

Survey of Metal Recovery in the U.S. WTE Industry

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Abstract

Part of the WTER effort to increase the amount of metals recovered by the U.S. Waste-to-Energy industry was a survey to determine the type of equipment used for metal recovery and the quantities of ferrous and non-ferrous metals recovered, and the distribution in percent between front- and back-end recovered metals. A questionnaire was sent to the headquarters of the three major WTE companies and fifty three WTE plants responded with data for the year 2004. As mass burn and RDF plants were examined separately, a comparison of metal recovery by means of these two technologies was possible.

The ways to recover metals in the U.S. WTE industry range from only manual separation of large objects at the tipping floor at mass burn facilities, to front-end recovery at RDF plants, to metal separation from the ash at the back-end of the WTE process or at a regional metal recovery facility.

Accordingly, the amounts of metals recovered range from very little to over 40,000 tons per year. Comparison of the collected with estimated averages of ferrous (5%) and non-ferrous (0.7%) metals in U.S. MSW, indicated that 48% of ferrous and 9% of non-ferrous metal input are recovered at these 53 WTE facilities every year. The remainder is landfilled and represents a revenue loss that may be as high as \$160 millions per year, including the payment of tipping fees for landfilling metals.

Mass burn facilities recover an average of 43% of the ferrous and 5% of the non-ferrous metals, while RDF plants recover 71% of ferrous and 30% of non-ferrous of the assumed metal input. However, the metal input in some WTEs may differ from the U.S. average because of effective metal recycling practice in the community.

Analysis of the front- and back-end recovery at mass burn and RDF plants shows that the former recover only 1% of the ferrous metal at the front-end and 99% from the bottom ash. In comparison, RDF plants recover 88% of the ferrous metal at the front-end and only 12% after combustion. Mass burn plants recover 94% of the non-ferrous metal at the back end. It is interesting to note that RDF plants also recover most of their non-ferrous metals (98% of the total) at the back-end.

Our analysis shows that there is room for increasing metal recovery of both ferrous and non-ferrous metals at selected mass burn facilities that presently recover less than 10% of the input ferrous metals. Non-ferrous metal recovery is very low for mass-burn and low for RDF plants. Since the value of WTE metals has increased appreciably recently, due to increased consumption in China, it is a good time to consider plant modifications that will help increase metal recovery. Some of the most likely WTEs for implementing such modifications have been identified and discussions are under way for effecting plant retrofits at some facilities.

A current objective is to obtain similar data from the nearly 30 facilities that were not included in the first part of this survey. We are also trying to determine how metal recycling practice in the communities that supply various WTE facilities correlates with the metal recoveries attained by these facilities.