F8. Waste

Refer to Section 2.8 of the Guidance Note

8A. Present Situation

Indicator	Type of Data (City/Regional/National)	Unit	Year of Data
Percentage of household waste sent to landfill	64.5	%	2015
Percentage of household waste sent for thermal treatment or similar recovery	8	%	2015
Percentage of organic waste collected separately *Please indicate what is included within the organic waste collected i.e. food waste only or food and garden waste **	9.37	%	2015
Percentage of recycled household waste	35.5	%	2015
Percentage of recycled packaging waste	0.07	%	2015
Percentage of recovered packaging waste	0.07	%	2015
Amount of household waste generated per capita	**	kg/capita	
Amount of municipal waste generated per capita	304	kg/capita	2015

** organic waste is garden waste only*
*** EU terminology differs from the Czech one – municipal waste includes all waste produced by households, municipal administration, small enterprises, etc… here. Household waste is not registered separately, but it creates the major part of municipal waste.*

Ostrava has achieved significant reductions in its production of unsorted (mixed) municipal waste, including household waste, especially due to systematic public education campaigns which have resulted in an increase in waste sorting for recycling purposes. Material recycling and energy production from waste more than doubled between 2010 and 2015. The City is taking a proactive approach to burdens caused by previous industrial activity, applying innovative technologies to solve these issues.

The City of Ostrava has drawn up a **Waste Management Plan** for the period 2017–2021, based on data from 2015.

Management of unsorted (mixed) municipal waste (including household waste)

In 2015, production of mixed municipal waste was 99 250 tonnes. The waste is collected in 70-1100-litre containers. The City specifies the size and number of these containers, and decides on collection frequencies, on the basis of the number of inhabitants and the volume of waste. The waste is deposited at a landfill site in the city, managed by the **Ostrava Waste Management Company** (OZO). A comprehensive range of systems are in place to reduce the environmental impact of the waste stored at the site. These include a system of degasification vents connected to a gas processing station. The biogas is used to produce electricity.

Separate collection of plastics, drinks cartons and metal packaging

Plastics, drinks cartons and metal packaging are collected in special containers located at around 1400 points within the city (within 100 metres of high-density residential areas and 200 metres of low-density

areas). These types of waste are collected together in order to reduce the costs of collection and the negative environmental impact of collection). A sorting line is then used to separate the individual types of plastics and plastic packaging, drinks cartons and metal packaging. In 2015 a total 3510 t of plastics were collected in this way (a further 104 at recycling centres). The recyclable material is then sold to processers; some material is used to produce alternative fuels. Of the waste sorted on the lines, 26% is used for material recycling, and 64% is used for energy generation. The remaining approx. 10% is not suitable for these purposes, and it is deposited as landfill.

Separate collection of paper

Paper is collected similarly to plastics (in different coloured containers), and also via scrap paper collection centres and scrap paper collection campaigns in schools (supporting environmental education). In 2015 a total 2657 t of paper was collected in coloured containers, 6325 at collection centres, and under 100 t **via schools.** 100% of the separately collected paper is used for recycling.

Separate collection of glass

Glass is collected in bottle banks (both clear and coloured glass together). There are also several underground bottle banks in Ostrava. All 1100 bottle banks in the city are located within 100 metres of high-density residential areas and 2500 metres of low-density areas. In 2015 a total 2654 tonnes of glass were collected. The glass is taken to the sorting facility, where it is sorted by colour and unwanted additional material is removed (usually up to 5% of the total volume). The separated glass is then supplied to glassworks for recycling.

Image 1: Recycle containers (plastic, paper, glass)

Organic (garden) waste

Garden waste comes from two main sources – either from City-owned green areas or privately owned gardens. Households with gardens can use special garden waste bins provided by the City. In 2016 the City supplied these 240-litre bins to households on request (free of charge). Householders can also use recycling centres, which have special containers for garden waste. The third collection system involves providing large skips (at the request of the municipal districts) at locations where greenery maintenance is planned. In 2015 a total 1057 t of garden waste were collected at garden waste bins. 2015 was a relatively dry year; this led to a reduction in the volume of garden waste (normal annual volumes range from 10 000 – 15 000 tons). Most garden waste is taken to the OZO composting centre, where it is processed to produce compost and substrate.

Image 2: Organic waste containers

8B. Past Performance

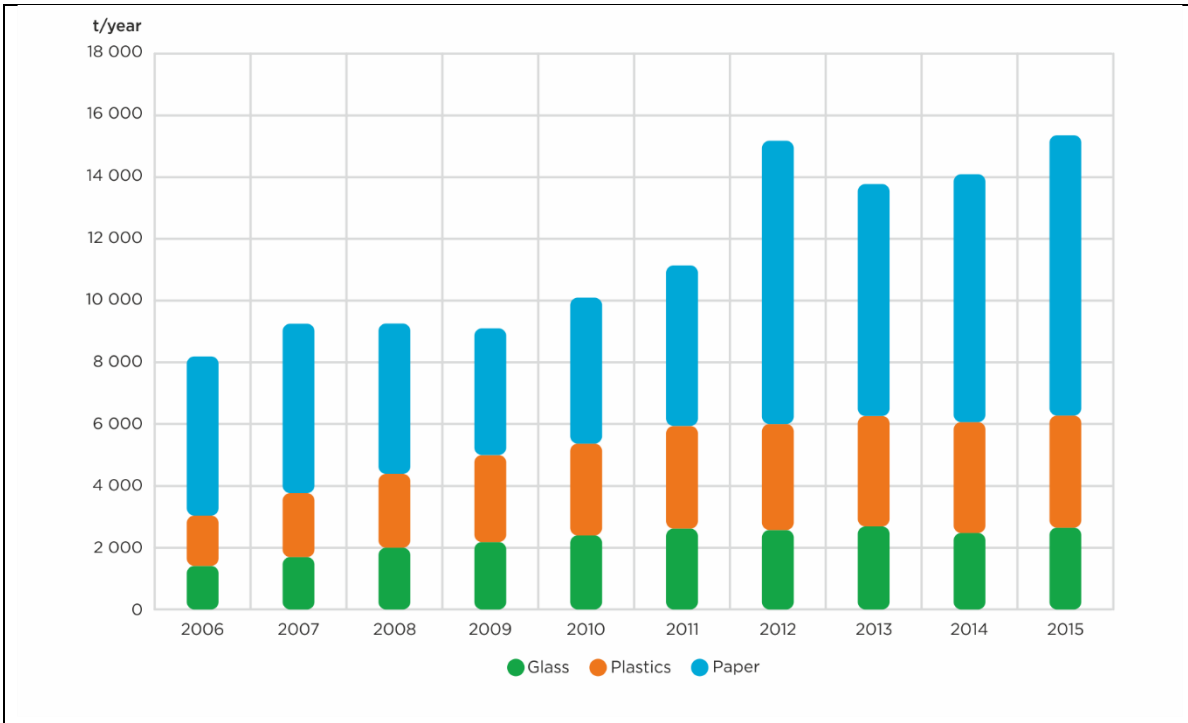
The tables below show that the City has achieved a significant reduction in volumes of unsorted (mixed) household waste, primarily due to an increase in volumes of waste collected separately for recycling. Material recycling and energy production from waste more than doubled between 2010 and 2015. However, the total production of mixed household waste has also risen during this period, although there has been no increase in population.

Waste type	Year	2010	2011	2012	2013	2014	2015
mixed municipal waste		58 518	58 326	56 064	53 450	52 847	52 138
outsized waste		10 188	11 019	10 172	8 884	9 408	10 785
paper		4 713	5 196	9 138	7 482	7 996	9 082
plastics		2 980	3 334	3 445	3 602	3 569	3 614
glass		2 409	2 630	2 591	2 688	2 521	2 655
drinks cartons		12		21	21	17	17
hazardous waste		132	135	135	135	150	164
construction waste		1 525	2 534	2 611	2 919	2 387	5 706
tyres		302	276	271	322	309	333
garden waste		5 192	11 188	8 639	10 129	14 122	8 163
metals		164	317	6 608	11 561	10 489	5 934
street-cleaning waste		1 050	1 000	698	480	2 433	265
non-compostable waste		425	456	523	418	416	420
Total		**87 598**	**96 411**	**100 896**	**102 069**	**106 648**	**99 258**

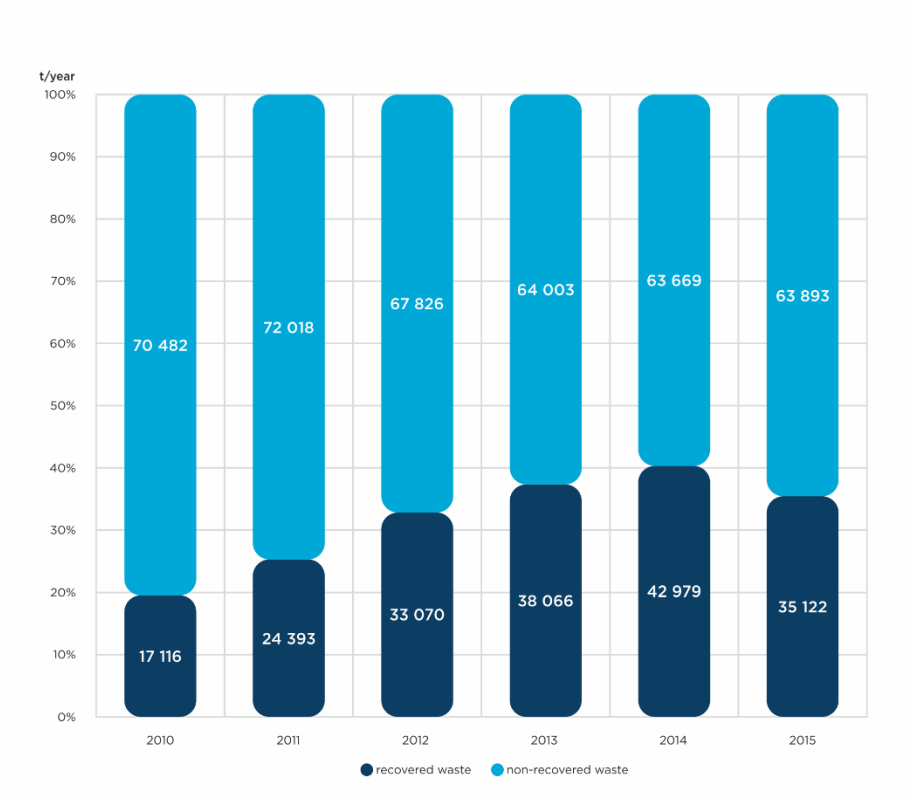
Table 1: Overview of different kinds of waste (2010-2015)

Year	Total waste production	Waste recovery	
2010	87 634 t/year	17 116 t/ year	19.5 %
2011	96 177 t/ year	24 393 t/ year	25.3 %
2012	100 916 t/ year	33 070 t/ year	32.8 %
2013	102 068 t/ year	38 066 t/ year	37.3 %
2014	106 648 t/ year	42 979 t/ year	40.3 %
2015	99 258 t/ year	35 737 t/ year	36 %

Table 2: Waste production and recovery (2010-2015)



Graph 1: Main components of separately collected waste 2006 – 2015 (t/year)



Graph 2: Waste recovery in Ostrava (t/year)

The most significant change in recent years has been the introduction of a new service for citizens – the

provision of 240-litre bins for garden waste (free of charge), including regular collections. The aim of this step is to reduce the volume of recoverable biodegradable waste in the mixed household waste that is deposited as landfill. The garden waste is used to make high-quality compost which is sold (at cost price) to citizens via the City's network of recycling centres or at the composting centre (see Present Situation).

Environmental education and promotional activities

The OZO company is involved in a range of educational and promotional activities in conjunction with the City of Ostrava. In addition to standard tools (internet advertising, excursions, information in the press and other media), citizens' awareness of waste-related issues is also raised via less traditional means – flash mobs giving unannounced **drumming performances** in Ostrava's shopping malls; shoppers are an ideal target group, and the drummers send a memorable message on the importance of sorting and recycling. The series of OZO flash mobs follows on from successful campaigns in previous years, including the distribution of sets of colour-coded recycling bags to households in the city. A video of an OZO flash mob at the Nova Karolina shopping mall is available on the OZO website/Facebook page and also on YouTube (see References). These activities are also funded via client payments to the EKO-KOM company, which recovers packaging from companies in accordance with their legal obligations under the Packaging Act. Every year the City budget receives over 1,2 million EUR in payments for recovered plastics (in 2016 it received 1,4 million EUR); these funds are used to support and develop the system of separate waste collection and processing.

Image 3: Mayor and deputy mayor involved in "Clean-up Ostrava" event

Slag-heaps

Remnants of the former mining activity can be found in many places in Ostrava and many of them are

challenge for the their use.

Image 4: Slag-heap Ema, one of favourite tourist points in Ostrava nowadays

8C. Future Plans

Goals, principles and measures set out in the City of Ostrava Waste Management Plan 2017–2021

The Waste Management Plan (WMP) for the period 2017–2021 sets out detailed goals and describes the processes for achieving these goals (the previous WMPs were approved in 2005 and 2010; the current WMP will be approved by the Local Government in November 2017, currently approved both by the Ministry of Environment and Regional Administration):

- By 2020, to increase to at least 50% the volume of separated waste for recovery and recycling – materials such as paper, plastics, metal and glass originating in households (or other sources).
- To reduce the maximum volume of biodegradable household waste deposited as landfill so that in 2020 this volume accounts for no more than 35% of the total mass of all biodegradable household waste that was produced in 1995.
- To reduce the percentage of biodegradable waste in mixed household waste.
- To use mixed household waste for energy generation (after sorting out material for recycling, hazardous components and biodegradable waste).
- To increase recycling of packaging waste to 70% by 2020.
- To increase the total recovery of packaging waste to 80% by 2020.
- To increase recycling of plastic packaging waste to 50% by 2020.
- To increase recycling of metal packaging waste to 55% by 2020.
- To recover 55% of all consumer packaging waste by 2020.
- To recycle 50% of all consumer packaging waste by 2020.

Part of the current concept is to use municipal waste for energy generation (though national-level legislation needs to be clarified before this can be implemented). Examples include the planned mixed municipal waste sorting line which will serve Ostrava and nearby Havirov city (total 400 000 inhabitants); the larger catchment area will enable the plant to operate more efficiently than if it were to serve only

Ostrava.

Currently, the most important activity in this area in which the City of Ostrava participates is the **Programme for long-term inter-sectoral collaboration between the private and academic spheres**. The Programme incorporates several areas focusing on the circular economy, management and use of materials and resources, technologies for developing Smart Cities.

Key waste-related projects

Clearance of the Hermanice slag-heap

The Hermanice slag-heap is the largest slag-heap complex in the Ostrava region and represents one of its main environmental burdens. It is a dump site for mining waste that was created at a time when technology did not yet allow coal to be completely separated from the waste rock with which it was mined. The slag-heap thus contains not only rock, but also remnants of coal; this material characteristically burns under the surface with low levels of oxygen present, releasing harmful pollutants into the atmosphere. The only way of dealing with this problem permanently is to completely clear the slag-heap and to separate the coal from the rock. This process is currently in its pilot phase; full operations will be launched next year, and the slag-heap will be completely cleared within 10 years. At full capacity the equipment can sort up to 350 t of rock/coal per hour. A wet process is used, ensuring that the burning material will be completely extinguished. The sorted materials can be used in construction and energy production; the rocks will also be used in modelling the terrain at the site.

This unique sorting operation will bring up to 100 jobs. 80 people are currently employed in the pilot phase; full-capacity operations will require 30 employees (plus dozens more at auxiliary operations and services).

Image 5: Hermanice slag-heap

Cleanup of the Ostramo lagoons

For several decades in the 20th century, the Ostramo oil refinery produced waste sludge which was stored in lagoons; this is one of Ostrava's most serious and pressing ecological burdens from former industrial activity. Part of the lagoons (which are situated in the vicinity of a residential area) has already been cleared. However, 100 000 tonnes of oil materials and 400 000 tonnes of contaminated soil still remain to be cleared. The aim of the cleanup project is to prepare the site for a new urban function. (An example of a successful cleanup project is the clearance at Nova Karolina, the site of a former coking plant – see Chapter 4).

Collection of Food Waste

On the basis of pilot project including collectiong of food waste from 5 school canteens in Ostrava during last year and its results assessment the plan to widen the collection of food waste to all Ostrava school canteens is currently being started.

8D. References

EGC Ostrava: https://egc.ostrava.cz/

City of Ostrava Waste Management Plan 2017 *(accessible after approval)*

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OZO Annual Report 2016: http://www.ozoostrava.cz/data/files/OZO%20VZ%202016-pro%20web.pdf

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prostredi/odpadove-hospodarstvi/odpadove-hospodarstvi/Hlavnislokyseparovanhoodpadu2014.png

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FlashMob Ostrava – waste separation show: https://www.youtube.com/watch?v=jXr_m3JApL0