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Data on quantities, qualities, treatment and disposal practices of MSW incineration residues in the Czech Republic

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Bottom ash (BA) from waste-to-energy (WtE) plants contains valuable components, especially Fe and NFe metals. Metal-free mineral fraction can be used in construction industry. There are three WtE plants in the Czech Republic that produce in total 160 000 tons of BA per year. One plant is nowadays equipped with conventional NFe metals recovery system whereas in other two plants only Fe scrap is separated. BA in the Czech Republic is usually landfilled or used as a protective and building material at landfill sites.

To assess the resource recovery potential of BA in the Czech Republic, it was necessary to obtain the information about its material composition. We analysed in total 6 samples from all three WtE plants in the Czech Republic. It was found that raw BA contains 10–23 % of glass, 2–5 % of ceramics, 10–16 % of magnetic fraction, 6–11 % of ferrous scrap, and around 1.3–2.8 % of non-ferrous metals. Lower glass or NFe content was found in WtE plant co-incinerating commercial waste.

The contents of individual components were also studied with respect to the granulometry. Most of the glass was found in size fractions between 6 and 20 mm. Ceramics and porcelain were mainly found in particles over 15 mm. The content of ferrous scrap increased with increasing particle size. Nonferrous metals were nearly equally spread into all size fractions.

Particles below 2 mm were analysed in cooperation with TESCAN company by SEM. The most abundant metals in fine fractions of BA were Fe (including Fe oxides) and Al (pure Al or Al₂O₃). Other metals like Cu, Zn, Pb, Sn, and different alloys were usually below 0.2 wt. %. Iron particles had usually elongated shape and had more than 80 % of the surface free. On the contrary, Al particles were substantially less liberated. Pure aluminium was often covered in Al₂O₃, caused by oxidation during the incineration process.