

LOCAL PLANS TO PRIORITIZE INTERVENTIONS

DT1.4.2

Version 1
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Introduction

The aim of the present document is to finalize the data collections and analysis built in DT1.3.2 (Report of the quantity of industrial waste in the CIRCE2020 industrial areas), DT1.3.3 (Report of the present destinations of industrial waste) and DT1.3.4 (M-scale analysis of the physical flows at local industrial system level). In a short way, this document summarizes the process that leads to pilot cases identification, from the recognition of waste production & destination to the physical flows maps. The present process to prioritize the interventions is also supported by a permanent consultation with the local stakeholders (administrations located in the pilot regions, trade and industrial associations, environmental authorities etc.) to come to a shared hierarchy of waste flows to optimize and/or to close (in DT1.1.3 and DT1.4.1).

1. Waste flows analysis

In this chapter, please recap the informations included in DT1.3.2. and DT1.3.3. We ask you to include:

- *short pilota rea description (e.g. dimension, economic avocation)*

Wielkopolska is the second largest region in Poland (area 29,826 km², which is 9.5% of the country). This region is characterized by a completely lowland landscape, characteristic of the Warsaw-Berlin glacial valley. The majority of the area of the region is agricultural land (64.7%) wooded and forested land (26.6%) and built-up areas (5.5%). Wielkopolska is inhabited by a population of 3.48 million inhabitants, and the average population density is 117 inhabitants per km², compared to the average for Poland of 123 people / km². There are 112 cities in Region, including 20 cities with more than 20,000 inhabitants, 4 cities with more than 40,000 inhabitants and 1 city (Poznań) with more than 200,000 inhabitants, the capital of the province, with a population of 542,000. The average size of the city is 17,000 inhabitants (country average of 25.3 thousand inhabitants).

10,12% of Polish GDP is generated in Wielkopolska Region; its value is approx. 184 billion PLN. 9.8% of all businesses operating in Poland are to be found in the Wielkopolska. The basis of the Wielkopolska's economy is the variety of industries, agriculture and well-developed services, particularly in the commercial and financial sectors. In 2015 about 15 % of Wielkopolska population was employed in agriculture. The services sector gives jobs to more than a half of population, whereas industry - to more than 30%. The unemployment rate is the lowest in Poland at 3.9% (January 2018). Over 560 ha of land is covered by Special Economic Zones, where pro-investment instruments of financial politics are applied, such as: lowering the rates of local taxes and implementing 5-year-long absolute exemption from real estate tax for investors. The main assets of the province include, among other items, an even economic development with an appreciable degree of industrialization and high level of technology. Wiekopolska's economy is rated as diversified, which can guarantee a stable development.

The number of enterprises in the Wielkopolska Region in 2015 was 409 865, which is 9.81% of the total in the country. Micro-enterprises (up to 9 employees) predominate in Wielkopolska. In 2015, they constituted 95.3% of all entities. The share of small entities (10-49 employees) was 3.9%, medium-sized



entities (50-249 employees) and large (over 250 employees), respectively 0.7% and 0.1% of all entities. The largest part of the mentioned entities (25.6%) conducted activity in the scope of wholesale and retail trade (G46, G47) as well as trade in vehicles and their repair (G45). The most important industries according to the NACE rev. 2, is: production of food products (C10) and beverages (C11); manufacture of motor vehicles, trailers and semi-trailers (C29); production of electrical equipment (C27); production of machinery and equipment, not classified elsewhere (C28).

- *source/ quality of data (e.g. problems and concerns faced in data collection)*

Data collection

Production of industrial waste in the area partially managed by AMTrans - Wielkopolska has been quantified from the information provided by MOWR (Marshall Office of the Wielkopolska Region) from Regional Waste System as well as from other sources, like Statistics Poland. The data shown in this Report refer to years 2013-2016 and have been taken from the statements fill in by waste managers.

Other information has been taken from MOWR publication Waste Management Plan for Wielkopolska Region for 2016-2022 Along with Investment Plan.

Notes on quality data

Quality of the data provided by Marshall Office is guaranteed by this institution and there is no other way of checking the data quality. However, there are no reasons to assume that data quality is questionable. All companies in Wielkopolska region are obliged to send in an annual reports on their waste management activities, with the exception of companies with very low waste production and thus almost no real environmental impact.

Main data collection problems

1. Stakeholders often protect their know-how and do not want to share with waste flow data and their problems with waste management.
2. Data mining problems with large and complex spreadsheets (merged cells, impossible to sort).
3. Explicit waste reports often contain data diverging from reality.
4. Recovery and disposal processes "R" are general and difficult to interpret. Especially R12 process, which cannot be easily distributed into other R processes, basing only on the officially available data.

- *overview of the main treatment operation of industrial waste*

In 2015, companies in Wielkopolska Region generated almost 10 mln tonnes of industrial waste. In 2016, companies generated around 250 thousand tonnes less than in 2015, so there might be a declining trend in industrial waste production but given the changes in quantity over the analysed period there seem to be no obvious trend.

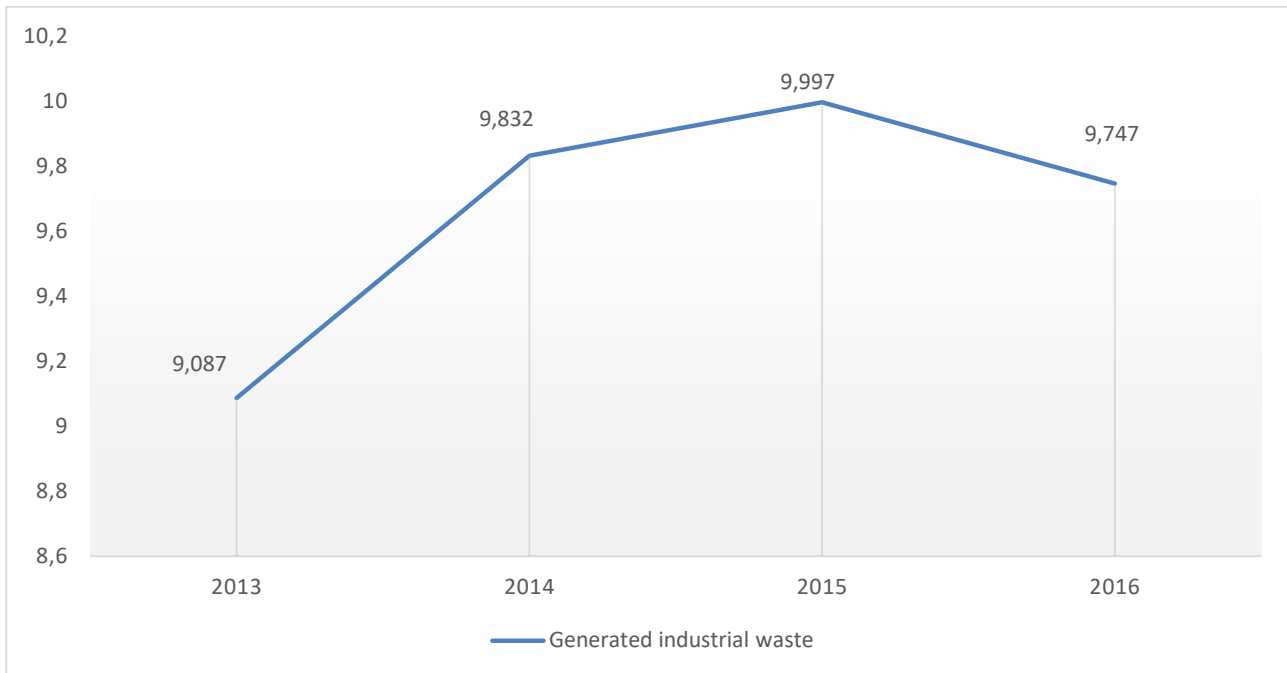


Figure 1 - Total industrial waste generation in Wielkopolska region (mln Mg/year), 2013-2016

The amount of hazardous waste generated in the Wielkopolska Region was 112 559 Mg in 2014 and was growing in quantity over previous years.

The most important problems in the field of waste management arising in the economic sector, according to Marshall Office are:

1. Failure by some of the entrepreneurs to comply with their waste management obligations under the law.
2. High costs of modern technological solutions leading to minimization of generated waste.
3. Lack of provisions able to prevent abuses of waste mediation companies dealing with illegal collection and storage of waste from the economic sector (especially hazardous waste).
4. Incorrect handling of waste generated in the small enterprise sector (e.g. abandonment of waste at illegal landfills).



Waste production by waste groups

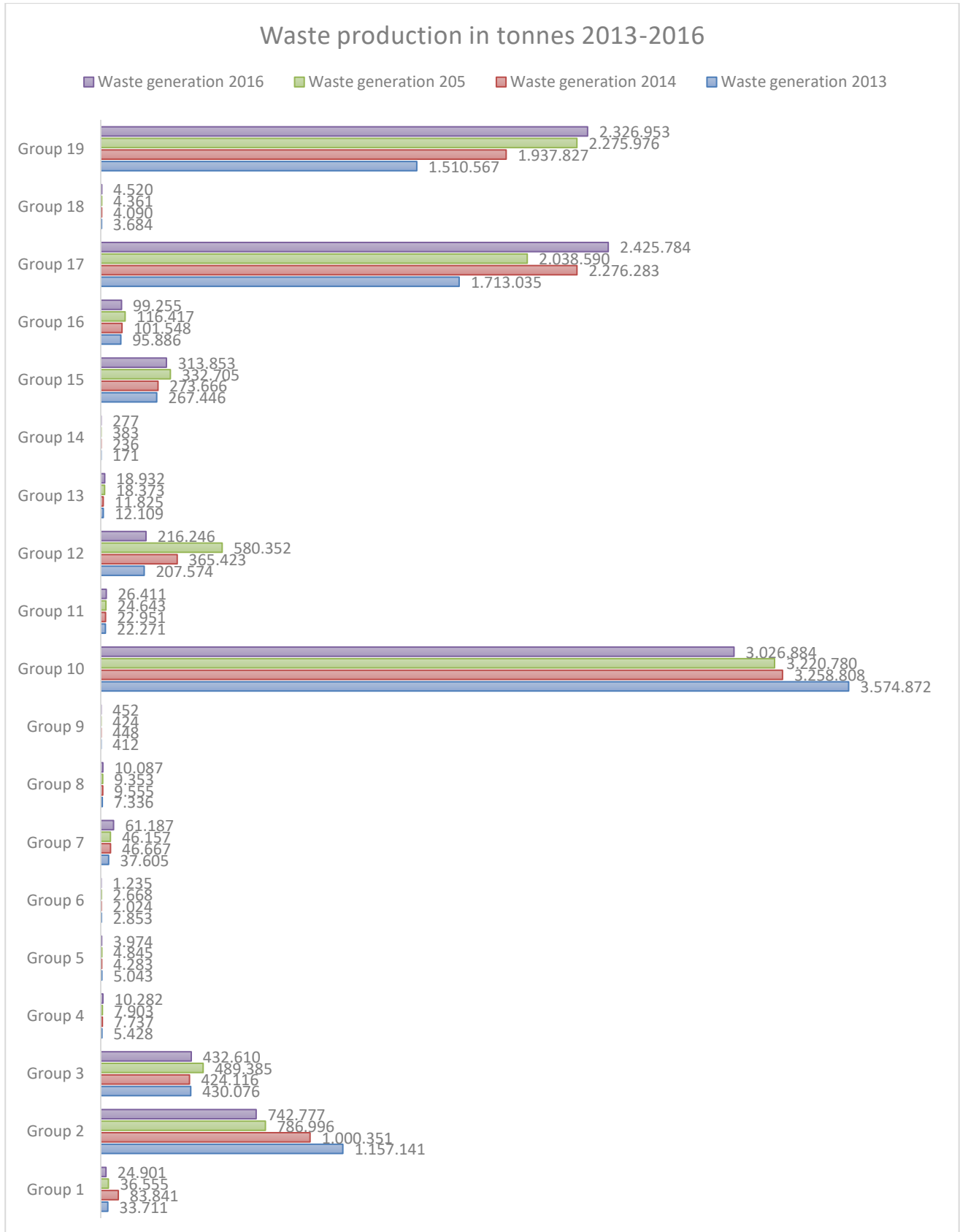


Figure - Total waste generation in Wielkopolska region by wastes groups (tones/year), 2013-201



Waste recovery and disposal

In 2015 companies recovered around 5,876 mln tonnes of industrial waste (58,78%) of which 4,150 mln tonnes were recovered in waste treatment plants. 3,352 mln tonnes were neutralized / disposed (33,53%). There were 3,240 mln of waste that was collected for further transport / recovery or disposal.

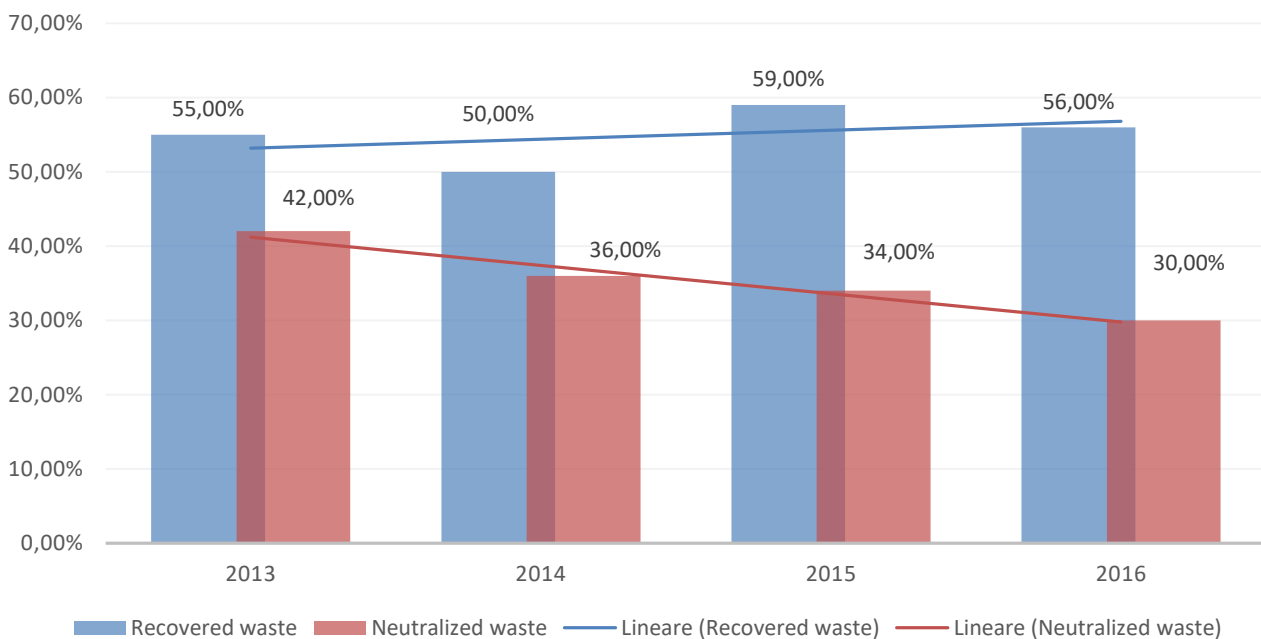


Figure - Total industrial waste recovery and disposal in Wielkopolska Region, 2013-2016

In 2016 companies recovered around 5,435 mln tonnes of industrial waste (55,76%) of which 3,815 tonnes were recovered in waste treatment plants. 2,904 mln tonnes were neutralized / disposed (29,79%). There were 3,924 mln of waste that was stored for further transport / recovery or disposal.

While recovery rate seems to grow over the years, though not by much, the disposal rate is lower each year in in the analysed time period. Disposal rate went down from 42% in 2013 to 30% in 2016. There seems to be no correlation between recovery and disposal rate. Perhaps disposal rate can be explained by waste generated in Wielkopolska, being neutralized in other regions.

Non-hazardous waste

Polish Waste Management Plan defines following non-hazardous waste groups, as particularly troubling and thus giving them a priority:

- wastes from construction, renovation and dismantling of construction sites and road infrastructure,
- biodegradable waste other than municipal.



- municipal sewage sludge,
- waste from selected branches of the economy, whose management creates problems (waste from groups 01 - wastes resulting from exploration, mining, quarrying, physical and chemical treatment of minerals, 06 - wastes from inorganic chemical processes and 10 - wastes from thermal processes).

Biodegradable waste other than municipal waste

Collection and transportation of non-municipal biodegradable waste is carried out by their producers and entities operating in the field of waste collection and transport. As for other wastes from the economic sector, biodegradable wastes other than municipal waste are, as far as possible, pre-processed by their producers, and if it is technologically and economically unjustified, they are transferred by authorized entities for recovery or disposal by external recipients.

Hazardous waste

Polish Waste Management Plan defines following hazardous waste groups, as particularly troubling and thus giving them a priority:

- Medical and veterinarian waste,
- Waste containing asbestos,
- Hazardous waste landfills in concrete silos for toxic, radioactive waste and others,
- Waste containing PCB (polychlorinated biphenyl).

Packaging and packaging waste

The packaging waste management system is based on the responsibility of entrepreneurs launching packaged products on the market for achieving the required levels of recovery and recycling and ensuring, by municipalities, conditions for the operation of a separate waste collection system for their recovery, including recycling.

- *main geographical destination and availability of treatment facilities in the pilot area*

(enter meaningful charts/ schemes / photos)

Table shows all waste treatment systems used for waste recovery and waste disposal; it reveals a complex system of waste management systems available in the area where AMTrans operates. In 2014 there were 427 active waste treatment systems in Wielkopolska Region.



	Wielkopolska Region
<i>Dismantling stations for end-of-life vehicles</i>	122
<i>Waste treatment plants for electronic and electrical equipment</i>	10
<i>Medical waste incinerators</i>	1
<i>Hazardous waste incinerators (incl. medical and veterinarian)</i>	1
<i>Waste treatment installations for paper</i>	11
<i>Waste treatment installations for used tires recycling</i>	7
<i>Waste treatment installations for plastics</i>	136
<i>Waste treatment installations for cullet</i>	12
<i>Waste treatment installations for ferrous and non-ferrous metals</i>	32
<i>Waste treatment installations for wood</i>	5
<i>Waste incinerators (excl. hazardous and municipal waste)</i>	4
<i>Waste-to-energy facilities (RDF) for non-municipal waste</i>	8
<i>Waste treatment installations for sewage sludge</i>	11
<i>Waste treatment installations for construction and demolition waste</i>	58
<i>Hazardous waste landfills</i>	2
<i>Non-hazardous and non-inert waste landfills (excl. municipal)</i>	6
<i>Inert waste landfills (excl. municipal)</i>	1
Total	427

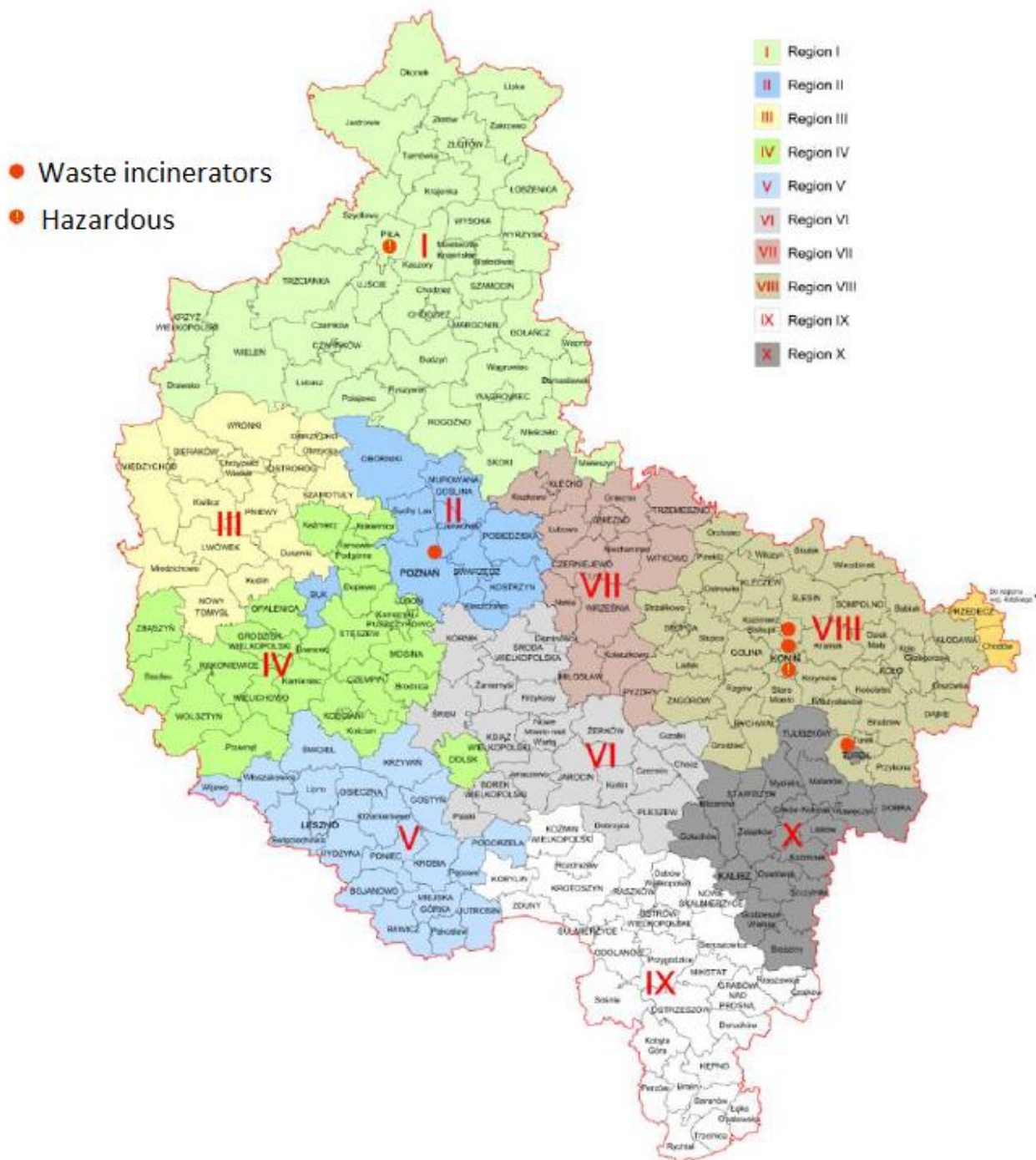
Table Number of treatment systems active in Wielkopolska Region (according to MOWR report on industrial waste)

Marshall Office of Wielkopolska Region defined most important issues with industrial waste management as:

- Some entrepreneurs are not upholding the laws concerning waste management,
- New technologies able to minimize waste generation are very expensive,
- Incorrect waste handling in small enterprise sector - e.g. dumping waste on illegal landfills,
- No legal means to contain some illegal practices of waste management intermediary companies, who collect and dispose waste without proper permissions.



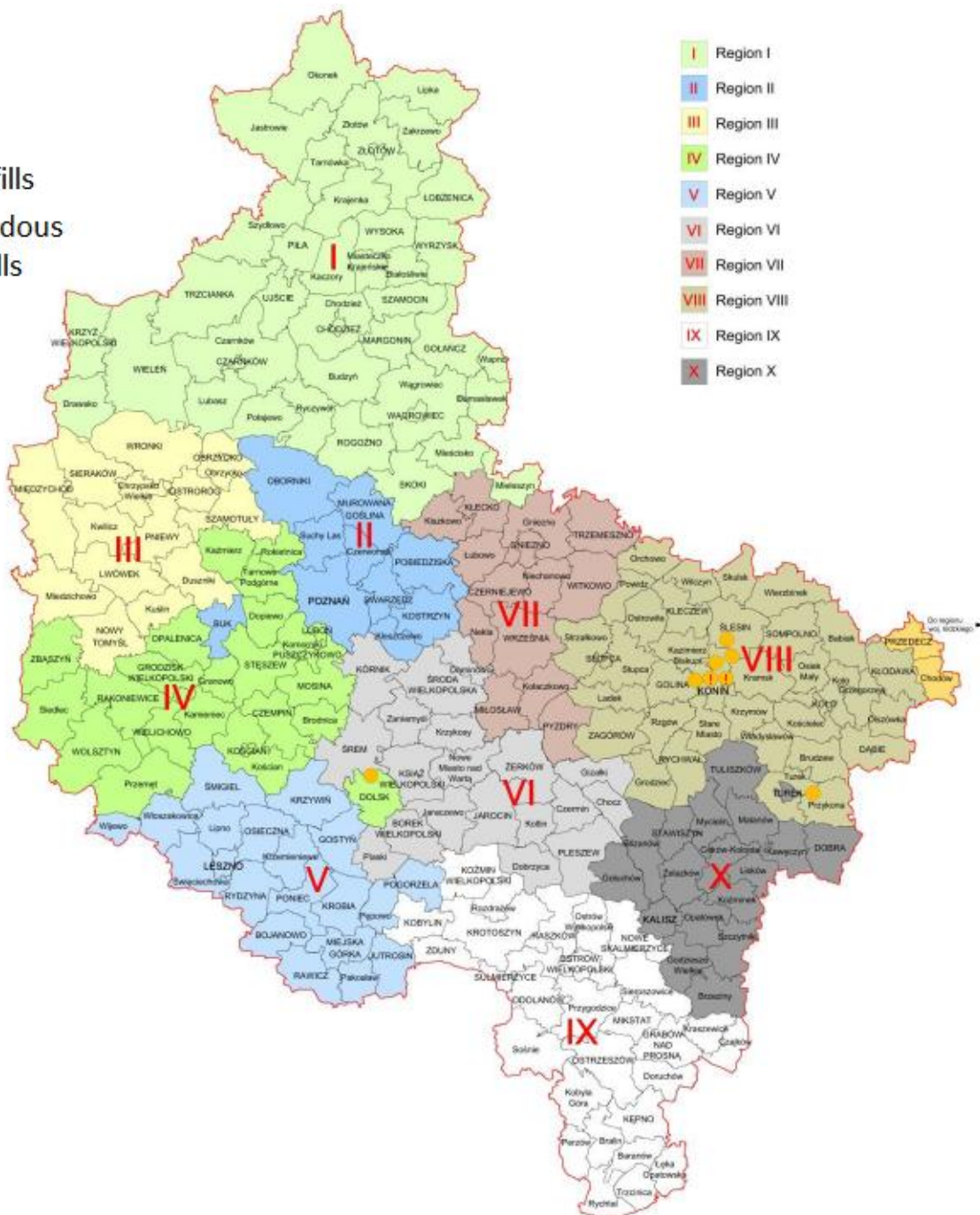
Hazardous waste geographical destination



Source: Waste Management Plan for Wielkopolska Region for 2016-2022 Along with Investment Plan



- Landfills
- Hazardous landfills



Source: Waste Management Plan for Wielkopolska Region for 2016-2022 Along with Investment Plan



2. Most promising waste flows

Please, insert here the list of most significant waste flows, and emphasize:

EWC6	Most promising waste flows produced in Wielkopolska region
02 07 02	Wastes from spirits distillation - diatomaceous earth
02 07 99	Waste not otherwise specified - diatomaceous earth
04 02 22	Wastes from processed textile fibers - faux leather
07 02 13	Waste plastic
12 01 05	Plastics shavings and turnings from automotive
12 01 13	Welding wastes from automotive
15 01 02	Plastic packaging
15 01 06	Mixed packaging
16 01 19	Plastic raw materials from end-of-life vehicles
17 03 80	Tar paper / roofing felt
10 12 08 10 12 99	Stone wool insulation



- *the criteria leading the choice*
- *others (if relevant): i.e. specific suggestion from stakeholders or S3 managers*

(enter meaningful charts/ schemes / photos)

Selection of relevant flows with a prospective of optimization of open flows were based on:

- expert insights on waste flows with highest potential for implementation of circular economy in Wielkopolska,
- 3 brainstorming sessions with AMTrans experts and PSTP experts,
- data provided by companies in Wielkopolska,
- taking into account EU Action Plan on Circular Economy,
- taking into account Waste Management Plan for Wielkopolska Region for 2016-2022 Along with Investment Plan,
- quantity of EWC produced in Wielkopolska.



3. The role of stakeholders

In this chapter, please summarise the activities performed in DT1.1.3 and DT1.4.1. We ask you to stress the following issues:

- *brief description of the number of meetings and stakeholders involved from the project start to current date (under DT1.1.3)*

We defined few the most important group of stakeholders:

- a. industry - bilateral meetings with 25 enterprises (donors of the waste) from different industry.
 - b. Chambers of commerce, associations, business centers, organisations supporting the local business. 4 meetings with local organisations - as the introduction to bilateral meetings (a). Next step - presentation of the project on the forum.
 - c. Univeristies, scientists - contact with Poznan univerities and technology parks
 - d. Local authorities
- *brief description of the intervention plans (waste flows to close/optimize; industrial sectors concerned) under the light of the Regional Smart Specialization Strategy (RIS3). Describe which type of interaction you had with the RIS3 Authority (under DT1.4.1)*

Areas emerging from traditional economic specializations of Wielkopolska and having potential for modernization thanks to the contact with the region's scientific specialization:

- Bio - based raw materials and food for informed consumers;
 - Interiors of the future;
 - The technology of tomorrow;
 - i. Specialised technologies, machines, devices and their elements for the agricultural and food, interior design, and transport industries;
 - ii. eco-innovative means of road and air transport, public transport vehicles and systems;
 - iii. eco-innovative means of road and air transport as well as public transport vehicles and systems;
 - iv. **recycled and recovered materials; (place for CIRCE2020)**
 - Specialized logistics processes;
 - ICT - based development
2. Meeting with RIS3 Authority. First meeting was organized, to introduce the project and to define the type of interaction.
 - Introduction of CIRCE2020
 - Presentation of the results of MFA - the most promising waste flow
 - Discussion about the possibility to promote the circular economy in the industrial sector



- Collaboration/exchanges
 - i. Technology brokerage
 - ii. Working group meetings under “technology of tomorrow”, impact on recommendation for Regional Policy
 - iii. Presentation the CIRCE2020 idea during the events, meeting
 - iv. Implementation the project into the Regional Strategic goals
 - v. Participation in CIRCE2020 project meetings

- 3. Working group meeting under “technology of tomorrow”. CIRCE2020 become the official member of dialog between scientists and business. Regular meetings are organized by RIS3 authority in working group forum. “Technology of tomorrow” forum is the place, where CIRCE2020 ideas found the excellent environment to develop and to impact on the regional policy. “Recycled and recovered materials” is one of four main topics developed in “Technology of tomorrow”.

- *main outcomes collected / discussed during this permanent consultation and how the territorial players’ position was interpolated with the M-scale analysis and has finally affected the decisions*
 1. Monthly project experts meetings - group of experts grow sistematically. Entrepreneurs, scientists, local authorities.
 2. M-scale analysis is the result of collaboration and discussion. To prepare the most promising waste flow, we combined:
 - Entrepreneurs voice. The most important was to find the industry and business that identify the CE project participation as the added value (not financial only).
 - Scientists voice. Experiences and technology
 - Local authorities voice. Especially authorities of the region, S3 Authorities - recommendation.