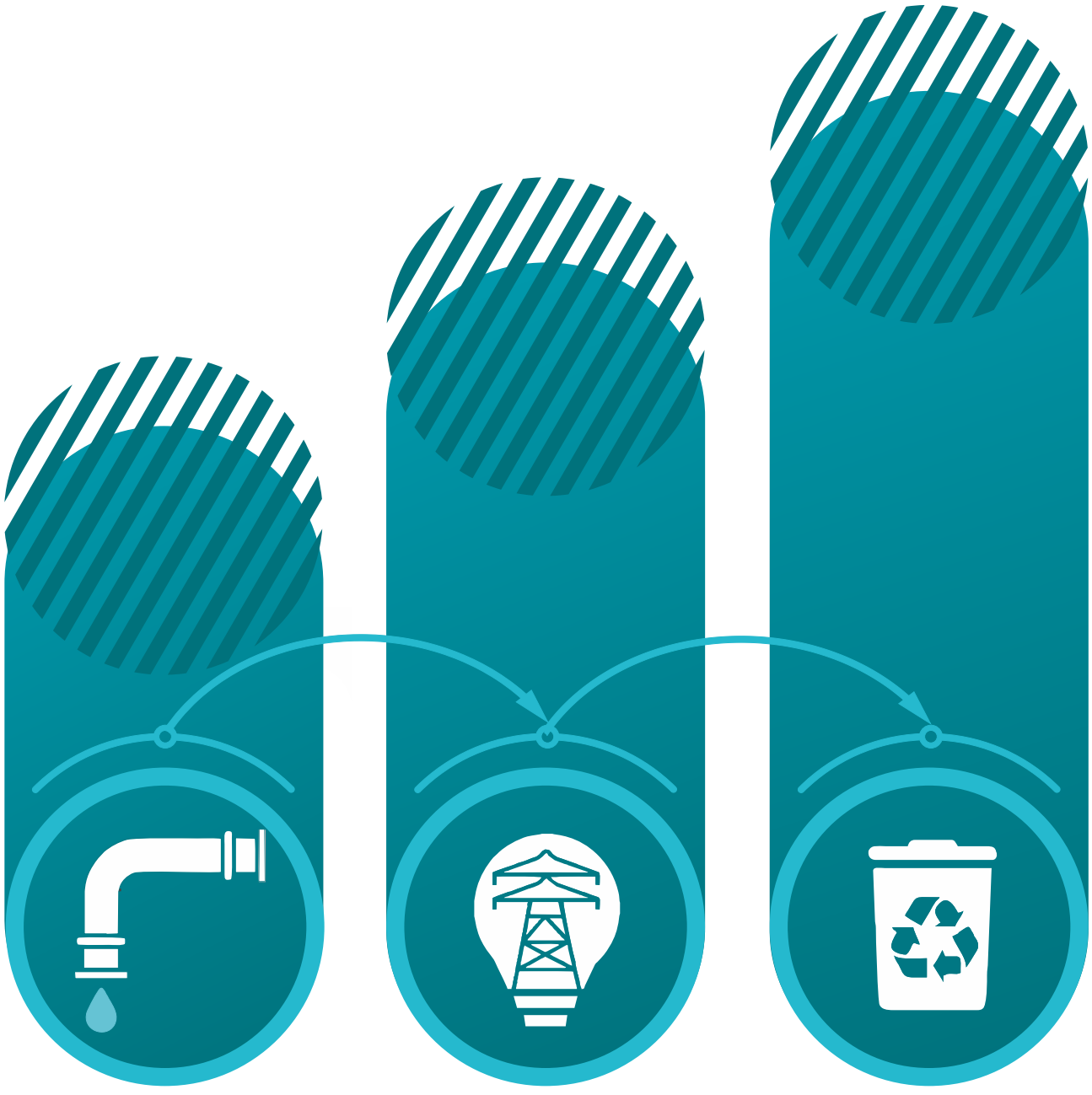
Analizy statystyczne
Statistical analyses

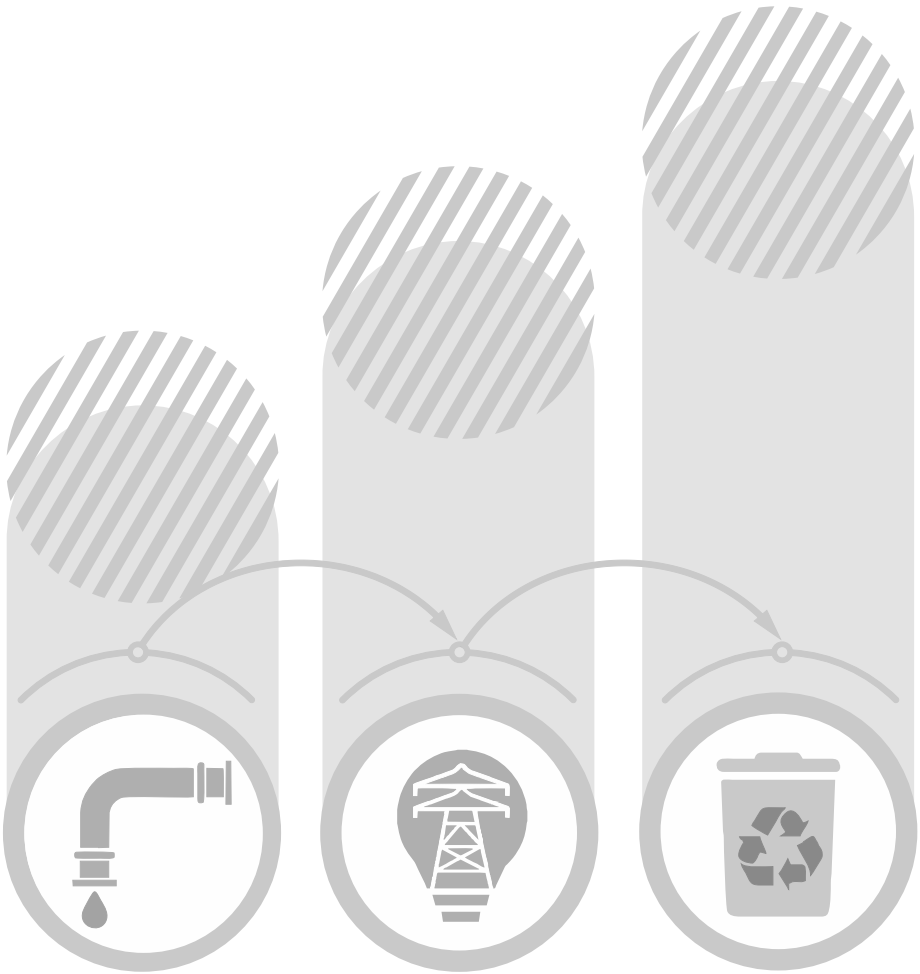


Infrastruktura komunalna w 2017 r.

Municipal infrastructure in 2017

Warszawa Warsaw 2018

Analizy statystyczne
Statistical analyses



Infrastruktura komunalna w 2017 r.

Municipal infrastructure in 2017

Główny Urząd Statystyczny Statistics Poland

Warszawa Warsaw 2018

Content-related works
Statistics Poland, Trade and Services Department

Editorial team
Izabella Adamczyk, Barbara Różańska, Marek Sobczyk

Supervisor
Agnieszka Matulska-Bachura

Typesetting and graphics
Danuta Niwińska, Halina Sztrantowicz, Beata Lipińska, Paweł Luty

Publication available on website
stat.gov.pl

When publishing Statistics Poland data — please indicate the source

100 lat GUS Zakład Wydawnictw Statystycznych 00-925 WARSZAWA, AL. NIEPODLEGŁOŚCI 208.
Zam. 403/2018

Preface

"Municipal infrastructure in 2017" is a consecutive edition of a publication devoted to the topic of municipal and services of general interest in Poland. Information presented in this study characterise the condition of technical infrastructure facilitating provision of services satisfying the basic living needs of society, as well as enable observation of changes occurring in the surveyed area of activities.

The study includes information on municipal equipment and services in the scope of water supply and sewage systems, heat management, electricity and network gas distribution as well as collection and treatment of municipal waste by location of equipment or the place of supply of municipal services – for Poland in total, and with a breakdown into voivodships, and urban and rural areas.

The publication uses results developed on the basis of data obtained from entities conducting activities in area of collective water supply and collective sewage removal from households and dealing with collecting municipal waste or collecting liquid waste, processing municipal waste, distribution of electricity, heat energy or network gas.

Subjective scope was presented broken down by voivodships. The information at lower levels of aggregation (poviats and gminas) and broken down by urban and rural areas were released in Local Data Bank on the Statistics Poland website (http://www.stat.gov.pl).

Planning further development of the municipal infrastructure surveys, authors will be grateful to all persons and institutions for providing suggestions and comments, which would contribute to shaping and enriching of content of future editions of this publication.

Director of Trade
and Services Department

Ewa Adach-Stankiewicz

President
Statistics Poland

dr Dominik Rozkrut

Warsaw, November 2018

Contents

List of tables

List of charts

List of maps

Symbols

Symbol	Description
(.)	no information available or no reliable information available
(–)	magnitude zero
„Of which"	indicates that not all elements of the sum are given

Abbreviations

Abbreviation	Meaning
thous.	thousand
mln	million
m^3	cubic metre
hm^3	cubic hectometre
km	kilometre
km^2	square kilometre
ha	hectare
kg	kilogram
t	ton
kWh	kilowatt-hour
GWh	gigawatt-hour
MJ	megajoule
TJ	terajoule
pcs	pieces

Chapter 1

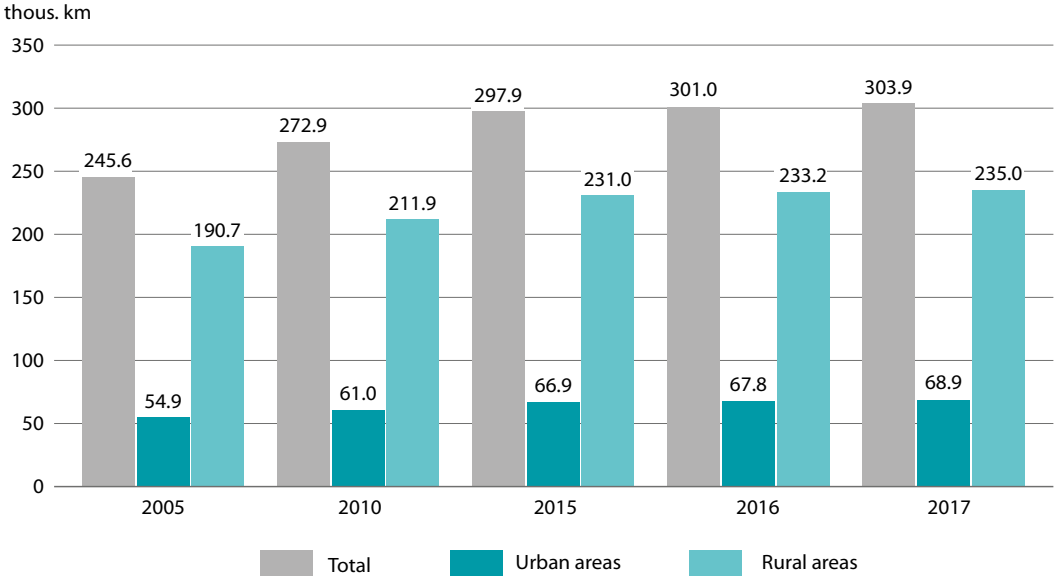
Water supply system and sewage system management

Water supply distribution network – street conduits used for distribution of water to consumers by the connections to buildings and other objects.
Water supply connection – a segment of a conduit connecting water supply network with internal water supply installation in a property of consumer together with a valve past the main water-meter.

Similarly to past years, in 2017 there were further investments in area of technical and sanitary infrastructure. As compared to 2005, the total length of water supply network increased by 23.7%, i.e. from 245.6 thous. km in 2005 to 303.9 thous. km in 2017, and in rural areas from 190.7 thous. km to 235.0 thous. km, i.e. by 23.2%. At the same time, the total number of connections increased by approx. 1 138 thous. pcs, i.e. by 25.2% and by approx. 727 thous. in rural areas, i.e. by 26.4%.

The most significant increase in the length of water supply network was observed in urban areas of the following voivodships: podkarpackie – of almost 58%, lubuskie – of almost 44%, and zachodniopomorskie – of more than 35%, and in rural areas of the following voivodships: zachodniopomorskie – of almost 43%, warmińsko-mazurskie – of approx. 37%, and mazowieckie – of more than 35%.

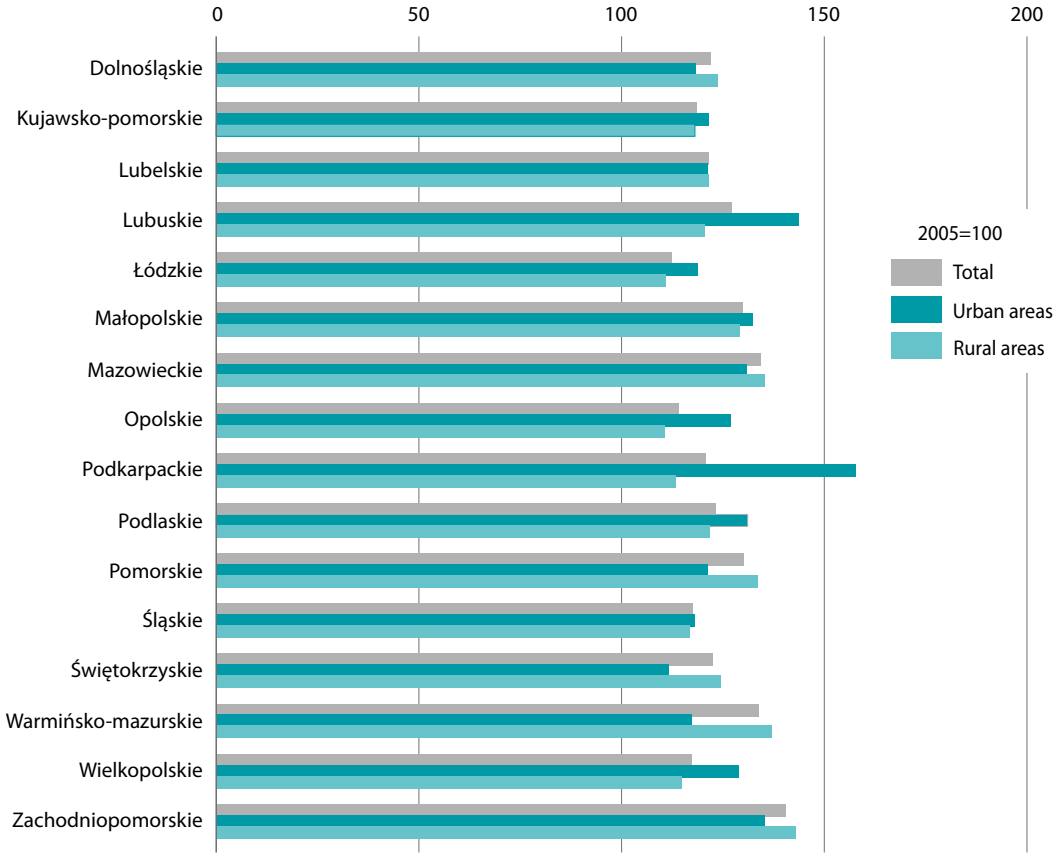
Chart 1. The length of active distribution water supply network in 2005, 2010, 2015–2017



In 2017, the length of **water supply network** in Poland amounted to almost 304 thous. km, and the number of connections – to more than 5.6 mln. As compared to 2016, the length of newly built or reconstructed water supply network increased by 2.9 thous. km, with a simultaneous increase in the number of connections to buildings of over 71 thous. pcs.

More than 77% of the length of water supply network and approx. 61.6% of connections to buildings were located in rural areas. As compared with the previous year, the length of water supply network in urban areas increased by more than 1.1 thous. km, and the number of connections by almost 40 thous. pcs. In rural areas there was an increase of more than 1.8 thous. km of new network, and the number of connections increased by over 31 thous. pcs.

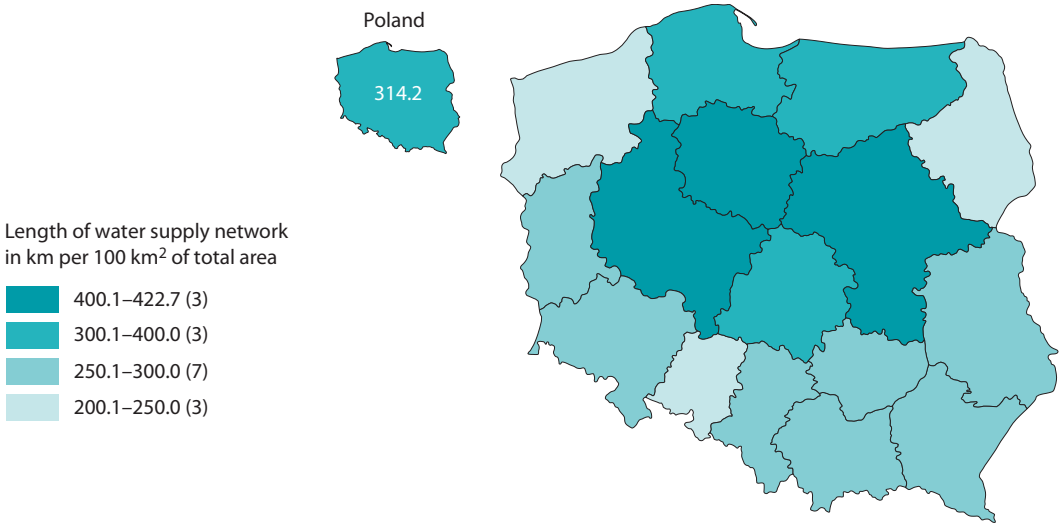
Chart 2. Change in the length of water supply network in 2005–2017



The highest values of the indicator of the **water supply network density** was observed in śląskie voivodship – 174.7 km per 100 km^2 (an increase of 1.4 km per 100 km^2 as compared to 2016) and małopolskie voivodship – 134.6 km per 100 km^2 (an increase of 1.3 km per 100 km^2), and the lowest in zachodniopomorskie voivodship – 49.6 km per 100 km^2 (an increase of 0.6 km per 100 km^2).

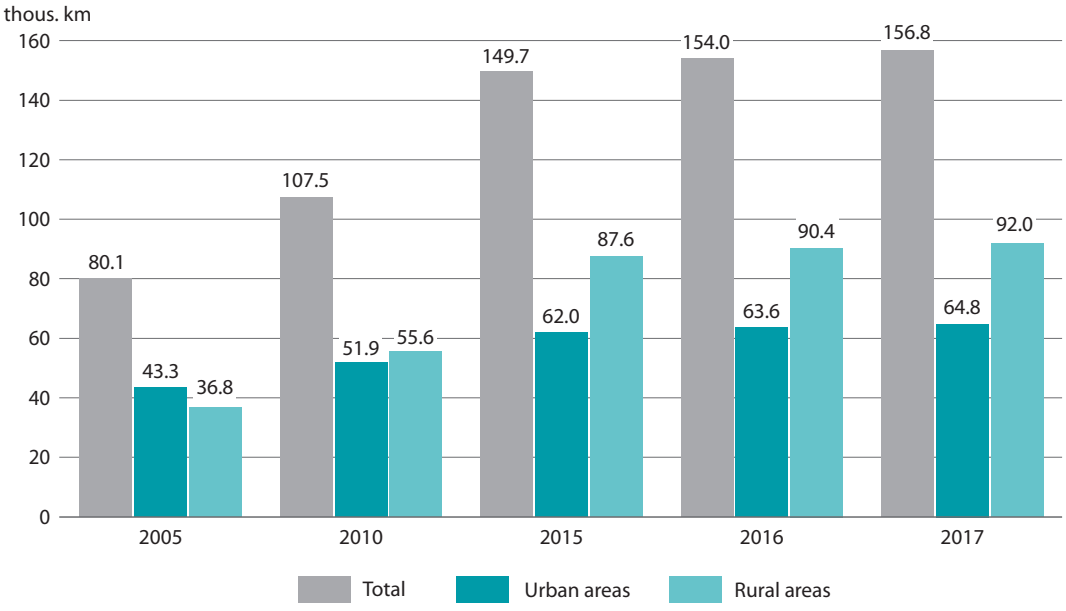
The density of water supply network per 100 km^2 – the indicator is a quotient obtained by dividing of the length of water supply network by the area of surveyed surface, multiplied by 100.

Map 1. The density of water supply network in urban areas in 2017



In the period from 2005 to 2017, the **length of sewage network** increased by 76.6 thous. km (by 95.7%), reaching 156.8 thous. km in 2017. In rural areas the network growth was higher by 55.2 thous. km (by 149.9%) than in urban areas, where an increase of almost 21.5 thous. km (of 49.5%) was observed.

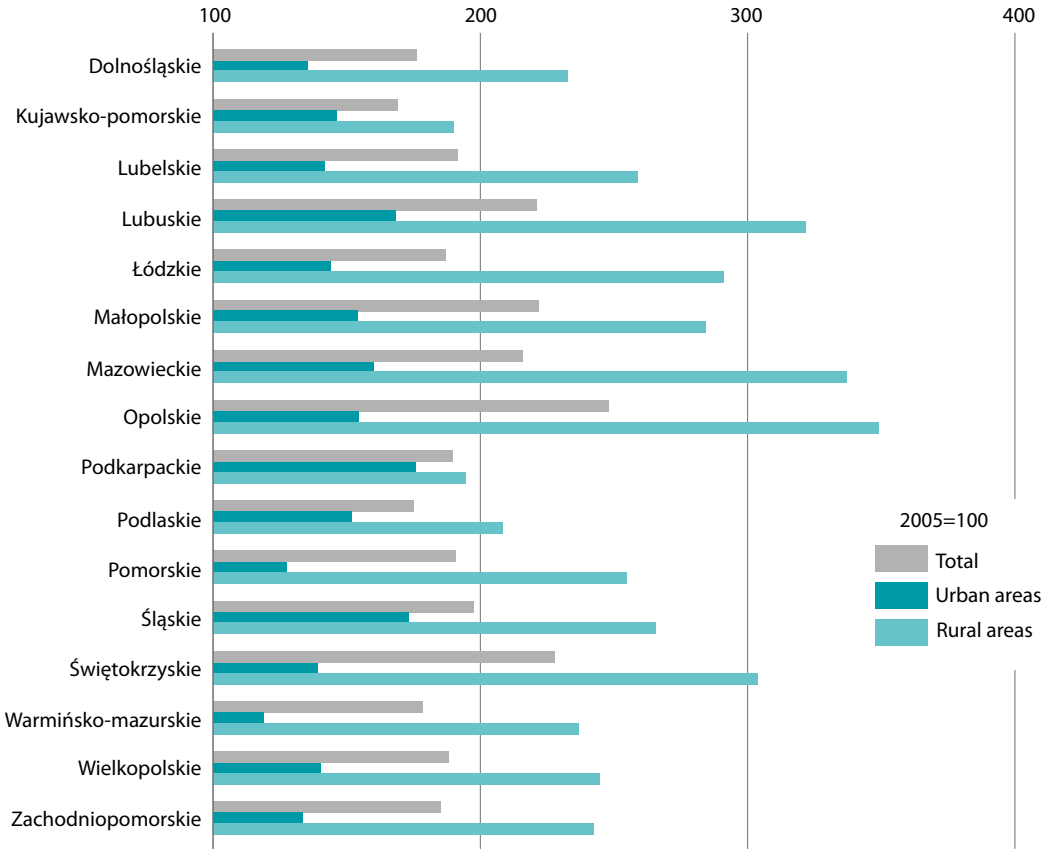
Chart 3. The length of active sewage network in 2005, 2010, 2015–2017



Active sewage network – a system of covered (underground) conduits discharging sewage from buildings and other objects to collectors or sewage treatment facilities.
Sewage connection – a segment of conduit connecting internal sewage installations on a property of consumer with the sewage network, past a first inspection chamber from a building, and in case of its lack – from a boundary of the property.

As far as individual voivodships are concerned, the most significant increase in the length of sewage network in rural areas was observed in opolskie – of 248.9%, mazowieckie – of 237.2%, lubuskie – of 221.7%, and świętokrzyskie – of 203.7%. At the same time, the highest increase in the length of sewage network in urban areas was observed in the following voivodships: podkarpackie – of 75.8%, śląskie – of 73.2%, and lubuskie – of 68.3%.

Chart 4. Change in the length of sewage network in 2005–2017



In 2017, the length of **sewage network** in Poland reached about 156.8 thous. km, with the number of connections to buildings at the level of 3.3 mln. pcs. As compared to 2016, the length of newly built and reconstructed sewage network increased by approx. 2.8 thous. km, i.e. by 1.8%, with a simultaneous increase in the number of connections of almost 82 thous. pcs, i.e. by 2.5%.

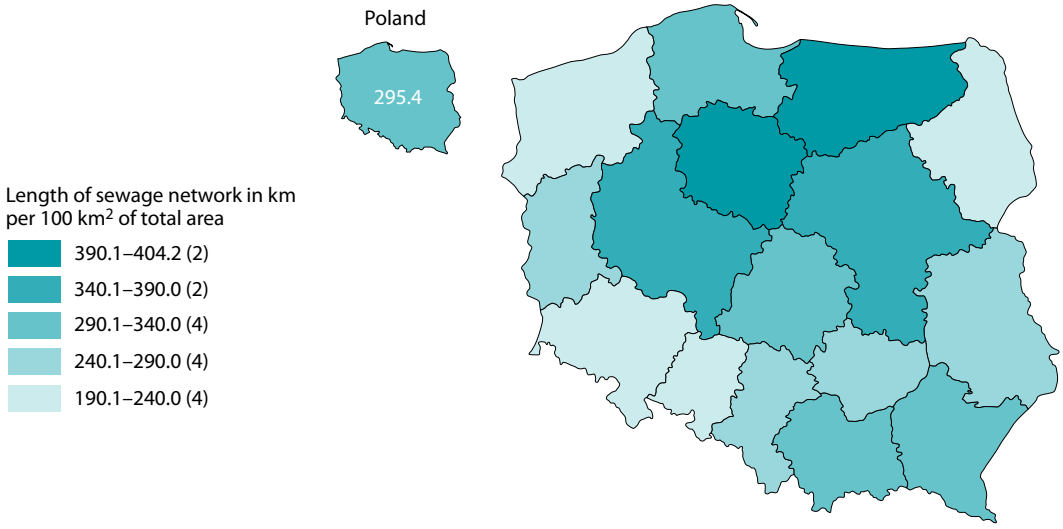
There was 58.7% of sewage network, and 45.3% of the number of connections located in rural areas. As compared to 2016, the length of sewage network in rural areas increased by almost 1.6 thous. km (by 1.7%), and the number of connections by almost 36 thous. pcs (by 2.4%). In the same period in urban areas were constructed more than 1.2 thous. km of sewage network (an increase of 1.9%) and approx. 46 thous. pcs of connections (an increase of 2.6%).

As compared to 2016, the highest increase in the length of sewage network in total was recorded in the following voivodships: mazowieckie – of 3.6% (in urban areas – of 5.5%) and of 3% in łódzkie (in urban areas – 1.3%) and dolnośląskie (in urban areas – 2.5%). As a result of actualisation of results of measurements of the length of sewage network conducted in different municipalities, a decrease in the length of the network was observed in świętokrzyskie and lubelskie voivodships (in lubelskie a total decrease of 0.3%, while in urban areas there was an increase of 0.9%, and in świętokrzyskie a total decrease of 0.5%, while in urban areas – of 3.8%).

The highest values of the sewage network density in 2017 were recorded in the following voivodships: śląskie – 131.9 km per 100 km^2 and małopolskie – 104.5 km per 100 km^2, and the lowest in podlaskie – 17.6 km per 100 km^2 and lubelskie – 25.6 km per 100 km^2.

The density of sewage network per 100 km^2 – the indicator is a quotient obtained by dividing of the length of sewage network by the area of surveyed surface, multiplied by 100.

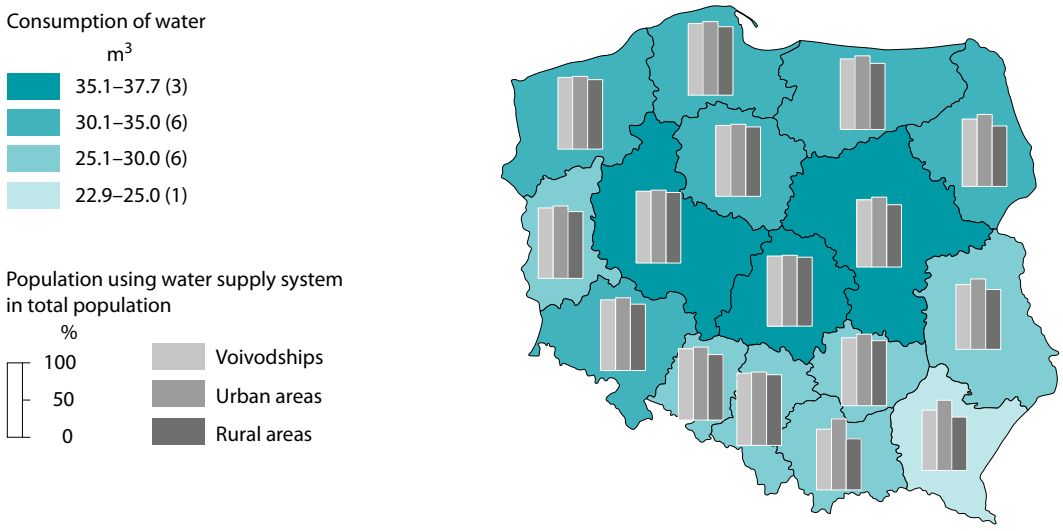
Map 2. The density of sewage network in urban areas in 2017



Along with the development of water supply and sewage infrastructure, the number of population using the aforementioned networks also increased. In 2017, water supply network was used by 92% of the total population (as compared to 2005, an increase of 5.9 percentage points). In urban areas, 96.6% of the total population had the access to water supply network (an increase of 1.7 percentage point in comparison to 2005). In rural areas the share of number of population using water supply network was at the level of 85% (similarly to the previous year).

Data regarding population using water supply system include people living in residential buildings and collective accommodation buildings connected to water supply system.

Map 3. Population using water supply system and consumption of water per capita in 2017



Despite the increasing number of people with access to water supply network, in the period from 2005 to 2017, the quantity of water used per capita was systematically decreasing, and it dropped by almost 15% in comparison to 2005. The main reasons for saving water by households are economic ones, resulting from common water consumption metering. Additionally, the decrease in water consumption is a result of limiting water losses in the system, associated with ongoing modernisations of the existing networks.

Table 1. Population using water supply system and consumption of water in households per capita in 2005, 2010, 2015–2017

Specification	2005	2010	2015	2016	2017
Population using water supply system in total population (%)	86.1	87.4	91.8	91.9	92.0
of which in urban areas	94.9	95.3	96.5	96.5	96.6
Water consumption per capita (m³)	32.0	31.1	32.2	32.2	31.8
of which in urban areas	37.2	35.0	34.3	34.2	34.1

The average water consumption by households in 2017 amounted to 31.8 m³ per capita, with 34.1 m³ in urban areas, and 28.5 m³ in rural areas. As compared to 2016, water consumption decreased slightly (by 0.4 m³). In urban areas there was a small decrease in consumption – of 0.1 m³, and in rural areas – of 0.7 m³. The deepest drops in water consumption were recorded in kujawsko-pomorskie voivodship – of 1.5 m³ per capita (for urban areas it amounted to 0.8 m³, and in rural areas to 2.4 m³) and in świętokrzyskie voivodship – of 1.3 m³ per capita (for urban areas it amounted to 3.2 m³, while in rural areas there was an increase of 0.2 m³).

The share of number of **population using sewage system** in the period from 2005 to 2017 increased from 59.2% to 70.5% (an increase of 11.3 percentage points). In urban areas, at the end of 2017, the system was used by 90.2% of population (an increase of 5.7 percentage points), and in rural areas by 40.8% of population (an increase of 21.8 percentage points).

Data regarding population using sewage system include people living in residential buildings and collective accommodation buildings connected to sewage system.

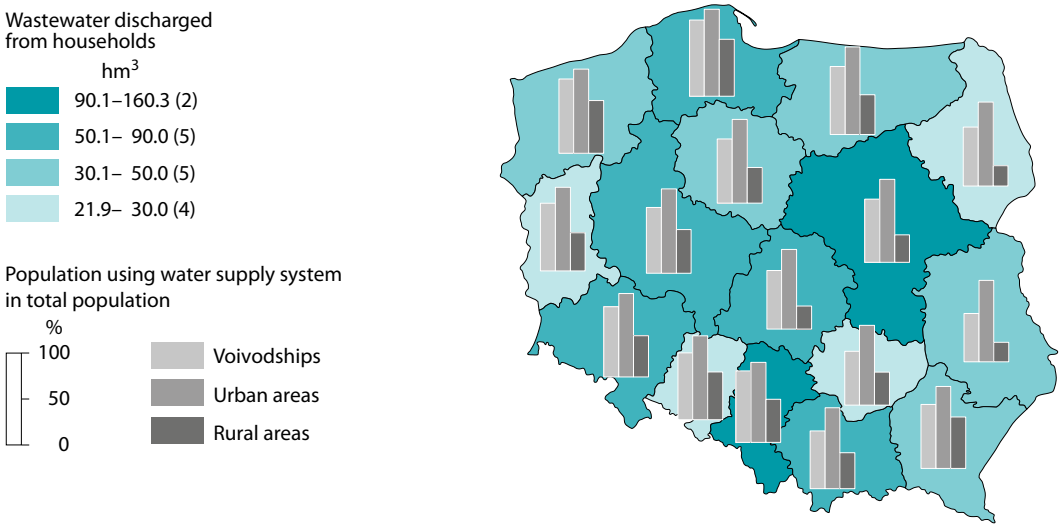
Table 2. Population using sewage system and the quantity of wastewater discharged from households in 2005, 2010, 2015–2017

Specification	2005	2010	2015	2016	2017
Population using sewage system in total population (%)	59.2	62.0	69.7	70.2	70.5
of which in urban areas	84.5	86.1	89.8	90.0	90.2
Wastewater from households discharged by sewage system during a year (hm^3)	927.7	901.6	926.1	938.1	954.4

The amount of wastewater discharged from households in 2017 amounted to 954.4 hm^3 (in urban areas 830.9 hm^3, and in rural areas 123.5 hm^3) and increased by 16 hm^3 in comparison to 2016 (by 12 hm^3 and by 4 hm^3, respectively).

Wastewater discharged – household wastewater or a mixture of household wastewater with rainfall wastewater or a mixture of household wastewater with industrial wastewater and rainfall wastewater.

Map 4. Population using sewage system and wastewater discharged from households in 2017



Chapter 2

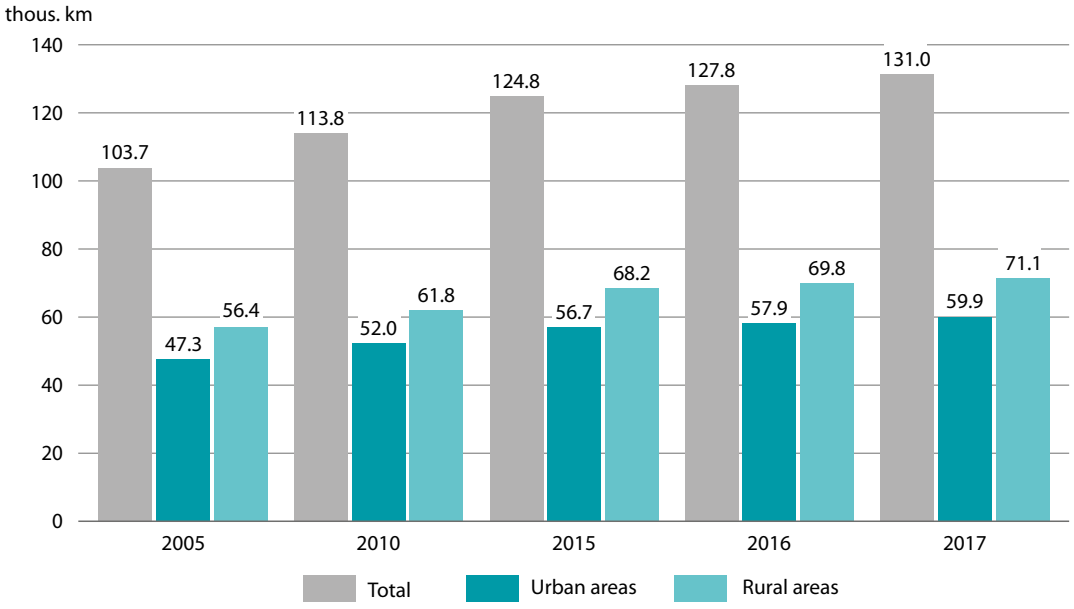
Electric energy and gas supply system management

Gas supply network is a system of conduits providing gas supplied by enterprises, which scope of economic activity includes transmission and distribution of gas to consumers. The system of conduits consists of:
- transmission and distribution network (with high-methane gas and nitrogenised gas) – street conduits used for distribution of gas to buildings or other objects by means of connections;
- connections – a system of conduits joining distribution gas supply network with buildings and other objects.

Over the last decade, there has been observed an increase in the investments in the area of **natural gas system infrastructure**. Since 2005, the length of gas network in total increased by 29.9 thous. km (by 24.5%) and in 2017 reached the length of 152.2 thous. km, of which 131.0 thous. km was distribution network. As compared to 2016, an increase in the length of gas network in total was observed, by approximately 3.2 thous. km (by 2.1%).

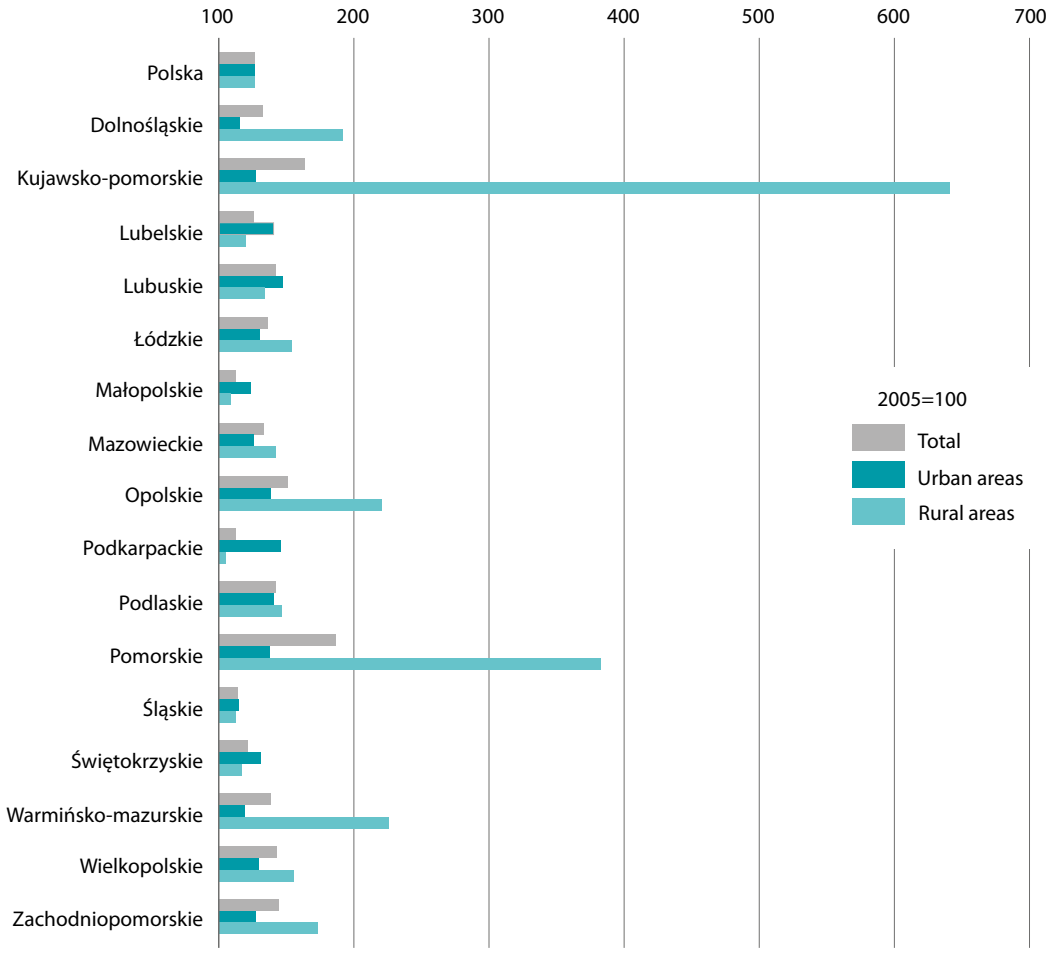
Since 2005, the length of gas distribution network increased by 27.4 thous. km (by 26.4%) and as of 31.12.2017 amounted to 131.0 thous. km. In rural areas its length increased by 14.7 thous. km (by 26.2%) amounting to 71.1 thous. km in 2017, while in urban areas by 12.6 thous. km (by 26.7%) – up to 59.9 thous. km. The number of connections increased in this period by approx. 666 thous., of which by approx. 281 thous. in rural areas.

Chart 5. The length of active gas supply distribution network in 2005, 2010, 2015–2017



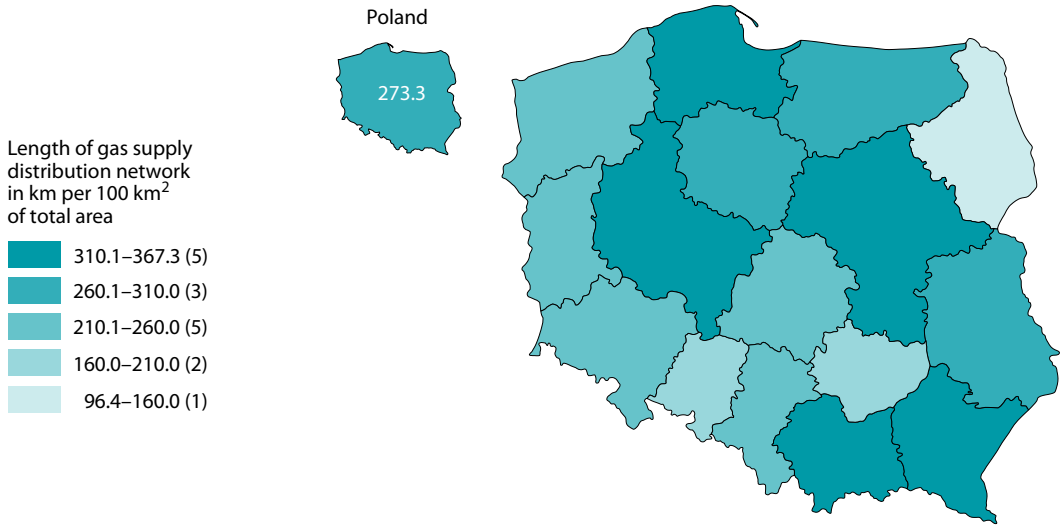
As compared to 2005, a significant increase in the length of gas supply distribution network was observed in urban areas of the following voivodships: lubuskie – of more than 47%, podkarpackie – of 45.6%, podlaskie – of 40.4%, and lubelskie – of 40.1%, as well as in rural areas of the following voivodships: kujawsko-pomorskie – of 539.1%, pomorskie – of almost 282%, and warmińsko-mazurskie – of more than 125%.

Chart 6. Change in the length of gas distribution network in 2005–2017



In spatial system of Poland, as of the end of 2017 in comparison to the previous year, the largest increase in the length of distribution system was observed in voivodships: opolskie – of 4.9% (in urban areas – of 6.2%), lubelskie – of 4.2% (in urban areas – of 7.2%), and mazowieckie – of 3.9% (in urban areas – of 2.8%), and smallest in podlaskie – of 1.2% (in urban areas – of 0.4%) and dolnośląskie – of 1.7% (in urban areas – of 1.0%).

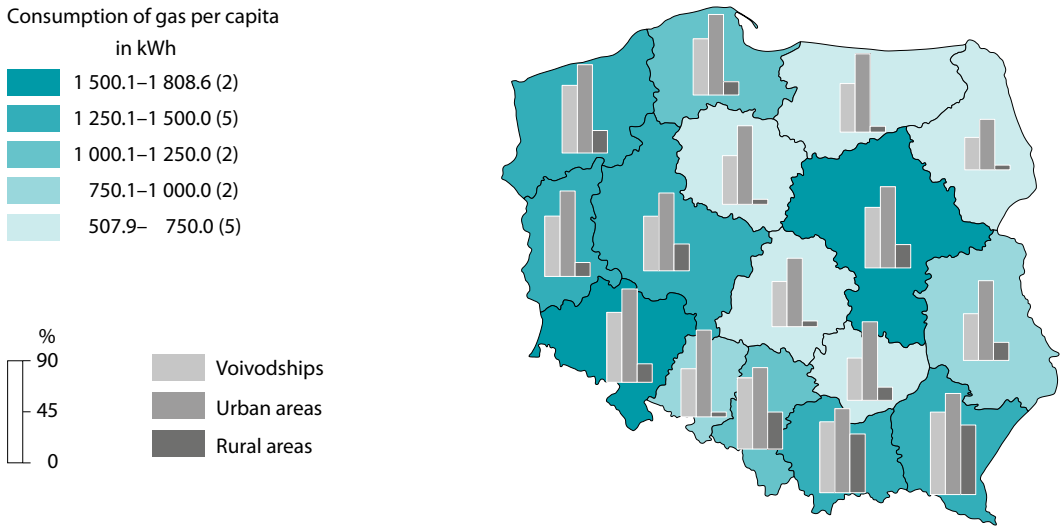
Map 5. The density of gas supply distribution network in urban areas in 2017



In Poland, in the period from 2005 to 2017, the number of people **using gas from supply system** was at a similar level. The percentage of the total population using the aforementioned system has increased since 2005 by 0.4 percentage point, with an increase of 5.4 percentage points in rural areas.

Data on gas users concern the population in dwellings equipped with gas network installations.

Map 6. Population using gas supply system and consumption of gas per capita in 2017



In 2017, in Poland the **percentage of the total population using gas supply system** remained the same as in 2016, i.e. at the level of 52.1%. In urban areas gas supply system was used by 71.2% of the total population, while in rural areas – by 23.3%. As compared to 2016, the percentage of population using gas supply system increased in rural areas by almost 0.3 percentage point, while in urban areas there was a drop of 0.2 percentage point.

Table 3. Population using gas supply system and consumption of gas in households per capita in 2005, 2010, 2015–2017

Specification	2005	2010	2015	2016	2017
Consumers of gas from gas supply system in total population (%)	51.7	52.5	52.1	52.1	52.1
of which in urban areas	73.0	72.9	71.6	71.4	71.2
Consumption of gas per capita (kWh)	101.0[a)]	110.0[a)]	1 060.3	1 177.4	1 224.0
of which in urban areas	136.4[a)]	145.9[a)]	1 369.6	1 522.8	1 564.5

a) m^3.

In 2017, consumption of gas from gas supply system amounted to 47 029.4 GWh and in comparison with 2016 increased by 4.4% (in rural areas by 8.6%, and in urban areas by 3.2%). At the same time, **consumption of gas from gas supply system by households** amounted to almost 6 268 kWh per 1 consumer, and in urban areas it was almost 5 606 kWh, while in rural areas – approx. 10 344 kWh. The highest consumption of gas from gas supply system by households per 1 consumer in Poland was recorded in wielkopolskie voivodship (8 261.6 kWh per 1 consumer; in 2016 – 8 093.8 kWh), and the lowest in łódzkie voivodship (4 149.2 kWh per 1 consumer; in 2016 – 4 054.2 kWh). As compared to 2016, consumption of gas from gas supply system per 1 consumer in urban areas increased by approx. 125 kWh, and in rural areas by 604.1 kWh.

Data regarding the number of consumers of gas fuels come from entities which have concessions for gas trade and are based on the number of contracts with consumers of gas from gas supply network.

Map 7. Sale of gas to households in 2017

Lower **electric energy consumption** by households has been observed in Poland in the period from 2005 to 2017. This phenomenon is above all a result of changes in population behaviour, i.e. replacing household appliances and light sources with those characterised by higher energy efficiency class.

Map 8. Consumers and consumption of electricity in households in 2017

In 2017, **electric energy consumption per 1 consumer** amounted to 1 962.6 kWh, and in urban areas was lower (1 736.8 kWh per 1 consumer) than in rural areas (2 407.3 kWh). As compared to 2016, electric energy consumption per 1 consumer in Poland decreased by 0.2%, with a decrease of 1.0% in urban areas, and an increase of 0.9% in rural areas.

Table 4. Consumers and consumption of electricity in households per capita in 2005, 2010, 2015–2017

Specification	2005	2010	2015	2016	2017
Consumers of electricity (thous.)	13 648.5	14 178.5	14 468.0	14 676.7	14 925.0
of which in urban areas	8 997.3	9 409.4	9 591.7	9 732.2	9 898.3
Consumption of electricity per capita (kWh)	696.1	773.0	736.3	751.1	762.4
of which in urban areas	714.9	785.4	727.6	737.3	743.4

Information on number of consumers and consumption of electricity concern households and collective accommodation establishments that pay bills for electricity consumption according to the rates of tariff group addressed to households.
Data on consumption of electricity were stated on the basis of advance payments made by consumers.

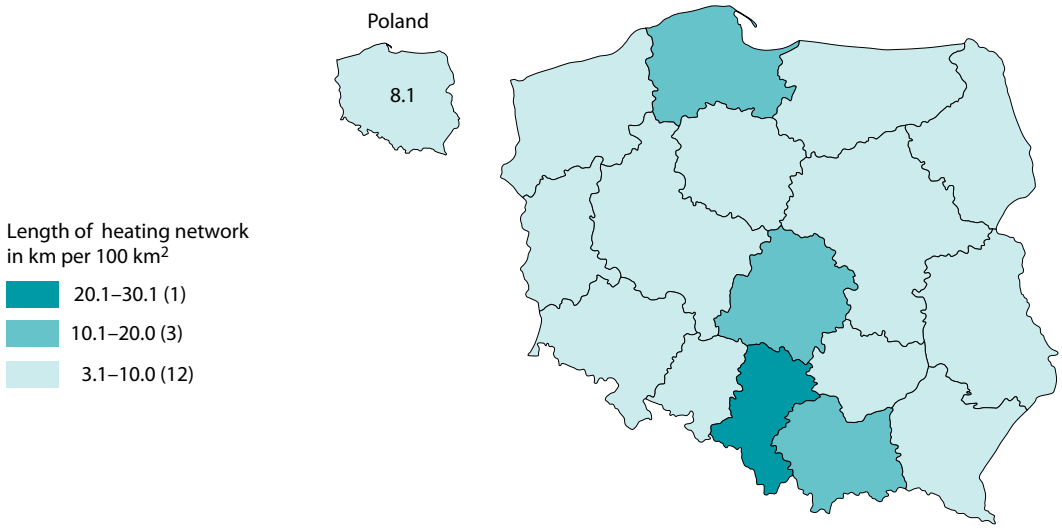
Chapter 3

Heating system management

Heating transmission network – a system of conduits transmitting heating medium to distribution conduits.
Heating distribution network – a system of distribution conduits transmitting heating medium to connections to buildings, which are conduits transmitting heating medium from distribution conduits or boiler houses to heat exchangers or heating substations in buildings or other facilities.

In 2017, the length of heating transmission network amounted in total to 16 thous. km. The highest values of the indicator of heating network density were recorded in the following voivodships: śląskie (30.1 km per 100 km^2), małopolskie (12.8 km per 100 km^2), łódzkie (11.5 km per 100 km^2), and pomorskie (10.2 km per 100 km^2), while the lowest in lubuskie voivodship – 3.6 km per 100 km^2.

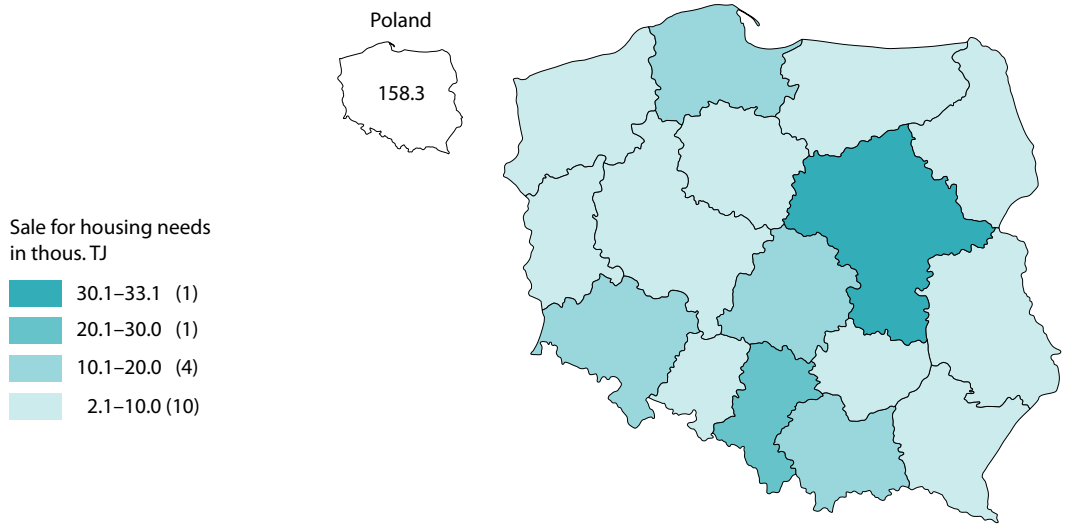
Map 9. The density of heating network in 2017



In 2017, the heat sales volume amounted to 205.1 thous. TJ, of which approx. 158.3 thous. TJ (77.2%) for heating of residential buildings. It facilitated heating of 2 439 828.3 thous. m^3 of cubic volume of buildings in total, of which 1 365 455.4 thous. m^3 of cubic volume of residential buildings.

Approximately 201.7 thous. TJ (98.3%) of heating energy was sold to inhabitants of urban areas, of which approx. 156.2 thous. TJ for heating purposes in residential buildings.

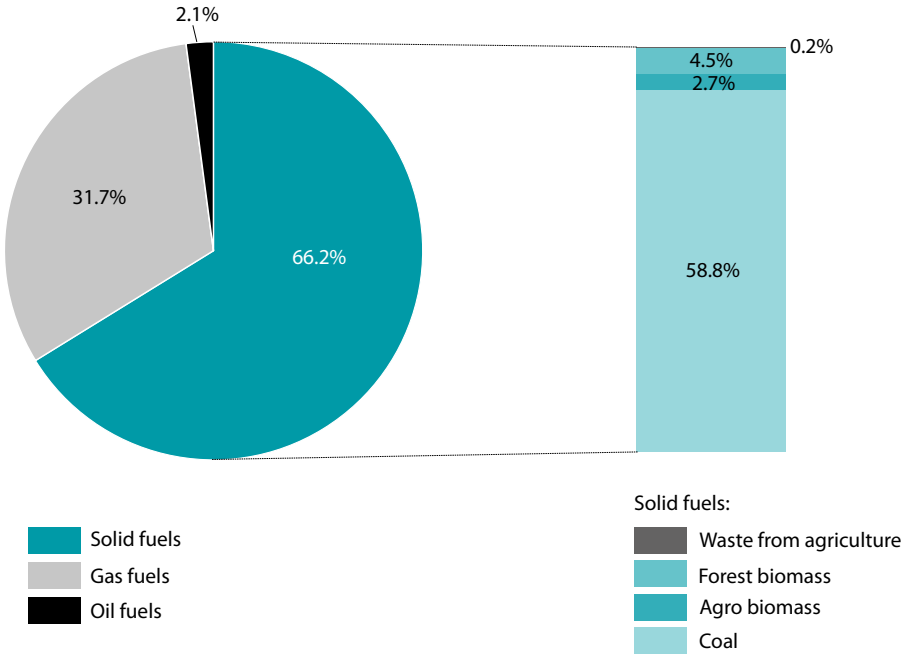
Map 10. Sale of heating energy in 2017



Information concerning heating energy include residential buildings and buildings of offices and institutions with central heating provided by heating transmission network.

The largest amount of heating energy was generated by using solid fuels – (66.2%), followed by gas – 31.7%, and oil – 2.1%.

Chart 7. Types of fuels used for production of heating energy in 2017



Chapter 4

Municipal waste management

Municipal waste is waste generated in households (excluding discarded vehicles) as well as waste generated by other producers of waste (excluding hazardous waste) which because of its character or composition is similar to waste from households.

In 2017, in Poland there were generated 11 968.7 thous. tonnes of municipal waste, which constituted an increase of 2.7% as compared to the previous year. There was on average 312 kg of collected municipal waste per one inhabitant of Poland, and in urban areas it was 371 kg, while in rural areas – 222 kg. The largest amount of municipal waste generated per 1 inhabitant was observed in the following voivodships: dolnośląskie and zachodniopomorskie (374 kg each), lubuskie (360 kg), and śląskie (352 kg), while the lowest amount of municipal waste was generated by inhabitants of: świętokrzyskie (188 kg), lubelskie (207 kg), and podkarpackie (218 kg) voivodships.

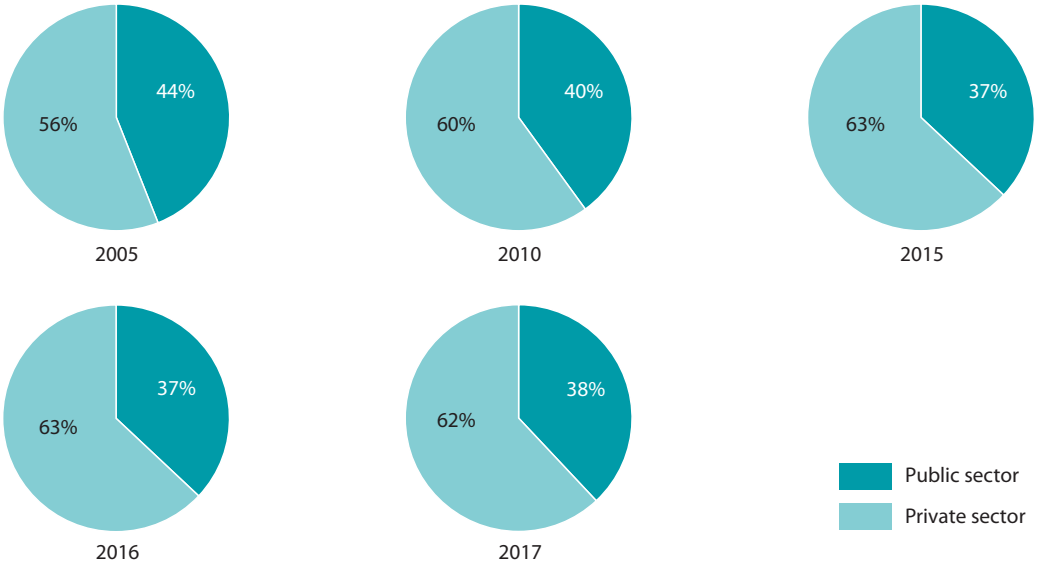
Table 5. Municipal waste collected per capita in 2005, 2010, 2015–2017

Municipal waste collected, per capita	2005	2010	2015	2016	2017
Total (kg)	245	261	283	303	312
Mixed (kg)	237	238	217	227	227
Collected separately (kg)	8	22	66	77	84

Municipal waste generated – due to the fact that since 1.07.2013, all real estate owners are covered by municipalities with municipal waste management system, starting from data for 2014, the amount of waste collected is deemed to be waste generated.

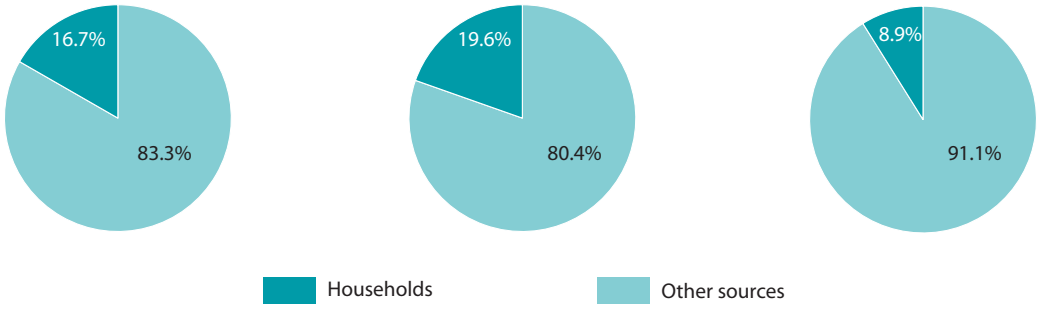
In 2017, private sector entities collected 61.8% of municipal waste (in 2016 – 62.7%). Entities with foreign capital collected the same amount as a year before (approximately 10%).

Chart 8. Municipal waste collected, by ownership sector of waste collectors in 2005, 2010, 2015–2017



In 2017, the majority of municipal waste (9 971.2 thous. tonnes) was generated by households (83.3% of the total amount of generated municipal waste). This amount increased by 4.3% in comparison to the previous year. The remaining part of municipal waste, collected among others, under provision of municipal services such as street cleaning or maintenance of parks or cemeteries, amounted to 1 997.5 thous. tonnes and constituted 16.7% of the total mass of the municipal waste collected in 2017. The share of this sources of origin of municipal waste collected in 2016 was 82.1% and 17.9%, respectively.

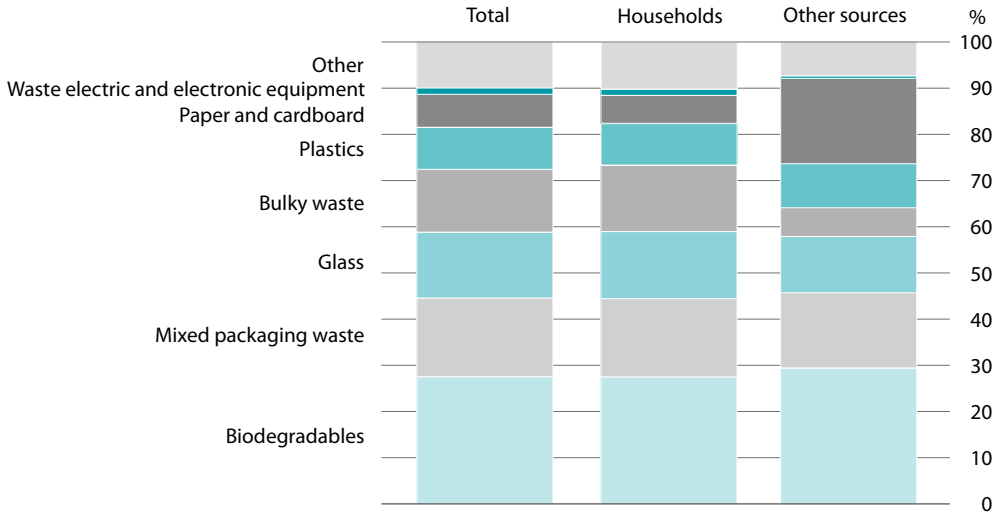
Chart 9. Sources of origin of municipal waste collected in 2017



In 2017 was recorded an increase in the share of waste collected separately in the total amount of municipal waste generated – to 27.1% from 25.3% in 2016. The total weight of waste collected separately increased from approximately 2 942 thous. tonnes in 2016 to about 3 239 thous. tonnes in 2017. There was approximately 84 kg of separately collected municipal waste per 1 inhabitant of Poland (a year before – 77 kg), with 98 kg in urban, and 64 kg in rural areas.

The largest amount (91.1%) of separately collected municipal waste in 2017 was generated by households. As compared to the previous year, the amount of this waste increased by 12.6% – from approximately 2 621.2 thous. tonnes to approximately 2 951.1 thous. tonnes. It was mainly biodegradable waste, mixed packaging waste, glass waste and bulky waste, which amounted to 73.4% of the total municipal waste collected separately generated by households in 2017.

Chart 10. Municipal waste collected separately, by fractions and sources of origin in 2017



Waste originating from other sources, collected, among others, under provision of municipal services related with maintenance of cleanliness and order in municipalities (mainly biodegradable waste, paper and cardboard, mixed packaging waste, and glass) accounted for 8.9% of the municipal waste collected separately, and their weight dropped by 10.2% – from about 321.0 thous. tonnes to approximately 288.4 thous. tonnes.

In 2017, the volume of separately collected glass waste amounted to 12.1 kg per 1 inhabitant and it was an increase of 3.5% as compared to the previous year. Per 1 inhabitant of Poland in 2017 there was approx. 7.7 kg of separately collected plastic waste (7.9 kg in 2016) and about 6.0 kg of paper and cardboard waste (6.6 kg in 2016). An increase was observed in the volume of collected biodegradable waste – from 21.4 kg per 1 inhabitant in 2016 to 23.3 kg per 1 inhabitant in 2017 (of 8.8 %) and bulky waste – from 8.8 kg to 11.5 kg (of 30.6%).

Table 6. Municipal waste fractions collected separately per capita in 2005, 2010, 2015–2017

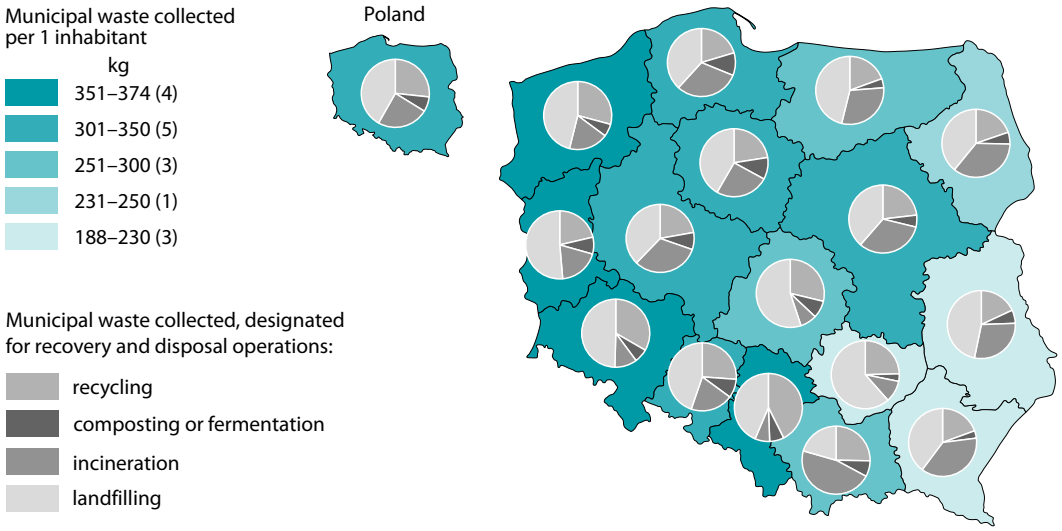
Separately collected waste per capita (kg)	2005	2010	2015	2016	2017
Total	7.7	22.3	66.0	76.6	84.3
Paper and cardboard	2.5	4.4	6.3	6.6	6.0
Glass	2.6	5.6	11.0	11.6	12.1
Plastics	1.1	3.2	7.9	7.9	7.7
Mixed packaging waste	.	.	10.9	13.3	14.3
Bulky	0.9	2.7	6.8	8.8	11.5
Biodegradable	.	4.7	17.1	21.4	23.3

In 2017, in Poland there were 2 148 public facilities of separate municipal waste collection (similar to the previous year – 2 more), of which 791 of such places (36.8%) were located in urban areas, and 1 357 – (63.2%) in rural areas.

Recovery of waste – any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

More than a half (57%) of municipal waste generated in 2017 was intended for recovery (6 770.9 thous. tonnes), of which about 3 198.68 thous. tonnes of municipal waste was intended for recycling (26.7% of the volume of collected municipal waste). There were both municipal waste collected separately and material waste sorted out of mixed municipal waste. In the previous year, 3 243.5 thous. tonnes of waste intended for recycling accounted for 27.8% of the volume of municipal waste generated.

Map 11. Municipal waste management in 2017



About 848.0 thous. tonnes of municipal waste was directed for biological treatment processes (composting or fermentation). Those were mainly bio-waste from gardens, parks and cemeteries, waste from market places, biodegradable kitchen waste and food waste from gastronomy. As compared with the previous year, the share of waste intended for such treatment in the total volume of municipal waste generated, increased by 0.1 percentage point to 7.1%.

Almost 2 724.2 thous. tonnes of municipal waste (about 22.8%) was intended for incineration with energy recovery. In 2016 it was 2 114.4 thous. tonnes, which accounted for approx. 18.1% of the volume of municipal waste generated. This increase results from investments conducted in the scope of incineration plants.

Disposal of waste – any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.

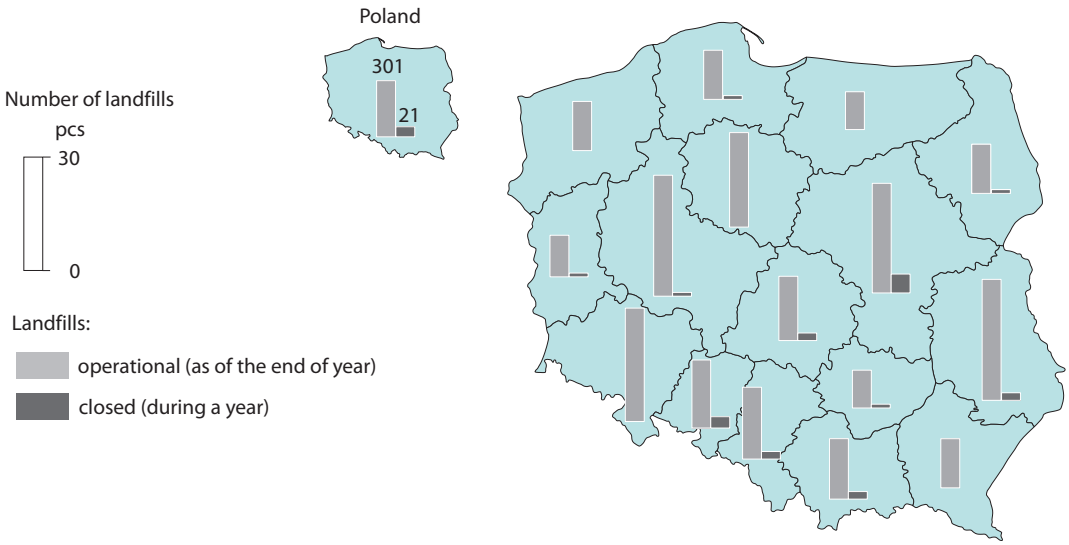
Total of 5 197.8 thous. tonnes were directed for disposal, of which 4 999.7 thous. tonnes (41.8% of total municipal waste generated) was intended for landfilling, and 198.1 thous. tonnes (1.7% of total municipal waste generated) for incineration without energy recovery. As compared to 2016, there was a decrease observed in the share of municipal waste intended for disposal through landfilling. In 2016, that waste still accounted for 45.7% of the total volume of municipal waste generated.

Table 7. Municipal waste treatment in 2005, 2010, 2015–2017

Specification	2005	2010	2015	2016	2017
Recovery of municipal waste (thous. t)	685	1 965	4 845	6 172	6 771
of which:					
material recycling	367	1 783	2 867	3 243	3 199
organic recycling (composting or fermentation)	318	181	661	814	848
incineration with energy recovery	–	–	1 318	2 114	2 724
Disposal of municipal waste (thous. t)	8 667	8 076	6 018	5 483	5 198
of which:					
landfilling	8 623	8 037	5 897	5 331	5 000
incineration without energy recovery	44	39	121	152	198

By the end of 2017, there were 301 operational landfill sites receiving municipal waste. Those landfill sites covered the total area of 1 741.6 ha. In 2017, 21 landfill sites of this type, covering area of about 59.7 ha, were closed.

Map 12. Controlled landfill sites in 2017



In relation to the need of adjusting the municipal waste landfill sites to technical and organisational requirements resulting from legal provisions, the number of landfill sites in operation has been systematically decreasing over past several years.

Chart 11. Landfill sites in operation in 2005–2017

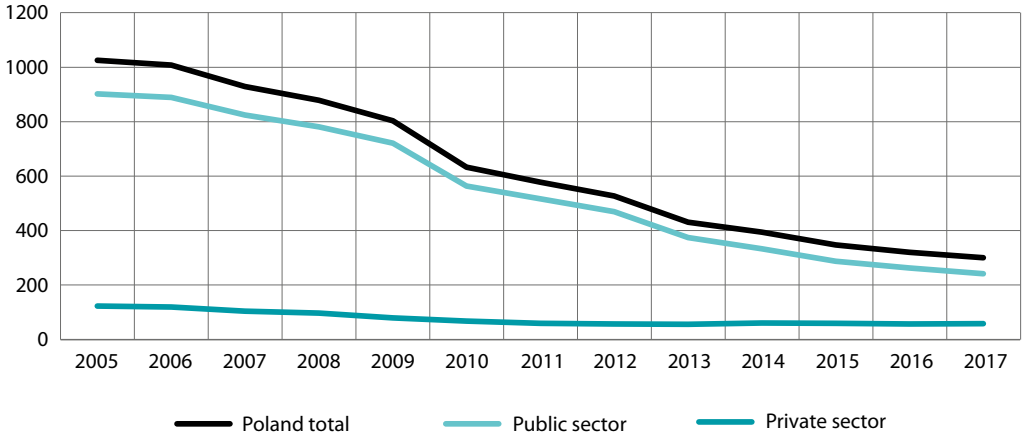
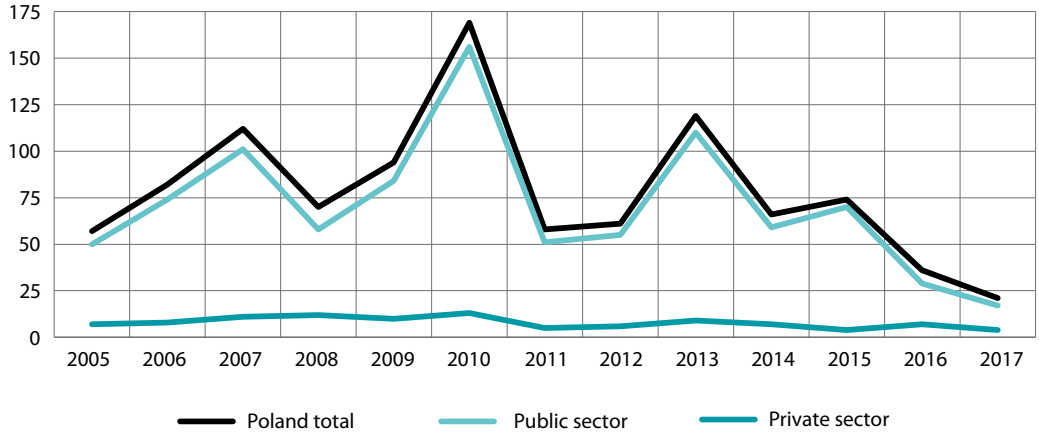
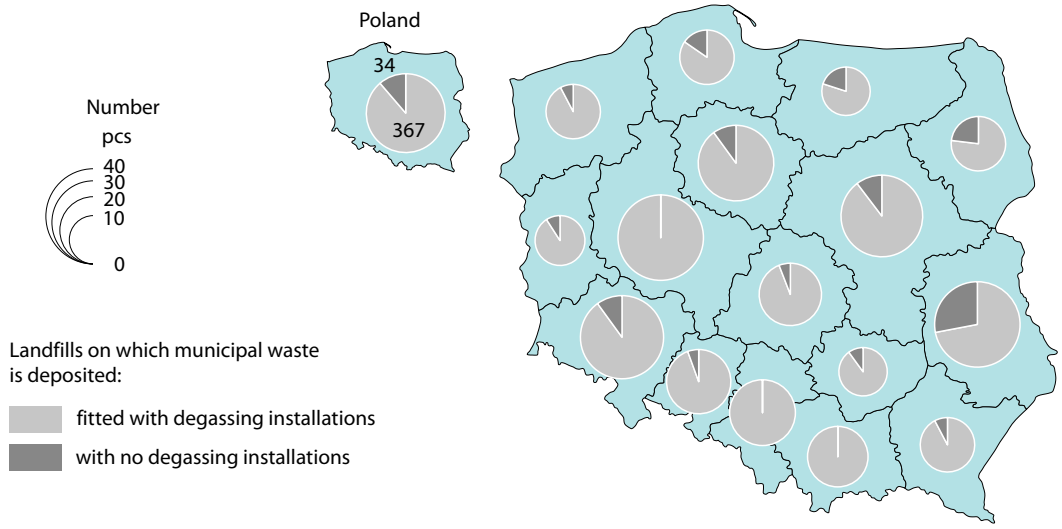


Chart 12. Landfill sites closed in 2005–2017



In 2017 in Poland, 267 landfill sites was fitted with degassing installations, and they accounted for 88.7% of all operational landfill sites where municipal waste was deposited (in the previous year 86.3%).

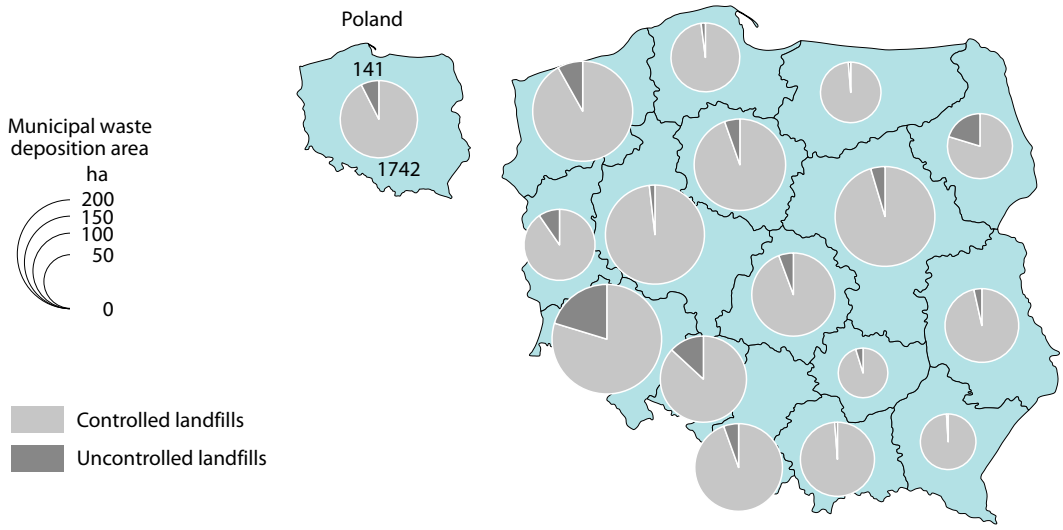
Map 13. Degassing of landfill sites in 2017



About 37% of the number of degassing installations were the installations with gas released directly to the atmosphere (similarly as in 2016), while 6.6% of the total number were those, in which the landfill gas was disposed of with energy recovery (an increase of 0.8 percentage point). About 20.3% were installations, with the use of which the landfill gas was used for electricity production (a decrease of 0.7 percentage point). In 2017, as a result of neutralisation of the captured landfill gas by burning 96 997 thous. MJ of heating energy (15.5% more than in 2016), and about 121 574 thous. kWh of electrical energy (9% less than in 2016) was recovered.

About 93% of the municipal waste deposition in Poland in 2017, was the area of landfill sites in operation (more by 1% than in 2016). The remaining part was the area of uncontrolled landfill sites, i.e. places not intended for deposition of municipal waste.

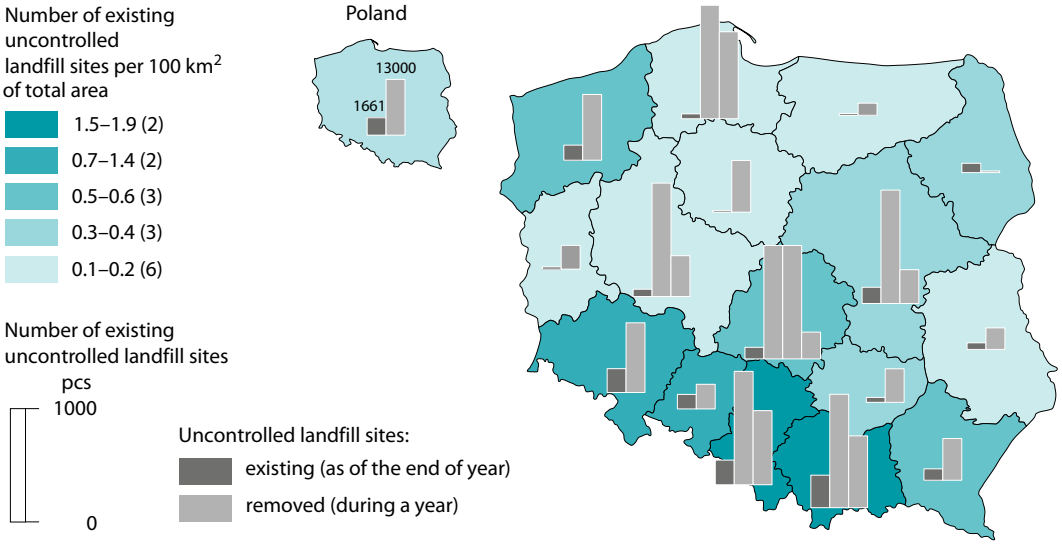
Map 14. Municipal waste deposition area in 2017



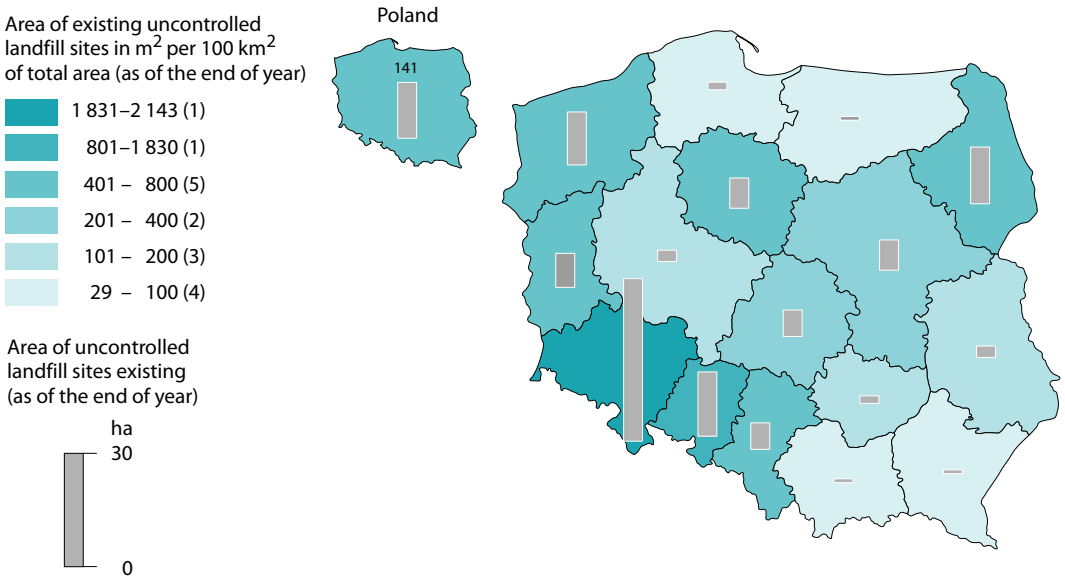
As of the end of 2017, in Poland there were 1 661 uncontrolled landfill sites, i.e. by 15.6% less than in the previous year. In urban areas, there were 407 such dumps (a decrease of 28.7% as compared to 2016), and in rural areas there were 1 254 illegal dumping sites (a decrease of 10.2% as compared to 2016).

In 2017, 13 thous. uncontrolled landfill sites were removed, of which 83.8% in urban areas. As compared to the previous year, the total number of removed illegal municipal waste deposition sites decreased by 15% (in urban areas it was a decrease of 18.1%, while in rural areas an increase of 5.9%). During removals of uncontrolled landfill sites, about 42.8 thous. tonnes of municipal waste was collected (less by 16.6% than in 2016), of which 76.6% in urban areas (a decrease of 7.9 percentage points as compared with the previous year).

Map 15. Uncontrolled landfill sites in 2017



Map 16. Area of uncontrolled landfill sites in 2017

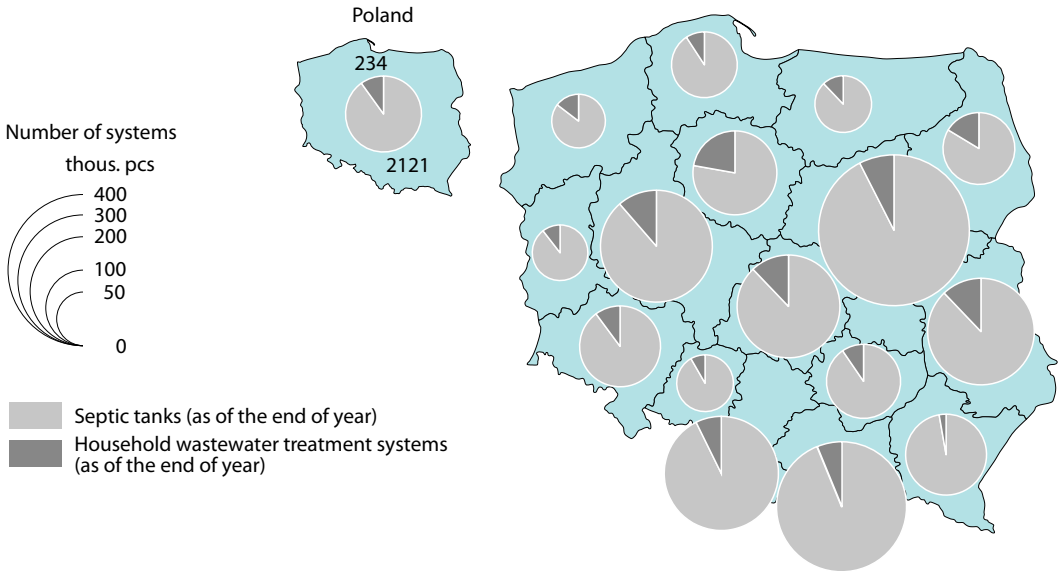


Chapter 5

Liquid waste management

Inhabitants of the areas with insufficiently developed sewage infrastructure use independent systems for sewage removal, namely septic tanks or household wastewater treatment systems. They are an alternative for construction of sewage system discharging sewage to wastewater treatment plants in cases where connecting of all real estates to sewage system is impossible or generates excessive costs. In Poland in 2017, there were 2 355 thous. of on-site systems for discharge of liquid waste, of which about 90% were septic tanks.

Map 17. On-site systems for discharging of wastewater in 2017



The number of septic tanks increased from approx. 2 117 thous. in 2016 to 2 121 thous. in 2017 (by 0.2%), while the number of household wastewater treatment systems increased from about 217 thous. in 2016 to approx. 234 thous. in 2017 (by 8.0%).

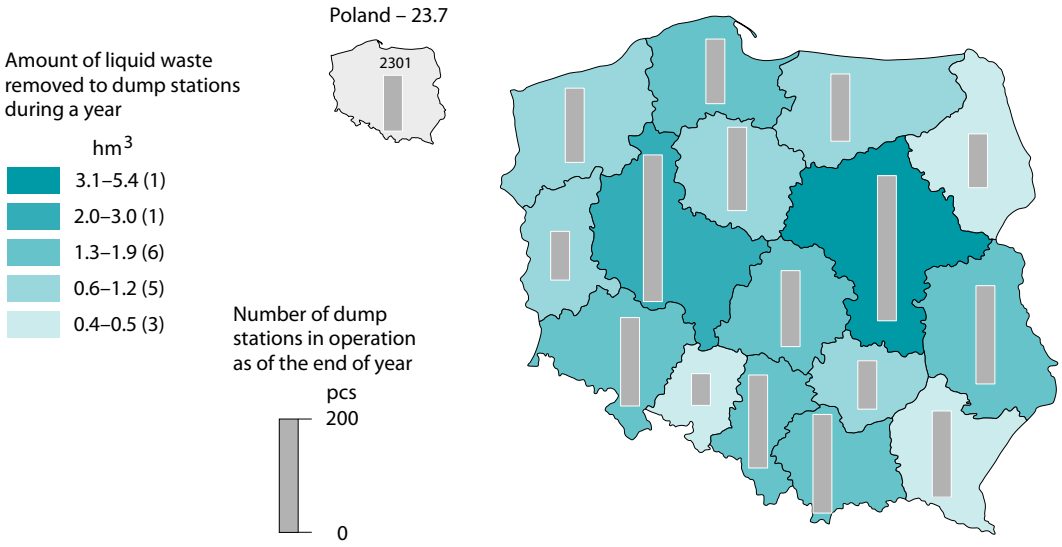
Table 8. On-site systems for discharging of wastewater in 2005, 2010, 2015–2017

On-site systems for liquid waste discharge	2005	2010	2015	2016	2017
Total (thous. pcs)	2 511.8	2 487.4	2 339.0	2 333.3	2 354.9
Urban areas	497.5	450.2	356,2	337.1	334.5
Rural areas	2 014.3	2 037.2	1 982,8	1 996.2	2 020.5
Septic tanks (thous. pcs)	2 483.9	2 406.8	2 136.2	2 116.7	2 121.1
Urban areas	493.4	441.2	339.0	319.0	314.8
Rural areas	1 990.5	1 965.6	1 797.1	1 797.7	1 806.2
Household wastewater treatment systems (thous. pcs)	27.9	80.6	202.8	216.6	233.8
Urban areas	4.1	9.0	17.2	18.1	19.6
Rural areas	23.8	71.6	185.6	198.5	214.2

The majority (almost 86%) of household wastewater discharge systems in 2017 were located in rural areas. About 85% of all septic tanks and about 92% of the total number of household wastewater treatment systems were located there.

Domestic sewage stored temporarily in septic tanks is collected from owners of the real estate equipped with such tanks by municipal organisational units or entities conducting activities in the scope of emptying septic tanks and transport of liquid waste on the basis of a permit granted pursuant to provisions of the Act on Maintaining Cleanliness and Order in Municipalities, and are afterwards entered into dump stations. In 2017, about 23.7 hm^3 of liquid waste was collected (by 2.3% more than in 2016), which corresponds to approx. 2.1% of the total volume of domestic sewage discharged by sewage system to wastewater treatment plants.

Map 18. Dump stations and liquid waste removed to dump stations in 2017



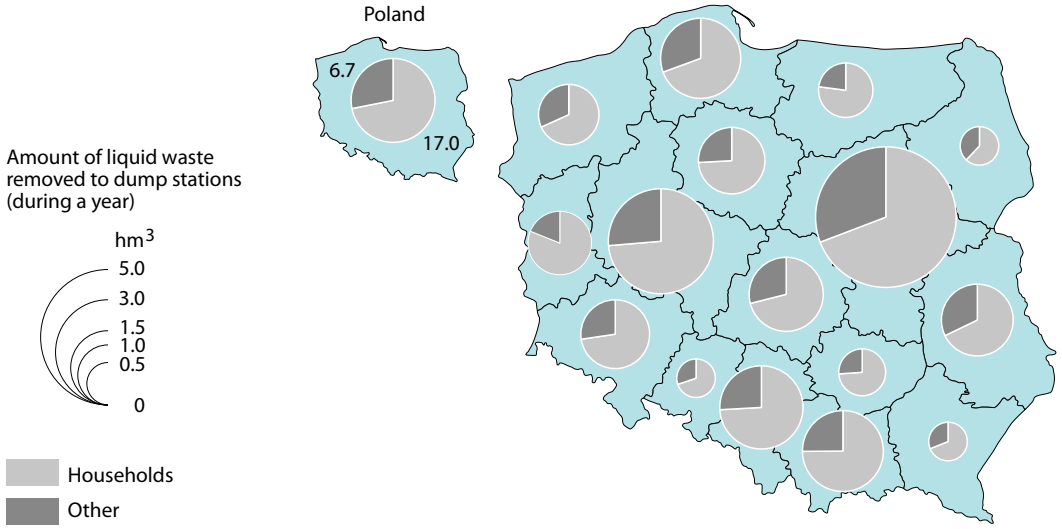
The total number of dump stations in operation in 2017 was at the similar level as in the previous year and amounted to 2 301 pcs. About 67% dump stations were located in rural areas. In 2017, approx. 68.6% of liquid waste was collected from those areas, while 31.4% of the total volume of liquid waste removed to dump stations originated from urban areas (in the previous year – 67.8% and 32.2%).

Table 9. Liquid waste collected in 2005, 2010, 2015–2017

Liquid waste collected	2005	2010	2015	2016	2017
Total (hm^3)	18.2	24.6	23.0	23.1	23.7
Urban areas	7.8	9.6	7.8	7.5	7.4
Rural areas	10.4	15.1	15.1	15.7	16.2
From households (hm^3)	10.6	16.2	15.8	16.2	17.0
Urban areas	4.7	6.1	5.2	5.0	4.9
Rural areas	5.9	10.0	10.6	11.2	12.1
From other sources of origin (hm^3)	7.6	8.5	7.1	6.9	6.7
Urban areas	3.1	3.4	2.6	2.5	2.5
Rural areas	4.5	5.0	4.5	4.4	4.2

Almost 72% of collected liquid waste originated from tanks used by households, and the remaining part (approx. 28%) from tanks servicing public utility buildings or buildings of entities conducting business activities (in 2016 it was 70% and 30%, respectively).

Map 19. Sources of origin of liquid waste in 2017



In 2017, approx. 72.9% of liquid waste were removed by private entities (73.1% in 2016), while 27.1% by entities from public sector (26.9% in 2016).

Methodological notes

1. Sources and scope of data

The source of information on municipal infrastructure in 2017 are results of surveys included in the programme of statistical surveys of official statistics (PBSSP):
1.26.06 – Technical infrastructure of water supply and sewage systems, heating, gas and energy,
1.26.08 – Municipal waste and maintenance of cleanliness and order in municipalities, and secondary use of data from surveys:
1.44.01 – Balance of fuels and energy,
1.44.02 – Electricity and heating sector.
Forms used for obtaining the data are as follows:

- M-06 Report on water supply network, sewage network and removal of liquid waste collected in septic tanks;
- M-09 Report on collection and treatment of municipal waste;
- SG-01 part 3 Statistics of municipality: housing and municipal economy;
- Annex to the SG-01 report – Statistics of municipality: housing and municipal economy.
- G-02g Report on infrastructure, consumers and sales of gas from gas supply network;
- G-02b Balance report on energy carriers and heating infrastructure.

The survey in the scope of water supply and sewage systems is conducted as a full survey and covers entities, which primary, secondary, and ancillary activities is management of water supply and sewage systems or liquid waste collection.

Data regarding users of water supply and sewage systems concern population living in residential buildings, and in collective accommodation establishments, connected to a specific network.

Data on gas consumers concern the population in dwellings equipped with gas network installations.

Data concerning population using water supply and sewage systems, since 2014, due to a change in estimation methods, are not fully comparable with the data presented in the previous editions of the publication.

Data on energy management cover entities granted concessions for transmission and distribution of fuels and energy. Information on number of consumers and consumption of electricity concern households and collective accommodation establishments that pay bills for electricity consumption according to the rates of tariff group addressed to households. Data on consumption of electricity were stated on the basis of advance payments made by consumers.

Data on number of consumers of gas fuels come from the entities granted fuel trade concessions and are based on the number of contracts signed with consumers of gas from gas supply network.

Information concerning heating energy include residential buildings and buildings of offices and institutions with central heating provided by transmission heating network, considered as a system of interconnected installations cooperating with each other, used for transmission and distribution of heating medium to recipients. Information on boiler houses include types of boilers, their power (i.e. maximum quantity of heat energy, which can be produced by boilers in a given time unit), annual production, and installed equipment supporting air protection (limiting emissions of air pollutants).

Since 2014, data on heating sector referring to sales of heating energy, number of boiler houses, cubic volume of buildings with central heating, characteristics of boilers, and equipment installed in boiler houses protecting the atmosphere against emissions of pollutions, include the change in the subjective scope of the survey.

The survey providing information on municipal waste is conducted as a full survey and includes entities operating in the field of collection or treatment of municipal waste. Results include: amount of waste collected (of which from households, from commerce, small business, offices and institutions and municipal services) and intended for recovery and disposal processes.

Due to the fact that since 1.07.2013, all real estate owners are covered by municipalities with municipal waste management system, the amount of waste collected is deemed to be waste generated. The conducted reform of the municipal waste management system changed the organisation of collection of municipal waste from real estate owners. At present, municipalities are obligated to organise tenders for collection of municipal waste from real estate owners or tenders for collection and management of that waste. Real estate owners do not enter into contracts with entities providing municipal waste collection services from inhabitants by themselves.

For computing data per 1 inhabitant (1000 of population, etc.) as of the end of the year (e.g. number of population using municipal equipment), data on population as of 31 XII were used, while for data describing the magnitude of a phenomenon during the year (e.g. consumption) – as of 30 VI.

2. Main definitions

Municipal management – a branch of national economy, which aim is to satisfy material and living needs of the population. In Poland, municipal management includes enterprises conducting an economic activity in the scope of water supply and sewage management, heating management as well as distribution of fuels and energy to households, and municipal waste management.

Municipal infrastructure – basic installations and service institutions, which are essential to functioning of the economy and population.

Water supply system – a set of water network devices serving collection of surface and underground waters, public wells, devices serving storage and treatment of water, water supply networks, and water pressure control devices.

Water supply transmission network – conduits bringing water from distant water intakes to distribution network.

Water supply distribution network – street conduits used for distribution of water to consumers by the connections to buildings and other objects.

Water supply connection – a segment of a conduit connecting water supply network with internal water supply installation on a property of consumer together with a valve past the main water-meter.

Street water outlets are publicly available facilities connected directly to water mains, serving the community for drawing water directly from the mains.

Water delivered to households is the quantity of water collected from water supply network using facilities installed in a building.

Water delivered for production purposes is water delivered to industrial, construction, transport enterprises (plants), etc., i.e. production plants in all divisions of national economy regardless of whether delivered water is used for technological purposes, or for social and living needs of staff (in lavatories, bathrooms, dining-rooms, canteens, day-rooms, and office buildings which are located within the plant).

Sewage system is a complete sewage collection system serving discharging of wastewater, including sewage network, outlets of devices used to emit sludge into the waters, or into the ground, sewage pretreatment and treatment facilities, and sewage pumping stations.

Active sewage network – a system of covered (underground) conduits discharging sewage from buildings and other objects to collectors or sewage treatment facilities.

Sewage connection – a segment of conduit connecting internal sewage installations on a property of consumer with the sewage network, past a first inspection chamber from a building, and in case of its lack – from a boundary of the property.

Wastewater discharged – household wastewater or a mixture of household wastewater with rainfall wastewater or a mixture of household wastewater with industrial wastewater and rainfall wastewater.

Septic tank – an installation and device intended for an accumulation of liquid waste where it is generated.

Liquid waste – sewage stored temporarily in septic tanks.

Dump station – an installation and device, placed near a sewer or a wastewater treatment plant, intended for collecting of liquid waste, transported by sewage disposal vehicles from where it was accumulated.

Gas supply network is a system of conduits providing gas supplied by enterprises, which scope of economic activity includes transmission and distribution of gas to consumers. The system of conduits consists of:
- transmission and distribution network (with high-methane gas and nitrogenised gas) – street conduits used for distribution of gas to buildings or other objects by means of connections;
- connections – a system of conduits joining distribution gas supply network with buildings and other objects.

Boiler-house or boiler-room is a building or a premise with boilers and installations used for production of heating energy for heating purposes or for simultaneous heating and supplying of hot water.

Municipal waste is waste generated in households (excluding discarded vehicles) as well as waste generated by other producers of waste (excluding hazardous waste) which because of its character or composition is similar to waste from households.

Biodegradable waste – waste capable of undergoing anaerobic or aerobic decomposition.

Collection of waste – means the gathering of waste, including the preliminary sorting and preliminary storage of waste for the purposes of transport to a waste treatment facility.

Separate collection – the collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment.

Municipal waste separate collection point – a stationary place where inhabitants can hand over various types of municipal waste, e.g. paper and cardboard, glass, composite packaging, plastics, or biodegradable municipal waste.

Waste management – the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker.

Treatment – recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery – any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

Thermal waste treatment – incineration of waste by oxidation and other processes of thermal treatment of waste including pyrolisis, gasification, and plasmic process provided that substances originating from these processes of thermal treatment of waste are incinerated afterwards.

Energy recovery – thermal waste treatment as a result of which energy is generated.

Recycling – any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal – any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.

Landfill site – a structure for the deposit of waste.

Degassing of landfill sites – collection of biogas from landfills receiving biodegradable waste. Collected gas is cleaned and used for production of energy, and if it is not possible (e.g. when its quantity is too small for effective energy production), it is neutralized through combustion in burners.