

# SECOND RAW MATERIALS: PACKAGING RECOVER

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## OVERVIEW

The paper focuses on the recycling of the packaging waste, from the sustainability and the environment protection perspective in the European contest. Regarding the dimension of the municipal solid waste reduction and the resource efficiency, the author presents a method to recover the packaging waste as “second raw materials”.

The 2020 objectives of the European Union aim to obtain a “clever, sustainable and inclusive” grew of the European State Members. The document starts from the increased awareness in the European waste management sector. To give a “second life” to the waste can reduce the human societies environmental pressures and impacts.

Through its recent legislation the European Union wants to lead the State Member in a passage from a linear economy toward a circular economy. A closed circle, closing the materials ring through the recycle step. The diffusion of automatic system of waste collection could represent a strategic way for that orientation.

The materials studied in the document are glass and plastic. The first one related to the refillable packaging waste, the second one to the non-refillable packaging.

The chain object of the analysis is the “reverse vending practice”. From the traditional collection “door to door”, in more than one country the consumers had been involved in the so called “reverse vending” collection of the packaging. This implies the use of automatic machines that collect the empty bottles and give back a deposit to the consumers. The materials collected are managed by an organization that transports, treats and sells them to the drinks producers. With these simple steps the efficiency of drinks' packaging collection can improve prominently. As well the energy to extract and transport new material is saved. Finally the environmental impacts of the waste disposal are considerably reduced.

## METHODS

The idea was extracted from a six month study exchange experience in the Faculty of Life Science of Copenhagen University in Denmark.

Thanks to the collaboration with the DRS and the official partner of the organization that manages the reverse vending machines (Wincor Nixdorf) the author collected the qualitative data and contributions. In the second part a quantitative analysis is elaborated with the given information.

The quantitative information collected by the author are numbers, graphics and data from the Environmental European Agency to give a brief description of the European waste management sector. Complete tables and numbers are included to give a full image of the Danish case study too. Following we incorporated an economic cost-benefit analysis about the potential application of a reverse vending system, it includes: return of investment (ROI) of the activity, the energy consumption, the emission saved from the recycle of the packaging, the social benefits for the community involved and the possibilities of auto-finance the system. Finally it's enclosed a parallel comparison between Denmark and the Italian waste management system with its obstacles.

The estimation of the aspects of the project has been analyzed in cooperation with the University of Roma Tre and the Marketing Manager of the Wincor Nixdorf.

## RESULTS

In terms of sustainability, all its three known dimension are satisfied: less environmental pollution; economic benefits for consumers and producers; social involvement of the local communities and new green job opportunities.

The reverse packaging recover system allows a resource efficiency and energy improvement, saving good percentages of raw materials and related energy use in the extraction and production.

As case study and an example of best practice the author goes deeply inside the “Dansk Retur System” (DRS). The Danish organization of waste management founded in the year 2000 obtained, as shown in the data inside the paper pages, great results on all the aspects.

In the document, a data estimation about the economic aspects of the practice is made. Supported by that data analysis finally there is a parallel comparison with Danish and Italian packaging collection systems. The scene designed by the analysis shows relevant different trends between the two systems. The main obstacles in the Italian society for the reverse vending practices are the missing cooperation among the actors, the traditional collecting system structure, and the difficulties to promote innovative methods in the current Italian panorama.

## CONCLUSIONS

The knowledge of the recycle Danish DRS, according to the European orientation, can be designed a best practice model for different state members. In the globalized today World the waste problem is becoming a priority question to deal with. The expected growth of population for the 2050 will give higher waste pressure and consequently more effective waste management solutions will be needed.

The spread of a “zero waste” society culture, could represent a way of competitiveness and development for the country that will promote it. The reverse vending machine system can give (a big/further) help for an important part of the municipal solid waste treatment.

The final proposal of the paper is too give a tool for the local areas, particularly the Italian one, to start to implement a reverse vending system as substitution of the inefficient traditional collecting system. Starting from a little community the system can be applied as a launch of a reverse vending network in other areas. The caution deposit method can incentivize the second raw material market, the energy savings and the widespread availability of the pro-active waste management.

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