Especially the guidelines of the EU landfill directive and of the waste framework directive increase the pressure on the Polish waste management to change the disposal structures. Experts already assume that Poland will not manage many of the short and medium term deadlines and has to expect to pay high fines partly, despite of exceptions and temporally delay by the EU. There is a strong need to catch up, and in the coming years substantial investments into the retrofit and new construction of treatment, recovery and disposal facilities have to be effected.

There is a rising amount of collected waste [1]. It has to be announced that not only the will of the population regarding collection of waste material has slightly improved but also the state initiated important steps for the implementation of EU directives. According to a survey to experts the implementation occurs very slowly. Since January 1st 2011, for instance, an obligation to make waste available to the local authority exists. However, this is to be expected for the middle of 2011 at the earliest. So far households have free choice by their waste disposal contractors. Therefore it is often impossible to collect all waste because the households searched for their own ways of disposal. The new arrangement will cause a higher contingent of collected waste.

Figure 1: Municipal waste in Poland, 2009

Sources:
The main way of waste disposal in Poland is still landfilling. Nearly 78 percent of municipal waste goes to landfills in 2009 (87 percent in 2008). Only 14 percent are recycled and about 7 percent are composted (2009).

Incineration of waste de facto plays no role because there only exists one waste incineration plant with a capacity of 42,000 tons per year in Poland so far.

Up to now it does not succeed to achieve a waste sorting in households in spite of strongly increased disposal fees [3]. First of all, packaging waste is sorted collected, especially those of paper, plastics and glass.

The polish waste management act envisions the publishing of a national waste management plan (KPOG), which includes the aims to achieve for every four years. Until the end of 2013, every household should be linked to an organized waste disposal system according to the concept of the polish government. The waste volume of landfilled municipal waste should be decreased to a maximum of 60 percent until 2014. The reuse and recycling rate of paper, glass, plastics and metal should be increased by 50 percent until 2020. Incineration is directed as main disposal method for disposal areas with more than 300,000 inhabitants. Instead, in smaller disposal areas mechanical-biological treatment plants should play an overriding role [4].

In the reference scenario the first new waste incineration plants will be brought on line in 2013. Their total capacity will increase to about 1.8 million tons per year by bringing into service more incineration plants until 2016. By this time, the plants which get an EU-advancement by the funding period from 2007 until 2013 have to be built because otherwise the payback of the funding has to be done. Until 2020, the capacity of waste incineration plants increases to about 2 million tons.

Based on the continuing strong economy in the building industry, also the incineration capacities in cement plants will increase. This leads to the fact that simultaneously to mechanical-biological treatment plants increasingly mechanical-physical and mechanical-biological stabilization plants with the main goal of RDF production will be built from about 2017.

In the reference scenario plant capacities develop slowly in the first instance. There will be a strong extension between 2012 and 2015 and a circa constant slightly extension of plant capacities from 2016 on.

Based on legal requirements (inter alia a landfill ban of untreated and flammable waste, directives of waste sorting and the closing of landfills) the capacities of sorting plants and mechanical-biological treatment plants will increase especially between 2013 and 2016. The surveyed experts act on the assumption that huge foreign companies will change from the erstwhile trend of many small plants to the point of few plants with high capacities (> 100,000 t/a) in particular.

Until 2020, about 3,000 ha acreage of landfills should be closed and recultured. New landfill-capacities for about eight million tons of waste will be developed. Assuming a 20-year useful life, capacities of another 52 million tons have to be developed until 2027.

The Polish market for municipal waste, for the period from 2010 to 2020 in the reference scenario, a total investment of about 2.8 billion Euros for the construction of plant capacities for the treatment and recycling of domestic waste does exist. The incineration-capacities of coal and cement plants are also included into this amount. Based on the high costs per tons of about 900 Euro the highest investment volume exists for the waste incineration plants. For the construction of sorting plants a market volume of about 210 million Euros is assumed in the reference scenario by 2020, for mechanical-biological treatment plants it
The Polish Market for Municipal Waste Affords High Potentials

is about 570 million Euros and for the retrofit of old landfills as well as for the construction of landfills it is about 800 million Euros. Despite the higher plant capacities, the volume of investments for sorting plants is not as high as the one for mechanical-biological plants because of lower costs per tons. The costs per tons of sorting capacity for sorting plants are up to about 65 Euros; for mechanical-biological plants they lie between 200 and 450 Euros (in relation to the equipment and treatment rate).

The intensity of competition in Poland is rated actually as strong (32 %) to very strong (22 %) by the market members being interviewed within this study (plant constructers, waste manager and experts). Most survey participants (24 %) rated good references as the key criterion for an entry into the polish market. Another important criterion is the contact to businesses of the branch in the country; but for plant constructers also the price for components and plants is worth. First of all the strategy options of cooperation with established national industries is a huge benefit in Poland. Smaller industries are confronted with an intensive competition by the established industries on the polish market for years.

Figure 2: Number of sorting plants in Poland

- Number of sorting plants for mixed collected waste
- Number of sorting plants for separately and mixed collected waste
- Number of sorting plants for separately collected waste
The risks for the entry into the polish market were asked in the surveys, too. According to an estimation of the market members first of all risks exist in the implementation of the legal framework as for instance the already mentioned obligation to make waste available or the landfill ban of untreated and flammable waste. On the other hand, this results in uncertainty of the investment.

Based on the actual framework conditions and status quo, the study analyses the future development of the polish municipal waste market and gives an overview about the investments needed for new disposal capacities. Strategy advises, based on the competition analysis and the shown trends, chances and risks, make it possible to proof a strategic positioning of plant constructors and waste managers. trend:research uses different field- and desk-research-methods. Simultaneously to comprehensive intra- and internet-database-analysis (incl. magazines, publications, conferences, annual reports etc.), 36 structured interviews are included which were led in Poland and other European countries under this study with plant operators, waste managers and conditioners, plant constructors and component manufacturers, administrations and alliances as well as other experts of the branch. Furthermore the relevant survey results from the actual studies Waste-to-energy until 2030 (3rd ed.) and sorting plants in Europe by 2025 were implicated.

**Literature**


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