

The Recycling Market in Poland

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1. Introduction

Poland is a country that only recently joined the EU and one that only for the last 20 years has benefited from the free market economy. After the changeover of the political system in 1989, the waste treatment sector of the economy was one of the most neglected ones. It only involved the collection of mixed communal waste and its delivery for storage. The last 20 years were marked with the rapid change in Polish economy, which had an impact on the development of the waste management sector as well. In the nineties, many of the community or municipally owned companies were privatized, largely through the selling of shares to foreign investors. Such form of privatization much influenced the present day condition of the sector. There was achieved a technological change and a change in the way of thinking about the waste. On the one hand, a quick rise of investments into technical means of collecting and storing the waste was accomplished, the process having been accompanied by an improvement of the treatment technology, on the other a change of thinking of the waste itself gradually occurred. The waste became an important source of raw materials (recyclable waste), thus becoming an important part of the incomes of the companies involved. Of importance were also the changes of the legal environment of the sector: they were mainly implemented as the consequence of Poland's membership in the EU. In Poland however, contrary to the majority of other member states, the sector still operates according to the free market mechanisms, this meaning that the services are delivered to all waste producers on the market conditions. Each and every waste producing subject decides by himself who and on what conditions collects the waste. The situation is about to change since – according to the amendment to the act on maintaining cleanliness and tidiness in the communities, one of 1st July 2001¹ – the waste shall become the property of local communities and its collection and treatment will be subject to public tenders. At the same time, waste producers will be burdened with the garbage tax and will

¹ Journal of Laws of the Republic of Poland No. 52 of 25th July 2011 roku, item 897

cease to decide who and under what conditions collects the waste. An important part of the new law is the obligation to recycle certain amounts of the specific materials before the year 2020, namely (Art. 3 b)²:

- paper, metals, plastic and glass – at least 50 % by weight,
- construction and demolition waste – at least 70 % by weight.

In the light of the above and considering that the present day recycling quota does not exceed 10 %, the recycling market faces great challenges. This creates huge investment potential in the scope of a selective collection and treatment of waste. Unanswered remains the question whether the change of law was necessary or would it have sufficed to adequately amend the act on maintaining cleanliness and tidiness in the communities, together with the requirements concerning entrepreneurs operating in the sector. On analysing the solutions from the most developed UE member states where such tax has been used for many years and where the way it is calculating is regarded as unfair by the majority of the societies, one may have many doubts.

2. Change of quantity and structure of waste

The rising incomes of the societies stimulate their consumption of goods and services.³ The research shows that the enhanced consumption results in increased amount of waste. Every act of a purchase of a product or the rendering of a service yields the production of waste. Originally, at the time of purchase, e.g. in the form of packaging and secondarily in the form of unused remainders of the product, or in case of durable goods, in time the product itself becomes waste. One could say that assuming the linear increase in incomes, the amount of communal waste is the derivative of the incomes function of the demand. The literature of the subject quotes many results of the empirical research concerning both the regions selected and different countries showing the relations of the amount and structure of the communal waste produced and the wealth of the society. Results of some of the research on the structure of waste relating to the society's wealth are to be found in the work of R. Saint-Fort⁴ (Table 1.).

Table 1 shows that with the increase of the state revenues the share of the specific components in the entire amount of waste changes, together with characteristics of the components:

- the share of paper increases,
- the share of plastic materials increase,
- the share of organic waste decreases,
- the moistness decreases,
- the bulk density decreases,
- the accumulation index increases,
- the amount of waste sized more than 50 mm increases.

Other general results of research are to be found in the paper of S.J. Cointreau-Levine, and they are reflected in Table 2.

² ibidem

³ Begg, D.; Fischer, S.; Dornbusch, R.: *Mikroekonomia*, PWE, Warszawa 2003, pages 127-130

⁴ Saint-Fort, R.: *Fate of Municipal Refuse Deposited in Sanitary Landfills and Leachate Treatability*, J. Environ. Sci. Health, A27(2), pages 369-401, 1992

⁵ Cointreau-Levine, S. J.: *Private Sektor Participation In Municipal Solid Waste Services In Developing Countries*. Word Bank, Washington DC 1992, page 41

Table 1: Characteristics of the communal waste against the per capita income annually: low income – up to \$ 360 (in 1978), medium income – \$ 360 – 3,500 (in 1978), developed countries – more than \$ 3,500 (in 1978)

Waste characteristics	Low-income countries	Medium-income countries	Developed countries
Description of waste (weight percentage)			
Paper	1 – 10	15 – 40	15 – 50
Glass, ceramics	1 – 10	0.1 – 10	0.4 – 12
Plastics	1 – 5	0.2 – 6	0.2 – 10
Wood, grass	1 – 5	no data	no data
Metals	1 – 5	1 – 5	3 – 13
Organic waste	40 – 85	20 – 65	20 – 50
Leather (hide), bones	1 – 5	no data	no data
Fabrics	1 – 5	2 – 10	2 – 10
Other inert waste	1 – 40	1 – 30	1 – 20
Moistness of waste (%)	40 – 80	40 – 60	20 – 40
Bulk density (kg/m ³)	250 – 500	170 – 330	100 – 200
Waste accumulation index (kg/person/day)	0.4 – 0.6	0.5 – 0.9	0.7 – 1.8
Composition (% > 50 mm)	5 – 35	No data	10 – 85

Source: Saint-Fort, R.: Fate of Municipal Refuse Deposited in Sanitary Landfills and Leachate Treatability. J. Environ. Sci. Health, A27(2), 1992, pages 369-401

Table 2: Communal waste in the developed countries

	Low-income countries \$ 350 p.c.p.a.	Medium-income countries \$ 1,950 p.c.p.a.	High-income countries \$ 17,500 p.c.p.a.
Amount of waste per person	200 kg	300 kg	600 kg
Amount of waste per \$ of income	0.51 kg p. \$	0.15 kg p. \$	0.03 kg p. \$

Source: based on Cointreau-Levine, S. J.: Private Sector Participation In Municipal Solid Waste Services In Developing Countries. Word Bank, Washington DC, 1992, page 41

In Poland, the morphology of the waste was also the subject of studies however only with respect of selected regions, mainly large cities. Many of the researches were conducted by the R&D Center of Urban Ecology based in Lodz (subsidiary of the Ministry of the Infrastructure). The presentation of the results of the Center's research may be found in the article *Morphology of communal waste and their fuel characteristics* published on the internet web site of the Faculty of Machines and Power Devices of the AGH University of Science and Technology in Kraków.

In Bydgoszcz, the research on waste were conducted in the years 1995 and 2005. Based on this data, it is possible to analyse the changes in trend. The results of both researches are shown in Table 4. The analysis of the outcome is consistent with the conclusion resulting from Tables 1 and 2, i.e. the increased amount of paper, glass and plastics.

Considering that presently in Poland some 320 kg of communal waste is produced per capita per annum, one can safely assume that the coming years will be characterised by a substantial increase in the waste amount produced and the change in its morphology. The above data indicate the large potential in the development of the recycling market. If we are going to fulfill the requirements, we have to recycle millions of tons of raw materials contained in the communal waste.

Table 3: Mean composition of communal waste in various cities of Poland as percentage of weight

Component of waste	Poland's average (1997)	Toruń (1992)	Olsztyn (1992)	Koszalin (1993)	Łódź (1997)	Warszawa (1996)	Kraków (1998)
Paper	10	14	21	22	20	16	20
Glass, ceramics	12	7	10	8	16	14	8
Metals	8	3	4	4	4	5	3
Plastics	10	5	7	12	14	12	14
Fabrics	5	4	6	4	4	3	6
Organic waste	38	36	39	32	30	35	36
Other waste	17	31	13	18	12	15	13

Source: <http://kmiue.imir.agh.edu.pl/tpodp/uwarunk/morfodp.htm>

Table 4: Composition of the communal waste in Bydgoszcz in the years 1995 and 2005 (percentage of the total waste weight)

Structure of waste (weight percentage)	Bydgoszcz 1995 (Hermann)	Bydgoszcz 2005 (Stegliński)	Change
Paper	12.2	19.5	+ 7.3
Rubber	0.3	no data	no data
Glass	6.1	14.8	+ 8.7
Plastic materials	8.8	16.1	+ 7.3
Fabrics	1.3	3.5	+ 2.2
Organic waste	28.2	25.4	- 3.2
Metals	1.1	4.2	+ 3.1
Non-organic waste	29.3	12.8	- 16.5
Other waste types	12.8	3.7	- 9.1

Hermann, J.: Kompleksowe badania i ocena odpadów komunalnych z terenu miasta Bydgoszczy w aspekcie możliwości ich wykorzystania, ATR Bydgoszcz, Bydgoszcz, 1995

Stegliński, W.: Badania ilości i składu morfologicznego odpadów komunalnych w Bydgoszczy, Łódź, 2006

Source: based on Hermann J., Kompleksowe badania i ocena odpadów komunalnych z terenu miasta Bydgoszczy w aspekcie możliwości ich wykorzystania. ATR Bydgoszcz, Bydgoszcz 1995, Stegliński W., Badania ilości i składu morfologicznego odpadów komunalnych w Bydgoszczy, Łódź, 2006

3. Experiences of the Remondis company

Within the framework of the law changes concerning the treatment of waste in Poland, in the year 2002 Remondis established a recycling organisation under the name of Eko Punkt. The company was to supposed to deal with the collection and sales of the recycled materials gathered by the Remondis group, as well as fulfilling the obligation to recycle the packaging materials from the products merchandised by the manufacturers. Changes in the amounts of the waste recycled by Remondis are shown on Figure 1.

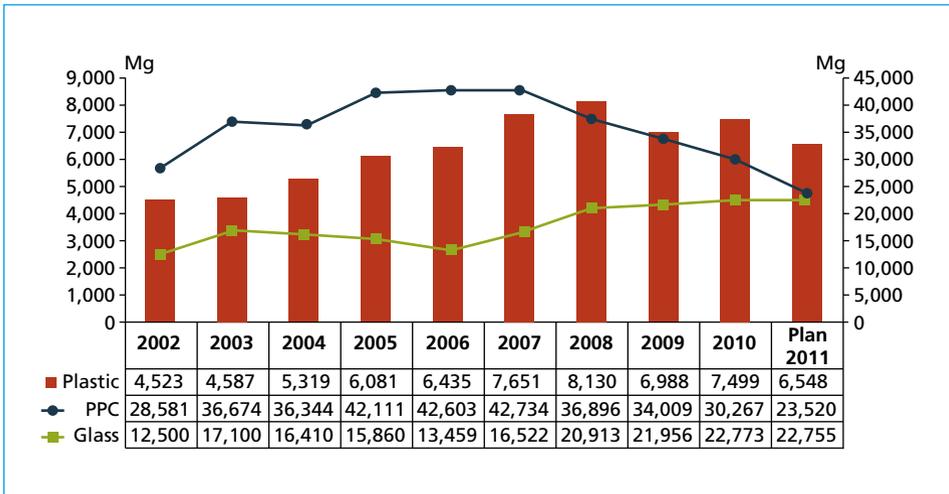


Figure 1: Development of the amounts of recyclable fractions 2002 to 2010

Source: Eko Punkt SA

The current experiences with the recycling materials from the communal waste indicate the necessity for changes in the system of collecting and sorting the original waste. The presently functioning waste collection systems as based on garbage bags or easily accessible containers show a little interest among the society. It is estimated that no more than 25 % of the inhabitants sort the waste in the place of its origin. Sorting the mixed communal waste yields poor effects due to the high degree of impurities. Only from about 5 % of the mixed waste it is possible to recycle materials. All the experiences explicitly point out that without the introduction of separate containers for different kinds of waste the fulfillment of the quota required by the new law would hardly be possible.

The Remondis company, that has operated in Poland since 1992, has tried to persuade the local governments to introduce the proper modifications to their tidiness regulations many times. However such changes have produced very poor effects, mainly due to political reasons. Such changes would result in showing the real volume of the waste produced, consequently bringing about increased indexes for setting the minimum quota of the waste. The current fiction translates to the piles of garbage on the containers and plastic bags placed next to them. Unfortunately, the charges for the disposal of waste concern the entire communities and they represent both a social and political problem. Given this, one could say that the new law has at least this one advantage that the regulations have to be changed and a selection of waste at the time of its production has to be introduced as well.

4. Advantages and drawbacks of the new law on waste

For the Polish society, the main drawback of the new law is the lack of the free market in the waste management sector: for a society that waited and fought for market economy for such a long time. The fundamental question that arises is one about the amount of the State in the economy. Do the resourceful Poles really want the State to make their choices

for them? Supporters of Keynes and those of Friedman will tend to argue the imperfection of the market and the necessity of the intervention by the State, as well as point out to the basic liberty, i.e. the free consumer's choice.

The new law introduces ways of setting the level of *garbage tax*. Article 6j indicates various methods of determining the charge to be collected for the waste management depending on different factors, i.e.:

- the number of the inhabitants of a given property;
- the volume of water used at the given property;
- the area of the living quarters.

However each of the above is burdened with the specific averaging feature, one rendering it impossible for each participant of the market to pay for the exact amount of the waste produced by them. Adopting the first method of calculation assumes that everybody produces the same amount of waste, which obviously is untrue and people with lower income would have to pay for those with higher one. From the ethical point of view it would be a very unfair tax. The second method means that whoever uses more water, produces more waste. Unfortunately, no research results are available to evidence the existence of such correlation.

However, intuitively we may feel that some relation between the two figures does exist, but without doing a pertinent research work we are unable to determine it. Introduction of such method of calculation is at least not well thought. The final method assumes the relation between the size of a living property and the amount of the waste produced. Another doubtful hypothesis is the one claiming that two persons living in a bigger flat produce more waste than the family of five living in a smaller one.

The above examples show that the legal solution in the form of waste management charge is unfair from the social point of view.

Another problem is the very idea of introducing the law, i.e. the effort to create a system that would discourage people from leaving their garbage in improper places (like forests, parking lots, other people's containers). However what will be the case of those for whom the containers assigned according to the calculations are not big enough but who are unwilling to pay more? Another issue concerns the motivation for selecting (sorting) the waste. If the system does not provide any financial advantages for the people, it would seem doubtful whether they would decide to have several waste containers, especially the inhabitants of small flats. In the apartment buildings characterised by the collective responsibility of their tenants, achieving the result of a sorted waste may prove to be very difficult.

An important negative trait of the new law is also the specific nationalisation of the sector. According to the assumptions made for the act, the charge for the waste management would be the income of the communities and towns, creating the threat that a large part of the means collected will not be utilised for the waste management. Collection and treatment of waste will be subject to public tenders. It means that the only criterion for selecting the refuse recycling company will be the price of the service and not its quality. Additionally, the relatively short-term contracts will not pose any motivation for such a company to invest in the development.

As already pointed out, the only advantage will be creation of the more realistic tidiness regulations in the communities and towns and this may contribute to creating the foundations of the waste management sector. However, it could have been introduced without changing the general rules of the market economy in this sector.

5. Conclusion

In the near future, Poland will be facing a real revolution in the field of the communal waste recycling. We will see for ourselves if the changes are working to our advantage. However all seems to indicate that denying the society a free choice in the scope of the waste management industry does not warrant achieving the goals assumed by the new law.

The recycling market has a huge potential. According to the official predictions, in 2020 Poland will generate 14 million tons of communal waste of which 50 % will be the recycling materials and 50 % of which will have to be recycled. This means that in 2020 some 3.5 million tons of materials will have to be recycled. Of crucial significance however is for everybody to understand how important the waste management industry really is in the world with limited and shrinking natural resources. In Poland, there is a great need for enhancing the ecological awareness of the society so that the proper handling of waste becomes the natural habit of everyone.

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