Training seminar for local authorities

Let's be ready for 2020 - how to increase recycling in the municipality.

Training materials

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Seminarium dofinansowane ze środków Visegrad Fund w ramach projektu
Reduce, reuse, recycle: regional policy and local actions

Let's be ready for 2020 or how to increase recycling in the municipality - free training seminar

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Waste production is one of the most serious environmental problems. For several years there has been a growing interest in waste management in Poland, not only in technologies to reduce their quantity, but also in activities aimed at their disposal and often economic re-use.

1. How much waste is produced in Poland?

In Polish, responsible for the implementation of changes in the waste management are municipalities. According to data published by GUS for 2015 outcome that the average Polish citizen produced 282kg of municipal waste per year. However, according to Grzegorz Wielgosiński PhD. Eng. from the Department of Process Engineering And Environmental Protection University of Technology in Lodz This value can be much higher and even be approx. 400 - 420kg / year. These discrepancies may arise primarily from the ambiguous calculation of municipal waste in municipalities. Building waste and green waste are not often included in municipal waste, whose presence significantly increases the annual mass of waste produced. However, even considering the lower value (given by GUS), the amount of municipal waste generated is still very high and in 2015 it amounted to 10.9mln tonnes (of which only 2.9 million tons were recycled, 1.7 million tons of composting, 1.4 million tons of thermal treatment in incineration plants, and 4.8 million tons were deposited in landfills.) The percentages of individual ways of dealing with municipal waste are shown in Fig.1.

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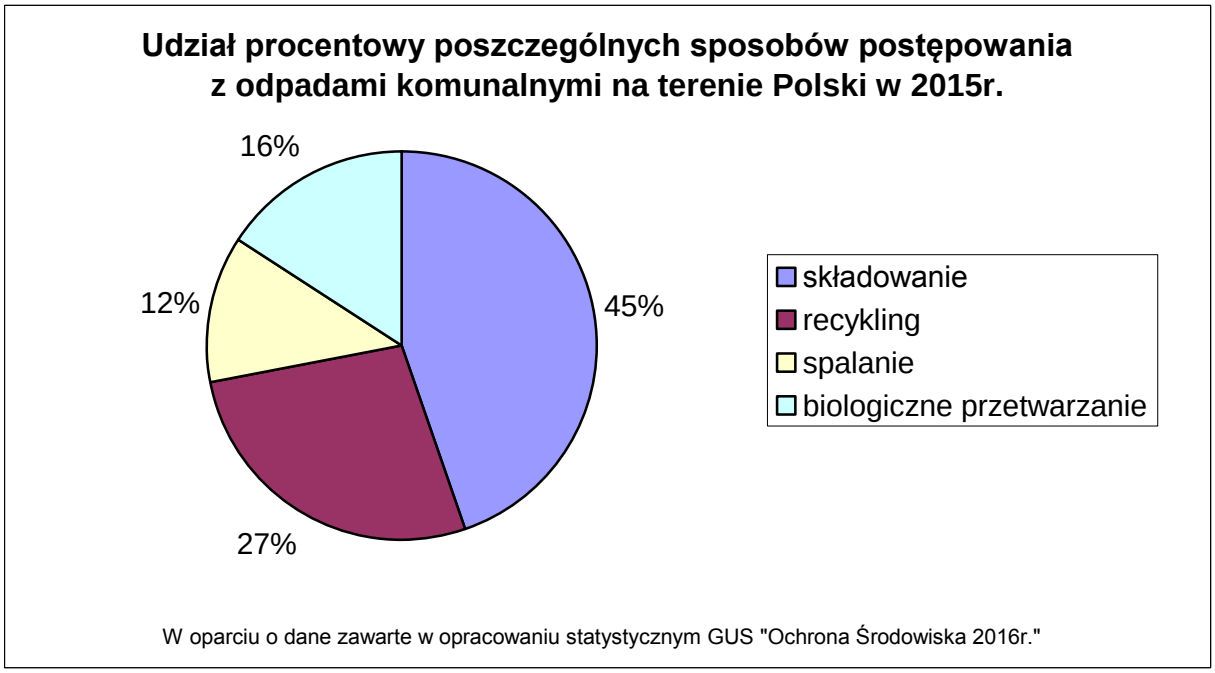
Fig.1 Methods of treatment of municipal waste in Poland - percentage share.



2. How to increase the effectiveness of selective waste collection and recycling in municipalities?

Based on the experience of other European countries, we can get a lot of ideas on how to reduce the production of municipal waste by using simple, cost-effective solutions. Here are some suggestions that have been formulated by PKE in a leaflet addressed to the Municipalities and Cities of the Silesian province in 2015.

1. Promote borrowing or exchanging rarely used equipment. Creating in the community "used things corner", where you can leave unnecessary items / equipment which can be used by others.
2. Promote the activity of food banks. Encourage prudent food purchases and efficient use in households and in restaurants
3. Promotion of reusable equipment.
4. Propagating "Economic shopping", encouraging the purchase of products in bulk or returnable packets, promoting "loosely" products - not packaged individually - packaging waste reduction
5. Support for eco-design companies that aims to reduce waste at the planning stage of production.

6. Introduction of "Green Public Procurement" in the offices and institutions and education on waste prevention options (double-sided printing, leasing, etc.).
7. Education in the area of conscious purchase of means of subsistence and equipment of catering facilities.
8. Encouraging the use of rental equipment such as travel equipment, sports equipment, etc.
9. Develop a local website / brochure / guide that will help local community to reduce household waste
10. Promotion of ecological and eco-labeled products
11. Create self-repair sites, and thus reuse electronic equipment, bicycles, furniture, toys, etc.
12. Creation of a local portal / informant for the exchange or sale of reusable products, organizing regular exchanges / sales of used equipment
13. Promote the use of "no" stickers on mailboxes, in order not to receive unaddressed advertising correspondence
14. Promote individual composting
15. Establishment of wood banks - places that will collect timber from, for example, construction sites, sort and sell for household, artists or firewood. Prices should be strongly competitive relative to common available firewood
16. Organize collections of unused paint, remaining after repairs, which will be transferred for social purposes
17. Changing the procurement policy of institutions and offices in terms of equipment for meetings and conferences - resignation from plastic plates, cutlery or food packed individually and beverages in plastic bottles
18. As a comprehensive solution, we can use the seven steps rule: collection of the organic fraction, a program to promote the exchange of unnecessary equipment between residents, introduction of new technologies in the field of waste management, change the mixed wastes bins on the streets with containers for segregated waste, reusable material collection programs, Home and garden composting and volume limits in the collection of waste.

19. It is also worth considering the introduction of restrictive penalties for storing waste outside designated areas and for other processing such as incineration in domestic central heating systems
20. Introducing a waste prevention policy. Zero waste policy should be included in employee training and widely promoted in all community centers (schools, libraries, offices, etc.). Consideration should be given to the introduction of economic instruments that will divert waste from landfills towards re-use of raw materials, recovery and composting.
21. Introducing additional benefits to society - positive incentives, to effectively start up and consolidate participation in recovery programs.
22. Introduction of eco advisors who will meet with the inhabitants of the municipality individually (or in small groups) in order to consolidate methods of changing consumer practices and approximate the rules of reducing waste in the household.

3. Wastes in EU and national legislation

It is important to have an appropriate environmental legislation. Among the numerous legal acts, including those of the EU, which are binding in Poland, are: Directive 2008/98 / EC on waste and repealing certain Directives and Council Directive 1999/31 / EC of 26 April 1999 on the landfill of waste. These directives define a number of constraints and regulations regarding waste management in Poland, including the reduction of biodegradable waste directed at a landfill or the recycling of 50% of all municipal waste. Most municipalities in Poland realizes with full responsibility guidelines Poland posed by the European Union. Unfortunately, there are still those who prefer to pay contractual penalties, the value of which is significantly lower than the cost of the change in waste management. The solution would be to introduce more severe penalties, however, there is still a lack of legal regulations in this area. It is doubtful that the assumptions of the laws (including recycling levels) will be fully realized. Among the difficulties that may arise, it is worth mentioning:

1. Lack of public education on the segregation of waste, despite many years of transitional period intended to prepare for the implementation of the law
2. The lack of technological facilities (segregation and composting facilities), which allows proper sorting / recycling of waste by waste companies

3. Too slow progress in selective collection of municipal waste, including hazardous waste, mixed with municipal waste
4. Despite the success of segregating packaging waste in the trade sector, this has not been replicated in households.
5. Non - harmonized procedures for reporting waste management in municipalities.
6. Not achieving the required level of selective collection of spent household equipment of 4kg / capita / year, which was due until 31 December 2008.
7. A portion of the waste electrical and electronic equipment is disposed of at scrap collection points and the waste is not adequately managed and is not subject to registration and filing.
8. It’s disturbing that waste landfills still exist which do not even meet the formal requirements for being considered as such facilities.

Poland's ecological policy, as well as its international obligations in the field of waste management and environmental protection, should shape proper attitudes, based on the belief that nothing is lost in nature. It is worth pointing out that adequate environmental awareness leads to faster and more sustainable achievement of the objectives set. It is therefore important to draw public attention to limiting the production of municipal waste as well as increasing recycling and preserving environmental attitudes. In the waste management, health and economic motivations are crucial. Incorrect collection or disposal of waste can lead to high epidemiological risks. On the other hand, economic issues are an impulse for the selective collection and minimization of the amount of municipal waste, the lower of which contributes to the reduction of the costs to the inhabitants.

The requirements of the European waste directives are an important force for the development of waste management. It has to be noted, however, that compliance problems are often the result of a non-uniform and unclear methodology for determining basic historical data on waste production.In countries where the requirements of European waste management legislation are not fulfilled, also in Poland, this pressure can be used to enforce the use of certain procedures and technologies that give rise to a rapid deception and easily meet the goals set. One of the representative examples may be the noticeable increase in the number of planned projects for the construction of municipal waste incineration plants. In the Landfill Directive 1999/31 / EC in article

5 requires the reduction of biodegradable waste directed to landfills to 75%, 50% and 35% compared to the amount of waste produced in 1995, by 2006, 2009 and 2016 respectively. However, Poland does include an exception to this requirement, including the possibility of meeting the abovementioned objectives with a deferral of 4 years (due to the fact that the percentage of municipal solid waste deposited in these countries exceeded 80% in 1995). In addition, the Directive lays down (Article 6) the need for waste treatment which is directed to landfills. In the Waste Framework Directive 2008/98, there is another requirement, ie the need to recycle at least 50% of paper, plastic, glass and metal from municipal waste and similar waste from retail outlets. The assumptions of our local legislation (National Waste Management Plan) require municipalities to demonstrate a 50% level of municipal waste recycling by 2020. All EU members are preparing for re-use and recycling of municipal waste at 65% (including 75% for packaging waste) up to 2030r. Another objective in this period is to reduce the storage of municipal waste to 10%. This means that both local and EU legislation obliges us to reduce the amount of landfill waste and to increase the amount of waste reused.

4. Waste incinerators, is it the best way to manage waste?

One of the increasingly proposed ways of managing the ever increasing number of municipal waste is to heat them in incineration plants. This solution is popular in Western European countries, however, based on newer and newer technologies. Most of the planned incinerators in Poland are to be based on grate technology, which was widely used in Germany in the 1970s and is currently being phased out. Grate burners are, unfortunately, an inefficient way of thermal recycling of municipal waste. These wastes have a low calorific value (about 7MJ / t average) to achieve a combustion temperature of 800-1000ºC without additional fuel (an increase in calorific value of approximately 18MJ / t of refill is required). More than this, due to the heterogeneity of batches of waste fed to the incinerator, its calorific value is highly diversified.

Waste incineration is a significant source of secondary pollutant emissions into the environment. The process of thermally converting inhomogeneous materials such as waste (not only municipal but also industrial, medical, etc.) is the source of many toxic and even carcinogenic substances released into the air. Even with the best technology, the combustion process is never perfect, resulting in significant amounts of intermediate decomposition and

oxidation products in the waste. The main disadvantage here is the combustion temperature of the order of "only" 1000 ° C, where many chemicals are not fully destroyed, resulting in numerous hydrocarbons, phenols, ketones, aldehydes, phthalates and acids in the exhaust (Eduljee 1994). Independent studies have confirmed the presence of more than 350 organic compounds in concentrations of more than 5 µg / m3 and numerous metal vapors such as mercury, arsenic, selenium and cadmium. In addition, due to the presence of unsaturated organic substances in the waste, thermal synthesis of polycyclic aromatic hydrocarbons with proven carcinogenic activity occurs during their thermal processing.

As a result of incineration of waste, many solid residues are generated in addition to the flue gases. The diagram below (Fig 2) shows the solid waste generated at the incineration plant, together with the percentage of their contents.

Rys.2. Percentage share of individual residues after thermal treatment of municipal waste

(The diagram was taken from the study by. Grzegorz Wielgosiński PhD. Eng. from the Faculty of Process Engineering and Environmental Protection, Lodz University of Technology "New Energy - an add-on to the thermal conversion of municipal waste".)

It is clear from the above scheme that 100 t of municipal waste incinerated in the incineration plant generates more than 30% of the waste, many of which are considered hazardous. According to the waste catalog, as defined in the Regulation of the Minister of the Environment of 29 December 2014, the above residues after combustion are classified as follows:

- Slag after the combustion process - code: 19 01 11 *) or 19 01 12
- solid wastes from waste pyrolysis - code: 19 01 17 *) or 19 01 18
- waste from the exhaust aftertreatment process:
    - fly ash - code: 19 01 13 *) or 19 01 14
    - dust - code: 19 01 15 *) or 19 01 16
    - filtering pans, sludges and other waste from flue gas cleaning - code: 19 01 05 *), 19 01 06 *), 19 01 07 *
    - spent sorbents (activated carbon) from the exhaust aftertreatment process - code: 19 01 10 *)

Of which the waste considered as hazardous was marked *). It follows that in the process of burning municipal waste, waste is much more problematic and requires special treatment. Methods of managing the above-mentioned residues after incineration are shown in Table 1.

Tab. 1. Hazards and treatment of secondary waste from the thermal process of waste recycling

Type of waste	**Danger**	**Procedure**
Slag and ash furnace	Dependent on the washability of heavy metals and test results specified in the Regulation of the Minister of the Environment on the conditions for the recognition of non-hazardous waste	In the case of low metal washability, construction of use or disposal at non-hazardous or inert waste landfills, in other cases, hazardous waste landfill
Pyrolysis coke (pyrolysis residue or gasification residue)	High risk due to the content of organic substances and dioxins	Incineration in hazardous waste incineration plant
Fly ash and dust from dust extraction systems	High threat due to heavy metal content and dioxin	Hazardous waste landfill, indicated solidified by concreting waste into blocks
Solid reaction products from gas purification systems	High threat due to heavy metal content and dioxin	Dangerous waste landfill, indicated concrete concretion of waste into blocks
Sewage sludge settlements	High threat due to heavy metal content	Dangerous waste landfill, indicated concrete concretion of waste into blocks

Used catalysts	High threat due to heavy metal content	Hazardous waste landfill or processing plant
Spent activated carbon	High threat due to heavy metal content and dioxin	Most often incineration in a hazardous waste incinerator (may be in its own in addition to other incinerated waste) or deposited in hazardous waste landfills

(The table is taken from the paper by Grzegorz Wielgosiński, Ph.D., Eng., from the Faculty of Process Engineering and Environmental Protection, Lodz University of Technology "New Energy - additive for thermal conversion of municipal waste").

It should be emphasized that the investment and operational costs of the incineration plant, compared to other waste treatment methods, are extremely high (even 5 times higher than the cost of construction and operation of the storage or composting plant). In addition, the actual cost of using such facilities is much higher than the design estimates. An example here is a waste incinerator in Poznań, put into operation in 2016. The cost of disposing of 1 t of municipal waste was estimated at about 600-700 PLN. In the meantime, the French company that builds this facility, the cost was set at at least 1200zł. For comparison, residents of the German Hanover in 2010 paid for recycling 1 t of waste about 400 euros.

In conclusion, grate incinerators are not the best option in the fight to reduce the amount of municipal waste directed to landfills. The environmental or economic aspect is ambiguously.

5. Is there an alternative to an incinerator?

Much cheaper and more efficient way to recycle non-recyclable waste is the vacuum pyrolysis. In this technology, the same types of waste can be disposed of in conventional conventional incineration plants, but they must be properly ground and homogenized to produce much higher calorific value. The main effect of pyrolysis is to reduce the volume and weight of waste while simultaneously storing their calorific value in market products such as gas and coke. It uses the fact that the water contained in the waste decomposes under appropriate conditions for oxygen and hydrogen. Fumes produced during this process are condensed and recycled. Interestingly, pyrolysis can recover chromium, copper or silver. The greatest advantage, however, is that the whole process is carried out under anaerobic conditions, resulting in no dioxins, furans or other toxic compounds produced by grate technology. Ecological energy generators for vacuum pyrolysis have been built in Poland

already several dozen and they are perfect for waste disposal without the emission of dangerous gases into the environment.

It should be stressed that the thermal transformation should only be subjected to this residue of waste, which, having previously carried out other disposal methods

Ie among others Recovery, recycling, composting; It has lost its usefulness but can still be used as an energy source. Plastic cullet, plastics, metals or paper can be sold, biological waste composted, construction waste from eg demolition can be reused as an aggregate, even for road construction. Once the waste is disposed of in such a way, the raw material suitable for incineration in the incineration plant is too little for the construction of further such facilities to be economically justified. An interesting example of recycling is Portugal, where no fees are levied on the citizens for waste disposal. Furthermore, waste disposal companies are demanding the introduction of sanctions for stealing waste from public bins. Waste is the raw material on which you can make a profit, and therefore the sale of recyclables is a lucrative venture worth bending over.

To sum up, in order to improve waste management, we have to create a system based on second hand goods to borrow, share, produce and repair the highest quality stuff. And above all, fully realize that we do not really inherit the Earth from our parents, but we rent it from our children.

Good practice for the collection of recyclable materials in Tychy

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According to the indication of the title, selective collection of waste can not indicate one behavior or method that would affect the desired effects of the collection of secondary raw materials, ie the achievement of legal recycling targets that should be achieved within a given time frame.

At this point I would like to point out the elements that make up the so-called. Good practices worked out, but further developed in Tychy.

Among the elements that should be pointed out are:

- Ensure proper infrastructure and operation,
- Shaping awareness of the local community,
- Co-operation of responsible entities.

In the first place, it is necessary to explain what we mean by providing the right infrastructure and its service. Proper and effective collection of recycled materials at source, ie at their place of origin, is not possible without the provision of waste collection tools to waste generators in accordance with the schema adopted in the municipality. In the case of Tychy we talk about the distribution of municipal waste to the following basic fractions:

- general waste (mixed municipal waste),
- waste plastics,
- waste paper and cardboard,
- waste packaging glass,
- biodegradable waste (green waste),
- Construction and renovation waste,
- large-scale waste and waste electrical equipment,
- other waste fractions.

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At the time when, pursuant to the amendment of the Act of 13 September 1996,

On maintenance of cleanliness and order in municipalities, the city became the entity responsible for the collection and management of municipal waste from property owners, it was decided to introduce a complex system of segregation of waste at source, it resulted both from the inconsistent interpretation of the provisions of the law at that time and the emphasis placed on maximizing the collection effect Secondary materials at their place of origin.

In order to ensure the proper implementation of local legislation, the municipality provided residents with the infrastructure to properly collect waste. In the family housing was introduced so-called, bag collection of recyclable materials. At present, more than 7,700 households receive paper and cardboard bags, plastics, packaging glass and so-called. Green waste of the parameters and in the number meeting their needs for collection of waste. Multi-family housing is in turn over 500 places equipped with containers for selective collection of municipal waste, which thanks to proper location and labeling give residents of multi-block buildings the possibility of proper collection of secondary raw materiale. The real estate itself was just the beginning, as it was also necessary to adjust the frequency of emptying the containers to the amount of waste collected. After more than three years of experience, we have observed the validity of the assumptions, although in every field and in the case of waste reception, the system should be continuously monitored and necessary adjustments made to achieve the intended purpose.

Thanks to the solutions adopted in the last two years at the source, the following quantities of waste collected selectively:

- In 2015:

Type of waste	**quantity** [in Mg]
Plastics	1 649,29
Paper and paperboard	1 373,04
Glass packaging	1 518,67
Metals	8,32

- In 2016:

Type of waste	**quantity** [in Mg]
Plastics	1 780,42

Paper and paperboard	1 400,13
Glass packaging	1 499,65
Metals	15,26

In 2015, the municipality achieved a 20.75% recycling rate, preparation for reuse and recovery of paper, metal, plastics and glass. In 2016 the level increased to 22.36%.

At this point it should be added that starting from the end of 2015 in the municipality introduced the obligation to selectively collect ash waste from home furnaces. This action was aimed primarily at improving the quality of general waste resulting from residential developments, which in turn better fulfills the conditions for their recovery in the installation. This allows for increased recovery rates, which for various reasons have not been selectively collected at source. On the other hand, selective collection of ash allows one to combat another negative phenomenon of waste incineration, through the control of the quantity of waste generated on the property during the heating period but also outside it. For the realization of the goals municipality took over the duty equipment estate with means for the proper collection of such waste. In 2016, the municipality received 1 492.21g ash waste. At present selective ash reception in the municipality covers 3 885 properties.

Another tool to help residents of Tychy to selective collection of municipal waste are Selective Collection Points. Since the beginning of the existence of the communal system of collection and management of waste in the municipality there are three Points, whose geographical position allows for trouble-free arrival of residents from each part of Tychy. The undoubted success of these points in the municipality is also influenced by their temporary availability, allowing residents to transfer waste to each of these places. This reflects the figures according to which in 2016, Points have been used by 11 369 inhabitants, that is, in practice, every eleventh resident of the municipality. They left at the Point of less than 2 270 Mg of waste, or nearly 5% of all municipal waste generated in the municipality in 2016. It should be emphasized that from year to year we observe an increase in the number of people interested in using the Points. Their presence in the municipality has translated into a reduction in the so-called wild dumps, liquidated annually in the city.

According to the adopted organizational chart and the service of the Points, the inhabitants have uninterrupted access to them and can use their services without any restrictions. At this

point, we should also mention the operating system in the municipality of receipt of the specific category of waste, which is waste of expired medicines. Currently, the system includes 19 pharmacies in which residents can leave the above mentioned waste. It should be added that the municipality is trying to ensure that their location does not cause "white spots" on the Tychy map in their availability to the local community. The existing solution allowed to collect 3.04 Mg of waste in 2016.

Going to the point of formation of awareness of the local community about the way of collecting waste and the appropriateness of adopted solutions one should point out the broadly understood educational, promotional and informative activity carried out by the municipality in the discussed scope.

The starting point for the above-mentioned activities was up wide to inform residents about the new general principles of waste collection has been made in 2013. Starting from that moment, we have adopted a directional scheme for influencing the awareness of the inhabitants through the annual typing of target groups to which educational and information activities will be addressed. In addition to educating the youngest inhabitants of our city, either through meetings of kindergarten students with a collection of secondary materials and connected games and games, or through interactive presentations addressed to primary school pupils, annual meetings are held with the inhabitants of Paprocany OW. They can get information on how to handle waste, look closely at the equipment the municipality is carrying out on a daily basis to collect waste, and the youngest to participate in games and play may find that waste collection is more than putting them in the bin. First of all, one should mention the campaign "Tyski preschooler knows how!" prepared by the municipality and carried out in November 2014. - February 2015. It took three thousand children aged four to six, who learned the rules for collecting recyclables, and had the opportunity to use their knowledge through play. This allowed the preschoolers to receive the title of "Waste Separation Master" honored with a commemorative medal for each of them. In 2016, educational activities were directed to pupils of primary school IV, presented in multimedia form as the essence of proper waste management, with particular discussion of waste management practices.

In addition, the municipality participates in meetings with residents who provide information on how to collect waste and its main purpose. Actions are being taken to ensure that the topic of waste collection is addressed in local media - both traditional and electronic.

Through good practice we also understand cooperation with responsible actors, that is, in the first row of the so-called. Service provider, other municipality organizational units, uniformed services and representatives of housing communities, housing councils and public benefit organizations.

It should be remembered that the role of the Service Provider is not only to receive waste, transfer them to the development and issue to the municipality appropriate documents. The attitude of the service provider's employees and the proper performance of the tasks entrusted to them are the basic manifestations of the municipal waste reception and management system. Also, the activity of the Service Provider taken over the contractual framework positively influences the ecological awareness of the inhabitants. Of course, such activities must be coordinated with the municipality to ensure a coherent message for the residents.

Involvement of representatives of uniformed services - primarily the municipal police - in the matter of proper waste management is desirable from the point of view of direct contact with the inhabitants and having the right tools to act against the bad practices in waste collection. Constant contact with property managers and representatives of residents also fulfills the postulate of cooperation. Thanks to their comments and observations, the municipality has the possibility of continuous improvement of the system and acting in the opposite direction - direct influence on the smallest groups of inhabitants of Tychy. The issue of cooperation with organizations operating in the sphere of environmental protection is similarly presented.

Prior examples of good practice do not reflect the complex problem of ensuring proper management of municipal waste in Tychy, but they are manifestations of municipal action in the desirable direction of increasing the rates of waste recovery.

The economics of the selective collection of recyclable materials in the light of the waste management plan for the Silesian province for the years 2016-2022

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The waste management in our country has changed radically over the last few years and it is the responsibility of the municipality to maintain the cleanliness and order in the municipality and for many years has been a kind of business practically practiced exclusively by municipal entities. Systemic change, accession to the structures of the European Union has led to the development of entities dealing with this part of the economy, changing the approach from purely municipal to business-environmental model in waste management.

Legal changes related to the adjustment to EU directives imposed targets to achieve high levels of resource recovery from waste cause the waste begins to have an intermediate value, which must be properly processed to achieve the expected profit and not necessarily financial and mainly environmental.

Introduced selective waste collection mobilizes our society to pay attention to what and where we throw away. The question is whether we really do it right and how many of us sort the waste by paying attention to what and where we throw it. An important element will be the standardization of this process so that in each municipality the segregation of waste operates according to the same rules. The above mentioned standardization was defined in the Ordinance of the Minister of the Environment of 29 December 2016 on the detailed method of selective collection of selected fractions of waste. However, it is important to remember that the most important element of waste thinking is to prevent them from forming, and in this case, every citizen can be an important part of the process.

The question of how to dispose of our waste is a key issue in considering waste segregation so that residents effectively and reasonably segregate waste. Can changes in regulations or waste management plans help? Or perhaps greater diversification of the fees for collection and disposal of mixed waste and selectively collected from residents? Of course, education is important, but it is carried out for a long time and its effects certainly are not what we expect.

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This Ordinance of the Minister of the Environment on the detailed method of selective collection of selected waste fractions systematizes the approach to segregation of waste, although the principles set out in this document have been functioning in many municipalities for a long time. By separating waste we need to change attitudes towards what they are. As previously mentioned, waste is selectively collected as an intermediate or recycled material that can be recycled or recycled into wholesome products that are often used for everyday use.

Taking into consideration that segregation of waste often gives them "second life" is it proper to think about waste incineration? Existing levels of recovery of packaging fractions such as plastics, paper, metals and glass are increasing, from 20% in 2017 to 50% in 2020.

The waste management plan for the Silesian Voivodship 2016-2022 (VWMP) assumes the construction of as many as 8 new municipal waste thermal treatment plants (ITPOK). If we assume that we are analyzing ITPOK installations for the management of residual waste after MBP processes including the incineration of alternative fuels produced from municipal waste, then the decision seems reasonable as long as the processing capacity of these installations is not overestimated. However VWMP for the Silesian province provides for the purpose of monitoring activities in the field of municipal waste management capacity ITPOK for mixed municipal waste, and here the question arises, to what end?

Targets for municipal waste management as defined in the Silesian province VWMP determine:

a) Achieve a level of recycling and preparation for reuse of fractions of paper, metals, plastics and glass from municipal waste by a minimum of 50% of their mass by 2020,

b) By 2020, the share of thermally transformed municipal waste and waste from the treatment of municipal waste in relation to municipal waste generated can not exceed 30%

c) By 2025 recycling should be subject to 60% of municipal waste,

d) By 2030 recycling should be subject to 65% of municipal waste,

e) Reduction of municipal waste storage to a maximum of 10% by 2030

With this in mind, we need to recover a minimum of 50% of the fractions collected selectively, to reach 65% recycling of all municipal waste, and plans up to 70% of the EU whether we have a place for the legitimacy ITPOK for mixed municipal waste? The answer is obvious.

Thinking about reducing waste generation, segregation, reuse should be a priority for us as one of the key elements of the environment..