

# Waste Management

*Update of 2018 State of the Environment Report*



**NCESD**

NATIONAL CENTRE for the ENVIRONMENT  
& Sustainable Development

*Villa Kazouli, Kifissias av. 241, 145 61 Kifissia*

*tel. 210 8089271, 3, fax 210 8084707, e-mail: [info-ekpaa@prv.ypeka.gr](mailto:info-ekpaa@prv.ypeka.gr), <http://ekpaa.ypeka.gr/>*

## Foreword

The National Center for Environment and Sustainable Development (NCESD) was established in 2000 with the aim of contributing to the integration of the environmental dimension into the broader development policy, sub-sectors and strategic planning, providing adequate know-how and objective information.

According to the Presidential Decree 325/2000 (Government Gazette A '266) establishing the NCESD, and particularly point (e) of Article 3 (2) thereof, it is provided that the NCESD “draws up an annual report assessing the state of environment in the country and estimating the environmental policy goals, directions and measures”.

In November 2018, the NCESD published the 2018 State of the Environment Report ([SoER 2018](#)), the first edition since 2013 (for the period 2008-2011), representing the 4th State of Environment Report of Greece. SoER 2018 stands as a comprehensive overview of developments and challenges registered in the main environmental areas and aims at providing detailed information to the citizens and the state as well as linking it to the corresponding report of the European Environment Agency. For the preparation of this Report, the NCESD had cooperated with academic institutions, research centers and technical consultancy companies. SoER 2018 includes detailed information for the state of the environment in Greece in the fields of climate change, air quality, noise, nature, water, waste and horizontal environmental issues, thus providing to all interested stakeholders with an objective source of knowledge.

The present update of SoER 2018 on waste management has been compiled on the basis of the most recent available data and focuses exclusively on waste management issues for which there is new official data compared to SoER 2018. The scope of this update is to provide objective information and to contribute to public discussion on waste management directions and policy measures with a view to a sustainable future.

The project team of SoER 2019 on waste management was composed by P. Varelidis, Ag. Kalliontzis, K. Korizi, G. Panagopoulou and Al. Pantelis.

We owe special thanks to the Waste Management Directorate of the Ministry of Environment and Energy (MoEE) and the Hellenic Recycling Agency (HRA) for their cooperation in providing seamless information.

Petros Varelidis  
Executive Director of NCESD

Zoe Vrontisi  
President of the  
Management Board of NCESD

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## Introduction

Waste management has been a cornerstone of the European Union's (EU) environmental policy for the past four decades through a number of actions and legislative acts, establishing common waste management principles, rules and monitoring procedures to ensure a high level of protection for the environment and human health in Europe. The EU waste strategy continues to be based on what is known as waste hierarchy, with waste prevention being the most preferred option, followed by recycling and other recovery options, while waste disposal being the last resort. Despite the significant progress made, waste management is still a major issue in EU, whereas it is also recognized as a major environmental challenge at international level, making it necessary to change the relationship between economic growth, resource use and waste generation. The long-term goal is to reduce the amount of waste generated and, if waste generation is unavoidable, promote waste as resource and achieve higher levels of recycling and safe disposal of waste. Following the revision of European legislation, even more ambitious targets for recycling were set in 2018 to be achieved by 2030.

The existing national waste policy, as revised in 2015 with the National Waste Management Plan (Act of Ministerial Council 49/15.12.2015 (Government Gazette 174A)), is oriented to the following 2020 milestones:

- The generation of waste per capita is drastically decreased
- Preparation for re-use and recycling with separate collection of recyclable and bio-waste is applied to 50% of municipal solid waste
- Energy recovery is a complementary management option when all other recovery options have been exhausted; and
- Landfill constitutes the least treatment option and is limited to less than 30% of municipal solid waste.

In view of the state of waste management in Greece, this section focuses on the development and main trends of municipal solid waste management and alternative management of waste streams, for which national legislation sets mandatory recycling and recovery targets.

Waste generation and management data are derived from official national datasets, which are available at the Eurostat database. Additional information was drawn from the Waste Management Directorate of the Ministry of Environment and Energy (MoEE), the Hellenic Recycling Agency (HRA) and the Alternative Management Systems reports. The statistics on annual population (arithmetic mean of population of two consecutive years) and gross domestic product (fixed 2010 prices), used for the development of specific waste generation indicators, are derived from the Eurostat database, as submitted by the Hellenic Statistical Authority.

## Municipal Solid Waste

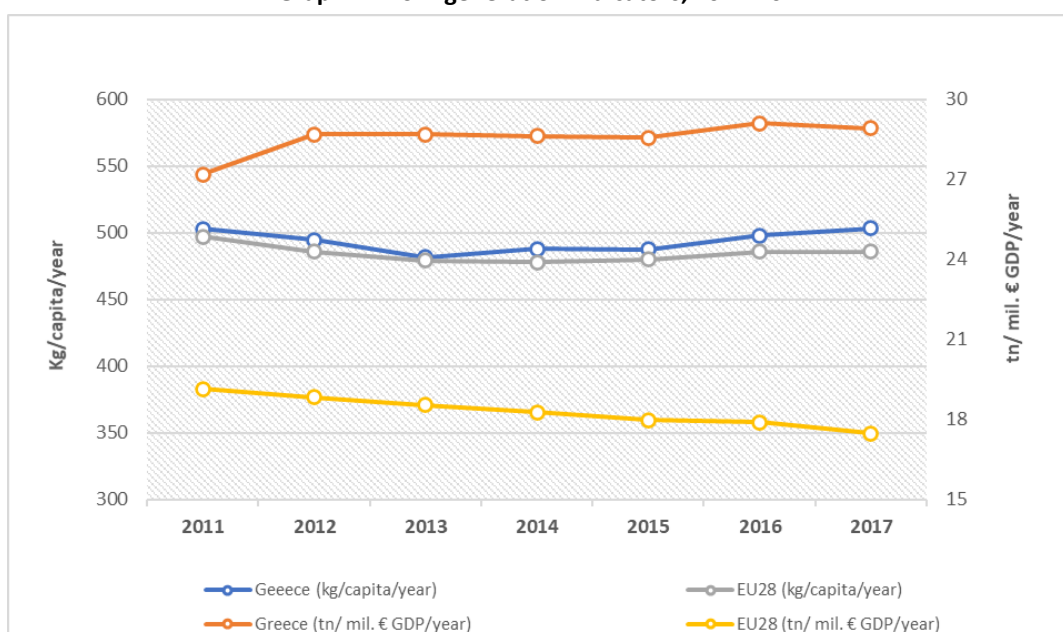
Source: Waste Management Directorate of MoEE & Eurostat

According to the municipal solid waste (MSW) generation data, there is a stabilizing trend over the period 2011-2017. MSW generation amounted to 504 kg/capita/year in 2017, just above the EU average (486 kg/capita/year). It is worth noting that there has been a slight upward trend in the generation of MSW in the last five years, which yet does not exceed 2.5%. Municipal solid waste generation in terms of GDP is much higher than the EU average and stands at 28.9 t/mil.€ GDP/year in 2017 compared to 17.5 t/mil.€ GDP/year in EU.

**Table 1. MSW generation, 2011-2017**

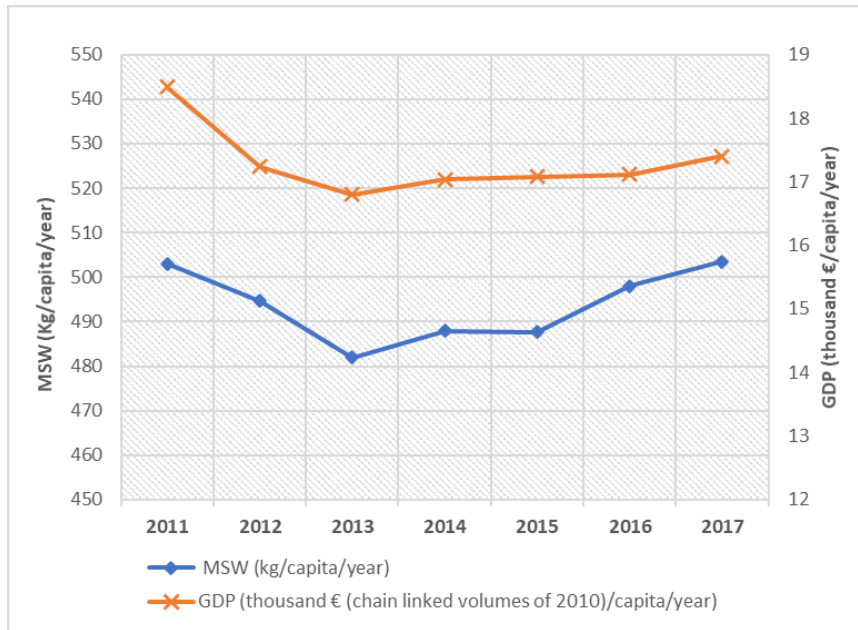
Municipal solid waste generation	2011	2012	2013	2014	2015	2016	2017
thousand tn	5586	5463	5284	5315	5277	5367	5415
kg/capita	503	495	482	488	488	498	504
tn/mil. € GDP	27,2	28,7	28,7	28,6	28,6	29,1	28,9

**Graph 1. MSW generation indicators, 2011-2017**



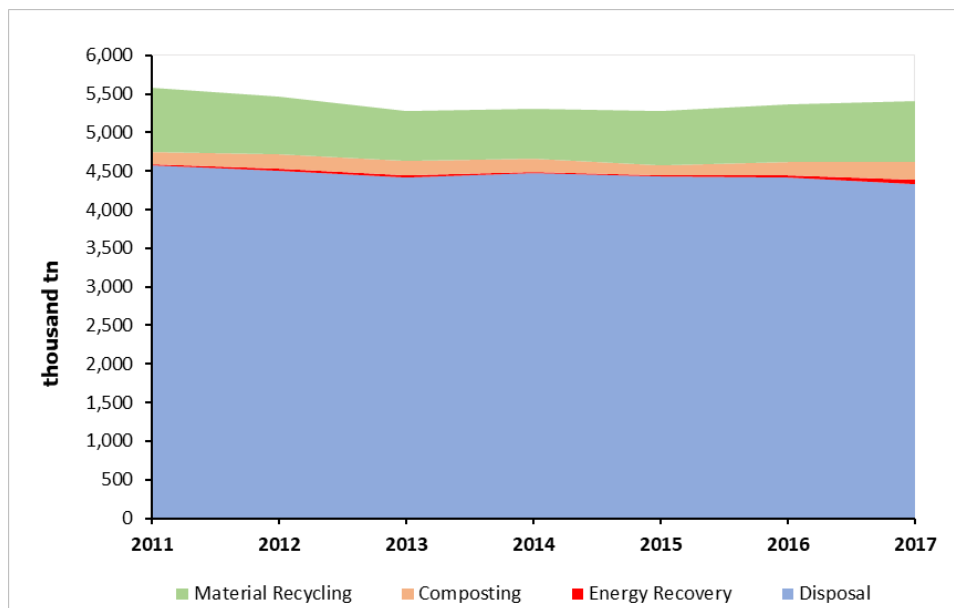
Graph 2 shows that the generation of municipal solid waste is closely linked to the development of the country's economy in terms of GDP.

**Graph 2. MSW generation and economic growth in terms of GDP**



In the period 2011-2017 there is no substantial change in MSW management operations (Graph 3). According to 2017 data, Greece still disposes the majority of its municipal waste in landfills (80%, compared to the EU average of 23.4%), while only 19% is recycled (EU average: 46.2%). In addition, a small percentage of the disposal (3.6%) ends up to uncontrolled waste disposal sites. It is worth noting that there has been a positive change in recycling by 22.5% over the last five years, but which is largely attributed to the alignment, for reasons of comparability, with the common practice of the other EU MSs to record compost produced from commingled MSW as recycled and not as recovered (which is more legally correct), an option that was indirectly legalized by the publication of Directive 2018/851 and which ends on 1/1/2027 (par. 4, Article 11a of Directive 2008/98).

**Graph 3. MSW Management, 2011-2017**

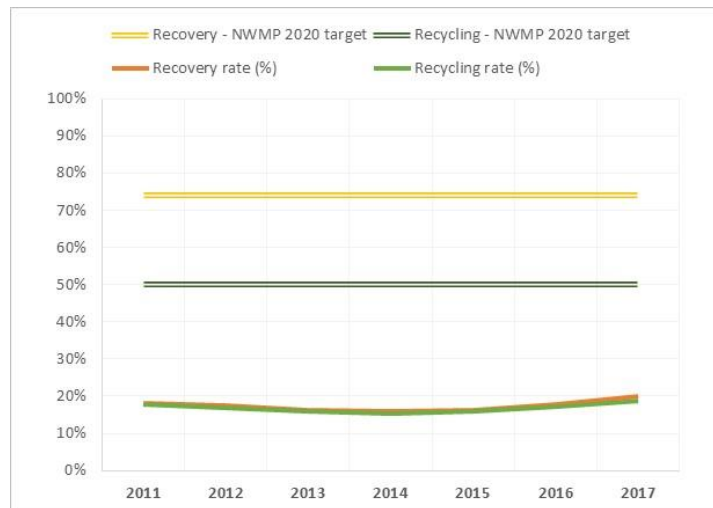


**Table 2. MSW Management, 2011-2017**

	2011	2012	2013	2014	2015	2016	2017
	5,586	5,434	5,284	5,315	5,277	5,367	5,415
<b>Disposal</b>	<b>4,578</b>	<b>4,507</b>	<b>4,421</b>	<b>4,470</b>	<b>4,426</b>	<b>4,415</b>	<b>4,335</b>
<b>Recovery</b>	<b>1,008</b>	<b>956</b>	<b>863</b>	<b>845</b>	<b>851</b>	<b>952</b>	<b>1,080</b>
Energy Recovery	16	29	29	25	18	27	58
Recycling	992	927	834	820	833	925	1,022
Material Recycling	832	747	647	652	698	743	798
Composting	160	180	187	168	135	182	224

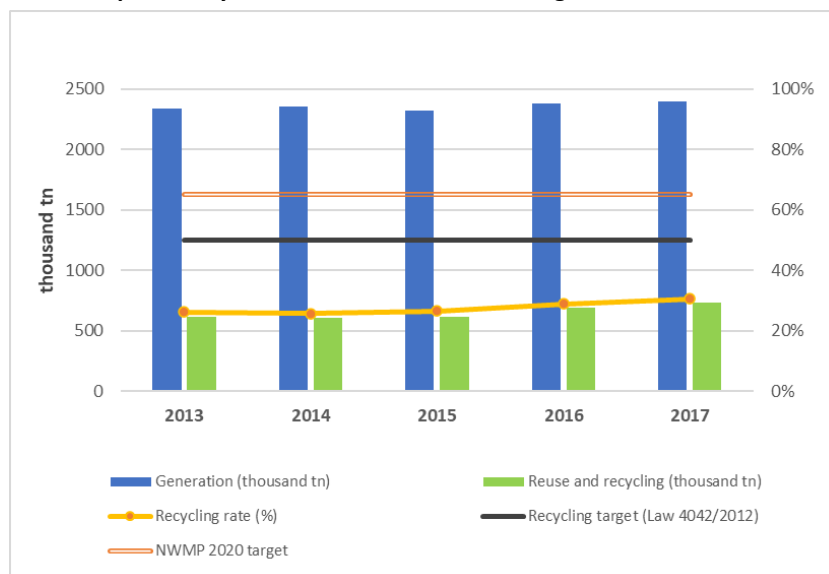
Graph 4 shows a comparison of the 50% recycling target and the 70% recycling target set by the country's 2020 national planning (NWMP). According to the results of the country's performance, more efforts will have to be made to comply with the targets set, as recovery and recycling rates are currently around 20%.

**Graph 4. Comparison with NWMP Targets**



Graph 5 shows the generation, re-use and recycling of recyclable waste materials for the period 2013-2017 and comparison with the 2020 targets. Although it has been increasing over time it is far from the 2020 target.

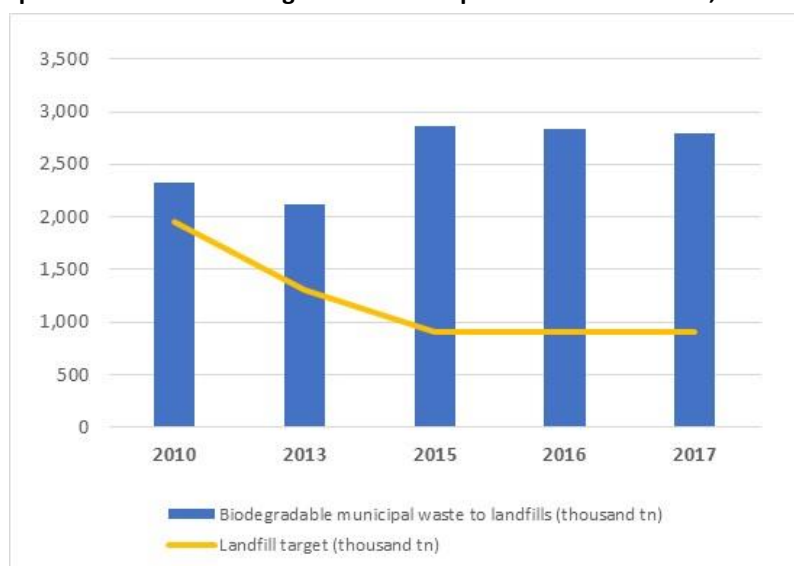
**Graph 5. Recyclable Waste Materials Management, 2013-2017**



**Table 3: Recyclable Waste Materials Management, 2013-2017**

	2013	2014	2015	2016	2017
Generation (thousand tons)	2341	2355	2325	2378	2399
Reuse and recycling (thousand tons)	613	605	616	687	732
Reuse and recycling rate (%)	26.2%	25.7%	26.5%	28.9%	30.5%

The following chart and table illustrate the development of biodegradable municipal waste diversion from landfill over the last decade, which show that the country failed to meet the targets set for 2010 and 2013 and is far from the target set for 2020.

**Graph 6: Diversion of biodegradable municipal waste from landfill, 2010-2017**

**Table 4: Diversion of biodegradable municipal waste from landfill, 2010-2017**

	2010	2013	2015	2016	2017
Generation (thousand tn)	3124	2817	3509	3569	3600
Diversion from landfill (thousand tn)	793	696	640	736	810
Diversion from landfill (%)	25.4%	24.7%	18.2%	20.6%	22.5%
Landfilling (thousand tn)	2331	2121	2869	2833	2790
Landfilling target (thousand tn)	1950	1300	910	910	910
Deviation from landfilling target (thousand tn)	381	821	1959	1923	1880
Deviation from landfilling target (%)	20%	63%	215%	211%	207%

The basic municipal waste treatment infrastructures are listed in Table 5 (end of 2018, according to the document ΥΠΕΝ/ΔΔΑΠΠ/62661/2486/28.2.2019).

**Table 5: Existing municipal waste recovery and disposal facilities**

Region	Sorting Plants	MBT	Landfill
Eastern Macedonia - Thrace	5	2	3
Attica	4	1	4
North Aegean	2	0	5
Western Greece	2	1	8
Western Macedonia	1	1	2
Epirus	1	1	3
Thessaly	3	0	7



Region	Sorting Plants	MBT	Landfill
Ionian Islands	2	3	2
Central Macedonia	7	0	11
Crete	2	2	7
South Aegean	6	0	24
Peloponnese	4	5	1
Central Greece	2	0	7

### Sorting Plants

There are 35 Sorting Plants affiliated with the EPR scheme “HERRCO SA”, which sort mixed packaging waste collected from the blue bin system. In addition, non-contracted with EPR schemes sorting facilities operate either by sorting packaging waste or a specific waste stream (paper or glass).

### Mechanical and biological treatment plants (MBT)

There are 16 MBT plants in operation that treat commingled municipal waste, 10 of which are temporary, including 2 MBTs in the East Macedonia-Thrace Region foreseen to operate in due course. The capacity of these installations is inadequate to meet the national needs.

### Composting plants for separately collected bio-waste

The separately collected bio-waste treatment plants are limited to 3 and actually involve a separate bio-waste processing line of the MBTs. It is noted that there are also private compost / soil conditioner plants which can treat separately collected bio-waste.

### Landfills

The number of landfills is 84.

In addition to the aforementioned infrastructures, there are also facilities of alternative management waste streams, which are presented in the following sections. Additional recovery and recycling infrastructures include industrial facilities such as the paper industry, the plastic industry, the steel industry, aluminum plants, glass industry and the cement industry. In addition, there is a transboundary shipment of waste destined for recycling operations, mainly for paper and plastic.

In conclusion, there is lack of sufficient municipal waste management infrastructures, while there are also cases of malfunctioning landfills or even non-operating landfills due to local reactions. Much of the required infrastructure is still under construction or planning, while these infrastructure investments should have been completed many years ago under EU law due also to the long maturity for their execution. These delays have the effect of preventing the country from keeping up with European waste legislation as it implements facilities and projects that meet the design requirements of the time and not the needs arising from the rapidly ongoing developments in legislation (see recent revision of Directive on waste - remarkable increase in waste targets, reducing usage of single-use plastics, target of limiting landfill to 10% etc., change of funding rules in the new NSRF programming period – non-funding of commingled waste treatment facilities) and technology. In particular, the delay in establishing new modern MSW management infrastructures in Attica (no substantial progress in the last 5 years - planning is still at a preliminary stage) can become a major problem if the state does not move decisively and very quickly, taking into account and the lengthy procurement procedures provided by law.

## Packaging and packaging waste

Source: HRA, Waste Management Directorate of MoEE, Eurostat and HERRCO SA

According to the development of packaging waste generated from 2014 to 2018, there is an increase of 8% in total generation. The share of individual packaging waste materials in total packaging waste generation does not appear to change over time, with 2018 showing a slight decline in plastics and a corresponding slight increase in paper & cardboard (around 2%) compared to 2014.

**Table 6. Packaging waste generation, 2014-2018**

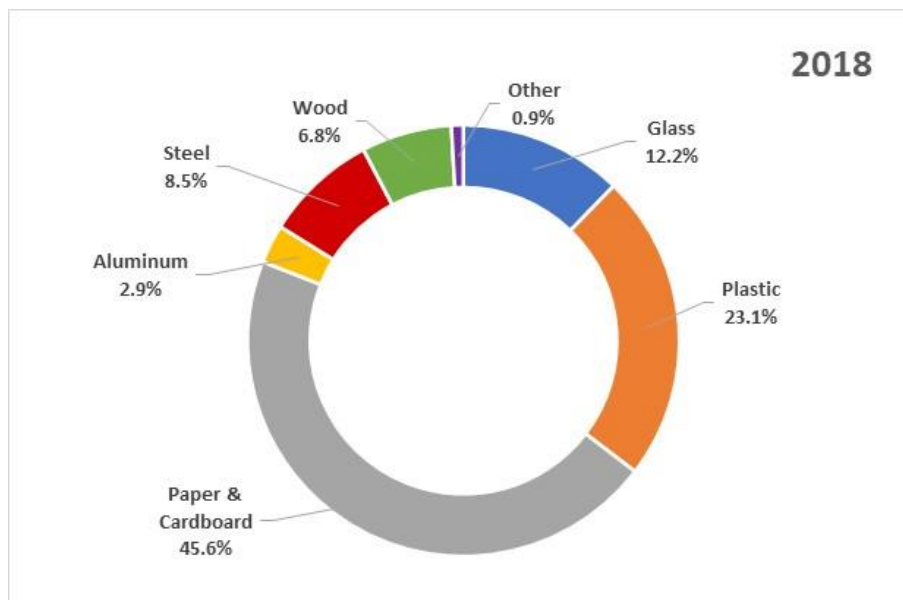
Material	2014	2015	2016	2017	2018	
<b>Glass</b>	93,000	88,800	90,500	95,800	99,300	
<b>Plastic</b>	184,400	183,800	186,600	188,200	187,600	
<b>Paper &amp; cardboard</b>	330,700	326,100	334,300	357,400	369,700	
<b>Metals</b>	<i>Aluminum</i>	19,200	20,900	21,700	21,700	23,500
	<i>Steel</i>	69,600	66,900	62,900	64,800	68,600
	<b>Total</b>	88,800	87,800	84,600	86,500	92,100
<b>Wood</b>	45,600	50,200	50,800	53,000	54,900	
<b>Other</b>	5,400	5,300	5,500	5,600	7,300	
<b>TOTAL</b>	<b>747,900</b>	<b>742,000</b>	<b>752,300</b>	<b>786,500</b>	<b>810,900</b>	

**Graph 7. Packaging waste generation indicators, 2014-2018**



From the analysis of packaging waste generation data for 2018, paper-cardboard has the highest share in total packaging waste generation (45.6%), followed by plastic (23.1%), glass (12, 2%) and metals (11.4%).

**Graph 8. Share of individual packaging waste materials in packaging waste generation, 2018**



The development of the separate packaging waste collection network is presented in Table 7. In 2018, the population coverage of the collection network typically amounts to 96% and there are 35 Sorting Plants that are affiliated with the EPR scheme “HERRCO SA”, which receive the recyclable waste packaging materials from the blue bin collection network.

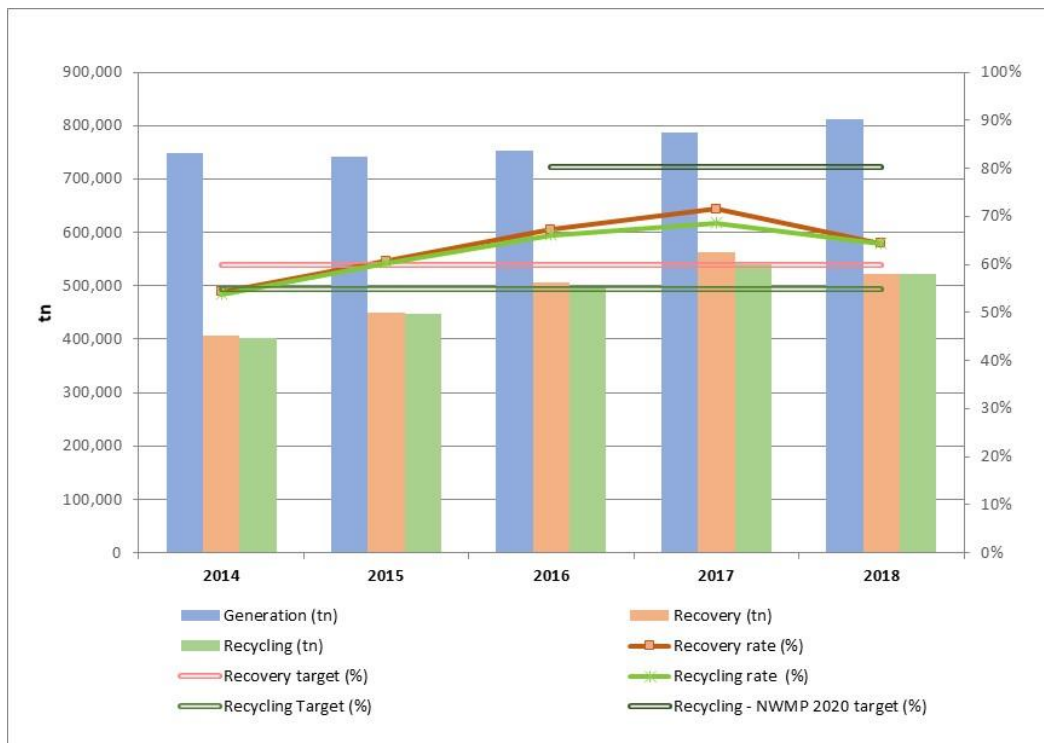
**Table 7. Separate Packaging Waste Collection Network, 2018**

YEAR	2014	2015	2016	2017	2018
Percentage of population coverage %	87%	92%	94%	95%	96%
Sorting Plants	30	32	32	33	35
Delivered Bins (thousands)	164	187	206	162	165

In addition, there are sorting facilities that are either not affiliated with HERRCO SA or are intended for the sorting of a specific waste stream (e.g. Didymoticho and Komotini for paper sorting). There are also two facilities for the sorting of glass trimmings (before they are brought to the final recipient ie glassmaking) of ASA SA. Their total capacity is over 1 million tons per year, which generally covers the national needs.

Graph 8 depicts the management data for all packaging waste for the period 2014-2018, recording a 30% increase in both recycling and recovery in 2018 compared to 2014, with a slight decline in 2018 compared to 2017. Regarding the minimum recycling and recovery targets set by the legislation, the performance rates are satisfactory after 2015, while the corresponding recycling performance is significantly lower than the target of the National Waste Management Plan for 2020. EU performance in terms of recycling and recovery is 67% and 80.1% respectively.

**Graph 9. Packaging waste management, 2014-2018**



	2014	2015	2016	2017	2018
Generation (tn)	747,900	742,000	752,300	786,500	810,900
Recycling (tn)	402,220	447,420	497,310	539,900	522,040
Recovery (tn)	405,820	450,150	505,710	563,100	522,040
Recycling rate (%)	53.8%	60.3%	66.1%	68.6%	64.4%
Recovery rate (%)	54.3%	60.7%	67.2%	71.6%	64.4%

In 2018, recovery operations include material recycling as well as other recycling operations (for wood). Regarding recycling performance, the mandatory individual targets have been met with the exception of glass, while it appears that the targets of the National Waste Management Plan for 2020 can be achieved only marginally for two streams of packaging waste, metals and paper & cardboard.

**Table 8. Management of individual packaging waste streams, 2018**

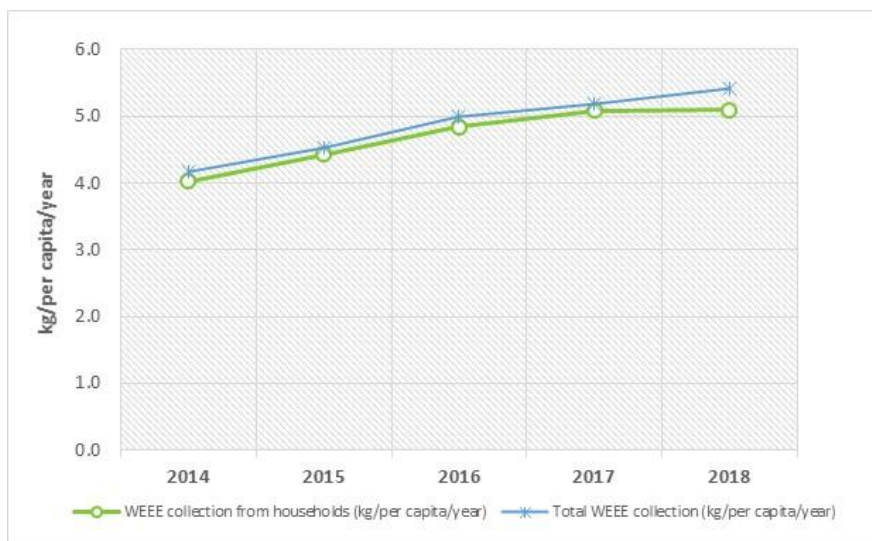
Material	Generation (tn)	Material Recycling (tn)	Other Recycling options	Energy Recovery (tn)	Recovery Total (tn)	% Recycling			
						Minimum Target	Performance rate	NWMP 2020 Target	Performance rate
Glass	99,300	34,960	0	0	34,960	60%	35.2%	70%	35.2%
Plastic	187,600	81,970	0	0	81,970	22.5%	43.7%	70%	43.7%
Paper & cardboard	369,700	327,610	0	0	327,610	60%	88.6%	92%	88.6%
Metals	Aluminum	23,500	8,020	0	8,020		34.1%		34%
	Steel	68,600	55,610	0	55,610		81.1%		81%
	Total	92,100	63,630	0	63,630	50%	69.1%	70%	69.1%
Wood	54,900	3,870	10,000	0	13,870	15%	25.3%	80%	25.3%
Other	7,300	0	0	0	0		0%		0%
<b>TOTAL</b>	<b>810,900</b>	<b>512,040</b>	<b>10,000</b>	<b>0</b>	<b>522,040</b>	<b>55%</b>	<b>64.4%</b>	<b>80.2%</b>	<b>64.4%</b>

# Waste Electrical and Electronic Equipment

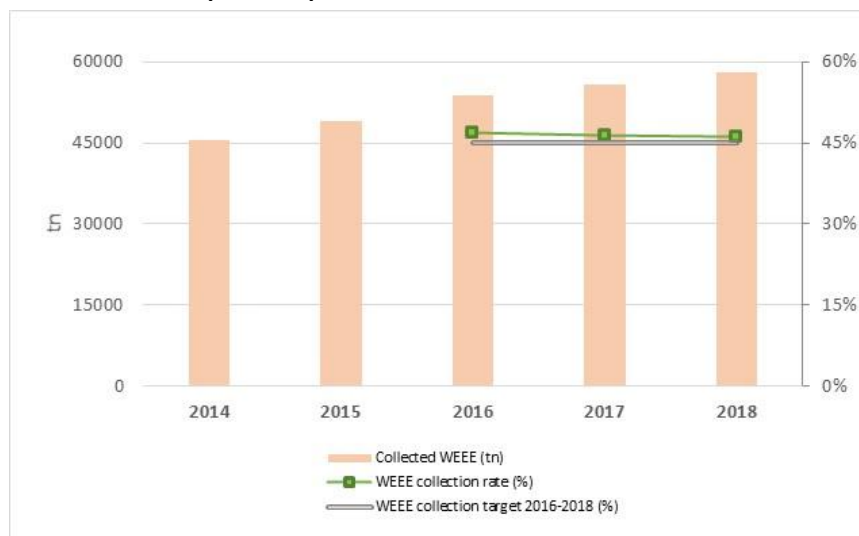
Source : HRA and Eurostat

According to the data for the management of waste electrical and electronic equipment (WEEE) for the period 2014-2018, the separate collection of WEEE shows an upward trend, exceeding 4 kg / inhabitant in the household sector. From 2016 onwards, where the target for WEEE collection is revised (45% of the average annual weight of EEE put on the market in the three preceding years), it appears that the collection target is marginally met.

**Graph 10. Indicators of separate WEEE collection, 2014-2018**



**Graph 11. Separate collection of WEEE, 2014-2018**



	2014	2015	2016	2017	2018
WEEE collection (tn)	45,419	49,005	53,718	55,831	58,040

Regarding the needs for WEEE collection, Graph 10 shows an increase in the quantities collected reflecting a corresponding increase in the EEE quantities put on the market (expressed as an average of the three preceding years), while the performance of WEEE collection is maintained at the same rates of 46-47% over the last three years. It is worth noting that the WEEE collection target is higher from 2019 onwards, as the minimum collection rate to be achieved annually is set at 65% of the average annual weight of EEE put on the market in the three preceding years, or alternatively at 85% of WEEE generated in that Member State.

Table 9 provides detailed data on the EEE put on the market and the WEEE collected from households and from sources other than households by equipment category for the year 2018. The categories with the largest share in the WEEE separate collection are category 1 "large household appliances" 67.6%, followed by categories 4 "consumer equipment" and 3 "IT & communications equipment" with 13.1% and 8.7%, respectively. The WEEE collection points of the two collective alternative management systems (Appliances Recycling SA & Fotokiklosi SA) at regional and national level is illustrated in Table 9.

**Table 9. EEE put on the market and WEEE collected, 2018**

Category	Put on Market (tn)	Collected - household sector (tn)	Collected -other than household sector (tn)	Total collected (tn)
1. Large household appliances	90,705.0	38,075.0	1,163.8	39,238.8
2. Small household	10,452.7	2,527.0	0.0	2,527.0
3. IT and telecommunications	10,151.3	5,077.5	0.4	5,077.9
4. Consumer equipment and				
4α. Consumer	8,409.1	7,576.9	0.4	7,577.3
4β. Photovoltaic panels				
5. Lighting equipment	8,100.0	1,363.8	133.8	1,497.6
5α. Gas discharge lamps	3,055.2	504.1	13.5	517.6
6. Electrical and electronic	5,052.1	115.5	0.0	115.5
7. Toys, leisure and sports	2,413.2	127.3	0.0	127.3
8. Medical devices	1,141.1	219.2	2.1	221.3
9. Monitoring and control	2,243.8	667.9	0.0	667.9
10. Automatic Dispensers	1,321.9	448.5	23.4	471.9
<b>TOTAL</b>	<b>143,045.4</b>	<b>56,702.6</b>	<b>1,337.3</b>	<b>58,039.9</b>

\* The amount of "Gas discharge lamps" is not included in the amount of "Lighting equipment"

**Table 10. WEEE collection points 2018**

REGION	Collective alternative management organisations			
	Appliances Recycling		Fotokiklosi	
	Collection Points	%	Collection Points	%
EAST MACEDONIA THRACE	918	6.2%	224	3.0%
ATTICA	4,810	32.4%	3579	47.4%
NORTH AEGEAN	371	2.5%	97	1.3%
WESTERN GREECE	582	3.9%	324	4.3%
WESTERN MACEDONIA	195	1.3%	273	3.6%
EPIRUS	314	2.1%	176	2.3%
THESSALY	702	4.7%	319	4.2%
IONIAN ISLANDS	362	2.4%	110	1.5%
CENTRAL MACEDONIA	3,304	22.2%	1,061	14.0%
CRETE	853	5.7%	387	5.1%
SOUTH AEGEAN	808	5.4%	254	3.4%
PELOPONNESE	734	4.9%	329	4.4%
CENTRAL GREECE	914	6.1%	423	5.6%
<b>Country Total</b>	<b>14,867</b>		<b>7,556</b>	

Regarding recovery and preparing for reuse-recycling, there are individual targets for the WEEE categories mandated by legislation. The following tables show the recovery and preparing for re-use/recycling performance per WEEE category for the period 2014-2018. In 2018 the targets have been met for all categories. In 2017 the targets were achieved with the exception of categories 3, 4 and 7, same as in 2016 with the exception of category 7. It is noted that after 15/8/2018 the change in WEEE categories (6 instead of 10) and the set targets, will bring increased needs for recovery and recycling rates.

**Table 11. Performance of WEEE recovery, 2014-2018**

Category	Recovery target		2014	2015	2016	2017	2018
	by 14/8/2015	15/8/2015-15/8/2018					
1. Large household appliances	80%	85%	80.4%	85.2%	91.6%	85.4%	88.4%
2. Small household appliances	70%	75%	85.1%	93.1%	89.2%	87.7%	78.6%
3. IT and telecommunications equipment	75%	80%	91.2%	98.3%	96.5%	81.1%	83.8%
4. Consumer equipment and photovoltaic panels							
4a. Consumer equipment	75%	80%	90.4%	97.2%	94.3%	73.4%	80.4%
4b. Photovoltaic panels	75%	80%			100.0%		
5. Lighting equipment	70%	75%	114.0%	104.1%	80.1%	100.9%	99.2%
5a. Gas discharge lamps							
6. Electrical and electronic tools	70%	75%	95.7%	94.4%	98.9%	92.7%	84.3%
7. Toys, leisure and sports equipment	70%	75%	75.4%	76.7%	73.3%	66.9%	79.8%
8. Medical devices	70%	75%	101.8%	88.2%	100.0%	94.9%	90.3%
9. Monitoring and control instruments	70%	75%	92.0%	97.2%	89.8%	94.1%	88.7%
10. Automatic Dispensers	80%	85%	85.8%	91.7%	100.0%	92.6%	99.9%

\* From 15/8/2018 the categories change from 10 to 6 (Annex III & IV of Directive 2012/19).

\*\* Recovery rates greater than 100% are due to stocks created in the previous year that were processed for the reference year

**Table 12. Performance of WEEE preparing for reuse & recycling, 2014-2018**

Category	Preparing for re-use and recycling target		2014	2015	2016	2017	2018
	by 14/8/2015	15/8/2015-15/8/2018					
1. Large household appliances	75%	80%	80.4%	85.2%	82.4%	81.8%	82.2%
2. Small household appliances	50%	55%	85.1%	93.1%	84.8%	77.8%	71.7%
3. IT and telecommunications equipment	65%	70%	91.2%	98.3%	93.9%	68.0%	74.8%
4. Consumer equipment and photovoltaic panels							
4a. Consumer equipment	65%	70%	90.4%	97.2%	92.6%	67.9%	77.0%
4b. Photovoltaic panels	65%	70%			100.0%		
5. Lighting equipment	50%	55%	114.0%	104.1%	80.1%	93.3%	90.8%
5a. Gas discharge lamps	80%	80%	71.9%	118.5%	92.7%	92.7%	85.3%
6. Electrical and electronic tools	50%	55%	95.7%	94.4%	97.3%	82.1%	74.1%
7. Toys, leisure and sports equipment	50%	55%	75.4%	76.7%	71.7%	60.2%	62.3%
8. Medical devices	50%	55%	101.8%	88.2%	99.6%	83.2%	79.4%
9. Monitoring and control instruments	50%	55%	92.0%	97.2%	89.0%	84.4%	77.8%
10. Automatic Dispensers	75%	80%	85.8%	91.7%	97.8%	89.2%	93.5%

\* Recovery rates greater than 100% are due to stocks created in the previous year that were processed for the reference year

The WEEE treatment (de-pollution / disassembly) facilities cooperating with the collective alternative management organisations (Appliances Recycling SA & Fotokiklosi SA) amount to 12. These plants can meet the needs of the country, as specified in the Directive 2012/19/EU, even after increasing the WEEE collection target from 45% to 65% of the average annual weight of EEE put on the market in the three preceding years.

## Waste Batteries and Accumulators

Source: HRA & Waste Management Directorate of MoEE

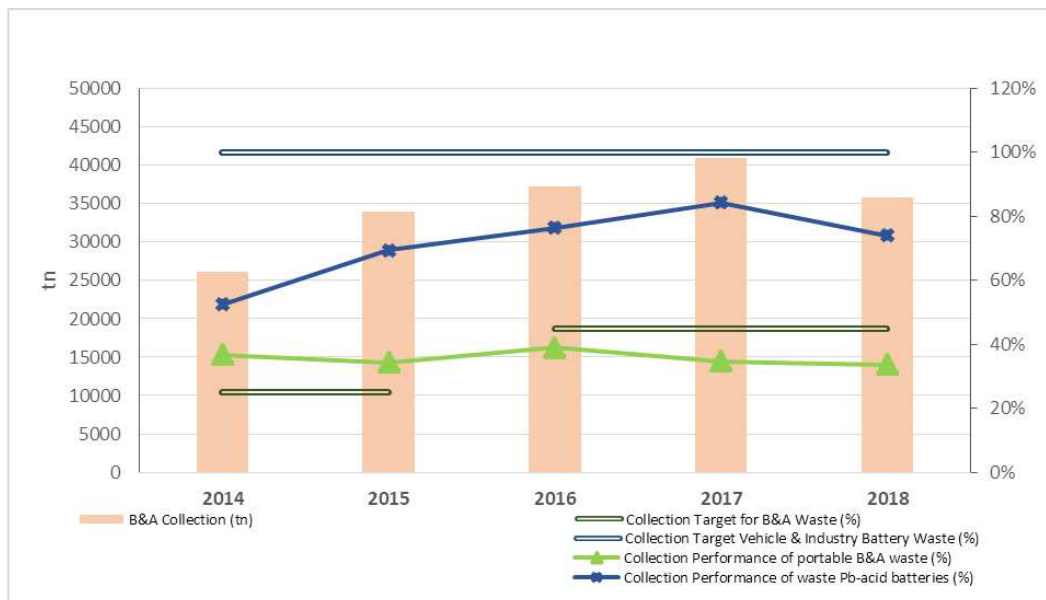
According to the waste batteries and accumulators (WB&A) management data, the country's performance in the separate collection of WB&A is presented in Table 13 and is shown in Graph 12 for the period 2014-2018. The results of the separate collection illustrate that the collection rate of waste portable batteries and accumulators remains approximately at the same level over the years and is not sufficient to achieve the post-2016 collection target which increased from 25% to 45%, moving away from the target by 11.4% in 2018.

Table 12. WB&A Collection, 2014-2018

	2014	2015	2016	2017	2018
<b>Portable B&amp;A waste</b>					
Products put on the market (tn)	1,620	1,657	1,599	1,692	1,646
Waste collection (tn)	608	567	632	570	553
Collection rate (%)	36.8%	34.4%	38.9%	34.6%	33.6%
<b>Lead-acid batteries waste</b>					
Products put on the market (tn)	21,978	20,529	21,891	19,936	14,869
Waste generation (tn)	48,630	48,029	47,750	47,750	47,750
Waste collection (tn)	25,526	33,319	36,498	40,250	35,296
Collection rate (%)	52.5%	69.4%	76.4%	84.3%	73.9%
<b>Ni-Cd batteries waste</b>					
Products put on the market (tn)	28.5	33.6	26.0	87.0	10.0
Waste collection (tn)	9.2	43.9	24.0	118.0	9.0

\* The collection rate of waste Ni-Cd batteries is not available as data on the quantities produced are not available.

Graph 12. WB&A Collection, 2014-2018



Regarding the performance of the separate collection of waste lead-acid batteries, the collection rate is up until 2017, with a decrease of at least 10 percentage points between 2017 and 2018, moving away from the target by 26.1%. However, it is estimated that the collection rate of waste lead-acid



batteries is much higher, as there are notable amounts collected from informal recycling systems. In addition, the performance of the collection target of waste lead-acid batteries is based on generation estimates according to a methodology developed by the MoEE and used in the National Waste Management Plan. In the context of the operation of the National Waste Producer Registry and the analysis of detailed data by the Hellenic Statistics Authority, HRA intends to improve the waste generation estimates and subsequently to assess more realistically the performance of their separate collection.

Concerning recycling in the period 2014-2018, there is no infrastructure for the treatment of the collected waste portable batteries. All the quantities collected from the EPD scheme for portable batteries (AFIS SA) are sent to processing plants abroad, in particular Revatech based in Belgium and Greenweee based in Romania.

Accordingly, the recycling of Ni-Cd batteries is of no positive value and the Greek market does not currently have a recycling infrastructure. The main recipient of this waste is the SNAM France Viviez recycling facility in France through the two EPR schemes for vehicle and industrial waste batteries (SYDESYS SA and COMBAT SA) and authorised collection and transport companies.

Concerning waste lead-acid batteries, 8 recycling facilities cooperating with the collective alternative management organisations (SYDESYS SA, COMBAT SA and REBATTERY SA) operate in Greece, which meet the needs of the country (end of 2018 according to ΥΠΕΝ/ΔΔΑΠΠ/62661/2486/28.2.2019). Table 13 presents the recycling rate of waste lead-acid batteries, where it appears that the target of 65% has been achieved throughout the period of 2014-2018.

**Table 13. Recycling rate of waste lead-acid batteries, 2014-2018**

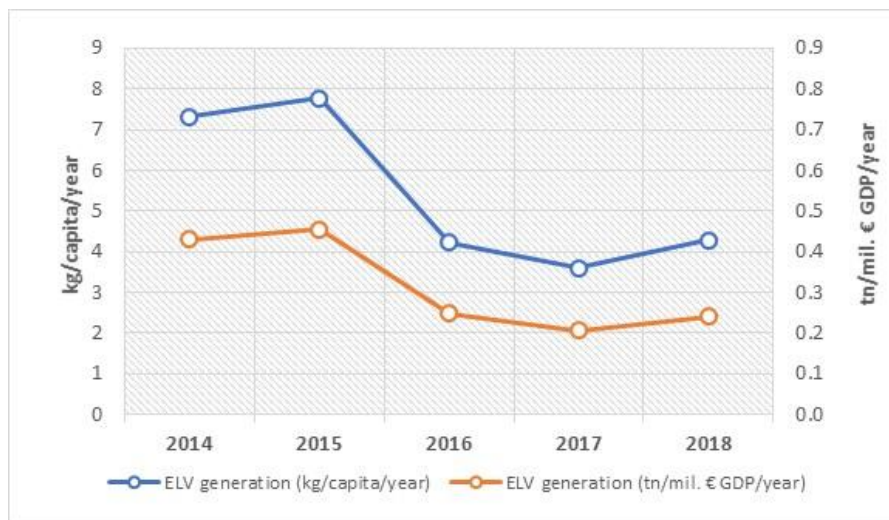
	2014	2015	2016	2017	2018
Average recycling performance	73.2%	74.8%	76.2%	81.3%	94.6%

## End-of-Life Vehicles

Source: HRA, Eurostat and EDOE

According to the development of ELV generated from 2014 to 2018, as illustrated in Figure 13, there is a significant decline in generation in the period 2015-2017 (by 54%) with a recovery trend in 2018 to 2016 levels.

**Graph 13. ELV generation indicators, 2014-2018**



	2014	2015	2016	2017	2018
ELV generation (tn)	79,668	84,046	45,570	38,654	45,971

Based on the geographic coverage data for the period 2014-2018, ELV collection is nationwide served. ELV collection points include dismantling facilities and collection points that need to be transported to dismantling facilities within 8 days. Data from the last five years show a steady decline in the collection points compared to 2015, which is related to the reduction of both dismantling facilities and collection points.

**Table 14. Geographical coverage of ELV collection, 2014-2018**

	2014	2015	2016	2017	2018
Regional Coverage	51	51	51	51	51
Delivery Points	158	167	161	164	151

**Table 15. ELV collection points, 2016-2018**

ΠΕΡΙΦΕΡΕΙΑ	2016		2017	2018	
	Dismantling facilities	Collection points	Dismantling facilities	Dismantling facilities	Collection points
EASTERN MACEDONIA - THRACE	8	0	8	8	0
ATTICA	17	5	18	12	2
NORTH AEGEAN	4	0	4	4	0
WESTERN GREECE	10	3	12	12	2
WESTERN MACEDONIA	5	1	6	6	0
EPIRUS	8	2	9	9	2
THESSALY	13	4	13	13	2
IONIAN ISLANDS	1	1	2	2	1
CENTRAL MACEDONIA	34	5	34	31	3
CRETE	5	1	6	6	1
SOUTH AEGEAN	6	3	6	6	4
PERLOPONNESE	11	2	13	13	2
CENTRAL GREECE	11	1	12	10	0
<b>TOTAL</b>	<b>133</b>	<b>28</b>	<b>143</b>	<b>132</b>	<b>19</b>

Regarding reuse, recycling and recovery, Graph 14 and Table 17 illustrate the quantities and performance rates of ELVs for 2014-2018, which dictate that the mandated targets have been achieved by 2016. It is worth noting that as far as reuse / recycling and reuse / recovery are concerned, EU’s performance for 2017 was 87.6% and 93.7% respectively. The existing dismantling facilities affiliated with the EPR scheme (EDOE) now stand at 132.

**Graph 14. ELV management, 2014-2018**



**Table 16. ELV management, 2014-2018**

<b>Quantitative data</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Reuse (tn)	17,389	18,504	12,810	9,077	7,841
Recycling (tn)	46,698	35,692	33,174	26,451	37,516
Recovery (tn)	50,689	39,376	36,391	29,385	41,942
Reuse / Recycling (tn)	64,087	54,196	45,984	35,528	45,357
Reuse / Recovery (tn)	68,078	57,880	49,201	38,462	49,783
<b>Performance</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Reuse / recycling rate (%)	80.4%	64.5%	100.9%	91.9%	98.7%
Reuse / recovery rate (tn)	85.5%	68.9%	108.0%	99.5%	108.3%

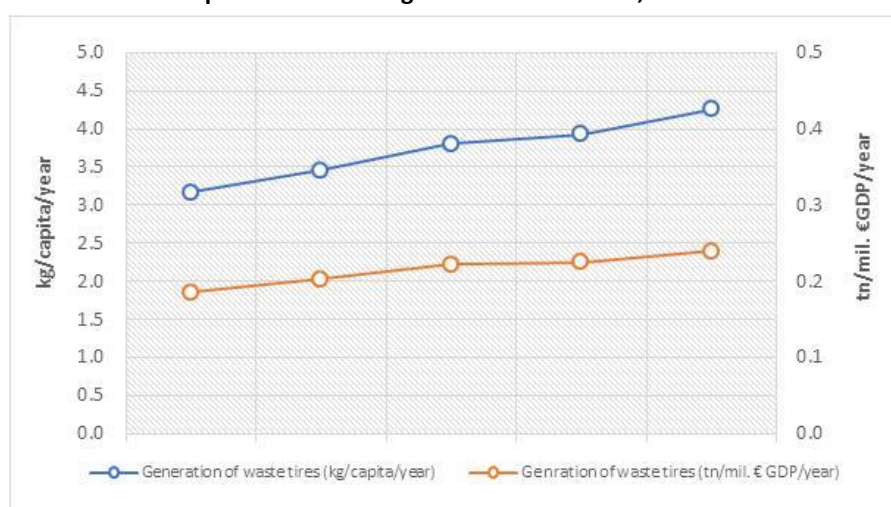
*\* Rates > 100% are related to the accumulation of ELV amounts from previous years, which are processed within the reference year*

## Waste Vehicle Tires

Source: HRA and ECOELASTIKA

According to the development of waste vehicle tires as depicted in Figure 15, there is a continuous increase in waste tire generation in the period 2014-2018, which is 32.4% higher in 2018 than 2014 levels.

**Graph 15. Waste tire generation indicators, 2014-2018**



**Table 17. Waste tires generation, 2014-2018**

	2014	2015	2016	2017	2018
Tires withdrawn (tn)	34,511	37,440	40,999	42,205	45,698

\* 2018 data are temporary.

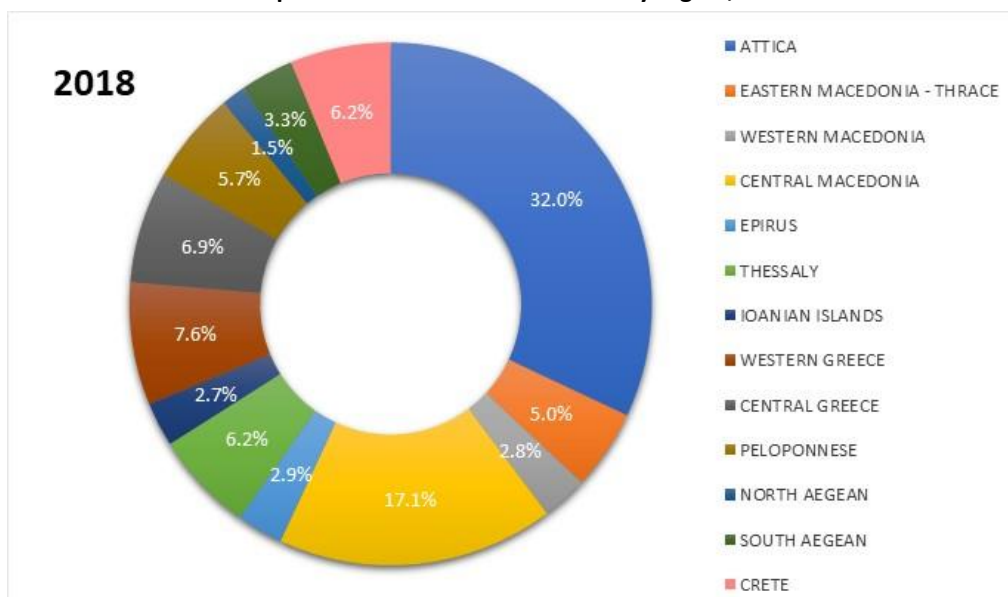
Table 19 shows the development of the share of different tire holders in the collection of waste tires for the period 2014-2018, according to which there is a small increase in the category of “other owners”.

**Table 18. Distribution of waste tire collection by owner category, 2014-2018**

	2014	2015	2016	2017	2018
Collection points (vulcanizers, garages)	94.0%	91.8%	94.1%	94.0%	91.6%
Vehicle dismantling facilities	4.0%	5.0%	3.2%	2.6%	4.4%
Other owners (municipalities, public authorities, large companies)	2.0%	3.2%	2.7%	3.4%	4.0%

Graph 16 illustrates the regions' share in the collection of waste tires for 2018, which shows that about half of the quantities collected come from Attica (32.0%) and Central Macedonia (17.1%), followed by Central Greece (6.9%), Thessaly (6.2%) and Crete (6.2%).

**Graph 16. Collection of waste tires by region, 2018**



The collected waste tires are dispatched to either energy recovery plants or mechanical processing facilities to produce finished products for sale (shredded / powder tire, metals, linen) and / or alternative fuel production. The waste tire-processing facilities in contract with the EPR scheme ECOELASTIKA SA amount to 6 (of which 2 involve shredding to produce alternative fuel). At the same time there is cooperation for burning tires (as tire-derived fuel) with 2 cement plants in Greece and 1 cement plant in Bulgaria. Table 20 presents the waste tire collection rates for the period 2014-2015, showing an increasing trend with an overall rise of 23.3% in 2018 compared to 2014.

**Table 19. Waste tires for recovery operations, 2014-2018**

	2014	2015	2016	2017	2018
Collected waste tires (tn)	33,735	35,914	36,308	38,538	41,598

\* 2018 data are temporary.

Table 21 lists the quantities of whole or processed tires promoted for energy recovery or recycling in the period 2014-2018.

**Table 20. Waste tires recovered / recycled, 2014-2018**

	2014	2015	2016	2017	2018
Energy recovery of whole tires (domestic)	6,871	5,815	4,317	4,511	5,448
Export of whole tires for energy recovery	5,557	2,038	4,610	2,326	1,552
Shredded tires for energy recovery	11,778	14,434	8,045	6,553	4,666
Sale of tire trim, metals, linens for recycling	13,589	16,341	18,818	23,540	31,386
<b>Total</b>	<b>37,795</b>	<b>38,628</b>	<b>35,790</b>	<b>36,930</b>	<b>43,052</b>

\* 2018 data are temporary.

It is noted that part of the annual quantities recovered in processing plants comes from previous years' stocks, which are deferred for processing at a later date. Table 22 shows the stored quantities of waste tires (whole or shredded and / or process residues) during the period 2014-2018, recording a continuous decline of the waste tires stocks.

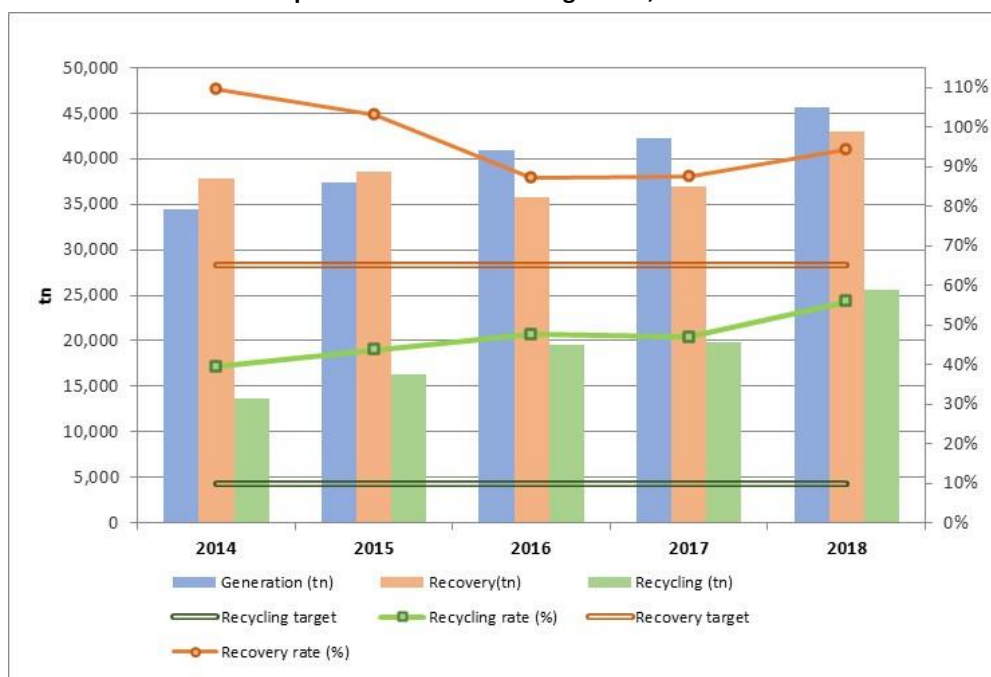
**Table 21. Stored quantities of waste tires, 2014-2018**

	2014	2015	2016	2017	2018
Waste tires stocks (tn)	30,332	28,582	22,964	22,740	20,787

\* 2018 data are temporary.

Regarding the performance of the recovery and recycling of waste tires, as illustrated in the diagram below, the mandated recovery target of 65% and the recycling target of 10% have been achieved over the last five-year period. The existing waste tires processing facilities in contract with ECOELASTIKA SA amount to 6. Their capacity meets the country's needs to meet both the recycling and recovery targets and along with the capacity of the cement plants the recovery target is also met.

**Graph 17. Waste tires management, 2014-2018**



\* Rates > 100% relate to stocks of waste tires to be treated from previous years, as they are deferred for processing at a later date.

\*\* 2018 data are temporary.

## Waste Oils

Source : HRA, Waste Management Directorate of MoEE and ENDIALE SA

According to the development of waste oil generation for the period 2014-2018, as illustrated in Figure 18, there is a relative stability with a trend of post-2016 decline, partly due to the change in the estimation methodology of the waste oil generation.

**Graph 18. Waste oil generation indicators, 2014-2018**



**Table 22. Waste oil generation, 2014-2018**

	2014	2015	2016	2017	2018
Waste oil generation (thousand tn)	34.8	33.1	35.9	34.4	33.7

\* 2018 data are temporary

The following table on the quantities of collected waste oils shows that the target of 70% is achieved from 2017 onwards. It is worth noting that in previous years the performance of separate collection was marginally close to the target.

**Table 23. Waste oil collection, 2014-2018**

	2014	2015	2016	2017	2018
Waste oil collected (thousand tn)	23.63	22.56	24.99	25.59	25.62
Waste oil collection rate (%)	67.9%	68.1%	69.7%	74.4%	76.0%

\* 2018 data are temporary

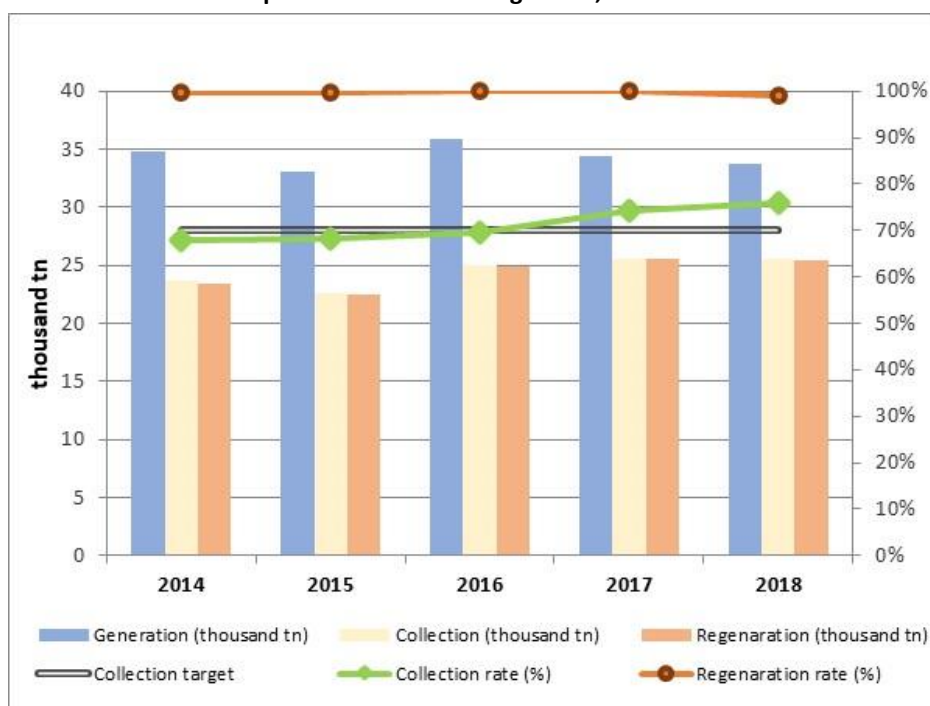
The collection points that deliver waste oil at least once a year as well as the recorded collection points are listed in Table 25 at regional level. In 2018, the recorded collection points reached 37,909.



**Table 24. Waste oil collection points by region, 2014-2017**

Region	2014	2015	2016	2017	Recorded collection points
Attica	4,689	4,753	4,926	4,895	13,197
Central Greece	753	731	806	776	2,231
Peloponnese	649	638	697	663	1,910
Western Greece	843	835	878	874	2,566
Epirus	362	356	382	403	990
Thessaly	598	724	650	671	1,769
Central Macedonia	1,998	2,170	2,452	2,317	7,064
Western Macedonia	477	476	441	412	1,195
Eastern Macedonia - Thrace	765	750	757	723	2,365
Crete	939	1,139	1,083	1,003	2,409
North Aegean	226	203	236	199	667
South Aegean	345	402	333	364	970
Ionian Islands	207	222	206	225	576
<b>Total</b>	<b>12,851</b>	<b>13,399</b>	<b>13,847</b>	<b>13,525</b>	<b>37,909</b>

The waste oil regeneration units that cooperate with the collective alternative management organisation “ENDIALE SA” are 8. The quantitative target for regeneration of waste oil set by law is at least 80% by weight of the collected waste oils. The graph below shows that the regeneration rates exceeded the target throughout the 2014-2018 period.

**Graph 19. Waste oil management, 2014-2018**

**Table 25. Waste oil regeneration, 2014-2018**

	2014	2015	2016	2017	2018
Regenerated waste oil (thousand tn)	23.5	22.5	24.9	25.5	25.4
Waste oil regeneration rate %	99.6%	99.8%	99.9%	99.9%	99.1%

\* 2018 data are temporary

## Excavation, Construction & Demolition Waste

*Source: HRA and Waste Management Directorate of MoEE*

The data recorded for the excavation, construction and demolition waste (ECDW) involve the amounts collected on an annual basis, which are dispatched to the treatment facilities by the authorised collective alternative management systems.

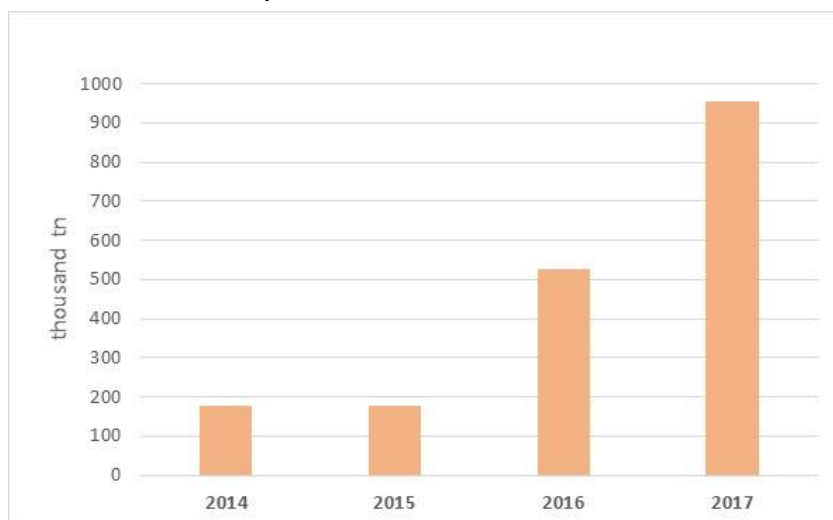
The following table and graph show the total quantities of ECDW that were processed in the 2014-2017 period, which reflect the rapid increase in ECDW collection rates, recording a 443% change in 2017 compared to 2014, while the geographical coverage with collective alternative management systems rose by 129%.

**Table 26. ECDW collection data, 2014-2017**

	2014	2015	2016	2017
Excavation waste (thousand tn)	142.7	96.6	373.9	434.8
Construction & Demolition Waste (thousand tn)	33.4	80.2	151.3	521.9
<b>Total (thousand tonnes)</b>	<b>176.1</b>	<b>176.8</b>	<b>525.3</b>	<b>956.7</b>
Alternative management systems	9	9	9	9
Geographical coverage	14 regional units	19 regional units	20 regional units	32 regional units

According to the 2019 figures, the authorised alternative management systems for ECDW now cover the needs for processing ECDW in 57 Regional Units of the country (77% of total regional units). The existing ECDW treatment facilities affiliated with the authorized ECDW EPR Schemes amount to 100.

**Graph 20. ECDW collection, 2014-2017**



Given that there are no available estimates of ECDW generation, no conclusions can be drawn on the country's performance regarding the legally set target of preparing for re-use, recycling and recovery of at least 70% by 2020.

# Financial data of Alternative Management Systems

Source: Alternative Management Systems

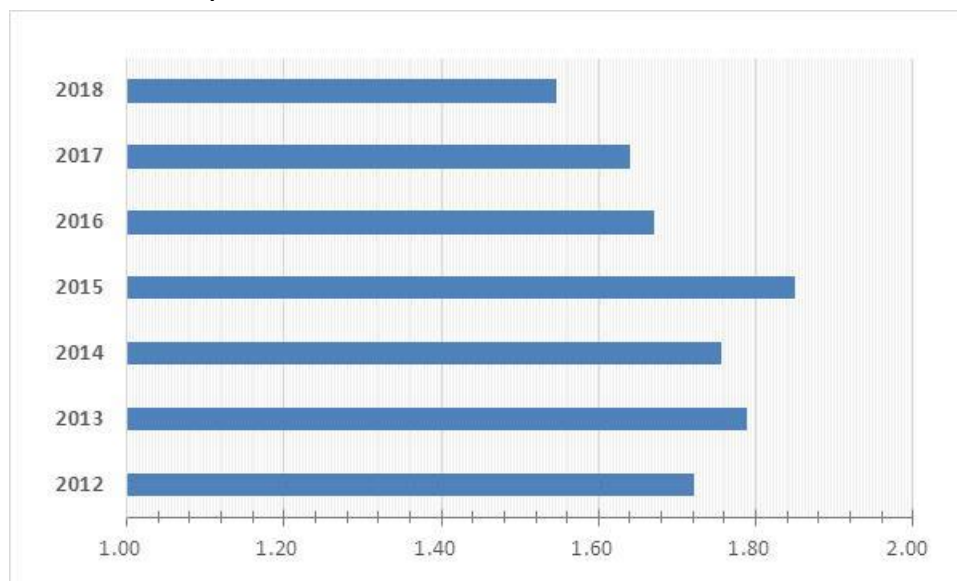
The revenues and financial reserves of the Alternative Management Systems for the period 2012-2018 are presented in the following table.

**Table 27. AMS financial data 2012-2018**

	Revenues (mil. €)	Reserves (mil. €)
2012	49.37	84.96
2013	47.84	85.59
2014	50.79	89.22
2015	50.22	92.86
2016	53.03	88.60
2017	54.09	88.70
2018	56.89	88.01

The Alternative Management Systems’ financial reserves have begun to drop as a percentage of annual revenue, but remain at very high levels (over 154% against the 35% target against a maximum of about 185% in 2015). Most of the decline is due to the increase in contributions and not to the reduction in financial reserves.

**Graph 21. Financial Reserves to Revenues ratio 2012-2018**



## Recording of fines imposed

1. The Judgment of the European Court of Justice (ECJ) of 2 December 2014 against Greece (Article 260 TFEU) for uncontrolled waste disposal, obliged the country to pay a lump sum of EUR 10,000,000 as well as a six-month penalty payment on the basis of the initial amount set at EUR 14,520,000, from which the following will be deducted:

→ EUR 40,000 per uncontrolled waste disposal site which has been closed down or cleaned up since 13 May 2014, and

→ EUR 80,000 for those sites which have by then been closed down and cleaned up.

To date, the country has paid:

Lump-sum: € 10 million

1st semester (2/6/2015): € 10.4 million (260 infringements),

2nd semester (2/12/2015): € 9.88 million (247 infringements),

3rd semester (2/6/2016): € 7 million (175 infringements),

4th semester (2/12/2016): € 4.44 million (111 infringements),

5th semester (2/6/2017): € 3.72 million (93 infringements),

6th semester (2/12/2017): € 2.96 million (74 infringements),

7th semester (2/6/2018): € 2.84 million (71 infringements),

8th semester (2/12/2018): € 2.64 million (66 infringements),

9th semester (2/6/2019): € 2.6 million (65 infringements),

10th semester (2/12/2019): € 2.4 million (60 infringements) (84% progress)

Total to date: €58.88 million

Overall, the country has paid € 58.88 million as penalty by the second half of 2019, while according to the Commission's latest evaluation for the 10th semester (2/12/2019), there were still 60 infringements in place (from an initial total of 363). It is yet noted that the rate of reduction of infringements has been significantly reduced.

2. The Judgment of the European Court of Justice of 7 September 2016 imposed a financial penalty on the country for non-enforcement of a previous decision (judgment of 10 September 2009, Commission v Greece, C-286/08) because the country:

→ Had not yet adopted a specific plan for hazardous waste management

→ Had not established an integrated and adequate network of hazardous waste disposal installations

→ Failed to implement proper management of the so-called 'historic waste' in accordance with the provisions of EU law.

Specifically, a lump-sum of € 10 million and a penalty payment of € 30,000 per day of delay have been imposed until full compliance with the decision. 10% of the penalty payment is subject to the absence of a National Hazardous Waste Management Plan and the remaining 90% to the absence of adequate hazardous waste disposal sites (45%) and the "permanent" temporary storage of significant industrial hazardous waste quantities (45%). To date the country has paid:

Lump-sum: € 10 million

1st semester installment (7.3.17): € 4.559 million

2nd semester installment (7.9.17): € 4.357 million

3rd semester installment (7.3.18): € 4.066 million

4th semester installment (7.9.18): € 4.008 million

5th semester installment (7.3.19): € 3.777 million

6th semester installment (7.9.19): € 3.805 million

Total to date: € 34.572 million

To date, the progress on compliance with the ECJ judgement is approximately 30%.

## Conclusions and assessment of environmental policy goals, directions and measures

As pointed out in SoER 2018, the waste management sector remains the most problematic. Greece, due to the chronic problem of illegal landfills and the lack of adequate infrastructure for the management of hazardous industrial waste, is paying significant fines.

Regarding municipal waste, most of the illegal landfills have been closed down (at the end of 2018 there were still 14 illegal landfills in operation) and an action plan is being implemented for the closure of the remaining ones even with delays. However, the country not only lacks sufficient municipal waste management facilities but some of those that are in place present operational problems<sup>1,2</sup>. Much of the required infrastructure is still under construction or in the planning stage and should have been completed many years ago under EU law, due also to the long maturity of the infrastructure projects. The result of these delays is that the country is implementing waste management infrastructure projects that respond to the design data of the past and not the needs arising from the rapidly ongoing developments in legislation (i.e. recent revision of waste Directives, change in funding rules of the new NSRF programming period, etc.) and technology. Of particular concern is the long delay of the required infrastructure in the Attica region.

Regarding recycling, although there are some noteworthy individual successes such as the significant reduction in the consumption of single-use plastic bags through tax charging and the very satisfactory results of certain extended producer responsibility schemes (e.g. waste oils, ELV, waste tires, WEEE etc.), the general feeling is that recycling in the country is well below the European average. The municipal waste recycling rate remains constant at around 19%, one of the lowest rates in the EU. Waste disposal at landfills exceeds 80% and rates of separate collection and composting of biodegradable waste are still very low. Certain positive steps are the replacement of the long waited landfill tax (which had been postponed many times) with a circular economy levy for landfilling untreated municipal waste (paid by the municipal waste management bodies and channeled to the Green Fund) to be exclusively used for financing measures to improve waste management in line with the waste hierarchy and the introduction of a new waste pricing system for municipalities by the municipal waste management bodies. Also, the operation of the Electronic Waste Registry (EWR) from 2017 onwards is expected to gradually improve waste statistics and traceability. The 2019 approval of the LIFE IP Circular Economy Implementation offers an additional important tool for the country to quickly fill the gaps in recycling.

The National Waste Management Plan (NWMP) adopted in 2015, in its vision, aspired to boost recycling and reduce the landfill of municipal waste by setting excessively ambitious targets, significantly exceeding those of the EU. In practice, however, due to the lack of realistic goals and the inactive participation of the regional waste management authorities, the plan has not been able to

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<sup>1</sup> Study to assess the implementation by the EU Member States of certain provisions of Directive 1999/31/EC on the landfill of waste, March 2017, <https://op.europa.eu/en/publication-detail/-/publication/cd1748fb-0884-11e7-8a35-01aa75ed71a1>

<sup>2</sup> EUP (2018) 9327/13.9.2018 «Implementation by Greece of the Directive 1999/31/EC on the landfill of waste and the Directive 2008/98/EC on waste»

contribute to the acceleration of the transition to an integrated municipal waste management model.

Law 4496/2017 on recycling explicitly introduced many of the provisions introduced by EU Directive 2018/851/EU such as the obligation of separate collection of at least four waste streams (paper, glass, metal and plastic), operating requirements for EPR schemes, transparency rules, etc. However, its full implementation and the efficient supervision of recycling EPR systems remain the major challenges for the immediate future.

Although the separate collection of four waste streams (paper, plastic, glass, metals) has been legally binding since 1/1/2015 (in accordance with Law 4042/2012, Directive 2008/98 and relevant European Commission Guidelines), an obligation that is even more explicitly reflected in Directive 2018/851/EU amending Directive 2008/98 (and in Law 4496/2017 amending Law 2939/2001), the dominant practice is still to collect all recyclables into a single bin, with sporadic separate collection for glass. Without prejudice to the conditions of Greek reality, the feasibility of radically altering the existing recycling system by gradually implementing the 4-stream separate collection scheme should be assessed, taking into account the derogations granted in accordance with Article 10 (3) of Directive 2008/98.

Implementing the provisions of both Directive 2018/851 on waste and Directive 2019/904 on single-use plastics as quickly and as accurately as possible could help reduce the deficit in the waste management system. Turning waste into resource requires the full implementation of the new EU waste legislation (including the waste hierarchy) which requires, inter alia:

- (i) the separate collection of at least four waste streams (paper, plastic, metal, glass), including for bio-waste, textile waste, hazardous waste from households, PET bottles, fishing nets, etc.;
- (ii) the reduction of waste generation per capita, especially single-use plastics; and
- (iii) the gradual phase out of landfilling of recyclable or recoverable waste. As the Environmental Policy Implementation Report (EIR) 2019 notes, the country “has planned to allocate a large proportion of EU funds to waste management measures and infrastructures - integrated waste treatment facilities and source separation schemes, in particular. However, there are doubts on whether spending on residual waste treatment at the lower levels of the waste hierarchy is too high compared to spending on infrastructure. Care must be taken not to move from landfilling to poor quality mechanical and biological treatment installations (49 MBEs are currently foreseen).”

It is further noted that, in line with the ECJ judgment of case C-323/13 (Malagrotta), the conclusions of which were incorporated in Directive 2018/850/EU amending Directive 1999/31/EC, it should be ensured that all waste capable of undergoing treatment is adequately treated to reduce the adverse effects before landfilling. Exceptions are permitted only for inert waste, in case the treatment is not technically feasible and for any other waste treatment that cannot contribute to the protection of human health and the environment... The treatment must involve, at a minimum, the proper sorting of the various waste streams and the stabilization of the organic fraction of waste.”<sup>2</sup>. Together with the mandatory implementation of waste hierarchy (Article 4 of Directive 2008/98), the separate collection of recyclable waste is a precondition prior to energy recovery (limiting energy recovery to non recyclable materials). In case of energy recovery from residual municipal waste, the most

adequate option is co-incineration in the cement industry or in power plants in areas where thermal energy can be utilised (such as areas with district heating networks).

The NWMP update is called upon to revise the existing targets, possibly by postponing the deadlines for attaining the targets in accordance with the provisions of EU legislation, and to make the necessary adjustments of the planned infrastructure of the regional waste management plans (RWMPs) taking also into account the actual situation (low rates of separate collection, lack of infrastructure, large quantities of "temporarily" stored municipal waste), EU legislation and the availability of public and private funding. The long maturation time of the projects shows that the five-year time frame of the NWMP is rather insufficient. In order for the country to meet the requirements of EU legislation, it is necessary to accelerate the implementation of mature projects (which have already been launched on the basis of current planning) and to make adjustments (possibly with interregional co-operation) to those in the early planning stages. At the same time, the state is called upon to deal with chronic social pathologies and to implement the legal framework in place, with the aim of the adoption of technically sound solutions and fair cost sharing.

The closure and rehabilitation of illegal landfills together with the sound treatment of hazardous waste (the action plan on the necessary hazardous waste treatment infrastructure is still pending) are matters of absolute priority.

The recently announced intention to introduce a mandatory separate collection of organic waste (which should be accompanied by composting plants for separately collected bio-waste) is considered to be a significant step forward as it will enable fertilizer production of good quality and can, not only improve bio-waste recycling rates, but also the quantity and the quality of recycling of other waste streams. It will also lead to an increase in the proportion of municipal waste being diverted from landfills and to a reduction of greenhouse gas emissions from landfills.

Furthermore, the feasibility of the following measures could be examined:

- avoidance of building excessive infrastructures for the treatment of residual municipal waste<sup>3</sup> (mechanical and biological treatment facilities<sup>4</sup> or incinerators) and flexibility in their design to meet the initially increased needs of commingled municipal waste treatment and their gradual decrease as the separate collection rates increase, these being specifications that should be reflected in the method of repayment of the project;
- improvement and expansion of separate waste collection, including for bio-waste;
- mandatory separate collection of the four streams (paper, plastic, metal, glass) in the central government buildings;
- expansion of the time frame of the NWMP and the RWMPs by 2030 (with an intermediate target for 2025);
- simplification of the endorsement process for the NWMP and the RWMPs;
- streamlining and implementation of the NWMP without excluding any technology;

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<sup>3</sup> Annual implementation reports – Comments of European Commission on the fulfillment of ex-ante conditionalities Ref. Ares(2017)3987408 – 10/08/2017

<sup>4</sup> MBT plants can reach a maximum recycling rate of 15%, but usually below 10%



- converting local waste management plans into operational plans for the implementation of the RWMPs;
- setting up of minimum service standards for separate collection (e.g. collection frequency, types of containers, avoidance of placing recycling bins with commingled waste bins, etc.) that municipalities must meet to ensure high rates of recyclable waste collection<sup>5</sup>;
- setting up of mandatory recycling targets for municipalities and a system for evaluating their performance in waste management<sup>5</sup>;
- regular audits on waste management facilities in accordance with the provisions of Directives 2008/98C and 2010/75 (Article 19 of Law 4042/2012 and Article 20 of Law 4014/2011 respectively);
- reduction of bureaucracy and simplification of environmental permitting such as the repeal of the permitting requirement for the collection and transport of non-hazardous waste, the simplification of the process of granting Standard Environmental Obligations (SEO), etc.
- enhancement of HRA's effectiveness in exercising its supervision role in order to make the most out of the financial contributions of the EPR schemes and to ensure healthy competition as well as to reduce fee evasion (establishing rules that enhance transparency, discourage the waste of EPR financial resources to non-productive actions, facilitate competition and the operation of multiple EPR schemes, automate sanctions),
- strengthening and improving audits from HRA (e.g. to be updated quarterly by the Hellenic Statistic Authority and the Ministry of Finance on intra-Community imports recorded in the INTRASTAT System and on third-country custom declarations of imports )<sup>6</sup>,
- optimal use of financial reserves and improvement of the efficiency of EPR schemes, in accordance with the general minimum requirements for extended producer responsibility;
- establishment and regular (every 3 months) convening meetings of the Consultative Committee referred to in Article 24 of Law 4496/2017 to consult the social partners and professional bodies involved in alternative waste management;
- defining the actual recycling cost on the producer's fees (producer contributions to a EPR scheme should take into account waste recyclability);
- introduction of minimum standards for waste management facilities such as biological and mechanical treatment plants, RMSC, composting plants, landfills etc. in accordance with Best Available Techniques (BAT);
- gradual introduction of a guarantee for PET bottles,
- specifications of the Standard Environmental Obligations for waste management facilities;
- improving the operation of MRFs (appropriate technological equipment such as the use of NIR for plastics' separation, funding instruments to upgrade capital equipment and economic instruments to adequately cover operating costs);
- improving the quality of waste statistics<sup>3</sup>;

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<sup>5</sup> The early warning report for Greece, SWD(2018) 418 final, Brussels, 24.9.2018

<sup>6</sup> [https://www.mof.gov.cy/mof/tax/taxdep.nsf/page22\\_gr/page22\\_gr?opendocument](https://www.mof.gov.cy/mof/tax/taxdep.nsf/page22_gr/page22_gr?opendocument)

- exploring the need of EPR schemes for new waste streams such as: pesticides, greenhouse plastics, plastic irrigation pipes, mattresses, etc;
- implementation of the new waste pricing policy;
- promoting the re-use and / or repair of suitable discarded products or their components, in particular through the use of educational or economic measures, logistics or other measures, such as providing support to or setting up authorised repair and re-use networks and, where appropriate, through initiatives belonging to the social and cooperative economy;
- full use of LIFE IP Circular Economy Implementation with appropriate coordination with parallel support actions, such as the technical assistance of the Structural Reform Support Service (SRSS) “Technical Assistance to the National Waste Management Plan (NWMP) of Greece” in order to avoid duplications and to create synergies;
- ratification of the Hong Kong Convention on the recycling of ships in order to be implemented as soon as possible in that it would be a strong signal to the European Commission and would mandatorily trigger the revision process<sup>7</sup> of the European Regulation 1257/2013 on the recycling of ships with a view to its full alignment with the Hong Kong Convention, with significant benefits to the competitiveness of Greek international shipping.

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<sup>7</sup> Article 30 (2) of Regulation 1257/2013

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1257&from=EN>