

Separate collection of MSW: effective recycling percentages for paper and plastics

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The European strategy for waste management attributes primary importance to the prevention of waste production and imposes a priority order in waste management based on: “preparing for re-use; recycling; other recovery, e.g. energy recovery; and disposal” (Directive 2008/98/EC). The recovery of effective goods and material has priority over other forms of recovery and is applied through re-use and recycling. On the other hand, waste disposal to landfills must be considered as the last possibility and limited to pre-treated wastes (not biologically active or not containing easily leachable hazardous substances).

In the field of Municipal Solid Waste (MSW), the way to effectively recover goods and material is based on the intense separate collection of the different types of materials (eg. kitchen waste, paper and cardboard, glass, plastic, cans, etc.), producing rather homogeneous flows with an effective potential for recycling. Thus, the main responsibilities are assigned to the MSW managing company, who has to provide the appropriate separate collection system – fitting the type of urban site, size, vocation, etc. – and to the citizens who have to accurately and appropriately separate the materials according to the local scheme.

Both the roles are crucial to increase not only the amounts of materials collected separately, but especially the quality of the collected materials, in terms of homogeneity and absence (or more realistically minimum presence) of undesired components. As a matter of fact, the quality is the main factor affecting the effective recovery, as the separate streams contaminated by undesired materials must be further processed to remove such impurities, generating, on their turn, scraps requiring further treatment and/or disposal.

Italy, as several countries in Europe, had defined separate collection targets, in terms of weight percentage with respect to the total MSW generated, to be reached along the time, without caring about the quality of the collected streams.

The latest EU Directive 2018/851, issued on 30th May 2018, amended Directive 2008/98/EC on waste, states that “waste management in the Union should be improved and transformed into sustainable material management”. In order to comply with the objectives of the Directive 2018/851, and “move to a European circular economy with a high level of resource efficiency, Member States shall take the necessary measures designed to achieve” the following minimum targets of MSW prepared for re-use and recycled should be reached: by 2025 a minimum of 55 % by weight; by 2030 a minimum of 60 % by weight; by 2035 a minimum of 65 % by weight. The very innovative point stressed by the Directive 2018/851, is that “the weight of the municipal waste recycled shall be calculated as the weight of waste which, having undergone all necessary checking, sorting and other preliminary operations to remove waste materials that are not targeted by the subsequent reprocessing and to ensure high-quality recycling, enters the recycling operation whereby waste materials are actually reprocessed into products, materials or substances”. Thus, the weight of the undesired materials collected within the separate collection must be accounted for, including finally the concept of the quality, distinguishing between what is collected and what is effectively recycled.

Within this framework, a study was started in relation to a specific territory of Central Tuscany (Italy), with the aim of calculating the effective contributions to recycling for two types of MSW separately collected: paper and plastics.

The flow diagram for the two types of MSW were re-constructed, trying to keep the information related to the origin in term of municipality and type of separate collection methodology. After the collection phase, these streams are sent to sorting plants to remove undesired materials. The main difficulties in following the fate of such streams is due to the presence of several sorting plants, accepting not only the streams object of this study, but also

others from different origins. Thus, in many cases, average values need to be used to estimate the scraps of the sorting processes.

The paper will report the picture of the present situation for the study case territory concerning the two streams of paper and plastics, with the aim of comparing the values of separate collection (as a contribution to the present targets of the Italian regulation) with the actual recycling rate. Also, the overall amount of waste produced by the sorting processes will be highlighted, stressing how it contributes to the requirement of non-recyclable waste treatment/disposal capacity.

References

Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives - Annex II, 19 November 2008.

Directive 2018/851/EC of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste.