new data will only be available from mid-2020 onwards.

### **Total waste generation in EEA countries**

The following table 1 gives a detailed overview on generation of waste by EEA countries in total tonnes per country for the years 2004 – 2016, as a share for each country of the EEA total waste in tonnes (2016) and per capita (2016).

Although total waste generation in the EEA has dropped slightly by about 1 percent from 2006 (2 577 183 117 tonnes) to 2016 (2 550 471 564 tonnes), the general tendency over this period shows that the amount of waste generated has remained almost unchanged from year to year. For the three EFTA EEA countries, the data shows a decline of total waste generation from 2008 – 2010, followed by a massive increase until 2016 for Iceland whereas the increase for Liechtenstein and Norway is somewhat more moderate but also clearly above the 2008 levels.

The 2016 figures for the total waste generation in tonnes per country show that the three biggest economies in the EEA in terms of GDP at market prices – Germany, the United Kingdom and France – also have the highest generation of waste in absolute figures. Although this correlation points in the direction of a direct link between economic production and waste generation, this tendency is not conclusive as the figures for Romania and Bulgaria show: Although the size of these economies ranks within the middle/lower middle of all EEA economies, the countries show comparatively higher amounts of total waste generation. This effect might – at least partially – be caused by different economic activities with varying degrees of waste generation in different economies. The figures for the 2016 waste generation by economic activity for EEA countries deliver some evidence for this assumption, showing that waste generation in “Mining and Quarrying” is amongst the highest for Romania and Bulgaria.

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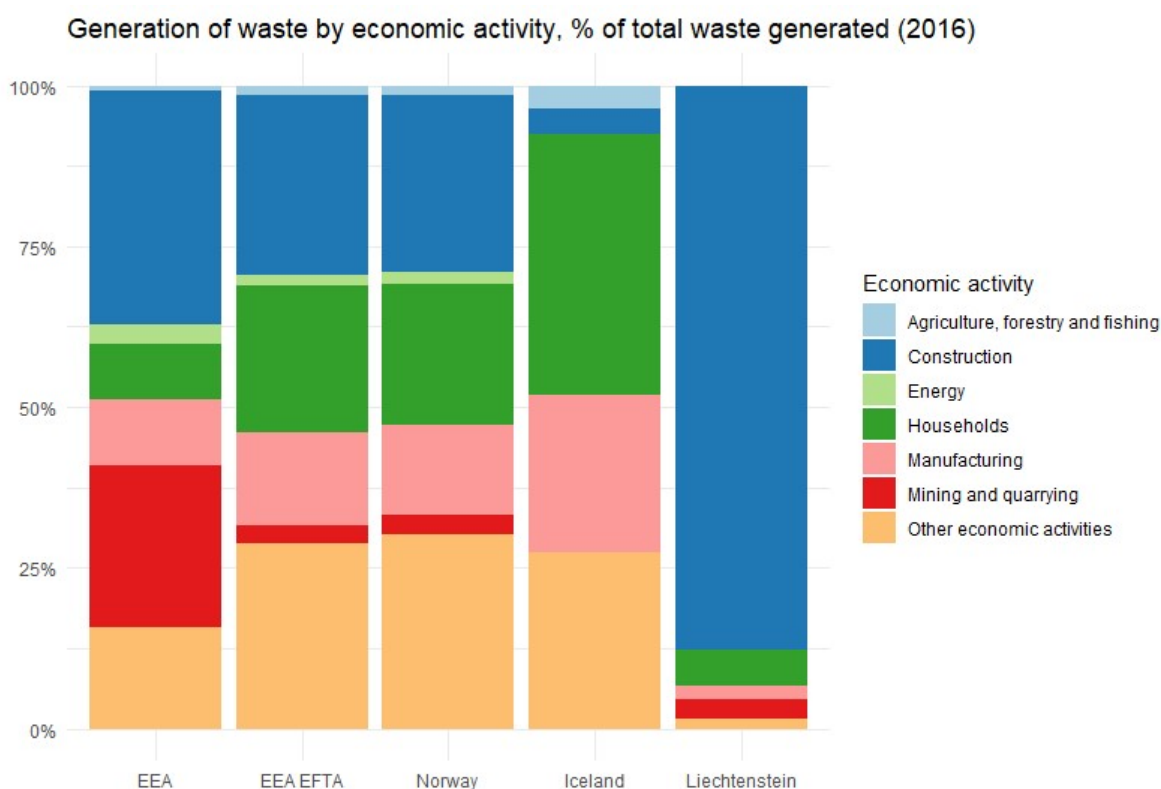
<sup>1</sup> See Briefing Note of the European Parliament “Closing the Loop: New Circular Economy Package”: [http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573899/EPRS\\_BRI\(2016\)573899\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573899/EPRS_BRI(2016)573899_EN.pdf)

<sup>2</sup> See also European Environment Agency on “Waste Generation”: <https://www.eea.europa.eu/downloads/dcbc960cd27348f3b98de78b6115bfc8/1564045924/waste-generation.pdf>

<sup>3</sup> See Eurostat's database for related data and methodological concepts used: <https://ec.europa.eu/eurostat/data>

	2004	2006	2008	2010	2012	2014	2016	2016 % of the EEA	2016 Kg/capita
European Economic Area (EEA)	2.555.544.637	2.577.183.117	2.438.439.036	2.464.974.260	2.495.991.397	2.519.091.377	2.550.471.564	100.0	:
European Union - 28 countries	2.547.590.000	2.567.270.000	2.427.000.000	2.454.720.000	2.484.270.000	2.507.090.000	2.537.770.000	:	4.968
Belgium	52.809.345	59.351.721	48.621.916	61.345.803	53.839.470	57.965.392	63.152.384	2.5	5.573
Bulgaria	201.020.467	162.881.368	167.646.316	167.396.268	161.252.166	179.677.011	120.508.475	4.7	16.907
Czech Republic	29.275.743	24.745.752	25.419.695	23.757.566	23.171.358	23.394.956	25.381.426	1.0	2.402
Denmark	12.588.952	14.703.138	15.155.208	16.217.736	16.713.822	20.808.843	20.981.931	0.8	3.663
Germany	364.021.937	363.786.069	372.796.355	363.544.995	368.022.172	387.504.241	400.071.672	15.7	4.858
Estonia	20.860.680	18.932.903	19.583.855	19.000.195	21.992.343	21.804.040	24.277.879	1.0	18.451
Ireland	24.499.142	29.599.175	22.502.816	19.807.586	12.713.021	15.166.830	15.251.689	0.6	3.207
Greece	33.346.962	51.324.662	68.643.963	70.432.705	72.328.280	69.758.868	72.358.026	2.8	6.715
Spain	160.668.134	160.946.629	149.254.157	137.518.902	118.561.669	110.518.494	128.958.523	5.1	2.774
France	296.580.889	312.297.824	345.002.210	355.081.245	344.731.922	324.462.969	323.474.270	12.7	4.848
Croatia	7.208.688	5.425.973	4.172.152	3.157.672	3.368.714	3.724.563	5.277.598	0.2	1.265
Italy	139.806.106	155.025.054	179.257.461	158.627.618	154.427.046	157.870.348	163.995.048	6.4	2.705
Cyprus	2.241.520	1.248.723	1.842.781	2.371.203	1.870.769	1.974.160	2.462.503	0.1	2.892
Latvia	1.257.225	1.858.551	1.495.084	1.498.200	2.309.581	2.621.495	2.532.684	0.1	1.292
Lithuania	7.010.178	6.361.109	6.333.352	5.578.134	5.678.751	6.200.450	6.644.315	0.3	2.317
Luxembourg	8.315.766	8.378.911	9.592.144	10.441.469	8.397.228	7.072.758	10.130.076	0.4	17.405
Hungary	24.660.920	22.287.476	16.949.197	16.735.423	16.310.151	16.650.639	15.938.077	0.6	1.624
Malta	3.146.062	2.861.489	2.070.391	1.352.994	1.456.213	1.664.836	1.965.514	0.1	4.316
Netherlands	92.448.121	99.166.563	102.648.605	121.145.468	121.194.466	132.362.297	141.024.020	5.5	8.281
Austria	53.020.950	54.286.603	56.308.766	46.799.579	48.045.089	55.868.298	61.225.037	2.4	7.008
Poland	137.478.449	153.628.937	138.984.638	158.661.957	162.382.959	179.179.899	182.005.677	7.1	4.793
Portugal	29.317.295	34.952.771	16.882.923	13.640.079	13.359.517	14.368.003	14.739.135	0.6	1.427
Romania	369.300.408	344.356.921	189.138.507	201.432.951	249.354.926	176.607.415	177.562.905	7.0	9.012
Slovenia	5.770.505	6.035.829	5.038.401	5.986.106	4.546.506	4.686.417	5.494.362	0.2	2.661
Slovakia	10.668.411	14.501.495	11.472.008	9.384.112	8.425.384	8.862.778	10.606.966	0.4	1.953
Finland	69.708.476	72.205.476	81.792.854	104.336.944	91.824.193	95.969.888	122.869.183	4.8	22.359
Sweden	91.759.469	94.971.307	86.168.590	117.645.185	156.306.504	167.026.886	141.625.718	5.6	14.272
United Kingdom	298.798.846	291.147.402	282.222.127	241.820.047	241.690.407	263.319.476	277.254.977	10.9	4.226
Iceland	501.426	:	772.584	510.941	529.351	815.148	1.067.319	0.0	3.182
Liechtenstein	:	:	383.337	312.180	466.547	569.067	502.581	0.0	13.325
Norway	7.453.565	9.913.286	10.286.643	9.432.997	10.720.872	10.614.912	11.131.594	0.4	2.127

**Table 1:** EEA total waste generation (hazardous and non-hazardous) 2004 - 2016 in tonnes, as shares of EEA total (2016) and kilos per capita (2016).



**Figure 1:** waste generation by economic activity 2016.

As can be seen in figure 1 with regard to waste generation by economic activity in general, within all EEA economies in 2016 the industrial sector (“Construction” and “Manufacturing”) generates the highest amounts of waste, mainly due to “Construction”, followed by the waste generation of the activity “Mining and Quarrying”. The service sector, which is included in the categories “Energy” and partially in “Other economic activities”, as well as “Households” obviously contributes to lesser extents to the total waste generation.

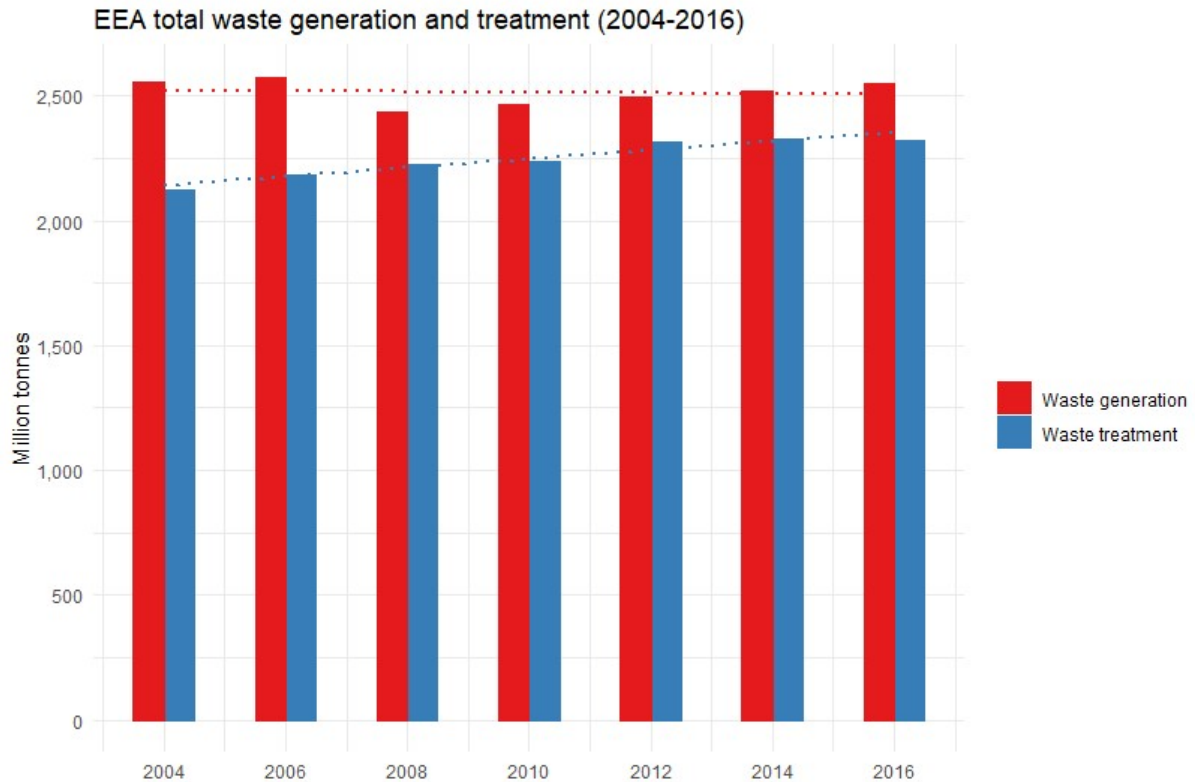
The picture is somewhat different when focusing on the EFTA EEA countries. Here, the “Other Economic Activities”, including parts of the service sector, generate the most waste. This result is mainly driven by Norway and Iceland. “Construction” accounts for the highest values of waste generation in Liechtenstein.

Another interesting fact is that waste generation by households from a national perspective ranks highest amongst economic activities for Iceland. Iceland together with Liechtenstein also shows the lowest figures in the EEA for waste generation by economic activity “Energy”.

### **Treatment and recovery of waste in the EEA**

Waste treatment as a key component of waste management refers to all actions that aim at reducing the environmental impact of waste. It entails disposal (mainly landfill and incineration) as well as recovery (recycling, backfilling and energy recovery) activities.

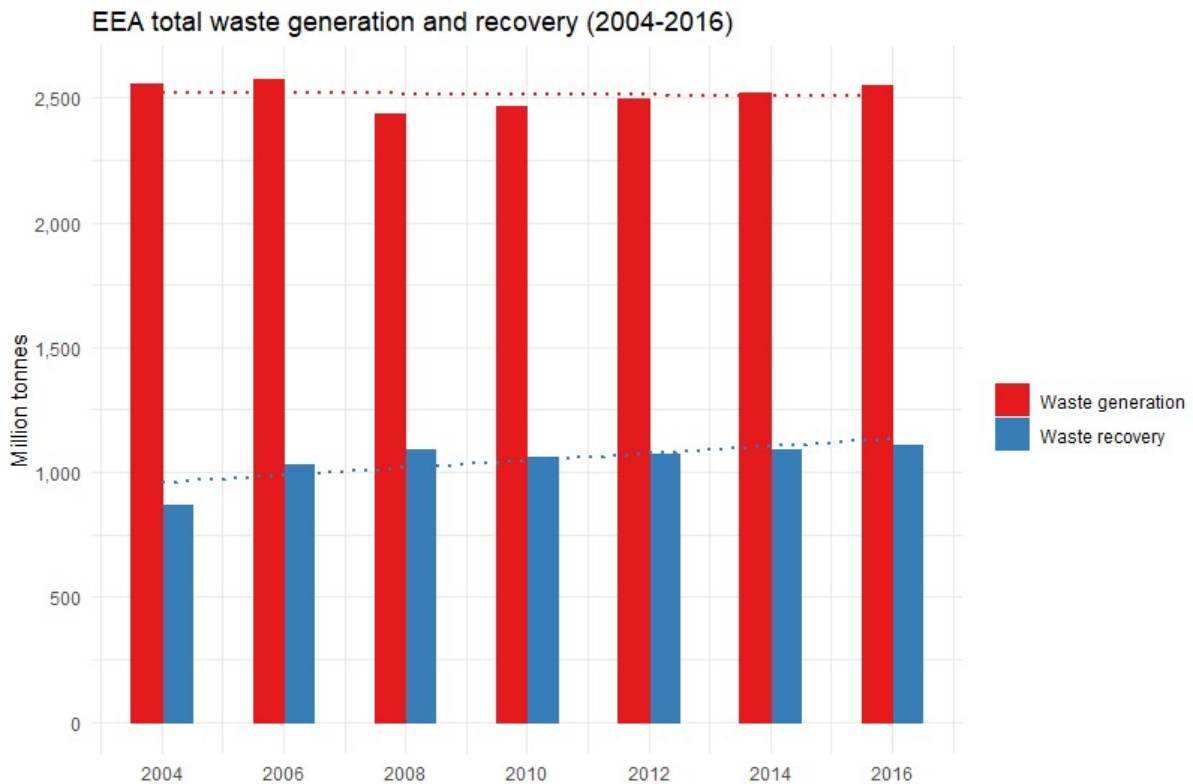
Figures on the total hazardous and non-hazardous waste treatment as compared to waste generation give a first impression on the level and development of the amount of total waste treated or not treated at all:



**Figure 2:** EEA total waste generation and treatment (hazardous and non-hazardous) 2004 – 2016 and trends.

Figure 2 visualises the already above-mentioned trend of an almost stagnating situation for total waste generation in the years 2004 – 2016 with the linear trend (dotted red line) remaining almost invariant. The increasing tendency of total waste treatment (dotted blue line) in this period is however clearly distinguishable with 83 percent of total waste treated in 2004 (hence, 17 percent of total waste not treated) up to 91 percent treated in 2016 (9 percent not treated).

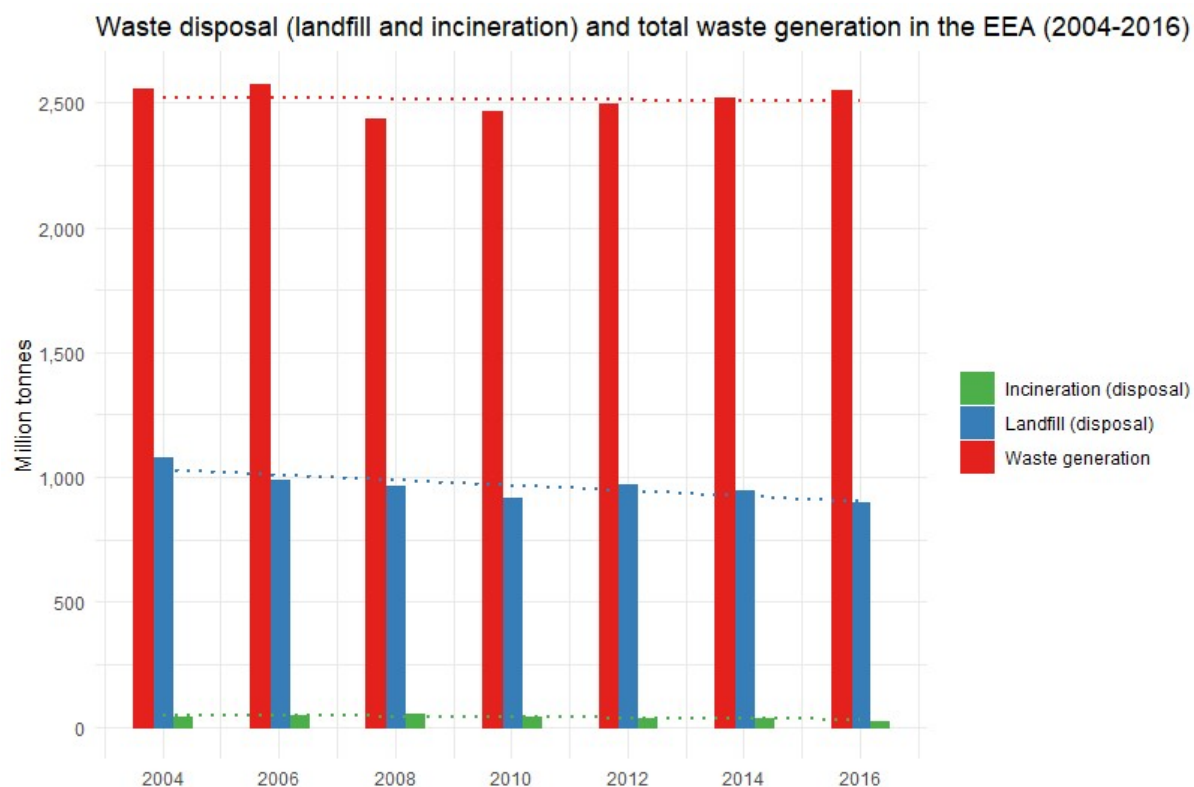
In order to obtain a clearer picture of the transformation towards circular economies it is obviously not sufficient to look at results for total waste treatment. Instead, we have to breakdown the category of “waste treatment” by looking at figures for “recovery” (recycling and backfilling) and confronting them with the total waste generation, as shown in figure 3:



**Figure 3:** Total waste generation and recovery (recycling and backfilling) of waste in the EEA in tonnes, 2004 – 2016.

In comparing recovery of waste (including recycling and backfilling) in figure 3 with the total generation of waste for the years 2004 – 2016 it becomes evident, that not even half of the total waste is subject to recovery actions, although the trend (blue dotted line) is steadily increasing. The shares of recovered waste amounted only to around 34 percent in 2004 and increased since then by approximately ten percentage points to 43 percent of total waste generation in 2016. It should be kept in mind, however, that probably not all kinds of waste generated are potentially subject to recycling or backfilling.

Given enterprises and consumers are at least partially trying to avoid waste, such a behaviour in addition to the recovery of waste for recycling, should result in a decrease of waste disposal over time. The tendency towards increased reuse of waste as a resource has also led to a decrease of waste disposal, as shown in figure 4.



**Figure 4:** Waste disposal (landfill and incineration) against total waste generation in the EEA 2004 – 2016.

Disposal of waste has been going down from 2004 to 2016 for both landfill and incineration. Whereas landfill disposal has been reduced from 42.2 percent in 2004 to 35.5 percent in 2016, incineration of disposal went down from 1.5 percent to 0.9 over the same period. The decline in landfill disposal is reflected in the clear downward trend (blue dotted line) and is in addition to the weaker downward tendency for disposal incineration and the increasing shares of waste recovery an indication that the situation is slowly changing towards a more sustainable treatment of waste.

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