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WASTE MANAGEMENT IN SWITZERLAND AND REMARKS TO OTHER COUNTRIES

Abstract

To understand the different situations in all countries it is necessary to compare the different mentality, financial situation, culture, politic, law and other influencing factors. Therefore, it is not possible to transfer one system from one country to another without special control of all possible situations. In most of the countries, cheap landfilling is popular. In Switzerland, since about 40 years ago landfilling of household waste was not allowed. The small county with 8.5 mi. inhabitants operate 25 incinerator plants for household- and hospital waste. There is also a recycling system in Switzerland, but recycling is too expensive. For this aspect, for most products a small part for the waste management is included in the selling price. The recycler gets this money paid by the waste foundation.

Introduction

In order to understand waste management situation in the world and the big difference between the countries, it is necessary to clarify the influencing factors such as mentality, culture, financial possibilities, politic situation, legal rights, market, acceptance by the people, and other. Therefore, it is not possible to transfer the system, which function in perfect way in one country, to another country. This is also valid for the waste management. For example, if waste pre-sorting is practiced in one country, it can fail in another country because the requirements are different. In many countries, waste is put away somewhere like a bad ghost, which we need to go away. Landfill is the most common method to eliminate a waste. It is cheap, without big technical installations, only collection, transportation and deposition. But the environmental consequences, especially impact on groundwater, are usually not discussed. The average household waste generation in Europe is about 280 to 350 kg per person [1,2] and the heat value is about 1000 to 1200 kJ/kg [3]. Thus, waste is a valuable material and could be used.

Discussion

In Switzerland, the first incineration plant for household waste started to operate in Zurich in 1974 and produced electric power and hot water for heating. In the same time, a new law abandoned landfills. In the small Switzerland with 8.5 Mio habitants, 25 waste incineration plants operate and produce about 18% of required energy [4,5]. The off gases from incinerators are cleaned by a filter and 3 steps of washing with chemicals are used to fulfill the requirements.

There is also a standard organic waste separation in the kitchen. People usually have two boxes for organic waste and other waste (for incineration), which are integrated in the furniture (Fig. 1).

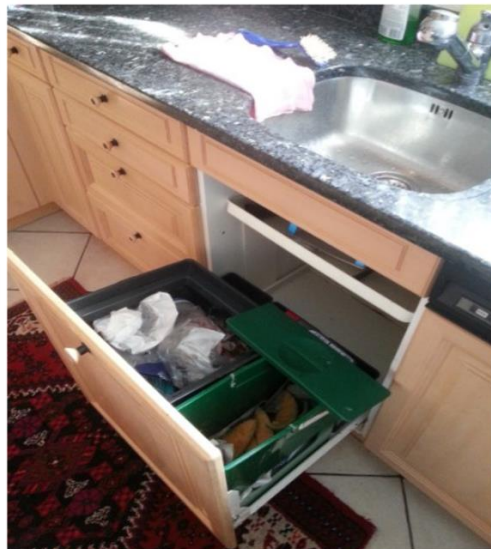


Figure 1. Standard kitchen with two boxes for household waste

The biological waste is then putted in controlled green container in front of every house (Fig. 2). The other (mixed) waste is collected in special black plastic bags with labels which people have to buy. Thus, two waste collection cars are necessary. It is possible to produce gas from biological waste under an anaerobic process. Also, one can compost biological waste – the product is composted earth and can be sold in garden centers for flowers.



Figure 2. The place for waste containers

If two different containers are located without control, the presorting will not function.

Nowadays, everyone in Europe is speaking about recycling. Recycling follows the standards of general management. Therefore, first point is to clarify: a) who will buy sorted material, b) what type of material (specification) does buyer need, and c) what is paid for this material. Below is an example of plastics. There are lot of different types of plastics. Do you have only PET? Which molecular type of PET? Color, caps, paper labels, not-washable glue of the labels and many other questions have to be clarified first. Then, one should check the existing input: mixed household waste or separately collected material. Then, you need to discuss the necessary preliminary work – separation, cleaning, press balls, etc.

Also, in Switzerland we have a special waste collecting system. We have a special law which implies recycling. If a shop sell something, then they have to take back the old product. Some money for the waste management is included in the selling price. For example, the selling price of refrigerator includes the costs for dismantling of an old one. The price for PET bottles also includes small amount for the recycling. At the entrance of the shopping centers, there are special installations for controlled return of PET bottles, glass bottles, batteries and other materials without payment (Fig. 3).

People's motivation to give back PET and glass bottles is the reduction of waste in black bags, for which they have to buy expensive labels.



Figure 3. Special installations in shopping centers

Other materials can also be returned to controlled waste collecting centers. Typical recycling materials are:

- newspapers and packaging paper (to produce carton and boxes);
- materials from buildings demolition (for street construction);
- glass (to produce isolation wool);
- batteries (for metal recycling);
- PET bottles (to produce parts for cars and other plastic parts);
- mixed plastic (for alternative fuel);
- tires (for alternative fuel, especially in cement plants);
- wood (to produce pellets for heating);
- biological material (for anaerobe process to produce gas).

In Switzerland, recycling is mostly an expensive idea. There is the pre-payment system (you pay for waste handling in the moment of buying). This additional amount of money is paid to special foundation. If some company show the correct recycling possibility and the product is of good quality, they get the necessary amount of money for the appropriate installations from this foundation. Export of waste is only possible if there is no possibility to process the waste in Switzerland.

Conclusion

Let us have a look to the future. Until recently, waste was never discussed. There was also no possibility to get know-how in this field. Today, most people know that waste is the “brother” of production and every product will once become waste. A lot of knowledge is necessary to handle waste in the right way. But much more commitments and efforts are necessary. Waste management needs know-how in standard management, chemistry, physics, mechanics, etc. If waste management is an accepted faculty, significant recourses saving is possible. But it is also necessary to change the mentality in some countries. For this change, the motivation (by education, money benefit or legislation) is needed. In waste management, too much regulations can eliminate the interest and efforts in this field. Not everything what is possible is reasonable.

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