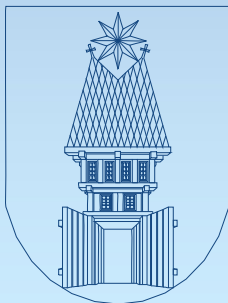
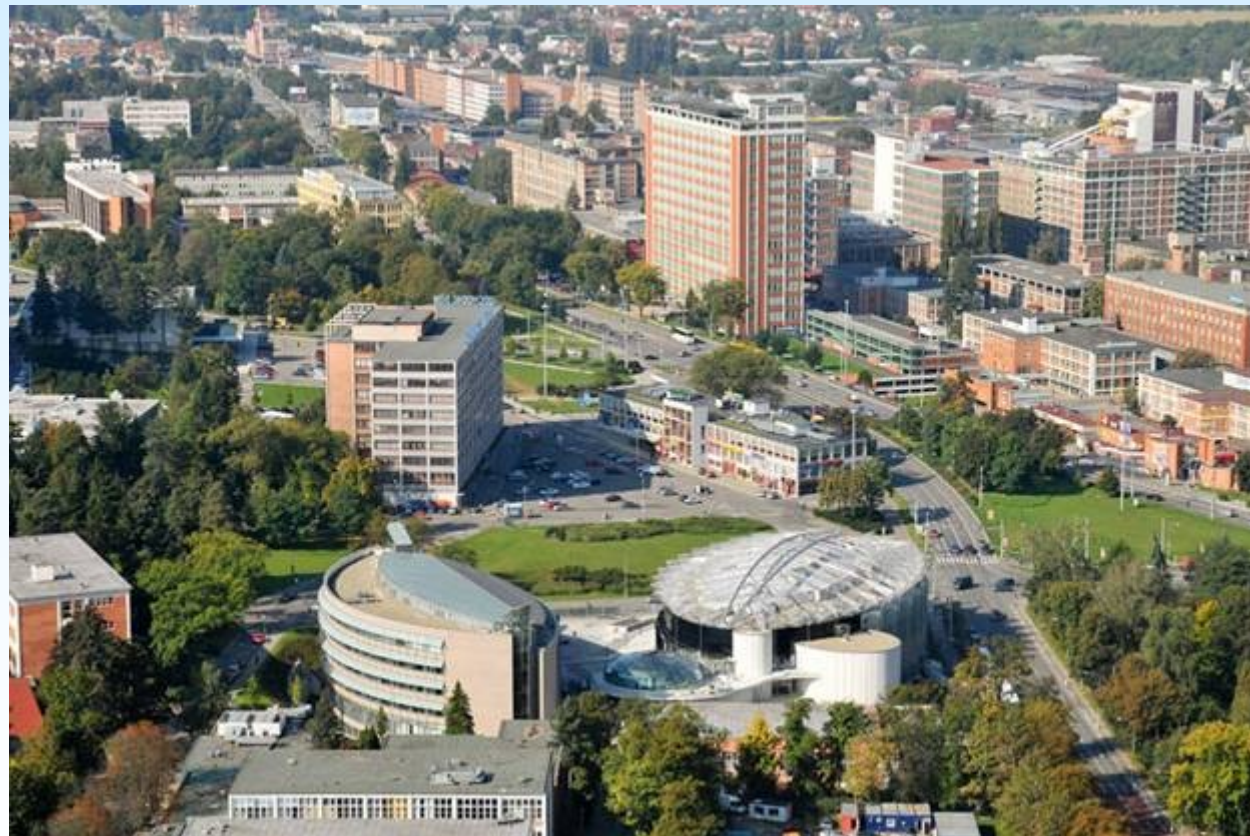
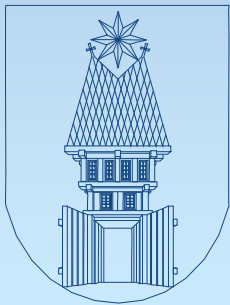


Statutory city of Zlin

The Czech republic

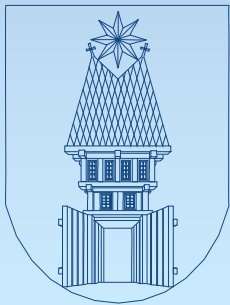


Geographical location of Zlin

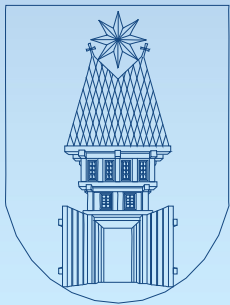


Basic information about Zlin

- Southeastern Moravia
- Mild climatic area
- County town of the Zlin region
- 74 887 Inhabitants (data from January 20, 2014)
- Birthplace of Thomas Bata – the founder of Bata Shoe Company → industrial center of the city, characteristic architecture, ...



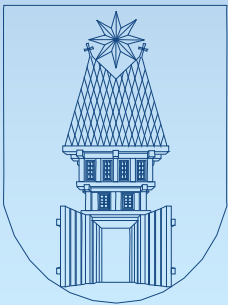
Typical „Bata“ houses



Municipal waste management of Zlin

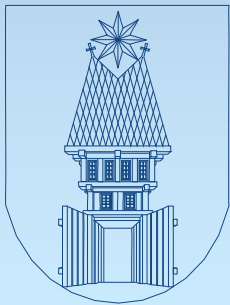
Summary

- Legislative duties of Zlin
- Separate waste collection
- Waste sorting
- Waste processing
- Sale of processed waste
- Management of not processed waste
- Waste management facilities
- Future possibilities of waste management



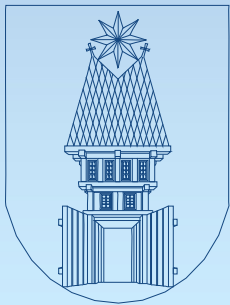
Waste management plan of Zlin

- Waste management plan (WMP) of Zlin → based on WMP of Zlin region → based on WMP of the Czech Republic
- Processed for period from 2011 to 2015
- Main purpose of WMP – creation of functional and efficient system of waste management, determination of goals for the best environmental protection and ways for their achievement



Main goals of Waste management plan

- 1) Prevent waste production, reduce their amount and hazardous properties
- 2) Secure material utilization of waste
- 3) Set rules for management with selected kinds of waste (e.g. electronic waste, construction waste, used tyres,...)
- 4) Create and manage integrated system of facilities for waste management
- 5) Monitoring of contaminated sites
- 6) Fulfill duties set by legislative acts



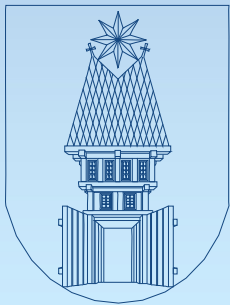
Separate waste collection

Containers:

- Plastic, tetrapak food cartons
- Glass (clear, coloured)
- Paper, cardboard
- Biodegradable waste
- Electronic waste
- Used clothes
- Mixed municipal waste

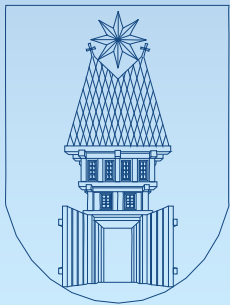
Civic amenity site:

- Metal
- Hazardous waste
- Bulky waste, construction waste, ...

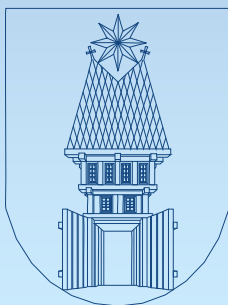


Plastic, tetrapak food cartons

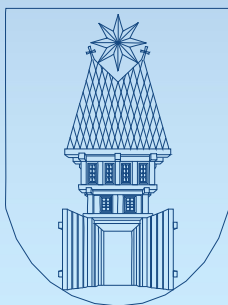
- Yellow waste container (one container for both commodities)
- Collected twice per week
- 302 waste containers
- 442 tons of plastic waste per year
 - 5,9 kilograms per 1 inhabitant per year
- 11 tons of tetrapak food cartons per year
 - 0,15 kilograms per 1 inhabitant per year



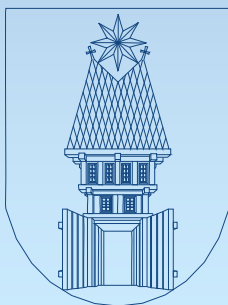
Waste sorting – plastic, tetrapak food cartons



Waste sorting – plastic, tetrapak food cartons

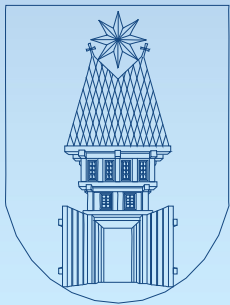


Waste sorting – plastic, tetrapak food cartons



Waste sorting – plastic, tetrapak food cartons

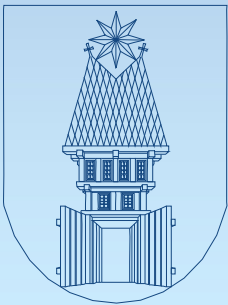
- Impurities about 40 - 50% of the production → landfill
- Sorted into (demanded for further processing):
 - 1) PET transparent
 - 2) PET blue
 - 3) PET green
 - 4) PET multicoloured
 - 5) Hollow plastics (laundry detergents, cleaning agents, washing liquids, soaps, ...)
 - 6) Plastic films transparent
 - 7) Plastic film multicoloured
 - 8) Tetrapak food cartons



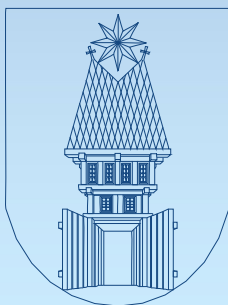
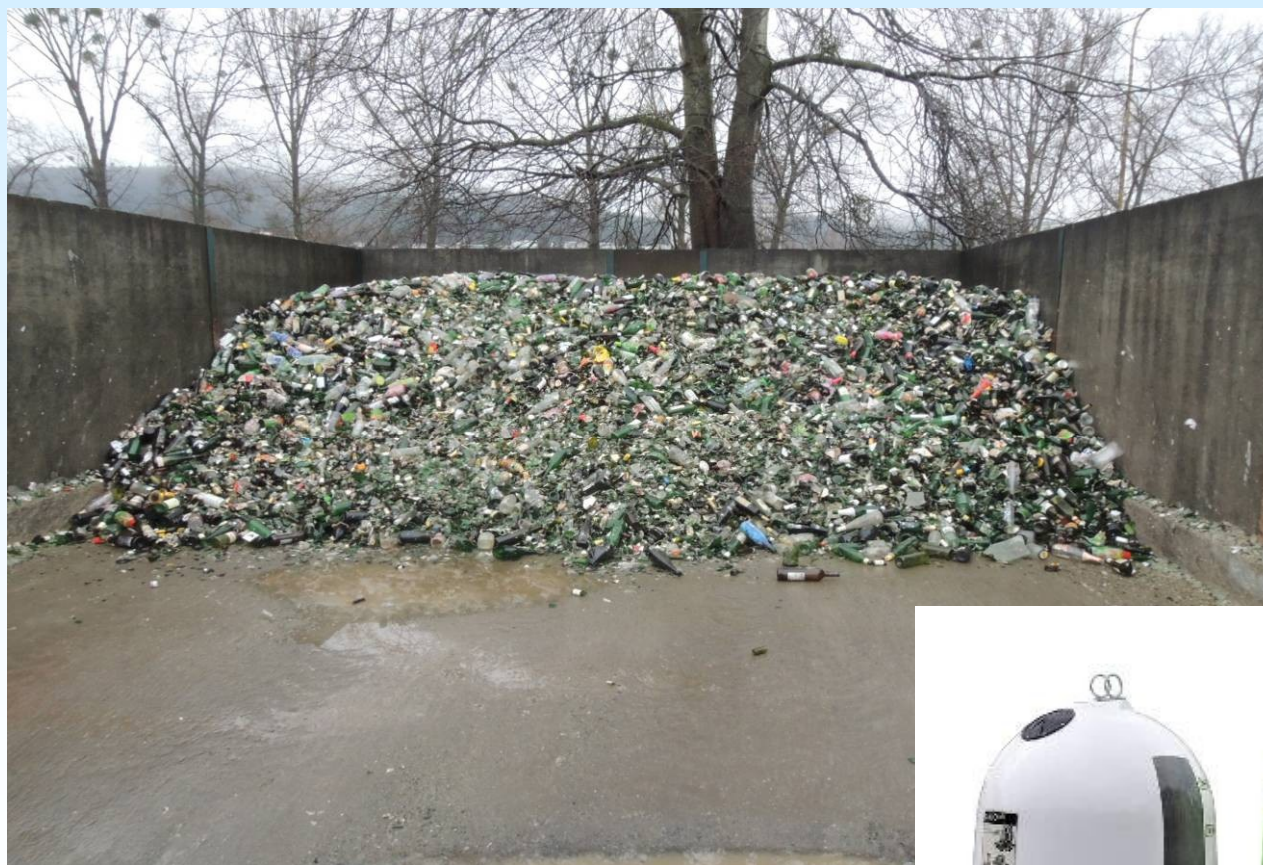


Glass (clear, coloured)

- White (for clear glass) and green (for coloured glass) waste containers
- Collected once per 2 months (clear), or once per 6 weeks (coloured)
- 429 waste containers (248 for coloured glass, 181 for clear glass)
- 662,5 tons of glass waste (205 tons clear glass; 457,5 tons coloured glass)
 - 8,9 kilograms per 1 inhabitant per year

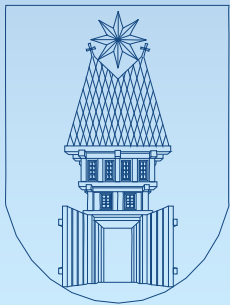


Waste sorting - glass

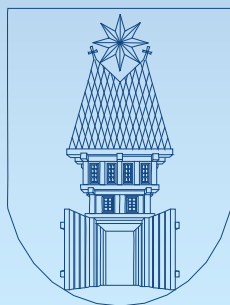


Paper, cardboard

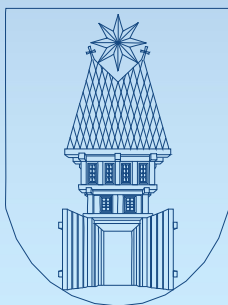
- Blue waste container
- Collected twice per week
- 272 waste containers
- 1 743 tons of paper waste
 - 23,3 kilograms per 1 inhabitant per year



Waste sorting – paper, cardboard



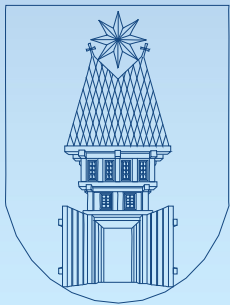
Waste sorting – paper, cardboard



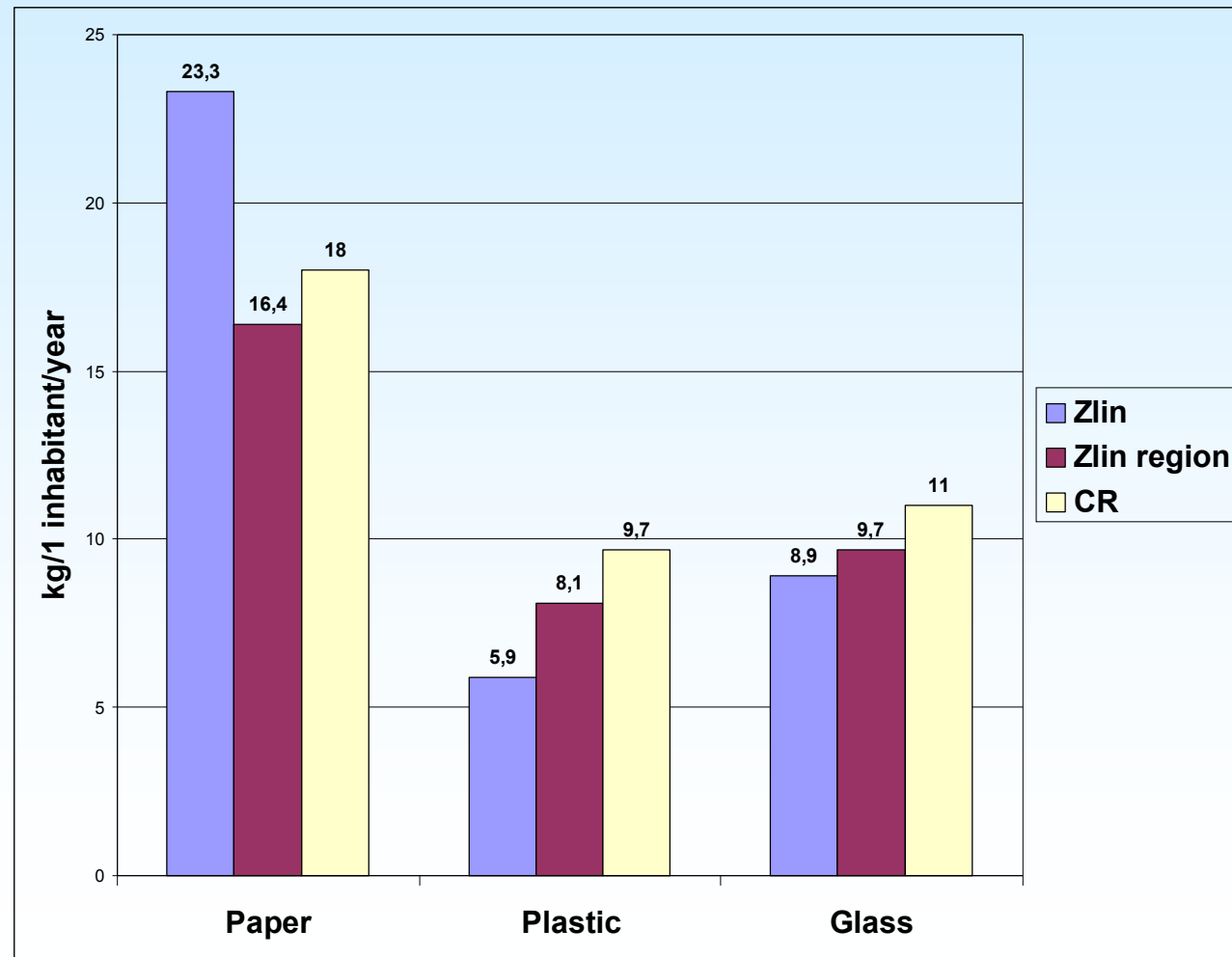
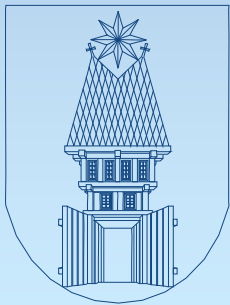
Waste sorting – paper, cardboard



- Impurities about 10% of the production → landfill
- Pressed into packages about 500 – 600 kg in weight
- Sold to paper mills

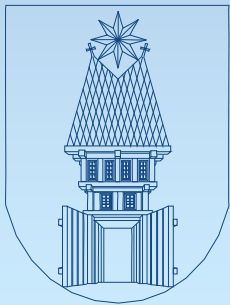


Separated waste - comparison in the Czech Republic (data from 2012)

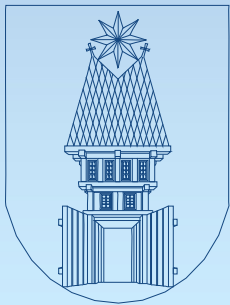


Biodegradable waste

- Brown waste container
- Collected once per 2 weeks
- 1 098 waste containers (in 2012)
- Only family houses
- 991 tons of biodegradable waste
 - 902 kilograms per 1 household per year
- 1 502 waste containers in 2013
- 4 220 waste containers – end of 2014

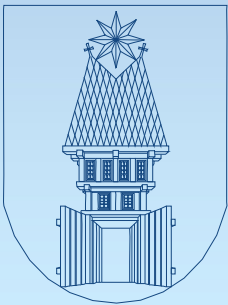


Brown waste container (compostainer)

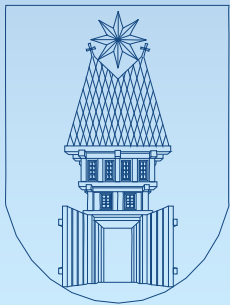


Waste processing - biodegradable waste

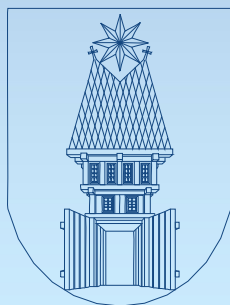
- 2 Aerobic fermenters EWA (Ecological Waste Apparatus)
- Compost for energetic use – calorific value cca 10 MJ (Compost for agro-technical use also available)
- Waste processed in 96 hours
- Sold for combustion in boilers for solid fuels – heating plant Alpiq Generation (CZ) Ltd.



Waste processing – biodegradable waste

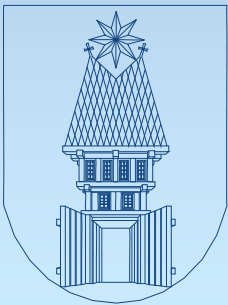


Waste processing – biodegradable waste

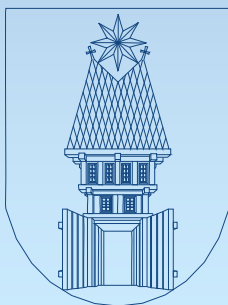


Waste processing in 2014 - biodegradable waste

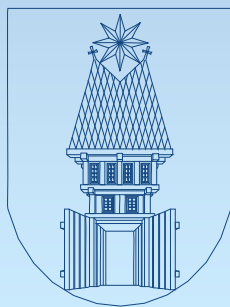
- Composting plant – start in Q2 2014
- Capacity of 2 500 tons of biodegradable waste per year
- Build in Q4 2013 – cca 350 000 € (technology including)



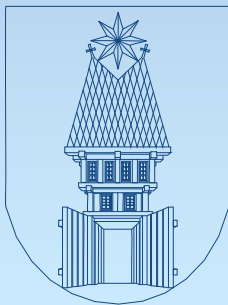
Waste processing in 2014 - biodegradable waste



Waste processing in 2014 - biodegradable waste



Waste processing in 2014 - biodegradable waste

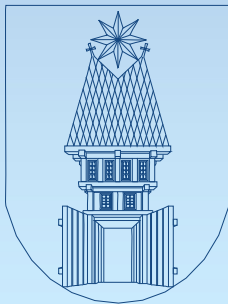


Electronic waste

- Red waste container
- Collected once per week
- 15 waste containers

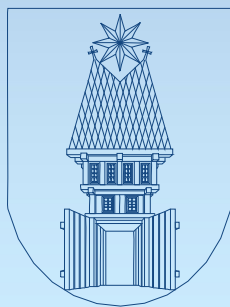


← Small containers placed in public institutions (schools, departments, offices,...)



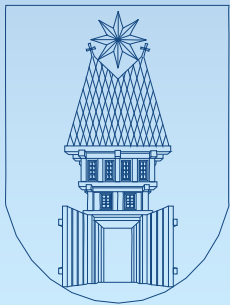
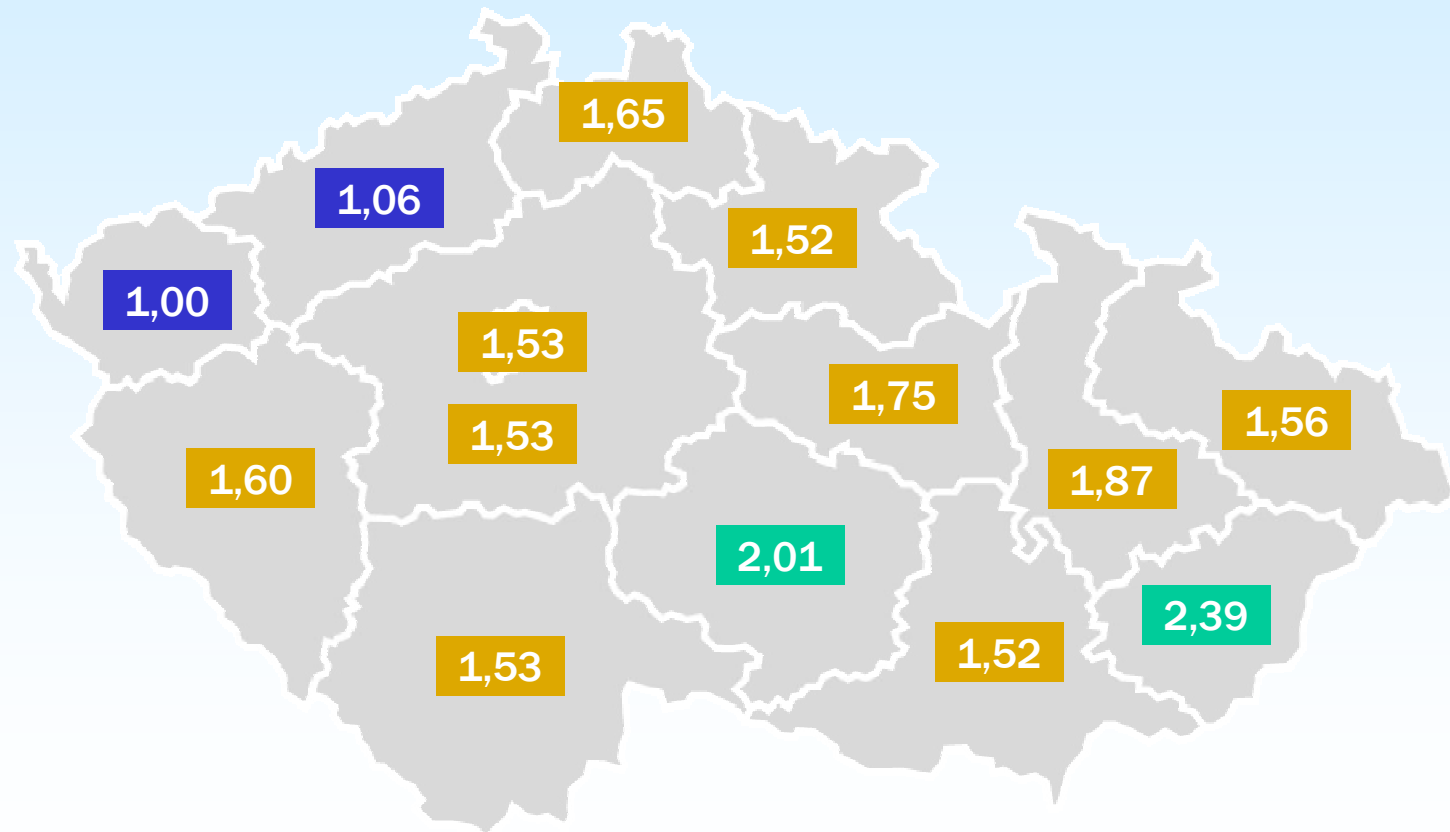
Electronic waste

- Civic amenity sites:



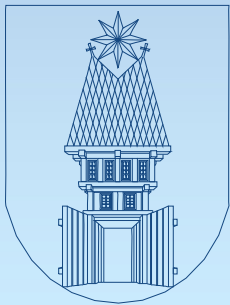
Electronic waste – Zlin region

(take-back in kg/1 inhabitant/year)

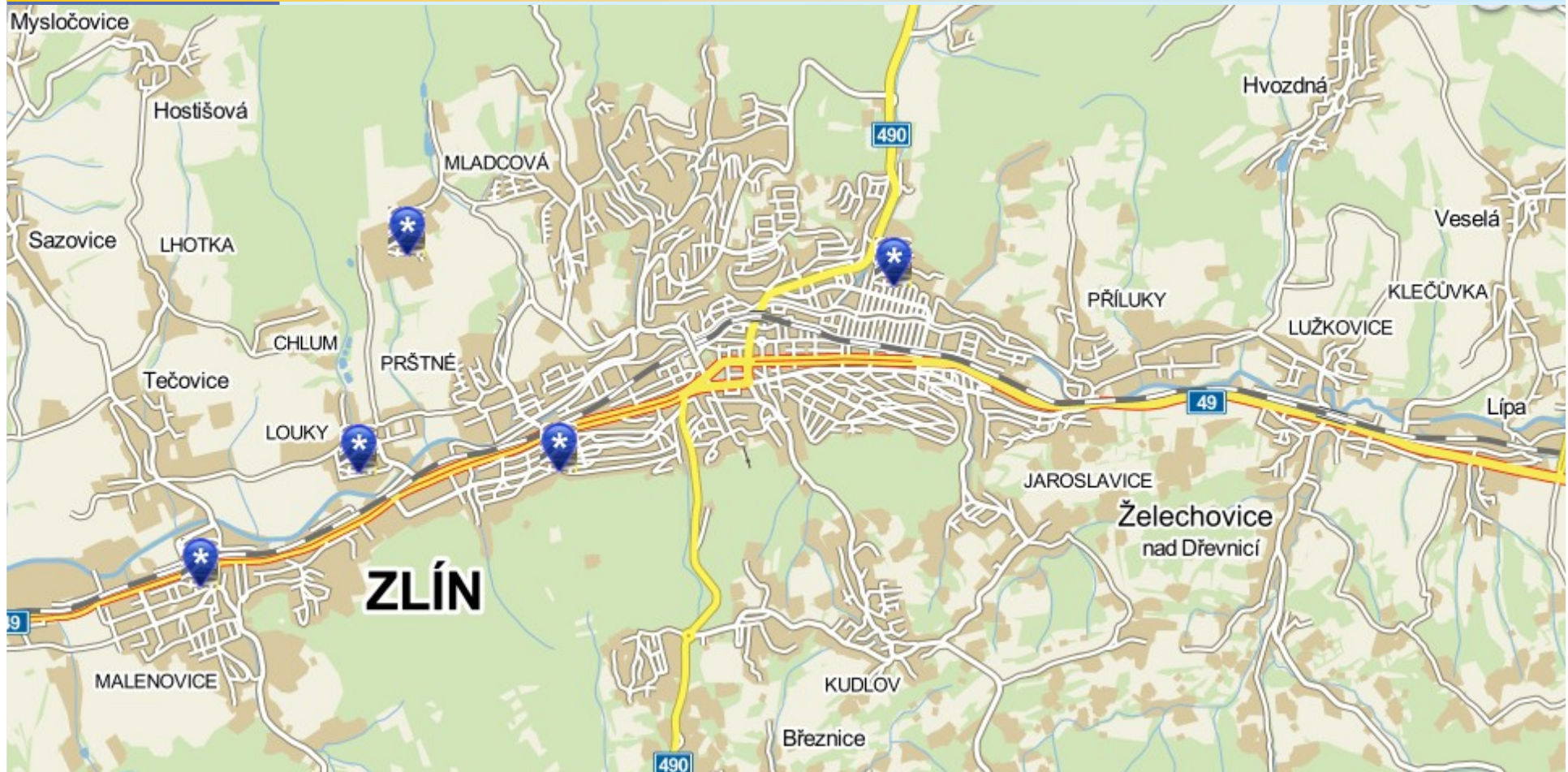


Used clothes

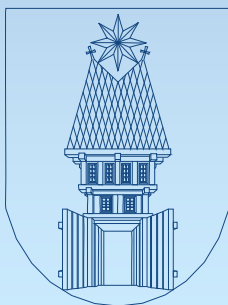
- White waste container
- Collected once per week
- 14 waste containers
- 99,8 tons of used clothes
 - 1,3 kg per 1 inhabitant per year



Zlin has 5 civic amenity sites



Civic amenity sites in Zlin

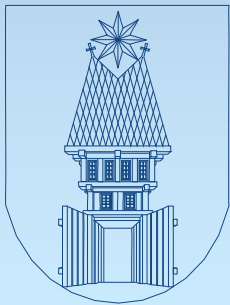


Civic amenity sites in Zlin



Mixed municipal waste

- Black waste container
- Collected - depends on a specific location
(from twice a week to once per 14 days)
- 12 906 waste containers (capacity about
2,967 mil. litres)
- 15 675,6 tons of mixed municipal waste
- 209 kilograms per 1 inhabitant per year

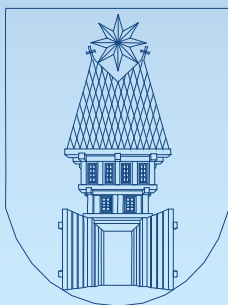


Mixed municipal waste

- 1 100 l → 1 134 pcs

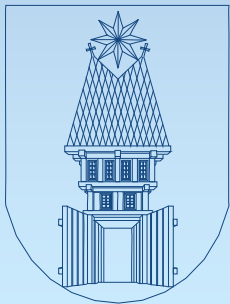


- 110 l → 3 131 pcs
- 120 l → 5 824 pcs
- 240 l → 2 817 pcs

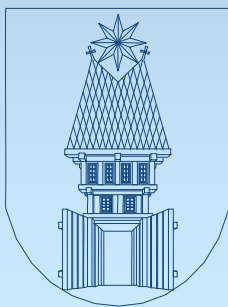


Waste processing – mixed municipal waste

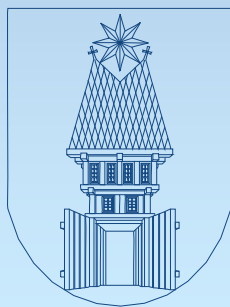
- Controlled landfill owned by Zlin
- Managed by Technical Services Zlin, Ltd. - owned by Zlin
- Landfill started in 1982
- Total surface about 21 hectares
- Divided into 3 parts:
 - 1) I. Part – 1982 – 1998, about 11,5 ha
– originally unsecured (till 90's)
 - 2) II. Part – 1998 – 2002
 - 3) III. Part – 2002 up to the present
– capacity of 935 320 m³
- Landfill gas - Sold to heating plant of Alpiq Generation (CZ) Ltd., or burned (co-generation)
- Landfill free capacity until 2024



Waste processing – mixed municipal waste

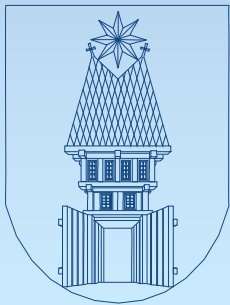


Waste processing – mixed municipal waste – gas collectors + co-generation



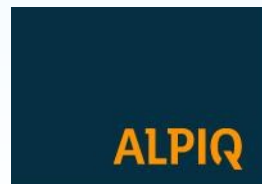
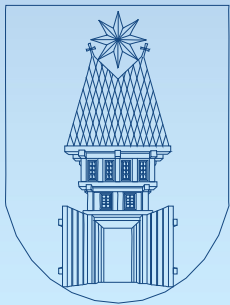
Services for citizens

- Provided 24 mobile collections per year (12 in spring, 12 in autumn)...
 - bulky waste, hazardous waste, metal, biodegradable waste
 - for a short period of time
- ...and 6 mobile collections per year (3 in spring, 3 in autumn)
 - so called „Clean City“
 - for a whole day (about 15 stands each collection)
 - bulky waste, biodegradable waste

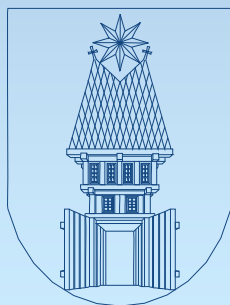


Look into the future

- Zlin cooperates with Alpiq Generation (CZ) Ltd., Technical Services Zlin Ltd. and Teplo Zlin PLC. on the study „Co-combustion of separated waste in the SAF form (solid alternative fuel)“ – expected ban on landfilling → possible way of waste management



Thank you for your
attention!



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Email: janhorak@zlin.eu