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**PRICES OF MUNICIPAL WASTE COLLECTION  
AND MANAGEMENT SERVICES IN POLAND  
FROM JULY 1, 2013 TO JULY 30, 2014**

**Summary**

The article describes the results of research into the costs of the implementation of tenders whose winners were selected by Polish municipalities in relation to the introduction of a municipal waste management reform. The research included tenders taking place in all Polish municipalities (nearly 2500) before the major part of the reform came into effect, that is until June 30, 2013, as well as the so-called second wave of tenders in about 950 municipalities during the period from July 1, 2013 to July 30, 2014. The results of the research are empirical distributions of the changing values of the tenders according to conversion rates, which are *per capita* costs of the monthly execution of tenders. The tables of the empirical distributions of conversion rates have been presented according to the scope of the tenders (tenders for municipal waste collection in one group and tenders for municipal waste collection and management in the second group), the scope of the municipalities' governance over municipal waste (basic and extended governance), the time at which a given tender came to an end (the first or second wave) and in division into winning and losing offers. The conclusions present the problem of an increase in the prices of the services in the context of a decrease in competition in the municipal waste collection industry.

**Keywords:** municipal waste, tenders, “waste revolution” in Poland, costs

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## Introduction

The municipal waste management reform introduced in Poland by the act of July 1, 2011 on the change of the act of maintenance of municipalities in a clean and orderly condition, and several other acts<sup>1</sup> (UCPG) has thoroughly rebuilt the principles of municipal waste management in Poland. Major changes have come into force on 1 July 2013. The previous system of civil law contracts between generating municipal waste property owners and companies involved in collecting and disposal of municipal waste has been replaced by introduced public-legal fee for municipal waste management. Since then, the municipality is to organize a comprehensive system of collection and management of municipal waste, what is financed by the waste management fees collected from the property owners generating municipal waste.

The reform have been raising numerous disputes and controversies in various communities, which is caused, among others, by the initially expected and later actually experienced increase in the costs of municipal waste management. The Central Statistical Office has observed an increase in the costs incurred by households in relation to municipal waste collection and management services, caused by the introduction (by means of the reform) of a levy paid to municipalities (fees for municipal waste management), which has translated into a significant – nearly 50 percent high – increase in the prices in a month from the moment of introducing the reform in July 2013<sup>2</sup>. Unfortunately, the increase was not the last one, as further increases are forecasted on a rather high level<sup>3</sup>.

The aim of this article is to present the problem of an increase in the prices of municipal waste management on the basis of a detailed analysis of tenders for municipal waste collection or collection and management, which municipalities are obliged to introduce within their territories on the basis of the reform, depending on the accepted scope of governance over municipal waste. The concept of waste governance or governance over waste is widely used in industry literature in order to indicate the role of municipalities in the Polish system of municipal waste management. It provides a convenient mental shortcut which may be used in order to describe the actual role of municipalities, which consists mainly in organizing

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<sup>1</sup> Ustawa z dnia 1 lipca 2011 r. o zmianie ustawy o utrzymaniu czystości i porządku w gminach oraz niektórych innych ustaw, „Dziennik Ustaw” 2011 nr 152, poz. 897.

<sup>2</sup> B. Piłat, P. Maciejewicz, *O ile naprawdę zdrożały śmieci*, „Gazeta Wyborcza”, 24.08.2013, [http://wyborcza.biz/biznes/1,100896,14485160,O\\_ile\\_naprawde\\_zdrozaly\\_smieci.html](http://wyborcza.biz/biznes/1,100896,14485160,O_ile_naprawde_zdrozaly_smieci.html).

<sup>3</sup> U. Mirowska-Łoskot, *Fala podwyżek za śmieci jest nieunikniona*, „Dziennik Gazeta Prawna”, 14.04.2015, <http://serwisy.gazetaprawna.pl/samorzad/artykuly/865454,fala-podwyzek-za-smieci-jest-nieunikniona.html>.

the system of municipal waste collection and management, setting fees for those services within statutory limits, as well as distributing profits from the fees between a given municipality's budget and economic entities cooperating with the municipality in this regard. This concept is not legally defined and it should not be related to the concept of ownership of municipal waste, which municipalities in Poland cannot claim. Whenever in this article the concept of basic governance is used, it should be understood as organization of the system only for the purpose of inhabited (residential) properties, while the concept of extended governance is related to organization of the system for all properties producing municipal waste in the municipality.

The substantive scope of the analyses in this article is limited to the costs of the organization of tenders for municipal waste collection or collection and management. Therefore, the analyzed problem of the costs for municipal waste management services does not take into consideration the whole problem connected with fees for municipal waste management, which, in the currently applied system in Poland, cover not only the costs of tenders analyzed in this article (which make up for a substantial part of total costs), but which must also cover the costs of administering the system (including information campaigns) as well as the costs of the establishment and use of recycling stations (in Poland known as separate municipal waste collection points, according to statutory terminology).

The analyses were conducted on the basis of a detailed economic database created with the use of generally available tender-related data from particular municipalities by one of the largest operators on the Polish municipal waste market. The data presented in tables 1–6 were selected from among 6194 offers submitted for tenders announced before July 1, 2013 by 2,459 municipalities in 2,709 sectors (the first tender wave) and 3653 offers submitted for tenders announced between July 1, 2013 and July 1, 2014 by 948 municipalities in 1,028 sectors (the second tender wave). In the analysis those offers and tenders have been omitted in which the scope of waste governance of the municipality, the type of tender (collection or collection and management), the conversion rates or the winning offer were impossible to determine.

The analyses generally answer the following question: how much (net prices) the municipalities paid in the examined period for municipal waste collection or collection and management to companies providing those services; hence the justified use of the concept of price in the essay. Therefore, the article itself does not answer questions connected with the costs of municipal waste management incurred by the residents.

## **1. Analysis of the winning offers**

Public procurement introduced obligatorily in municipal waste management is varied in its scope, and analyzing particular orders together is groundless due to the various groups of costs within particular scopes; therefore, the orders have been divided into groups on the basis of their elementary characteristics. The most important factor is the division into procurement including or excluding waste management, which is why the tender analyses have been divided into two major groups – tenders for waste collection as the first group and tenders for waste collection and management as the second one. Moreover, information collected from the database allows us to distinguish tenders in municipalities which decided to have basic governance over municipal waste (only residential properties) as opposed to those invited by municipalities which decided to have extended governance (municipal waste collection and management from both residential and uninhabited properties). Moreover, data from the so-called first-wave tenders (announced before July 1, 2013) have been distinguished from those in which the winners were selected later (the so-called second wave), that is during the performance of contracts signed after selecting the winners of first-wave tenders; as a result, it was possible to notice the direction of changes in prices on the market.

There are other criteria differentiating the level of average total costs of tender execution. Those include:

- the contractor’s obligation to equip the owners of given properties with appropriate containers,
- the requirement to utilize advanced devices monitoring the waste stream,
- the degree of complexity of the system of separate waste collection,
- the obligation to create or manage recycling stations,
- the intensity of waste production,
- the frequency of waste collection,
- methods of waste management,
- distance between the places of waste production and the place of waste management,
- fluctuations in the municipalities’ populations,
- the dispersal of building development (including the degree of population density),
- the nature of the building development.

Unfortunately, none of the abovementioned additional criteria of differentiating costs are permitted to be used in the analyses by the information collected from tender procedures; therefore, information of this kind has been acquired from municipalities on the basis of surveys in the form of separate questions, which are not described in this article. However, information about the value of the winning offers of municipal tenders has been collected and processed. It has also been related to the population index given in tender specifications, in this way creating conversion rates recognized as net costs (monthly costs per resident), that is ones not including value-added tax, of hiring the contractor by the municipality. As a result, one is able to compare particular companies' expenses in order to compile data. The data given in Tables 1 and 2 are not concerned with municipalities as with waste management sectors (N – number of waste management sectors in municipalities), as in the reformed system of municipal waste management the basic unit of territorial organization of tenders is the sector of waste management, which may be optionally formed by local authorities in municipalities of over 10,000 inhabitants (usually municipalities deciding to divide their territories into sectors significantly exceed the limit value specified in the act – those are usually municipalities of over 100,000 inhabitants). In order to calculate the weighted average in all the tables of the article, the number of residents according to the terms of reference has been used as a weight.

While analyzing the data presented in both Tables (1 and 2), one should very carefully propose conclusions on the subject of changing conversion rates arising from the decisions of the second wave in relation to the first wave due to the fact that the compilations of first and second wave tenders do not pertain to the same number of tenders or the same municipalities. In principle, each of the eight compilations of data must be interpreted separately, as they describe not only different groups of tenders in terms of their scope but also different sets of municipalities.

The most important information is provided by tender compilations from municipalities with basic governance over municipal waste. Conversion rates here are related to the analogical scope of procurement. In case of tender compilations in municipalities with extended governance over waste, conversion rates are higher because payments from the owners of residential properties are registered in the system with payments from the owners of uninhabited properties and the rate does not take it into consideration. While calculating a municipality's expenses one would have to add 8% VAT to the costs given in the compilations.

Table 1

Selected measures of the empirical distribution of the net conversion rates  
(without VAT) of the winning offers for municipal waste collection  
[PLN/month/per capita]

		Basic governance over waste		Extended governance over waste	
		1st wave	2nd wave	1st wave	2nd wave
N		155	71	178	116
Arithmetic average		3.31	3.36	3.98	4.74
Minimum		0.71	0.65	0.66	1.06
K-quantiles	k = 0.1	1.58	1.58	1.63	1.74
	k = 0.2	1.84	2.08	2.25	2.12
	k = 0.3	2.14	2.54	2.71	2.53
	k = 0.4	2.50	2.89	3.32	3.61
	k = 0.5 (median)	2.85	3.02	3.51	4.47
	k = 0.6	3.46	3.40	3.91	5.27
	k = 0.7	4.16	3.76	4.38	5.89
	k = 0.8	4.55	4.29	5.09	7.07
	k = 0.9	5.43	6.00	6.73	8.36
	Maximum		10.83	7.68	13.35
Weighted average		3.62	3.31	4.16*	4.69

\* N = 158 because not all municipalities quote the number of residents in a given sector in the terms of reference.

Source: own elaboration based on data from tender procedures in municipalities.

Special attention should be given to weighted averages from the values of tenders with extended governance over waste (Table 2). The high level of the first wave is profoundly influenced by the Warsaw tender, which is not present in the second wave. The same holds for Table 3.

The compilations of data from Tables 1 and 2 also provide grounds for estimating the costs of waste management. Admittedly, in the analyzed database no cases of winning a tender for waste management only were found (without collection); however, one may venture to draw conclusions on those costs on the basis of the differences between the average values of the conversion rates of the winning offers for waste collection and management and the analogical rates for collection only. Table 3 presents the results of the calculations.

From the statistics of municipal waste production it arises that the data should be called into question in terms of reflecting the real (or better: legal) costs of municipal waste management, as, assuming on the basis of the data from Table 3 that the costs of municipal waste management are PLN 2.50 per capita average, it would amount to only PLN 30 a year. With production of about 300 kg

Table 2

Selected measures of the empirical distribution of the net conversion rates (without VAT) of the winning offers for municipal waste collection and management [PLN/month/per capita]

	Basic governance over waste		Extended governance over waste	
	1st wave	2nd wave	1st wave	2nd wave
N	968	457	450	166
Arithmetic average	4.99	5.68	6.60	7.11
Minimum	0.07	0.52	0.16	0.38
K-quantiles	k = 0.1	2.54	2.93	3.17
	k = 0.2	3.08	3.64	3.87
	k = 0.3	3.53	4.08	4.60
	k = 0.4	3.98	4.65	5.17
	k = 0.5 (median)	4.45	5.32	5.65
	k = 0.6	4.93	6.00	6.53
	k = 0.7	5.48	6.65	7.54
	k = 0.8	6.34	7.51	8.67
	k = 0.9	7.51	9.08	10.64
	Maximum	89.56	20.74	23.74
Weighted average	6.61*	5.86**	9.15***	7.52

\*N = 928 because not all municipalities quote the number of residents in a given sector in the terms of reference. \*\* N = 454. \*\*\* N = 396.

Source: own elaboration based on data from tender procedures in municipalities.

Table 3

Differences in the average net conversion rates (without VAT) of the winning offers related to municipal waste [PLN/month/per capita]

	Basic governance over waste		Extended governance over waste	
	1st wave	2nd wave	1st wave	2nd wave
Arithmetic average difference	1.68	2.32	2.62	2.37
Weighted average difference	2.99	2.55	4.99	2.83

Source: own elaboration based on data from tender procedures in municipalities.

of waste a year by a statistical Polish citizen, average costs of management of 1 Mg would thus amount to about PLN 100, while such prices virtually do not exist on the market. In view of numerous allegations in the professional literature pointing to the mainly price-related fight for the market, the values of tenders may be understated for three different reasons, either occurring as single factors or combined:

- dumping,
- illegal management of waste,
- cross-subsidization of the company's costs.

## 2. Analysis of the losing offers

Additional material on the topic of the companies' costs is provided by the losing offers in tender procedures. The analysis of the empirical distribution of the value of those offers does not substantially deviate from the analysis of the winning offers, except for the fact that particular values in the tables presenting the losing offers are usually several percent higher than those in the tables presenting the winning offers. In Tables 4 and 5, analogically to Tables 1 and 2, data concerning the losing offers for municipal waste collection and management have been presented. (N – number of offers in particular sectors of waste management in municipalities.)

Table 4

Selected measures of the empirical distribution of the net conversion rates  
(without VAT) of the losing offers for municipal waste collection  
[PLN/month/per capita]

		Basic governance over waste		Extended governance over waste	
		1st wave	2nd wave	1st wave	2nd wave
N		196	54	214	131
Arithmetic average		4.19	4.01	5.23	5.93
Minimum		0.18	1.78	1.25	1.12
K-quantiles	k = 0.1	1.80	1.96	1.96	2.25
	k = 0.2	2.10	2.24	2.69	2.75
	k = 0.3	2.44	2.63	3.20	3.51
	k = 0.4	2.98	3.07	3.80	4.01
	k = 0.5 (median)	3.37	3.38	4.27	4.81
	k = 0.6	3.76	3.90	4.88	5.81
	k = 0.7	4.43	4.51	5.90	6.54
	k = 0.8	5.61	5.68	6.84	8.04
	k = 0.9	7.32	7.00	8.82	11.08
	Maximum		36.23	9.26	23.02
Weighted average		4.16	3.71	5.40	5.44

Source: own elaboration based on data from tender procedures in municipalities.



Table 5

Selected measures of the empirical distribution of the net conversion rates (without VAT) of the losing offers for municipal waste collection and management [PLN/month/per capita]

		Basic governance over waste		Extended governance over waste	
		1st wave	2nd wave	1st wave	2nd wave
N		1,277	562	396	142
Arithmetic average		6.15	7.71	7.22	8.61
Minimum		0.48	0.72	0.83	0.35
K-quantiles	k = 0.1	3.30	3.86	3.48	4.30
	k = 0.2	3.85	4.53	4.05	4.96
	k = 0.3	4.34	5.41	4.98	6.07
	k = 0.4	4.82	6.31	5.56	6.91
	k = 0.5 (median)	5.42	7.02	6.34	7.82
	k = 0.6	5.94	7.69	7.21	8.79
	k = 0.7	6.57	8.68	8.06	10.02
	k = 0.8	7.63	10.09	9.78	12.65
	k = 0.9	9.57	12.68	11.90	14.46
	Maximum	50.32	46.29	23.25	19.38
	Weighted average	7.15	8.01	10.26	8.98

Source: own elaboration based on data from tender procedures in municipalities.

As one may see, tender offers (both the winning and the losing ones) are largely varied in terms of conversion rates. After rejecting 10–20% of the extreme offers from each of the compilations, differences between the quantiles of 0.1 and 0.9 or 0.2 and 0.8 are still very large (several times larger). 90-percentiles have in particular compilations from about 3 to about 5 times higher values than 10-percentiles. On the other hand, 80-percentiles have in particular compilations from about 2 to about 3 times higher values than 20-percentiles. It demonstrates the need to conduct an in-depth examination of the costs of waste collection and management by means of additional tools, which would allow us to identify the parameters on which the conversion rates of the costs depend.

## Conclusions

The summary study of the costs of the executed tenders pertains to an analysis of the problem of changes over time in the prices of municipal waste collection and management services. The analyzed information resources enable

us to contrast second-wave tenders with tenders in which the winners were selected in the same sectors of particular municipalities during the first wave. The aim of this compilation is only to indicate changes in the prices; therefore, it will not refer to the scope of the tender or to governance over waste, which might differ in the second procedure as opposed to the first one. However, municipalities tend to apply similar approaches and thus one may assume that the scope of the compared tenders has not changed. Therefore, in Table 6, data concerning conversion rates in the 677 winning offers from the second wave of tenders have been contrasted with analogical data concerning the winning offers in the same sectors selected during the first wave. The compilation comprises only those sectors in which conversion rates of the winning offers during both tender waves were established.

Table 6

Selected measures of the empirical distribution of changes  
in the conversion rates of the winning offers [1st wave = 100]

Minimum	K-quantiles									Maximum	Arithmetic average	Weighted average
	k = 0.1	k = 0.2	k = 0.3	k = 0.4	k = 0.5 (median)	k = 0.6	k = 0.7	k = 0.8	k = 0.9			
7.69	77.86	93.73	101.38	108.95	115.52	123.50	137.89	156.38	197.42	1,873.91	141.16	143.63

Source: own elaboration on the basis of data from tender procedures in municipalities.

Prices of the contracted services increased in 485 sectors, including an over 50-percent increase in 157 sectors and an over 100-percent increase in 65 sectors. An over 25-percent decrease was reported in 56 sectors, and an over 50-percent decrease – in 15. On average, the prices of municipal waste collection or collection and management services increased in the researched sectors (municipalities) by about 42%.

The reason for the increase in the prices may be the drastic decrease in competition anticipated by the Office for Competition and Consumer Protection's (OCCP) before the reform on the municipal waste collection market. In early 2012 the OCCP said: "On most markets one will see a situation in which numerous entities will have to leave one or all of the markets on which they operate, as they will be unable to win tenders organized by municipalities. From the calculations

based mostly on estimations with the use of the acquired data it arises that there might be as many as a few hundred of such entities. (...) One of the signs of effective competition on the market is its influence on the level of the prices. (...) The quickest average increases in prices for collection have been recorded in the group of municipalities in which only one company collecting waste has been active'<sup>4</sup>.

The introduction of the tender rule as a result of the reform has caused changes in the market model. Before the reform came into effect, the model of market fight for customers used to dominate; after the statutory changes have been introduced – the model has become one of fight for the entire local market, in which only one company wins and becomes a local monopoly for the time of performing the contract. The consequences of the above as regards changes in the prices of the services have been described in a report by the Sobieski Institute: “During the analyzed period prices of waste (garbage) collection increased by over 100% and by nearly 30% in the year in which changes in the system of municipal waste management were introduced. In spite of the introduction of a mechanism specifying the maximum fees for waste collection (management) into the revision to the act UCPG, further increases of about 30% are predicted. It should be noted that the costs of the functioning of the system of municipal waste management are increasing, mainly because of the prices for waste processing, including the necessity to return expenses incurred by the companies for investments connected with adaptation of waste processing systems to standards specified by legal regulations. The increase in the overheads is also affected by the costs of the administrative management of the system”<sup>5</sup>.

## Literature

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<sup>4</sup> *Konkurencja na polskim rynku usług odbioru i zagospodarowania odpadów komunalnych*,  
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<sup>5</sup> T. Styś, R. Foks, *Rynek gospodarowania odpadami komunalnymi w Polsce. Perspektywa 2030*, Instytut Sobieskiego, Warszawa 2014, p. 57.

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## **CENY USŁUG ODBIERANIA I ZAGOSPODAROWANIA ODPADÓW KOMUNALNYCH W POLSCE W OKRESIE OD 1 LIPCA 2013 ROKU DO 30 LIPCA 2014 ROKU**

### **Streszczenie**

W artykule opisano wyniki badań kosztów realizacji przetargów rozstrzyganych przez gminy w Polsce w związku z wejściem w życie reformy gospodarowania odpadami komunalnymi. Badaniami objęto przetargi rozstrzygane przez wszystkie niespełna 2500 gmin w Polsce przed wejściem w życie zasadniczej części reformy, czyli do 30 czerwca 2013 r., oraz tzw. drugą falę przetargów rozstrzygniętych przez ok. 950 gmin w okresie od 1 lipca 2013 r. do 30 lipca 2014 r. Wynikiem badań są empiryczne rozkłady zmienności wartości rozstrzyganych przetargów wg stawek przeliczeniowych, którymi są koszty miesięcznej realizacji przetargu *per capita*. Tabele rozkładów empirycznych stawek przeliczeniowych przedstawiono wg zakresu przetargów (przetargi na odbieranie odpadów komunalnych w jednej grupie oraz przetargi na odbieranie z jednoczesnym zagospodarowaniem odpadów komunalnych w drugiej grupie); wg zakresu gminnego władztwa nad odpadami komunalnymi (władztwo podstawowe i rozszerzone); wg czasu rozstrzygnięcia (I fala i II fala) oraz w podziale na oferty zwycięskie i przegrane. W podsumowaniu przedstawiono problem wzrostu cen tytułowych usług dla gmin w kontekście ograniczenia konkurencji w branży związanej z odbieraniem odpadów komunalnych.

**Słowa kluczowe:** odpady komunalne, przetargi, rewolucja śmieciowa w Polsce, koszty

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