Urban waste for biomethane grid injection and transport in urban areas

Project No: IEE/10/251

Results of the survey on waste management in Rzeszów - Poland

WP 3 – Task 3.5 / D 3.5

October 2011

POLSKIE STOWARZYSZENIE BIOGAZU
Polish Biogas Association

Authors: Michal Surowiec, Polish Biogas Association

Editors: Michal Surowiec, Polish Biogas Association

Contact: Polish Biogas Assocation
Michal Surowiec
Email: Michal.surowiec@pba.org.pl, Tel: +48 (58) 622 81 81
Al. Zwycięstwa 94/96
81-451 Gdynia, Poland
www.pba.org.pl

The UrbanBiogas project (Urban waste for biomethane grid injection and transport in urban areas) is supported by the European Commission in the Intelligent Energy for Europe Programme). The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EACI nor the European Commission are responsible for any use that may be made of the information contained therein. The UrbanBiogas project duration is May 2011 to April 2014 (Contract Number: IEE/10/251).

UrbanBiogas website: www.urbanbiogas.eu

Contents

1. Aim of the study and the profile of the sample _____4

2. General information and habits regarding waste management _____4

3. Existing waste management infrastructure and the level of residents' satisfaction _____6

4. Education and awareness_____6

5. Issues and possible actions_____7

6. Conclusion _____7

1. Aim of the study and the profile of the sample

The aim of the study was to assess the possibility of introducing additional waste separation. The study was carried out between June and August 2012 in the Rzeszów region and covered 1000 respondents, who received the **questionnaire survey** by e-mail.

Most of the respondents were female (61%). The average age of respondents was 42.5 years in females 44.2 years in males. The majority of females reported having an intellectual profession, such as office assistant, office employee, teacher and others. The majority of male respondents were engaged in manual labour (construction workers, drivers, welders and other trades). The average household size was 4.2 people. The majority were living in flats (69% of all respondents).

2. General information and habits regarding waste management

The results of the study helped verify respondents' habits with regard to waste management. The majority of respondents (81%) reported that they paid attention to the amount of waste generated in their households. The average quantity of waste per household was approximately 522 kg per year or 43.5 kg per month. Larger amounts of household waste were reported by women. All respondents were well informed as to the amount of waste they produced. They were also asked to order waste based on their quantity and type on a 1-7 scale, where “1” referred to the type of waste generated in the smallest quantity in a given household. The most common types of waste produced by respondents are shown in Figure 1. Respondents reported no hazardous waste in their households.

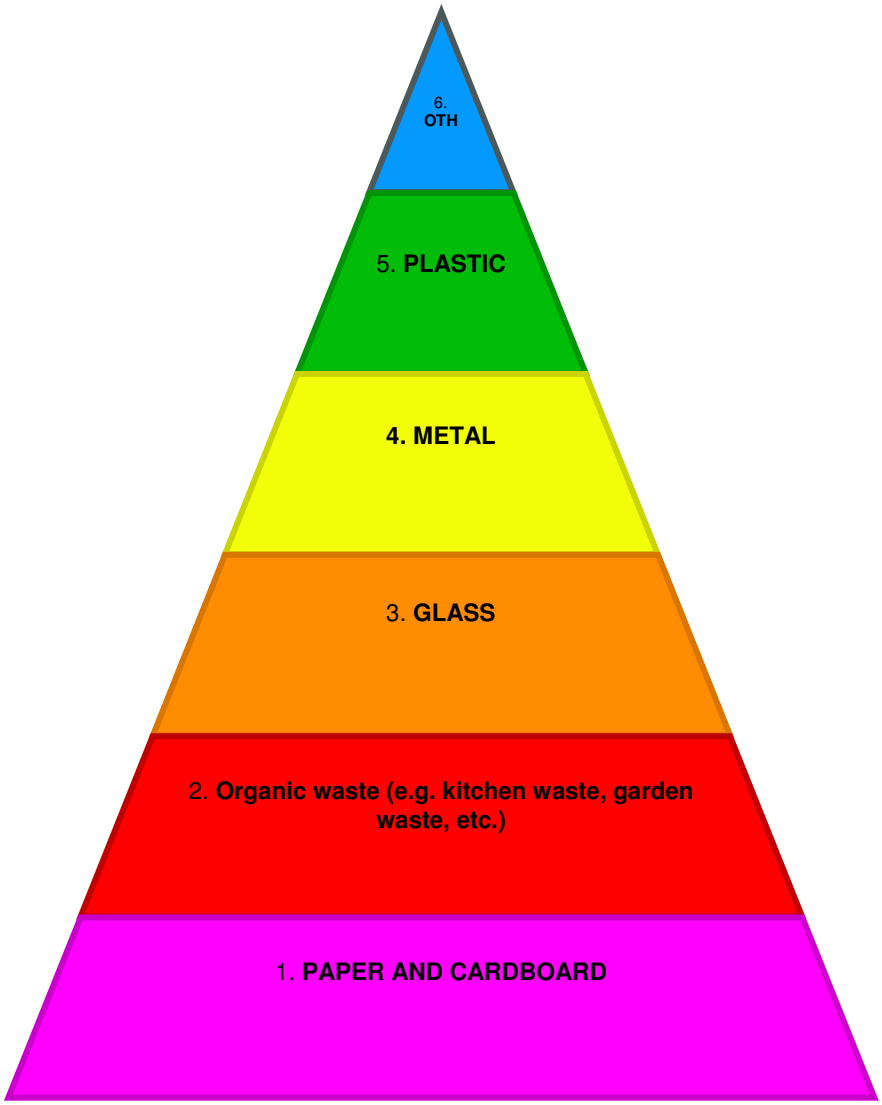

Figure 1. Hierarchy of waste with regard to their type and quantity – based on survey results

As many as 96% of respondents reported sorting waste generated in their households and work. Out of these, the majority were female. Respondents sorted all types of waste and displayed a high level of environmental awareness. The most common reasons for waste sorting they reported include:

- acknowledging the necessity of recycling,
- awareness of the need to minimize the amount of waste,
- pro-environmental lifestyle,
- reducing the costs of waste management,
- protecting the natural environment.

The main reason for not sorting waste reported by respondents included lack of time (3% of all respondents), while 1% claimed that waste sorting was pointless, as all their waste was collected by a single, multi-purpose waste disposal vehicle.

The majority of respondents utilised organic waste, including kitchen and garden waste, by sorting it for recycling (53%) or by composting (11%). The rest of them disposed of organic waste into an all-purpose container which is then taken to a landfill.

The average monthly cost of waste management per household reported by respondents living in single-family houses ranged between 85 PLN and 150 PLN, while in the case of those living in flats it was much lower, ranging between 28 PLN and 35 PLN. Most respondents (84%) paid the charge for household waste collection to a privately-owned public utility, and the rest paid the charge to a public utility owned by the municipality.

3. Existing waste management infrastructure and the level of residents' satisfaction

Waste management infrastructure significantly affects the satisfaction of nearby residents. 100% of respondents stated they were satisfied with the existing waste management system in the Rzeszów municipality, as well as with the amount of waste collected monthly, while 84% were satisfied with the city's waste sorting infrastructure. Those who were dissatisfied reported a long distance to the nearest sorting containers from their households. The vast majority of respondents believed that the scope of waste sorting was satisfactory (99%). The same number of respondents reported that there were waste sorting containers available near their homes.

4. Education and awareness

The majority of respondents (85%) believed the amount of waste disposed of in landfills should be reduced. In their opinion, municipal authorities should take appropriate action towards minimizing waste production (100%).

Most respondents (84%) were able to propose solutions for waste reduction. Some interesting examples included burning paper and cardboard waste in fireplaces and/or stoves, buying only drinks packaged in glass, using reusable shopping bags (made of fabric), buying products in bulk packs (e.g. sugar, washing powder, coffee, etc.).

Respondents could list a number of organic waste recycling methods other than land disposal (79%). The recycling of organic waste (including waste separated from municipal solid waste), apart from serving its fundamental purpose, which is to limit the amount of landfilled municipal waste and reduce reliance on landfill sites, should also be economically viable. One of the methods which have so far partly solved problems related to landfilling organic waste is landfill degasification. However, it seems more reasonable to recycle organic waste before they are landfilled, which involves the ned to introduce selective waste collection and biological processing solutions in an organised fashion. Once separated, waste can be subjected to aerobic treatment (composting), anaerobic treatment (fermentation), or a combination of both. The composting of easily decomposing biological waste with high water content may be problematic due to the possibility of anaerobic zones developing within the composting pile. Similarly, not all types of waste suitable for composting can be treated using the aerobic process. Just as traditional methods of organic waste composting require substantial outlays for maintaining open-air piles or special bioreactor systems, so anaerobic fermentation of ground-up and hydrated waste requires expenditures on constructing closed fermentation chambers. Generally, each of these processes is considered effective as long as it is carried out properly and yields meaningful and measurable results.

Most respondents rated their knowledge level in the area of waste sorting as good (64%), very good (26%) or fair (10%), while the level of knowledge in the area of organic waste

recycling, for instance through biogas production, was mostly rated as fair (56%), good (23%), very good (11%) and poor (10%).

In respondents' opinion, information on waste sorting delivered by public institutions was sufficient (98%). Respondents are aware of the existence of information sources on sustainable waste management (99%). The sources reported most often include: municipal (communal) office, waste removal companies, ecological societies, web sites.

Only a minor percentage of respondents (11%) had taken part in a training on waste sorting or biogas production from organic waste. Nevertheless, municipalities and communes hold various events aiming to familiarise residents with the problem of waste sorting. There are also relevant programmed addressed to children and teenagers. The study indicates that respondents displayed marginal interest in attending a training on waste sorting or biogas production from organic waste (only 7% were interested).

5. Issues and possible actions

A clear majority of respondents claimed that the current waste management system involving the collection of waste to separate containers by municipal authorities did not cause any problems for them (96%). The other group of respondents were of the opinion that there was a low level of environmental awareness and knowledge in the society and pointed out an excessive lack of control over hazardous waste.

All respondents (100%) declared that they would be willing to support the municipal authorities of Rzeszów in an attempt to reduce the amount of biodegradable waste disposed of in landfills. The majority admitted they saw no need to use additional containers designated for organic waste (79%). In most cases, respondents displayed no interest in acquiring their own containers for storing organic kitchen waste (91%). The remaining portion of respondents were of the opinion that waste from such containers should be collected every second day.

In the view of respondents, the distance from their place of residence to the point of waste sorting was an extremely important factor (85%). Additionally, the maximum distance should not exceed 100 metres. 65% of the sample claimed that they could devote their time to sorting their household waste. They would not like, however, to incur any additional costs related to the collection of an increased amount of segregated waste (83%). The other respondents declared they could spend up to 30 PLN for this purpose.

Respondents stated they would support an idea of constructing an organic waste sorting facility (21%). The majority were against locating any waste management facility near the town or city where they lived (95%).

6. Conclusion

The aim of the study was to assess the possibility of introducing additional waste separation.

The results of the study helped verify respondents' habits with regard to waste management. The majority of respondents (81%) reported that they pay attention to the amount of waste generated in their households. The average quantity of waste per respondents' households was approximately 522 kg per year or 43.5 kg per month. Larger amounts of household waste were reported by women.

As many as 96% of respondents reported sorting waste generated in their households and work. Out of these, the majority were female. Respondents sort all types of waste and display a high level of environmental awareness.

The majority of respondents utilised organic waste, including kitchen and garden waste, by sorting it for recycling (53%) or by composting (11%). The rest of them disposed of organic waste into an all-purpose container which is then taken to a landfill.

Waste management infrastructure significantly affects the satisfaction of nearby residents. 100% of respondents stated they were satisfied with the existing waste management system in the Rzeszów municipality.

The majority of respondents (85%) believed the amount of waste disposed of in landfills should be reduced. In their opinion, municipal authorities should take appropriate action towards minimizing waste production (100%).

Most respondents (84%) were able to propose solutions for waste reduction.

Most respondents rated their knowledge level in the area of waste sorting as good (64%), very good (26%) or fair (10%), while the level of knowledge in the area of organic waste recycling, for instance through biogas production, was mostly rated as fair (56%), good (23%), very good (11%) and poor (10%).

A clear majority of respondents claimed that the current waste management system involving the collection of waste to separate containers by municipal authorities did not cause any problems for them (96%). The other group of respondents were of the opinion that there was a low level of environmental awareness and knowledge in the society and pointed out an excessive lack of control over hazardous waste.

All respondents (100%) declared that they would be willing to support the municipal authorities of Rzeszów in an attempt to reduce the amount of biodegradable waste disposed of in landfills. The majority admitted they saw no need to use additional containers designated for organic waste (79%). In most cases, respondents displayed no interest in acquiring their own containers for storing organic kitchen waste (91%). The remaining portion of respondents were of the opinion that waste from such containers should be collected every second day.

In the view of respondents, the distance from their place of residence to the point of waste sorting was an extremely important factor (85%). Additionally, the maximum distance should not exceed 100 metres. 65% of the sample claimed that they could devote their time to sorting their household waste. They would not like, however, to incur any additional costs related to the collection of an increased amount of segregated waste (83%). The other respondents declared they could spend up to 30 PLN for this purpose.

Respondents stated they would support an idea of constructing an organic waste sorting facility (21%).

The majority of respondents were against locating any waste management facility near the town or city where they lived (95%).

Conclusions from the results of the study indicate that there is no possibility to introduce additional waste sorting, both due to the economic situation of respondents and because of their reluctance to undertake additional effort which could go in vain.