Potential of recycables in mixed commerical waste fractions (Wertstoffpotentiale in gemischten Abfällen aus Industrie und Gewerbe)

The application of sensor-based near infrared (NIR)-sorting technologies in the field of separating recyclable fractions out of mixed packaging waste deriving from municipal solid waste collection, e.g. blown PET- or PP-bottle fractions, are state of the art in modern waste management business. Various intelligent sensor-based sorters linked with special high resolution camera systems working with IR-spectra meet the standard in nondestructive material identification. The use of sensor-based NIR sorting systems to characterize different commercial waste fractions is a logical consequence step with regard to recover secondary raw materials out of industrial waste.

The implementation of a NIR-system requires amongst others conditioning and particle size reduction of numerous commercial waste input fractions and is currently under examination by the Institute for Sustainable Waste Management and Technology (IAE). In this connection a joint research project together with a leading private Austrian waste management company is accomplished. The aim is to develop a concept separating recyclables (different types of plastics and several types of paper- and cardboard-qualities) out of high-calorific and middle-calorific fractions of commercial refuse originating from the output materials of a commercial waste splitting plant.

It has to be considered that these commercial waste fractions comprise a remarkable hidden resource potential. The amount of secondary raw materials coming from Austrian's industrial sector is more than two million tons per year, across Europe (EU-27) more than 53 million tons. For Austria, this corresponds to 4% of the total collected amount of all waste fractions. Within the framework of the above mentioned project, numerous manual sorting analyses have been accomplished to characterize material composition and to evaluate the resource potential of commercial waste. As a result, different fractions like inert materials, metals, textiles, beverage PET-bottles, paper/cardboard, wood, other organics, hazardous waste, plastics and composite materials have been separately defined. Data interpretation and roundup of four described sorting analyses characterize the average material composition of input fractions. Additionally bench-scale experiments provided information about optimized parameters and the adapted setup for the pilot NIR-sorting plant. The next step was to verify the developed parameters. The analyses of NIR-sorting results on an existing large-scale plant showed that some parameters and adjustments have to be modified. Overall the results obtained for sensor-based sorting pointed out, that secondary raw materials in different commercial waste streams exist in an adequate amount to be identified using NIR-technology.

Based on the developed innovative knowledge, an upgrade of an existing sorting plant for commercial waste with NIR-sorting technology will be implemented. A further challenge for the ongoing project is to optimize the recovery rates and to increase the purity of the secondary raw materials concurrently to make them available to the secondary feedstock market. All these attempts are targeted on saving primary resources as well as executing EU-waste framework directive in terms of reinforcement material recycling.

Anmerkung: Das Poster ist in deutscher Sprache verfasst.