

ASSESSING THE CONTRIBUTION OF ALUMINIUM RECOVERY FROM WASTE INCINERATION BOTTOM ASH TO THE EU RECYCLING TARGETS

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The behaviour of aluminium items when processed in waste incineration plants as a part of the Residual Waste (RW) stream has been extensively studied in recent years. Research has showed that a significant amount of the input material is found in the bottom ash, and this is true also for relatively thin items, such as most of the packaging materials (pure aluminium or poly-laminated foils). Then the recovery of aluminium from bottom ash has become mainstream, with some advanced plants entering into operation in many European countries, equipped with Eddy Current Separators (ECS) for non-ferrous extraction, and sometimes with further upgrade of aluminium from the heavy non-ferrous fraction.

Building up from a previous research, in the present study the amount of aluminium potentially recovered from bottom ash has been estimated for the specific case of Italy, by applying a Material Flow Analysis (MFA) to the aluminium items that end up in the municipal waste stream, including the source separated fractions as well as the residual waste. Starting from the baseline situation of year 2017, two future timeframes have been investigated, 2020 and 2030, with different scenarios related to the expected evolution of a number of parameters such as: aluminium put on the market, population, per-capita waste generation, source separation level, effectiveness of bottom ash processing technologies. Very critical was the estimate of the future incineration capacity, that has proven to be highly affected by the political debate, with many planned plants being cancelled, despite the chronic lack of capacity in many Italian Regions. Another aspect that adds uncertainty to the estimate is the amount of aluminium items that are not tracked because they don't fall under the formal definition of "packaging", although they are (for examples the trays when they are sold in a bunch and not for the purpose of containing something). The fact that such streams are not subjected to the Extended Producer Responsibility (EPR) contribution makes their tracking nearly impossible, then it is necessary to use some estimation. On the other hand, when they end up in the waste stream, it is not possible to distinguish whether they are part of the EPR scheme or not, thus making the matching between input and output more difficult.

Results showed that the contribution of aluminium extracted from bottom ash is non-negligible, since it might add 15 to 20 percentage points to the aluminium sorted from source separation, then helping to achieve the very ambitious recycling targets set by the 2018/852/EC Directive.

In addition of being a final sinks technology, waste incineration then plays an important role as a tool for increasing material recycling.