



CENTRAL STATISTICAL OFFICE

# MUNICIPAL INFRASTRUCTURE IN 2015

WARSAW 2016

STATISTICAL INFORMATION AND ELABORATIONS

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## **PREFACE**

*The present publication is a consecutive edition of “Municipal Infrastructure”. It aims at presenting recipients with the characteristics of municipal services market in Poland in 2015 and tendencies of changes taking place in surveyed area of activity.*

*The elaboration includes information on installations and municipal services in the scope of water supply and sewage systems, heating management, distribution of electricity, and gas from gas-line network as well as collection and treatment of municipal waste. The statistical data have been compiled regarding the location of facilities or the place of rendering municipal services and are presented for Poland as a total and with the breakdown into voivodships, and urban and rural areas.*

*The publication uses the results of compilations, got from statistical reports completed by entities, which scope of economic activities includes supplying of water to households, and discharging wastewater from them as well as collecting of municipal waste and liquid waste, treating of municipal waste, or distributing of electricity, heat energy, and gas from gas-line network.*

*Thematic scope was presented in voivodships breakdown. Information at lower levels of aggregation (poviats and gminas), and data broken down by urban and rural areas are available in Local Data Bank on the website of Central Statistical Office (<http://www.stat.gov.pl>).*

*The authors will be grateful to all people and institutions for sending their comments, which will shape and enhance the content of next editions of the publication.*

*Director  
of Trade and Services Department  
Ewa Adach-Stankiewicz*

*Warsaw, October 2016*

## **CONTENTS**

<b>PREFACE</b>	<b>3</b>
<b>ABBREVIATIONS</b>	<b>5</b>
<b>1. METHODOLOGICAL NOTES</b>	<b>6</b>
1.1. SOURCES AND SCOPE OF DATA	6
<b>1.2. MAIN DEFINITIONS</b>	<b>8</b>
<b>2. RESULTS OF SURVEYS – SYNTHESIS</b>	<b>11</b>
2.1. WATER SUPPLY SYSTEM AND SEWAGE SYSTEM MANAGEMENT	11
2.2. ENERGY MANAGEMENT AND GAS ENGINEERING	19
2.3. HEATING MANAGEMENT	23
2.4. MUNICIPAL WASTE MANAGEMENT	25
<b>GRAPHS AND MAPS</b>	<b>34</b>
<b>TABLES – IN A SEPARATE EXCEL FILE</b>	

## Symbols

“.”	– no information or no reliable information available.
“_”	– magnitude zero.
“0”	– magnitude not zero, but less than 0.5 unit.
“x”	– not applicable.
“*”	– indicates that data have been changed in relation to the data published in the previous edition of publication.
"of which"	– indicates that not all elements of the sum are given.

## **ABBREVIATIONS**

thous.	thousand
mln	million
m	metre
m <sup>2</sup>	square metre
m <sup>3</sup>	cubic metre
hm <sup>3</sup>	cubic hectometre
km	kilometre
km <sup>2</sup>	square kilometre
ha	hectare
dam <sup>3</sup>	cubic decametre
kWh	kilowatt-hour
MWh	megawatt-hour
GWh	gigawatt-hour
J	joule
kJ	kilojoule
GJ	gigajoule
TJ	terajoule
cont.	continued
pc	piece

## **1. METHODOLOGICAL NOTES**

### **1.1. SOURCES AND SCOPE OF DATA**

Sources of information on municipal infrastructure in 2015 are results of statistical surveys carried out on forms as well as the secondary use of data from the survey on balance of energy carriers and heating infrastructure, and data coming from internal information systems of the Energy Market Agency S.A.

The forms used for data collection are:

- 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 SG-01 report – Statistics of municipality: housing and municipal economy. Maintaining cleanliness and order in municipalities.

Data on water supply and sewage system management are collected within the full survey, which comprises units with a primary, secondary or ancillary activity in management of water supply and sewage systems or liquid waste collection.

Data regarding population using water supply and sewage systems include people living in residential buildings and collective accommodation buildings connected to a specific network.

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

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

Data on energy management cover units which were granted concessions for transmission and distribution of fuels and energy. Information on the number of consumers and consumption of electricity concern households and collective accommodation places that pay bills for consumption of electricity according to the rates of “households” tariff group. Data on consumption of electricity are presented on the basis of information on advanced payments made by consumers.

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.

Information on heating include residential buildings, office and institutional buildings with central heating provided by transmission thermic-line, considered as the system of interconnected installations cooperating with each other, used for transmission and distribution of heating medium to recipients. Information regarding boiler-houses or boiler-rooms cover types of boilers, their power (i.e. the maximum quantity of heat energy which can be produced by boilers in a defined unit of time), annual production, and installed facilities protecting atmosphere (limiting emission of pollutants to the atmosphere).

Data in the field of heating, referring to the sales of heat energy, the number of boiler houses, the cubic volume of a buildings with central heating, the characteristics of boilers and equipment protecting the atmosphere from the emission of air pollutants installed in boiler houses since 2014 has included a change in the subjective scope of the survey.

The survey providing information about municipal waste (M-09 form) 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 (from households, from trade, small business, offices and institutions, and from municipal services), and amount of waste designated for recovery and disposal operations.

Due to the fact that since 1 July 2013 all real estate owners are covered by municipal waste management system, the amount of waste collected is considered to be waste generated. The reform of municipal waste management system has changed the organisation of collection of municipal waste from real estate owners. Currently, municipalities are obliged to organize a tender for collection of municipal waste from real estate owners, or a tender for collection and management of that waste. Real estate owners no longer conclude contracts with providers of municipal waste collection services from residents on their own.

For computing data per 1 inhabitant (1,000 population, etc.) as of the end of a year (e.g., population using municipal installations), population as of 31 XII was used, while data describing the magnitude of a phenomenon within a year (e.g., consumption) – as of 30 VI.

## 1.2. 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 in a property of consumer together with a valve past the main water-meter.

**Street outlets** are publicly available facilities connected directly to street 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 in a property of the services consumer with the sewage network after a first inspection chamber from a side of 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.

**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 pyrolysis, gasification, and plasma 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.

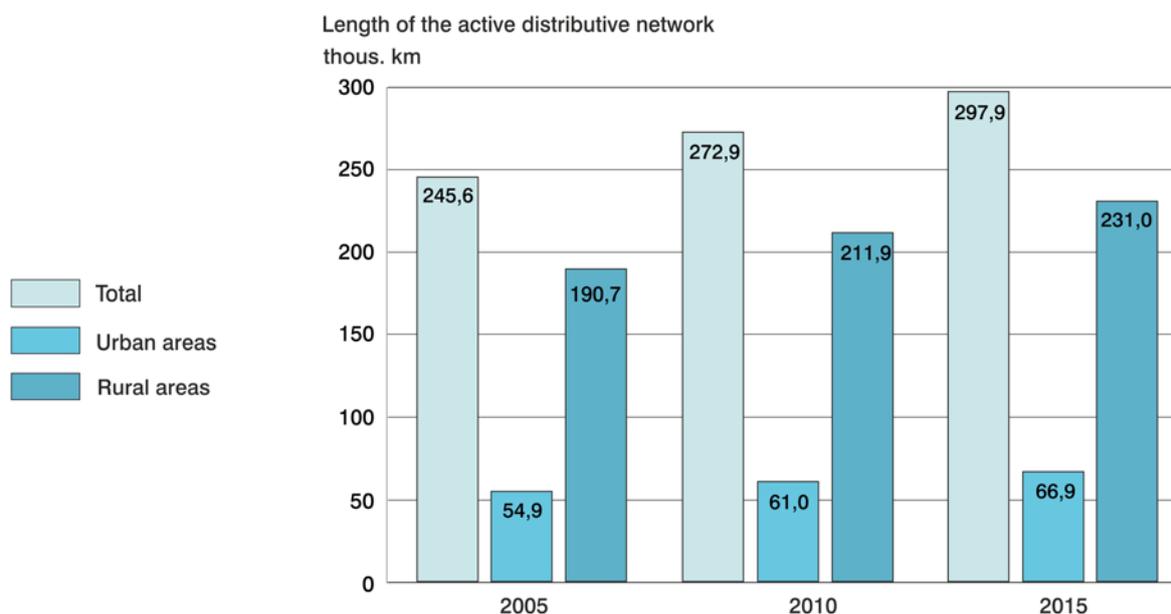
## 2. RESULTS OF SURVEYS – SYNTHESIS

### 2.1. WATER SUPPLY SYSTEM AND SEWAGE SYSTEM MANAGEMENT

In the last ten years in Poland a considerable increase has been observed in investments in the area of technical and sanitary infrastructure. In the period in question the length of the water supply network increased by 245.6 thous. km to 297.9 thous. in 2015, i.e. by 21.3%, of which in rural areas from 190.7 thous. km to 231.0 thous. km of the network, i.e. by 21.1%. However, the number of connections grew by nearly 970 thous., i.e. by 21.5%, of which approx. 633 thous. in rural areas, i.e. by 23.0%.

The most considerable increase in the length of the water supply network was observed in the urban areas of the following voivodships: Podkarpackie – of over 50%, Lubuskie – of nearly 46% and Zachodniopomorskie – of 33%, and in rural areas of voivodships: Zachodniopomorskie – of over 39%, Warmińsko-Mazurskie – of almost 34% and Mazowieckie – of nearly 33%.

#### CONDITION OF WATER SUPPLY NETWORK IN 2005, 2010 AND 2015

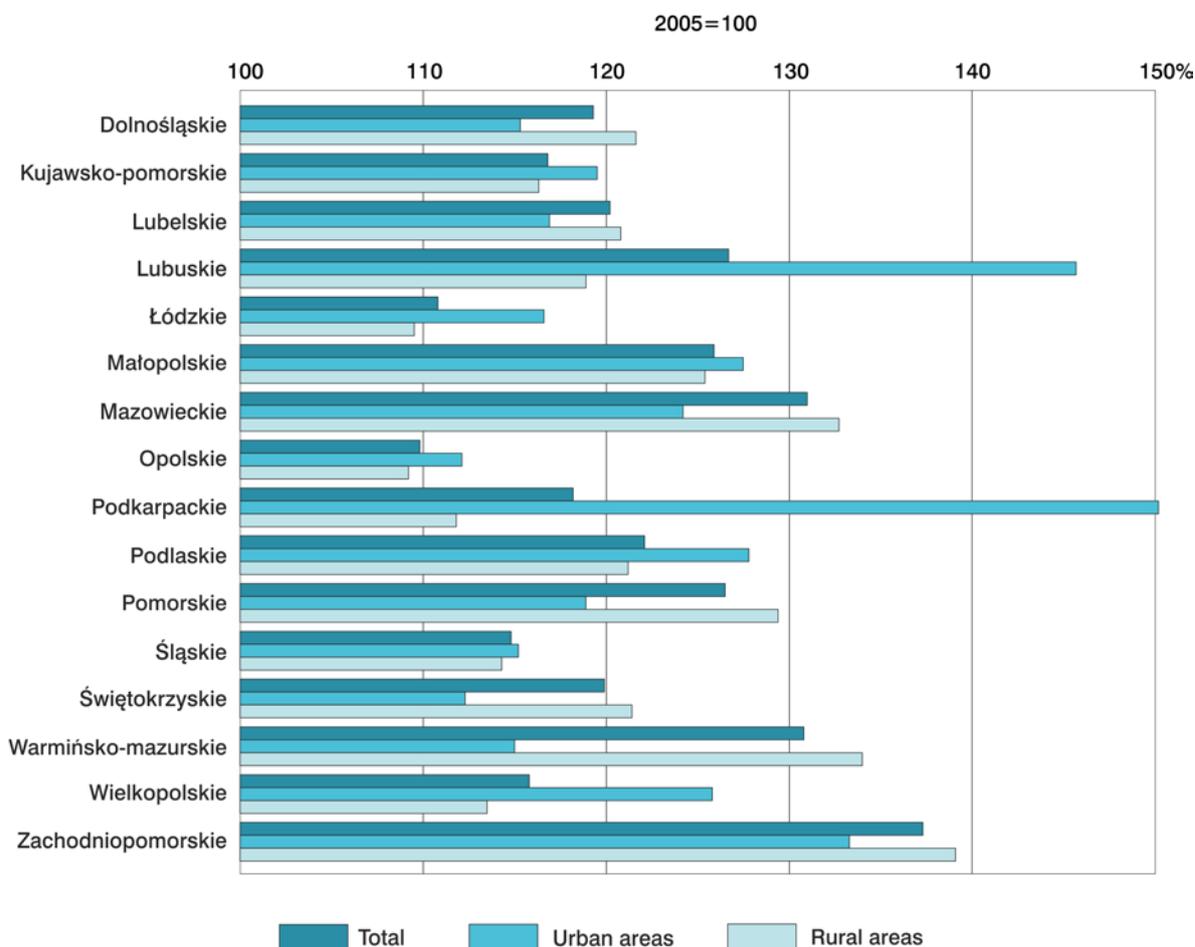


In 2015 the length of **the water supply network** in Poland reached almost 298 thous. km, and the number of connections – nearly 5.5 mln. The length of the newly built or reconstructed water supply network in comparison with 2014 grew by 5.4 thous. km, with a simultaneous growth in the number of connections to buildings of nearly 107 thous. units.

Over 77.5% of the length of the water supply network and approx. 61.8% of connections to buildings were located in rural areas. As compared to the previous year – the length of the water

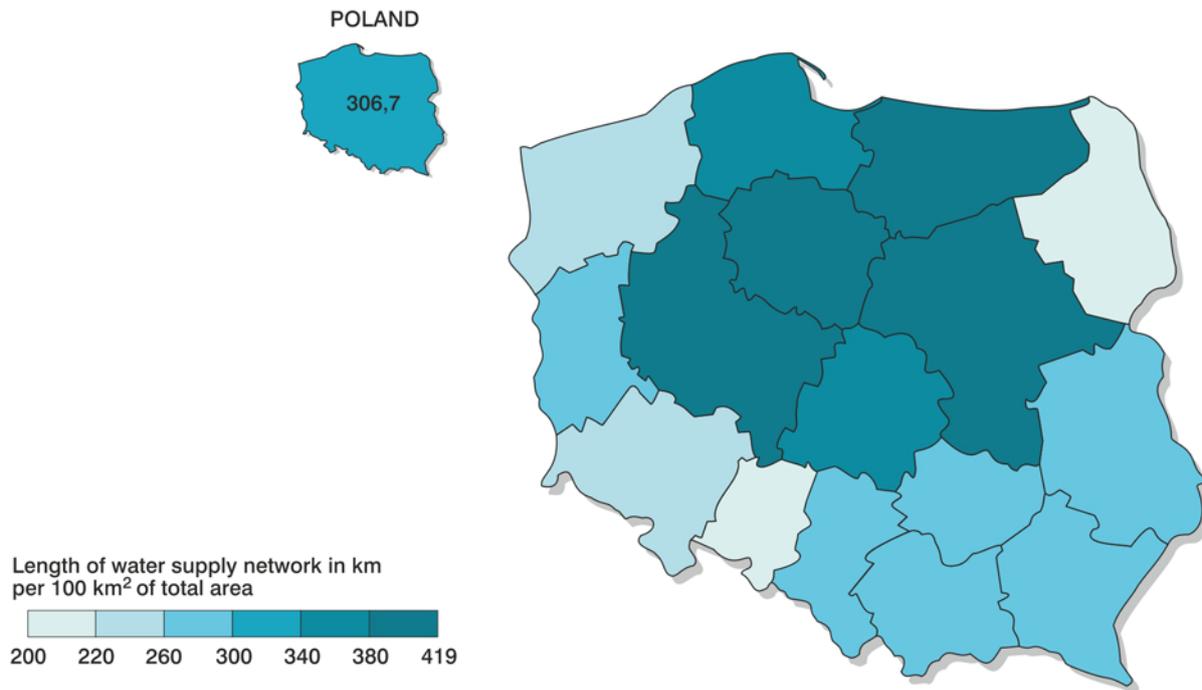
supply network increased in urban areas by over 1.3 thous. km, and the number of connections – by almost 37.3 thous. units. In rural areas there were over 4.1 thous. km of new network, and the number of connections grew by 69.2 thous. units.

#### CHANGE IN LENGTH OF WATER SUPPLY NETWORK IN 2005–2015



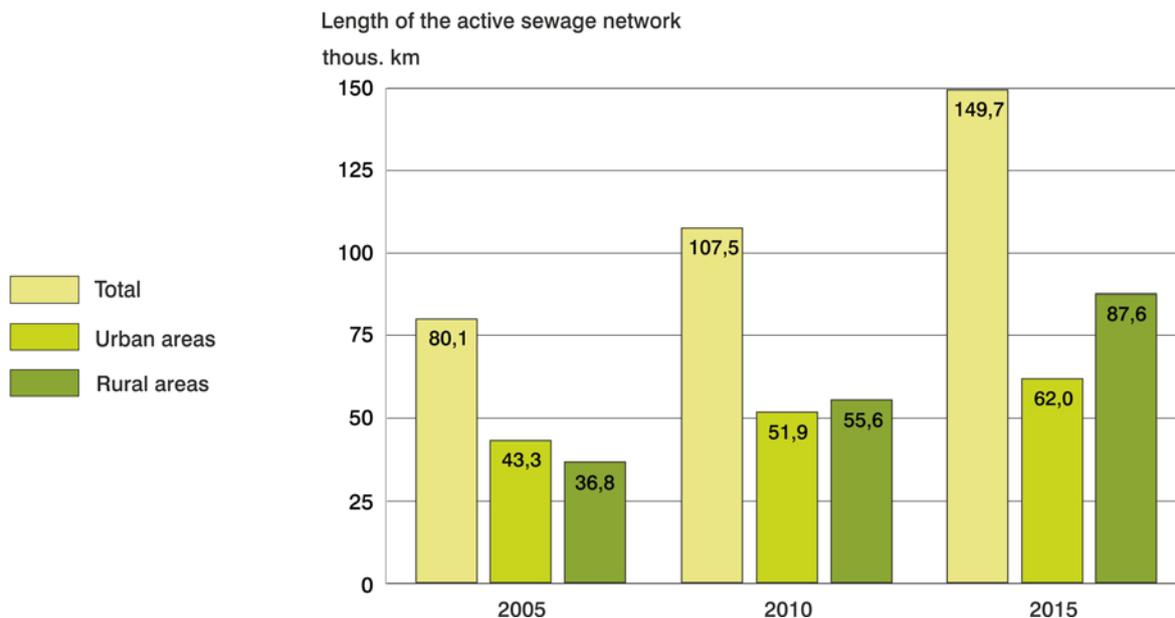
The highest **water supply network density** was observed in the following voivodships: Śląskie – 170.7 km per 100 km<sup>2</sup> (an increase as compared to 2014 by 1.7 km per 100 km<sup>2</sup>), Małopolskie – 130.3 (of 5.1 km per 100 km<sup>2</sup>), and the lowest in the following voivodships: Zachodniopomorskie – 48.5 (of 0.9 km per 100 km<sup>2</sup>) and Lubuskie 49.8 (of 1.1 km per 100 km<sup>2</sup>).

**DENSITY OF WATER SUPPLY NETWORK IN URBAN AREAS IN 2015 R.**



In the period 2005-2015 **the sewage network length** was extended by 69.5 thous. km (i.e. by 86.8%), reaching 149.7 thous. km in 2015. In rural areas the network growth was higher, i.e. by 51 thous. km (by 138%), than in urban areas, which means an increase of 18.7 thous. km was observed (of 43.2%).

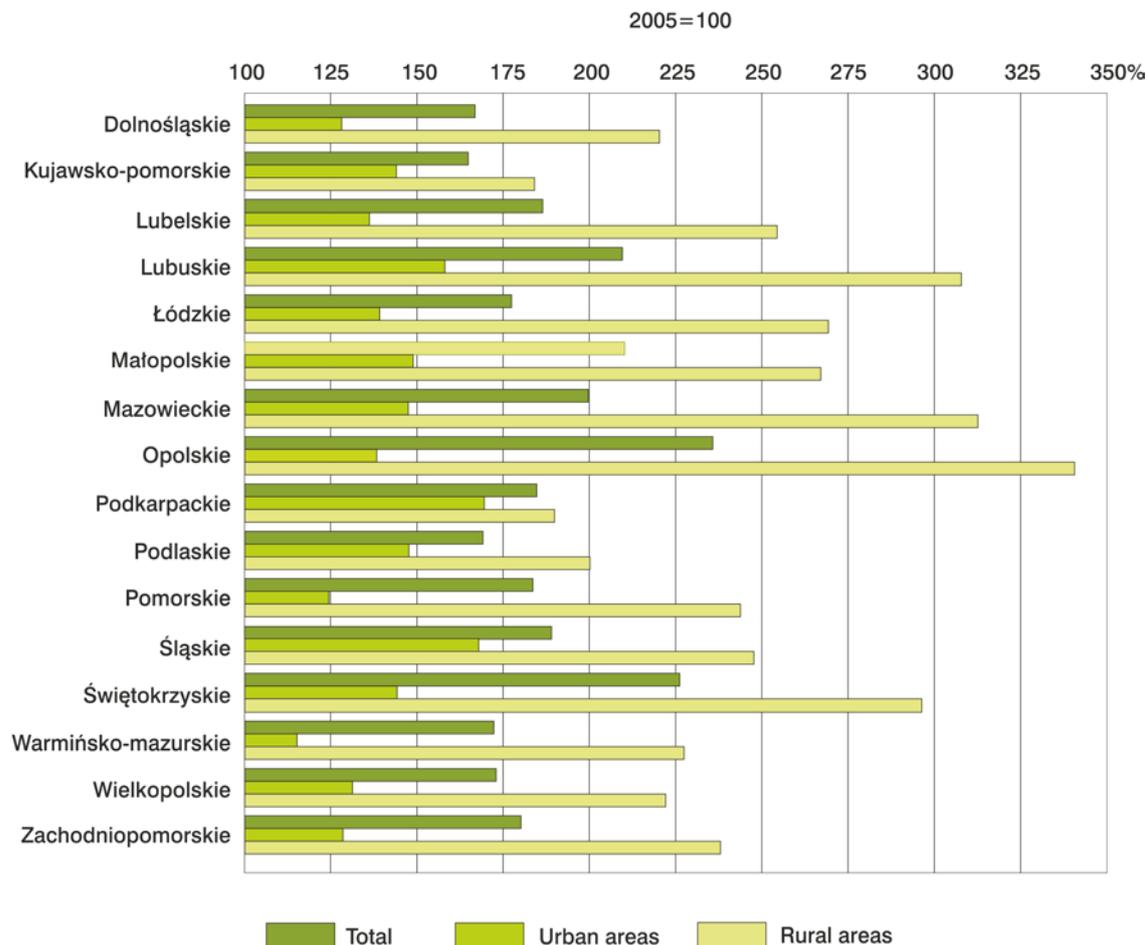
**CONDITION OF SEWAGE NETWORK IN 2005, 2010 AND 2015**



In voivodship terms, the most considerable rise in the sewage network length in rural areas was observed in the following voivodships: Opolskie – by over 240.7%, Mazowieckie – by 212.7%, Lubuskie – by approx. 207.9% and Świętokrzyskie – by nearly 196.3%. However, in urban areas

the highest growth of the sewage network length was observed in the Podkarpackie, Śląskie and Lubuskie Voivodship (of over 69.6%, approx. 67.9% and 57.9%, respectively).

#### CHANGE IN LENGTH OF SEWAGE NETWORK IN 2005–2015



In 2015 the length of **the sewage network** in Poland reached almost 150 thous. km, and the number of connections to buildings – approx. 3.1 mln units. In comparison to 2014, the length of the newly built or reconstructed sewage network increased by approx. 6.8 thous. km, i.e. 4.8%, with a simultaneous rise in the number of connections by over 160 thous. units, i.e. 5.5%.

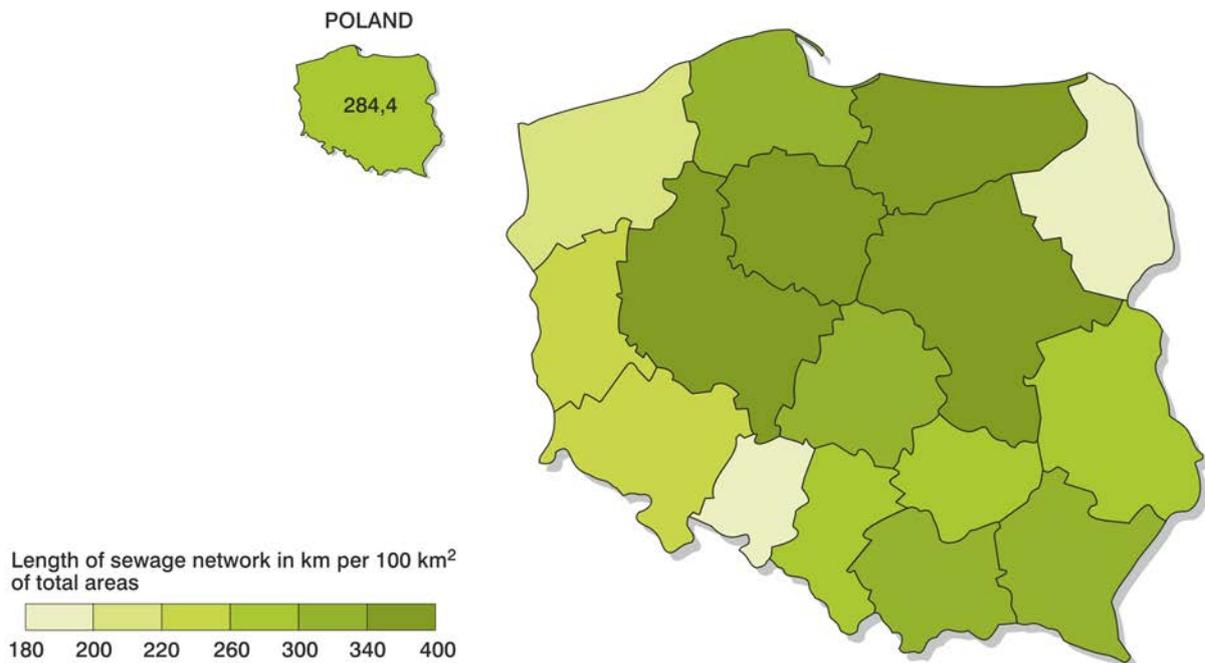
In rural areas there were 58.6% of the sewage network and 44.9% of the number of connections. As compared to 2014, the length of the network increased in urban areas by over 6.3 thous. km (7.7%), and the number of connections – by more than 101.8 thous. units. (8.0%). In the corresponding period in urban areas over 0.5 thous. km (by 0.9% more) new network and approx. 58.6 thous. connections (by 3.6% more) were constructed.

In comparison to 2014 the highest growth in the sewage network length in total was recorded in the following voivodships – of 14.8% (in urban areas – of 12.6%), Opolskie – of 12.4% (in urban

areas – of 2.4%), and Małopolskie – of 11.4% (in urban areas – of 5.4%), and the lowest rise – in Mazowieckie Voivodship (of 0.4%) (in urban areas, correspondingly, of 12.1%).

The highest **sewage network density in 2015** was observed in the following voivodships: Śląskie – 126.1 km per 100 km<sup>2</sup>, Małopolskie – 99.1, and the lowest in the Podlaskie Voivodship – 17.0 and Lubelskie – 25.0.

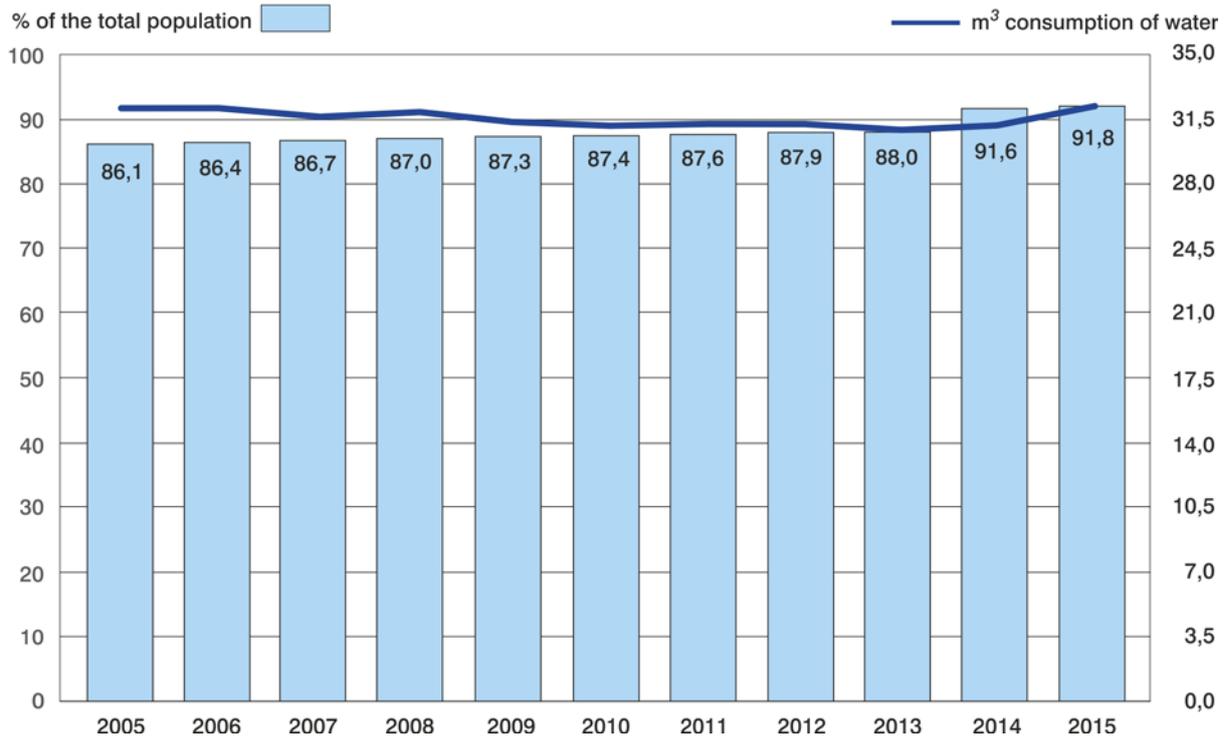
#### DENSITY OF SEWAGE NETWORK IN URBAN AREAS IN 2015



Together with the development of the water supply and sewage infrastructure, in the last decade the population using the mentioned networks has also increased.

At the same time it is possible to observe a drop in the amount of water consumed per capita. Water saving by households results from changes in water prices per 1 m<sup>3</sup> and the general metering of its use. Furthermore, the decrease in water consumption results from limiting network water losses due to the modernisation of the existing networks.

**POPULATION USING THE WATER SUPPLY SYSTEM AND CONSUMPTION OF WATER PER CAPITA  
IN 2005–2015**

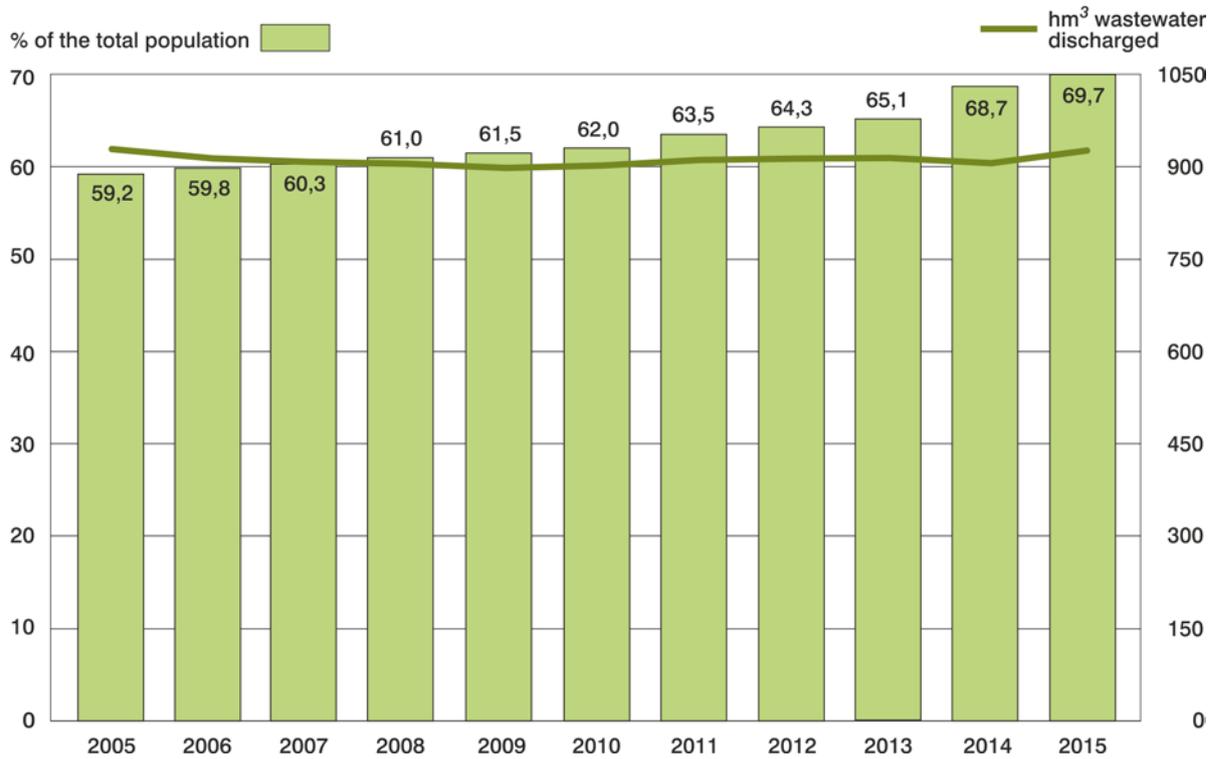


In 2015 nearly 91.8% of the population in total used the water supply network (in comparison to 2005 an increase of 5.7 percentage points). In urban areas over 96.5% of total population had access to the water supply system (a rise of 1.2 percentage points in comparison to 2005). In rural areas the share of the population using the water supply system was at the level of 84.7%(\*).

**The average water consumption by households** in 2015 amounted to 32.2 m<sup>3</sup> per capita, while in urban areas it amounted to 34.3 m<sup>3</sup> and in rural areas – to 29.0 m<sup>3</sup>. In comparison to 2014, water consumption increased by 1.1 m<sup>3</sup>. In urban areas a slight increase in water consumption was recorded – of 0.4 m<sup>3</sup>, while in rural areas the growth amounted to 2.2 m<sup>3</sup>. The highest water consumption increase was observed in the Łódzkie Voivodship (of 2.9 m<sup>3</sup> per capita (of which in urban areas it amounted to 1.3 m<sup>3</sup>, and in rural areas – 5.7 m<sup>3</sup>).

**The percentage of persons using the sewage network** in the period of 2005-2015 grew from 59.2% to 69.7% (a rise of 10.5 percentage points). In urban areas the network was used by 89.8% of the population (an increase of 5.0 percentage points), and in rural areas by 39.2% (a rise of 20.4 percentage points).

**POPULATION USING THE SEWAGE SYSTEM AND WASTEWATER DISCHARGED FROM HOUSEHOLDS IN 2005–2015**

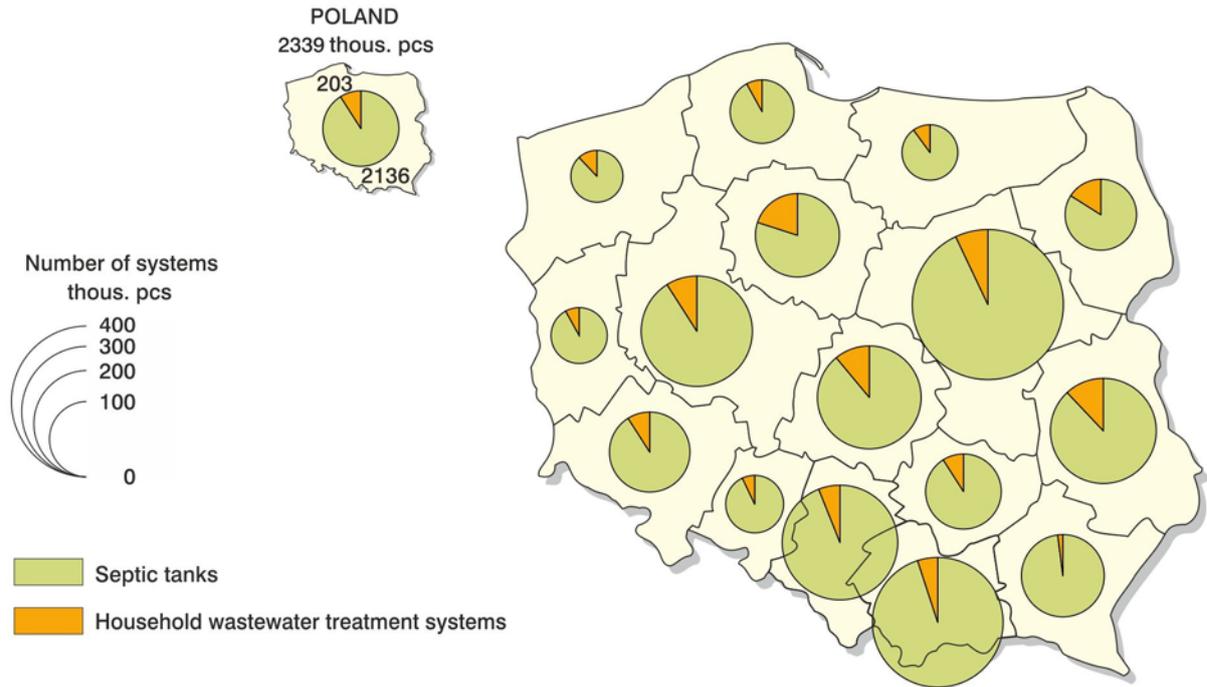


In the areas of the country with insufficiently developed sewage infrastructure some of the inhabitants use on-site systems for collection of liquid waste, which can be a cheaper alternative to the construction of sewage systems channelling sewage to wastewater treatment plants. These are mainly septic tanks and household wastewater treatment systems. In Poland in 2015, there were 2 339 thous. of such devices, of which approx. 91% were septic tanks.

For several years, a systematic decline in the number of septic tanks has been observed, whereas the number of household wastewater treatment systems has been increasing. The number of septic tanks decreased from about 2 192 thous. in 2014 to 2 136 thous. in 2015 (by 2.6%), while the number of household wastewater treatment systems increased from about 181 thous. in 2014 to approx. 203 thous. in 2015 (by 11.9%).

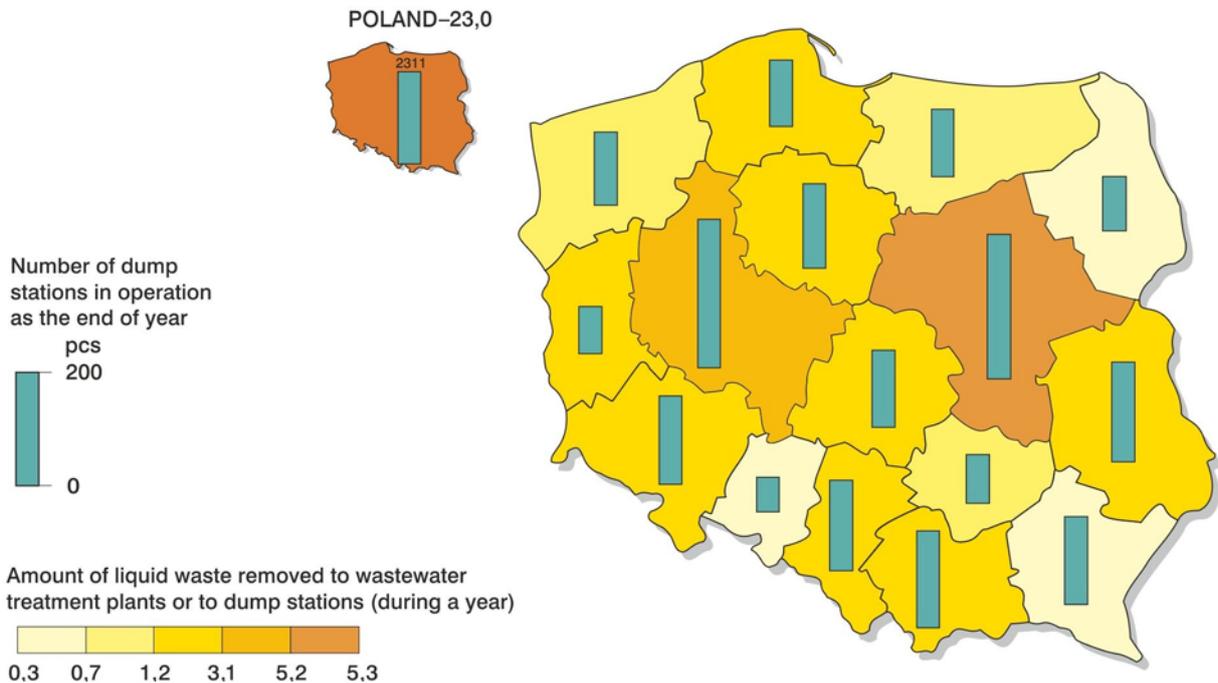
The majority, i.e. almost 85% of on-site systems for the collection of liquid waste were located in rural areas. About 84% of all septic tanks and approx. 92% of the total number of household wastewater treatment systems were located there.

**ON-SITE SYSTEMS FOR COLLECTION OF LIQUID WASTE IN 2015**



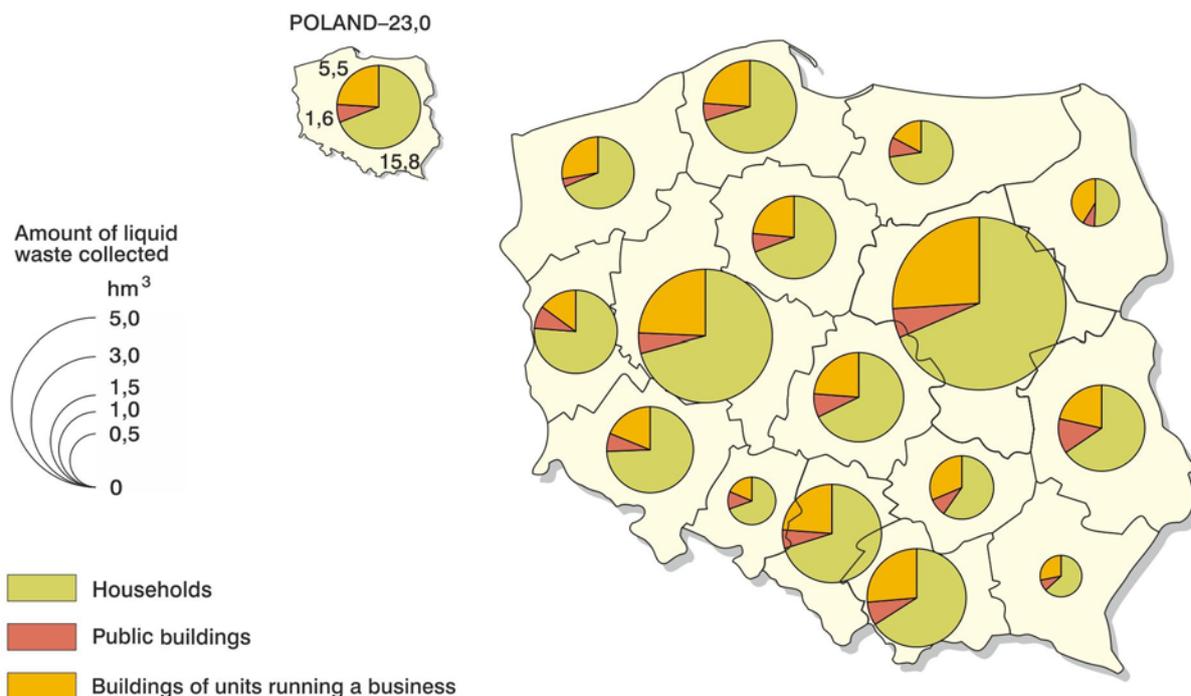
Liquid waste was collected from owners of septic tanks and delivered to wastewater treatment plants or to dump stations. In 2015, approx. 22.9 hm<sup>3</sup> of liquid waste were collected (as in the previous year), which accounts for about 2.1% of the total quantity of the wastewater discharged to the wastewater treatment plants by sewage system. About 68% of dump stations were located in rural areas. Their total number increased from 2 305 in 2014 to 2 311 in 2015; in urban areas it grew by 0.5%, and in rural areas – by 0.1%.

**DUMP STATIONS AND LIQUID WASTE REMOVED TO WASTEWATER TREATMENT PLANTS OR TO DUMP STATIONS IN 2015**



Out of the total quantity of liquid waste transported to wastewater treatment plants or to dump stations in 2015, about 69.0% originated from households, and 24.0% from buildings of business entities, and the remaining part of liquid waste (7.0%) from public utility buildings (in 2014, it was 67.7%, 25.1% and 7.2%, respectively). In 2015, approx. 73.2% of liquid waste was transported by private enterprises (73.3% in 2014), and 26.8% by public sector companies (26.7% in 2014).

#### SOURCES OF LIQUID WASTE IN 2015

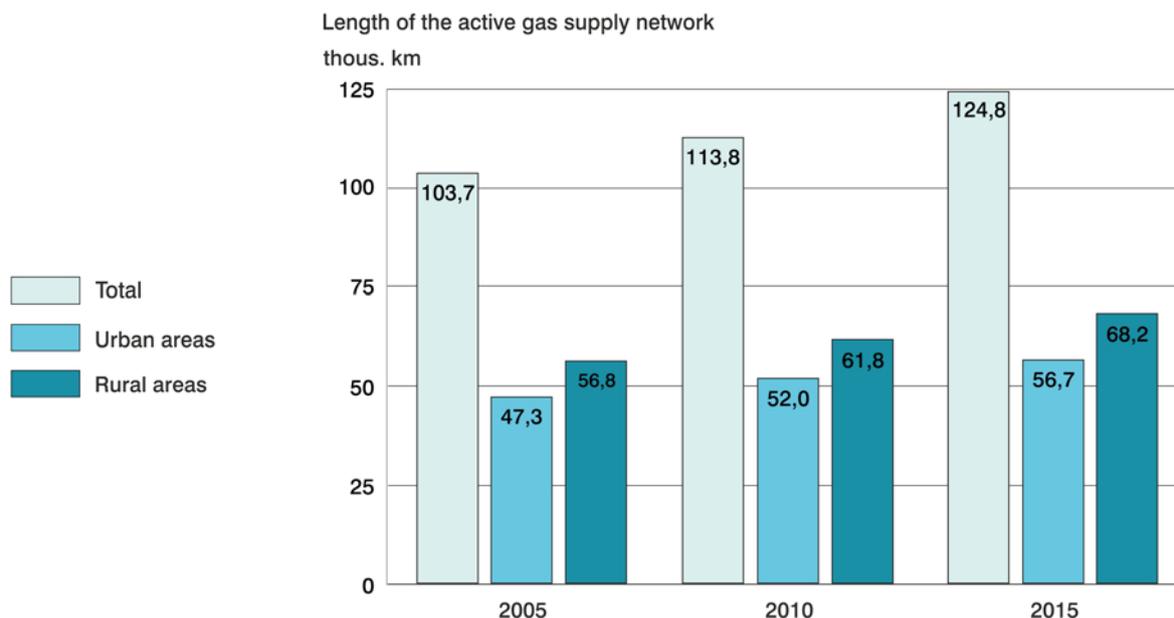


## 2.2. ENERGY MANAGEMENT AND GAS ENGINEERING

In the last decade the increase in investments in the area of **the natural gas system infrastructure**. Since 2005 the length of the gas network in total increased by 23.7 thous. km (i.e. by approx. 19.4%) and in 2015 it reached the length of 146.0 thous. km, of which 124.8 thous. km belonged to the distributive network. In comparison to 2014 a growth in the length of the gas network in total was observed of nearly 3.6 thous. km (i.e. of 2.5%).

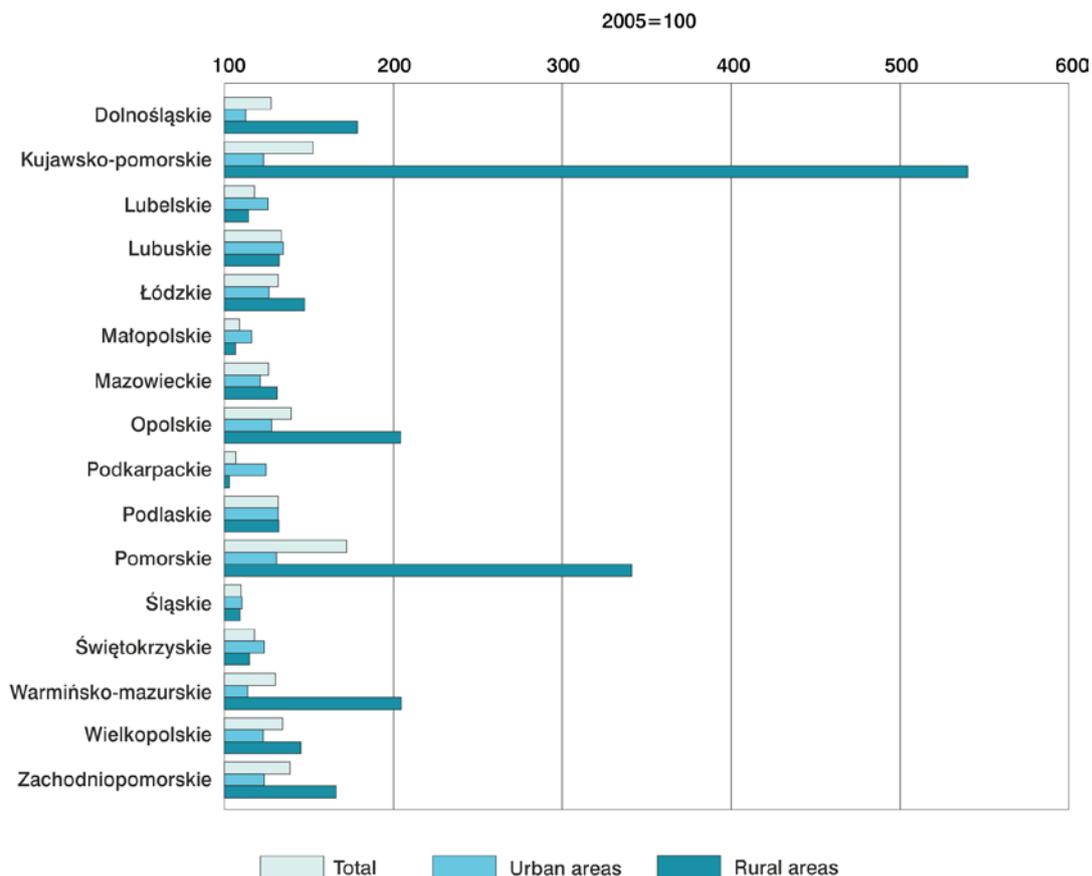
Since 2005 the length of the distributive gas network increased by 21.2 thous. km (i.e. by 20.4%) and as of 31 December 2015 it amounted to 124.8 thous. km. In rural areas its length increased by 11.8 thous. km (i.e. by 20.9%), in 2015 reaching 68.2 thous. km, and in urban areas a rise of 9.4 thous. km was recorded (i.e. of 19.8%), in 2015 amounting to 56.7 thous. km. The number of connections in this period increased by nearly 489 thous. km, of which over 186 thous. in rural areas.

## CONDITION OF GAS SUPPLY DISTRIBUTION NETWORK IN 2005–2015



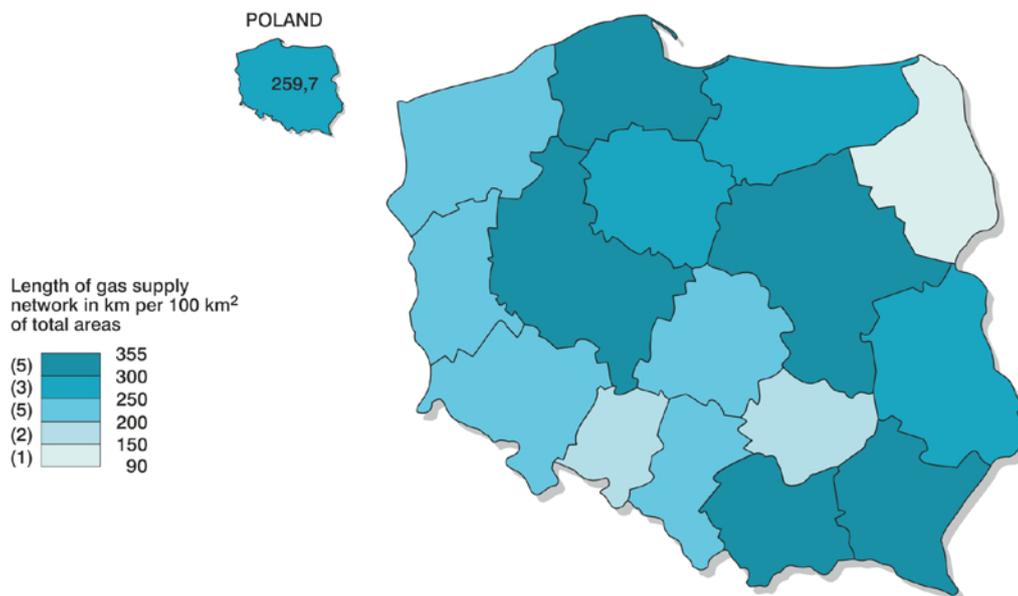
A considerable increase in the length of the distributive gas network was observed in the urban areas of the following voivodships: Lubuskie – of nearly 35%, Podlaskie – of 31.5% and Pomorskie – of 30.5%, and in rural areas of voivodships: Kujawsko-Pomorskie – of 440%, Pomorskie – of almost 241% and Warmińsko-Mazurskie – of nearly 105%.

## CHANGE IN LENGTH OF GAS SUPPLY DISTRIBUTION NETWORK IN 2005–2015



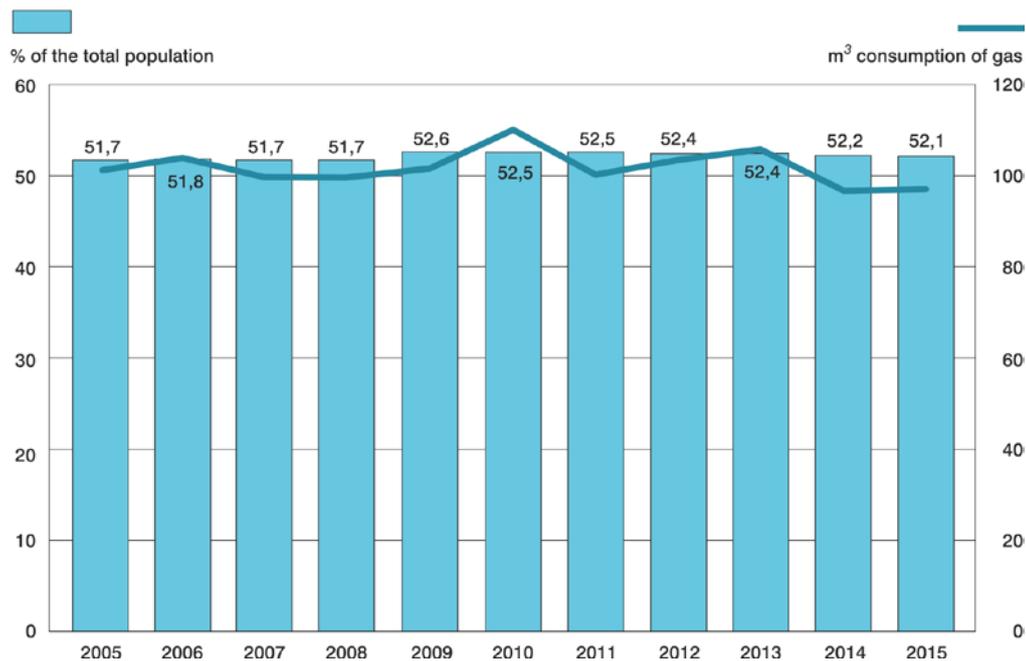
In the spatial arrangement in Poland at the end of 2015, in comparison with the previous year, the highest growth in the length of the distributive network was recorded in the following voivodships: Kujawsko-Pomorskie – of 8.2% (in urban areas – of 3.5%), Opolskie – of 6.7% (in urban areas – of 1.5%) and Pomorskie – of 5.9% (in urban areas – of 0.2%), and the lowest – in the Podkarpackie Voivodship – of 0.7%.

**DENSITY OF GAS SUPPLY DISTRIBUTION NETWORK IN URBAN AREAS IN 2015**



In the last decade in Poland the number of persons **using gas from the gas supply system** has not changed significantly. The percentage of the total population using the network has increased since 2005 by 0.4 percentage point, of which in rural areas – by 4.8 percentage points.

**POPULATION USING THE GAS SUPPLY SYSTEM AND COSUMPTION OF GAS PER CAPITA IN 2005-2015**



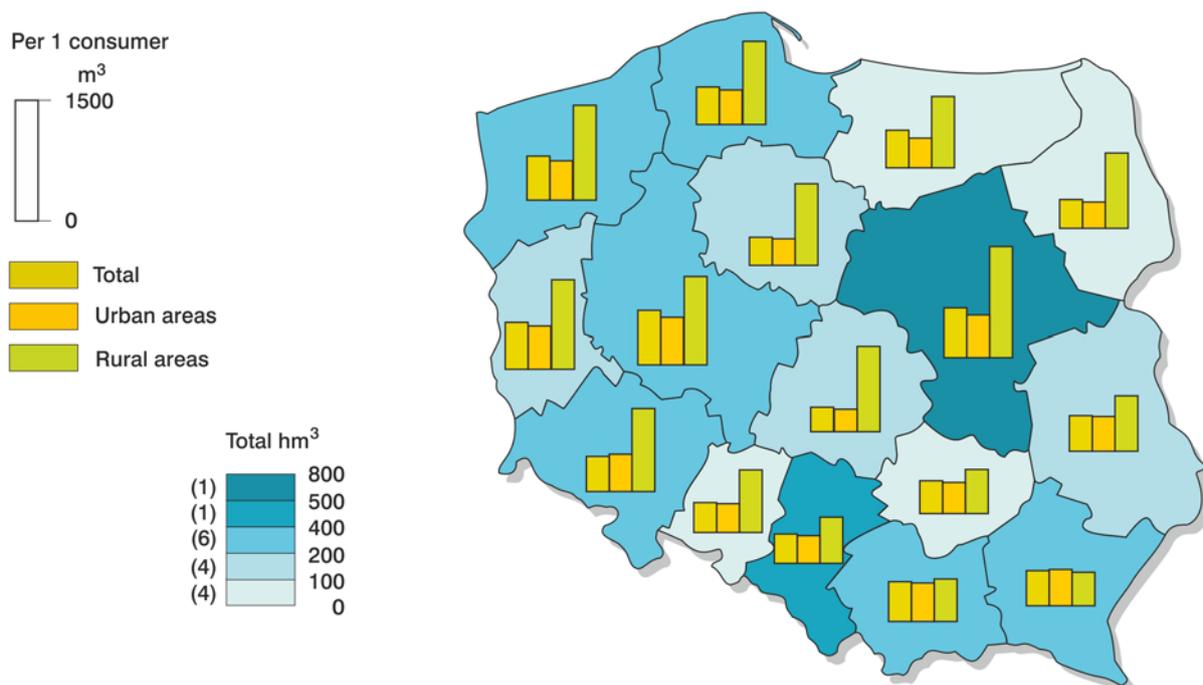
In 2015 in Poland **the percentage of the total population using the gas network** decreased in comparison to 2014 by 0.1% of the population in total. In urban areas 71.6% of the total population used the gas network, while in rural areas – 22.6%. In comparison to 2014, the percentage of population using the gas network increased in rural areas by almost 0.2 percentage point, with a drop of 0.1 percentage point in urban areas.

In comparison to 2005 in Poland, the consumption of gas from the gas supply system by households dropped by 3.3%, with a simultaneous rise in the number of consumers of 5.2%. In urban areas it decreased by 9.3%, with a rise in the number of consumers of 2.1%, while in rural areas an increase was observed both in the gas consumption (of 25.9%) and the number of consumers (of 31.0%).

In 2015 r. **the consumption of gas from the gas supply system by households** was nearly 506 hm<sup>3</sup> per 1 consumer, while in urban areas it amounted to more than 455 hm<sup>3</sup>, and in rural areas – approx. 829 hm<sup>3</sup>. As compared to 2014, the consumption of gas from the gas supply system increased slightly by 0.3% (in rural areas by 2.5%, with a decrease in urban areas by 0.5%).

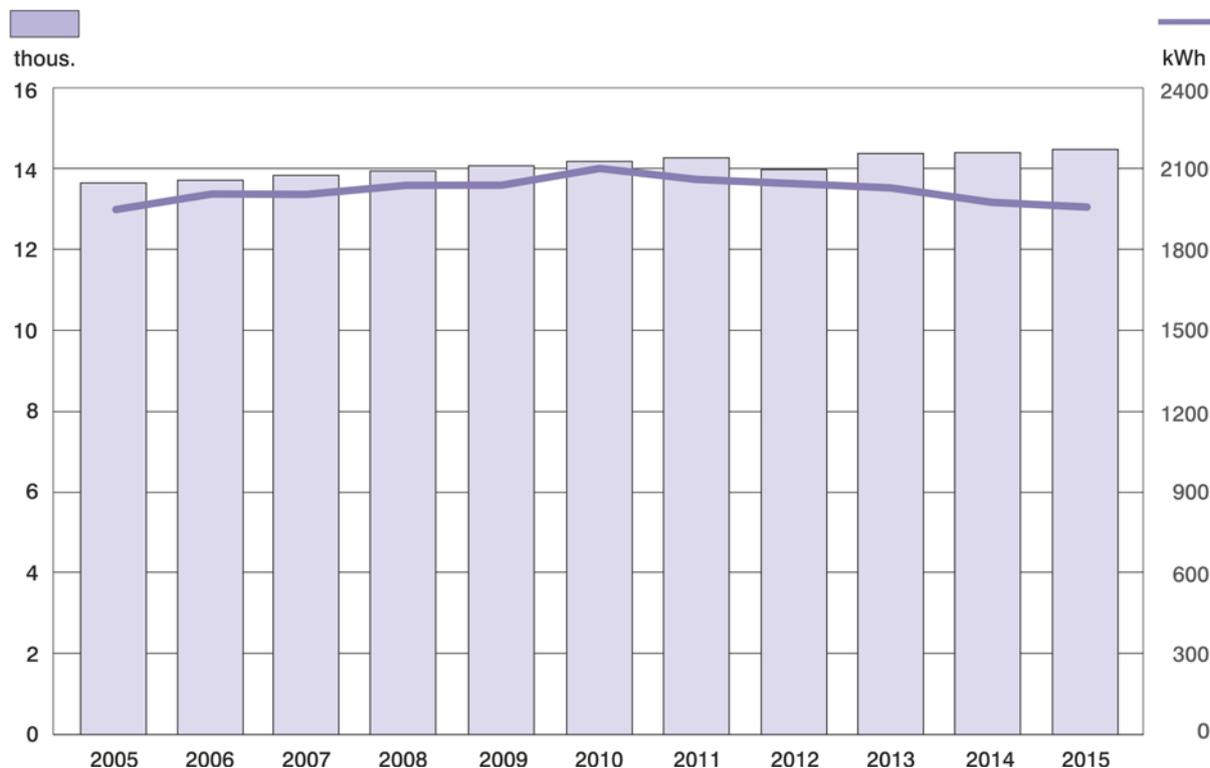
The highest consumption of gas from the gas supply system by households in Poland per 1 consumer was recorded in the Wielkopolskie Voivodship (691.3 hm<sup>3</sup> per 1 consumer), and the lowest in the Łódzkie Voivodship (324.6 hm<sup>3</sup> per 1 consumer). In comparison to 2014 the consumption of gas from the gas supply system decreased in urban areas by approx. 2.5 hm<sup>3</sup> per 1 consumer, in rural areas it grew by approx. 20.3 hm<sup>3</sup>.

#### SALE OF GAS TO HOUSEHOLDS IN 2015



In the years 2005-2015 in Poland a gradually decreasing **electric energy consumption** by households was observed. This is mainly a result of changes in the population's behaviour, i.e. increasing the energy efficiency of households, and also replacing household appliances with those with improved energy-saving parameters.

**CONSUMERS AND CONSUMPTION OF ELECTRICITY IN HOUSEHOLDS IN 2005–2015**



In 2015 **electric energy consumption per 1 consumer** was 1 954.6 kWh; in urban areas it was lower (1 759.4 kWh per 1 consumer) than in rural areas (2 338.4 kWh). As compared to 2014, electric energy consumption per 1 consumer in Poland dropped by 1%; in urban areas – by 1.7% and in rural areas it was at the previously recorded level.

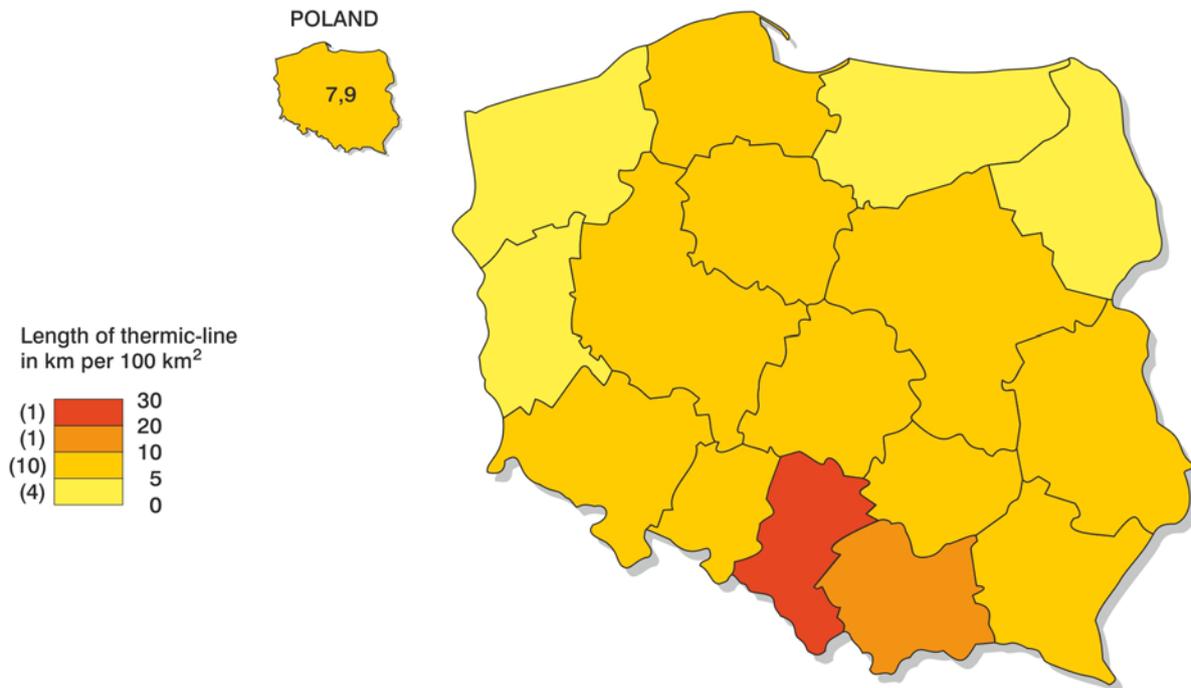
**2.3. HEATING MANAGEMENT<sup>1</sup>**

In 2015 the length of **the heat transmission network** in total amounted to approx. 16 thous. km. In relation to 2014, the length of the newly built or reconstructed heat network grew by 182 km, i.e. 1.2%. 15.1 thous.. km were located in urban areas, accounting for 94.7% of the heat network, which in comparison with 2014 increased by over 198 km, i.e. 1.3%.

<sup>1</sup> See methodological remarks on page 7.

The highest **heat network density** was observed in the following voivodships: Śląskie (29.2 km per 100 km<sup>2</sup>), Małopolskie (12.8 km per 100 km<sup>2</sup>), Mazowieckie (9.9 km per 100 km<sup>2</sup>) and Pomorskie (9.8 km per 100 km<sup>2</sup>), and the lowest – in the Lubuskie Voivodship – 3.6 km per 100 km<sup>2</sup>.

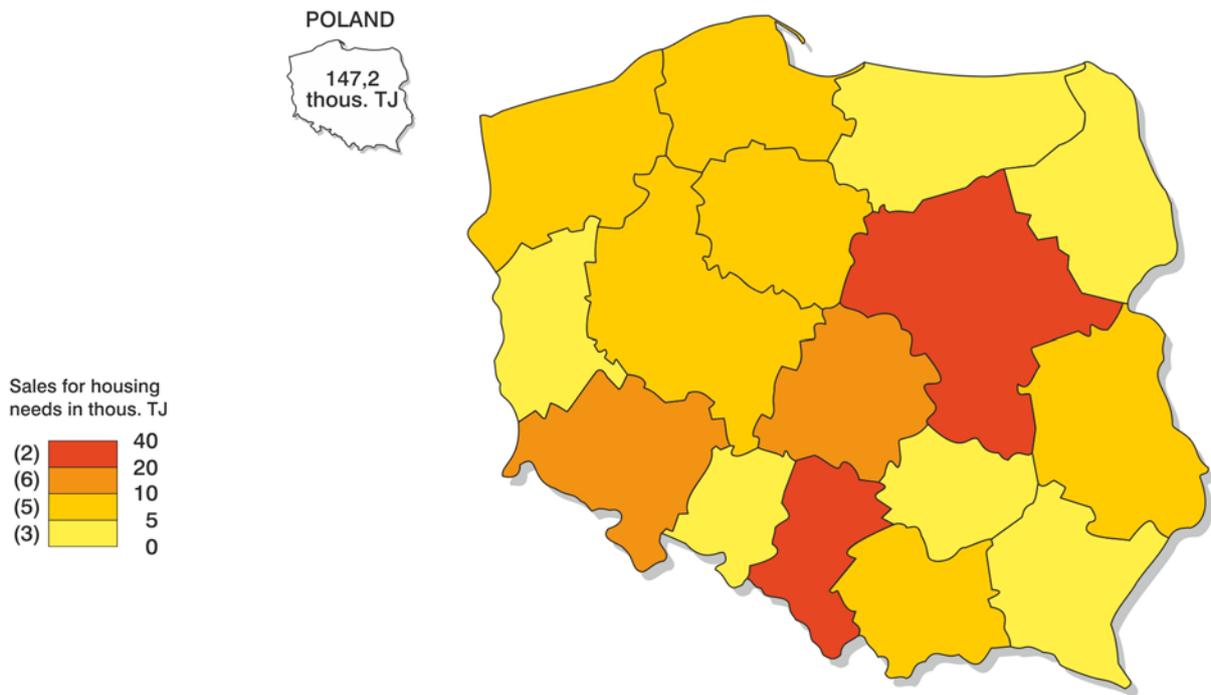
**THERMIC-LINE DENSITY IN 2015**



In 2015 over 186.4 thous. TJ of heat energy were sold, of which approx. 147.2 thous. TJ (79.0%) for heating of residential buildings. This amount was used to provide heating to 2 244 865 thous. m<sup>3</sup> of the cubic volume of buildings in total, of which 1 273 470 thous. m<sup>3</sup> of the cubic volume of residential buildings.

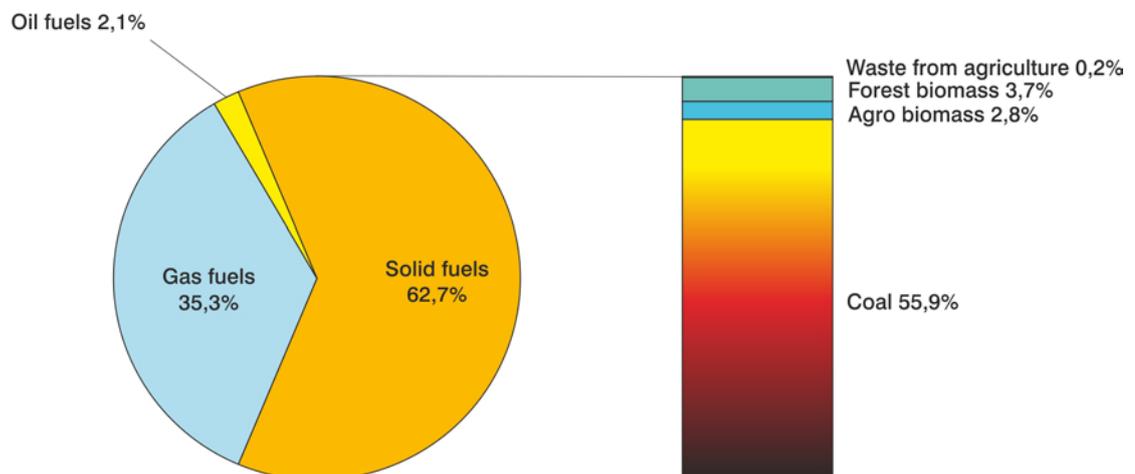
Nearly 183.9 thous. TJ, i.e. 98.6%, of the heat energy were sold in urban areas, of which for the purposes of heating of residential buildings – over 145.4 thous. TJ, i.e. (98.8%).

## SALES OF HEAT ENERGY IN 2015



The largest amount of thermal energy for heating purposes was generated using solid fuels – 62.7%, followed by gas – 35.3% and oil – 2.1%.

## TYPE OF FUELS USED FOR PRODUCTION OF HEAT ENERGY IN 2015



## 2.4. MUNICIPAL WASTE MANAGEMENT

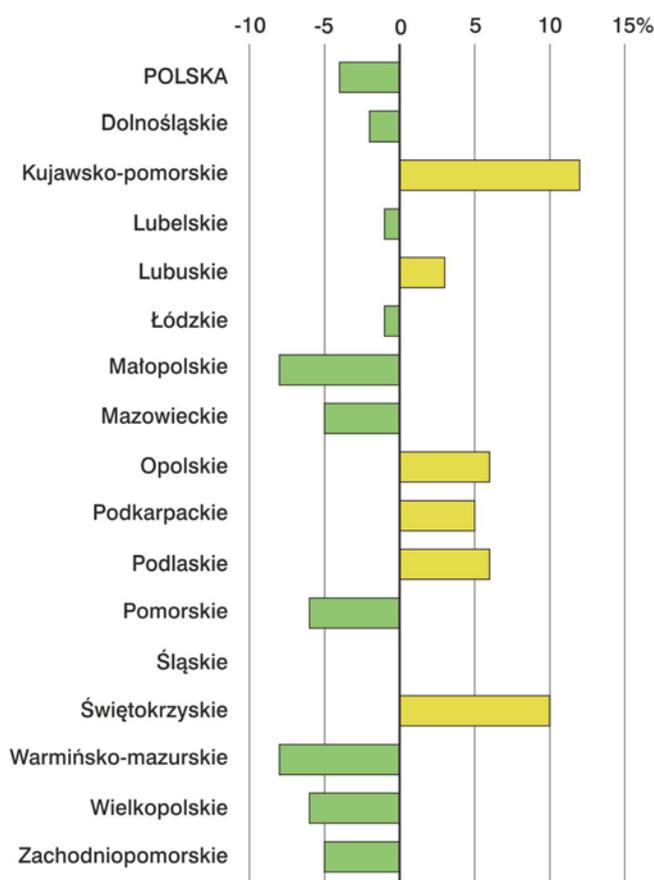
In 2015, in Poland 10 863.5 thous. tonnes of municipal waste were collected (an increase of 5.2% as compared to 2014). For one inhabitant of Poland there were on average 283 kg of

collected municipal waste, the most in voivodships: dolnośląskie (340 kg), zachodniopomorskie (337 kg), śląskie (332 kg), and lubuskie (328 kg); the least in voivodships: świętokrzyskie (166 kg), lubelskie (180 kg), and podkarpackie (196 kg).

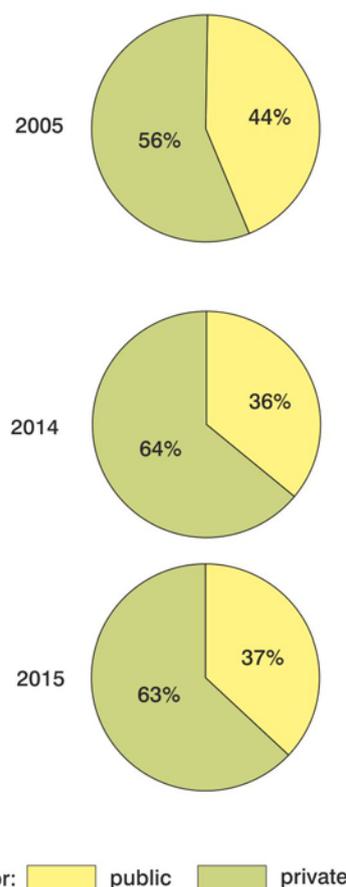
The total number of enterprises which in 2015 were collecting municipal waste from real estate owners amounted to 1 517 and decreased by 4% in comparison to the previous year<sup>2</sup>. In 2015, private enterprises collected 62.7% of municipal waste (63.6% in 2014). Foreign-owned entities collected 9.8% of municipal waste, which is less than in the previous year (13.1%).

**CHANGES IN NUMBER OF ENTITIES COLLECTING MUNICIPAL WASTE FROM REAL ESTATE OWNERS IN 2014 AND 2015**

POLAND: 2013–1769, 2014–1424



**COLLECTED MUNICIPAL WASTE BY OWNERSHIP SECTOR IN 2005, 2014 AND 2015**

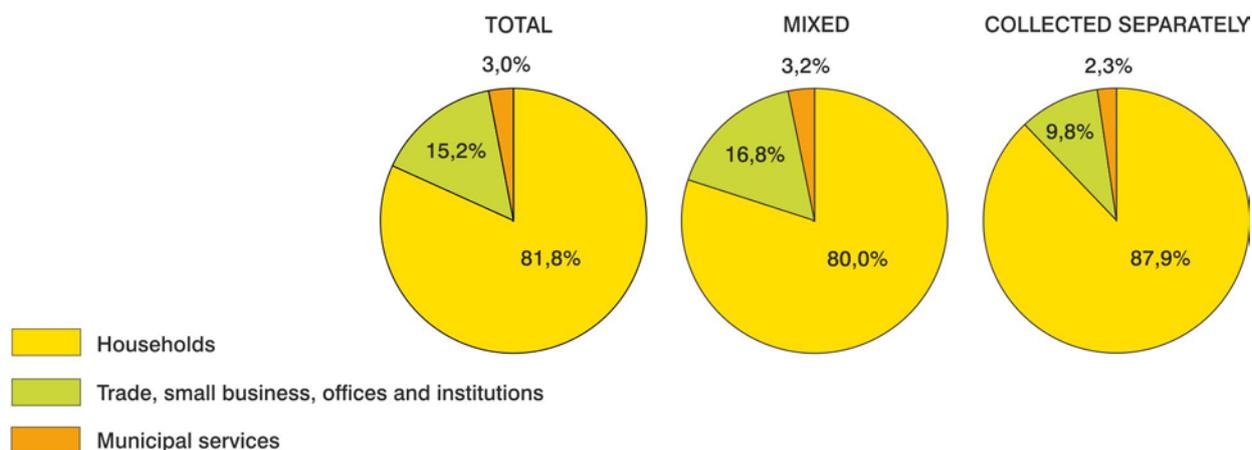


The majority of municipal waste (81.8%) in 2015 was collected from households. In terms of quantity, it was 8 888.8 thous. tonnes – a rise of 5.2% in comparison with the previous year. The second significant source of origin of municipal waste (15.2%) was trade, small business, offices and institutions. The quantity of waste collected from this source amounted to 1 652.2 thous. tonnes (a drop of 4.9% in comparison with the previous year). Waste from municipal services,

<sup>2</sup> See general notes, page 7.

such as street cleaning or maintaining parks or cemeteries, accounted for 3.0% of the total mass of municipal waste collected (322.5 thous. tonnes – a decrease of 8.5% in comparison to 2014). In 2014, the share of these three sources in the amount of municipal waste collected was 79.8%, 16.8%, and 3.4%, respectively.

#### SOURCES OF MUNICIPAL WASTE COLLECTED IN 2015



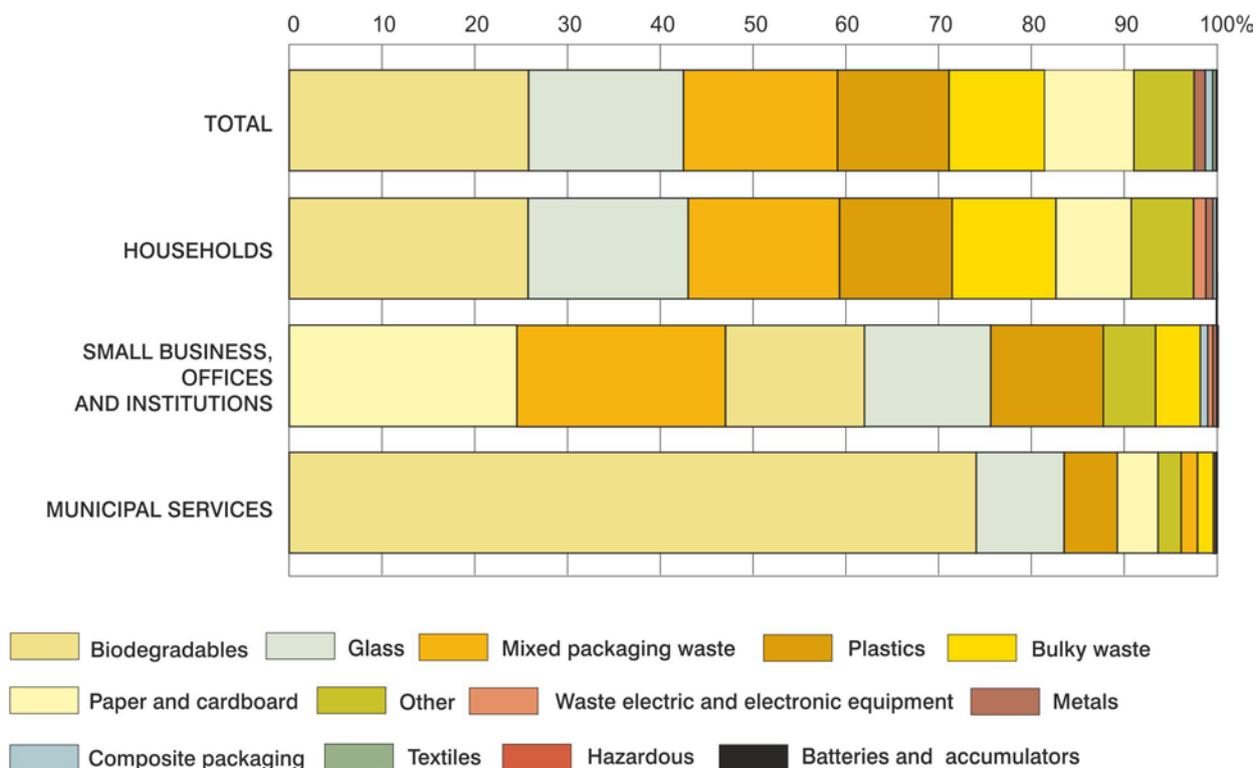
In 2015, there was an increase in the share of separately collected waste in the total amount of municipal waste collected – from 19.8% in 2014 to 23.4%. The total weight of separately collected waste increased from approx. 2 049 thous. tonnes in 2014 to approx. 2 537 thous. tonnes in 2015. There were about 66 kg of separately collected municipal waste per one inhabitant of Poland (a year before – 53 kg).

The most (87.9%) of separately collected municipal waste in 2015 came from households (mainly biodegradable waste and glass waste) and in comparison with the previous year it was an increase by 27.9% (i.e. from 1,744.0 thous. tonnes to 2 230.8 thous. tonnes). Waste from trade and small business entities, offices, and institutions (mainly paper and cardboard) accounted for 9.8% of the amount of separately collected municipal waste, and their mass grew by 9.7% (i.e. from 227.1 thous. tonnes to 249.2 thous. tonnes). Separately collected waste from municipal services was 57.5 thous. tonnes (mainly biodegradable waste), which accounted for 2.3% of separately collected municipal waste (a decrease of 26.4% in comparison to 2014). In the previous year, the share of separately collected waste from the aforementioned groups amounted to 85.1%, 11.1% and 3.8%, respectively.

In 2015, the amount of separately collected glass waste amounted to 11.0 kg per capita, which was an 3.2% growth as compared to the previous year. In 2015, there were about 7.9 kg of separately collected plastics (3.5% less than in 2014) and approx. 6.3 kg of paper and cardboard

waste (1.1% more) per one inhabitant of Poland. The amount of biodegradable waste collected separately per capita grew from 15.2 kg in 2014 to 17.1 kg in 2015 (by 12.6%) and bulky waste – from 5.5 kg to 6.8 kg (by 23.1%).

**MUNICIPAL WASTE COLLECTED SEPARATELY BY FRACTIONS AND SOURCES IN 2015**



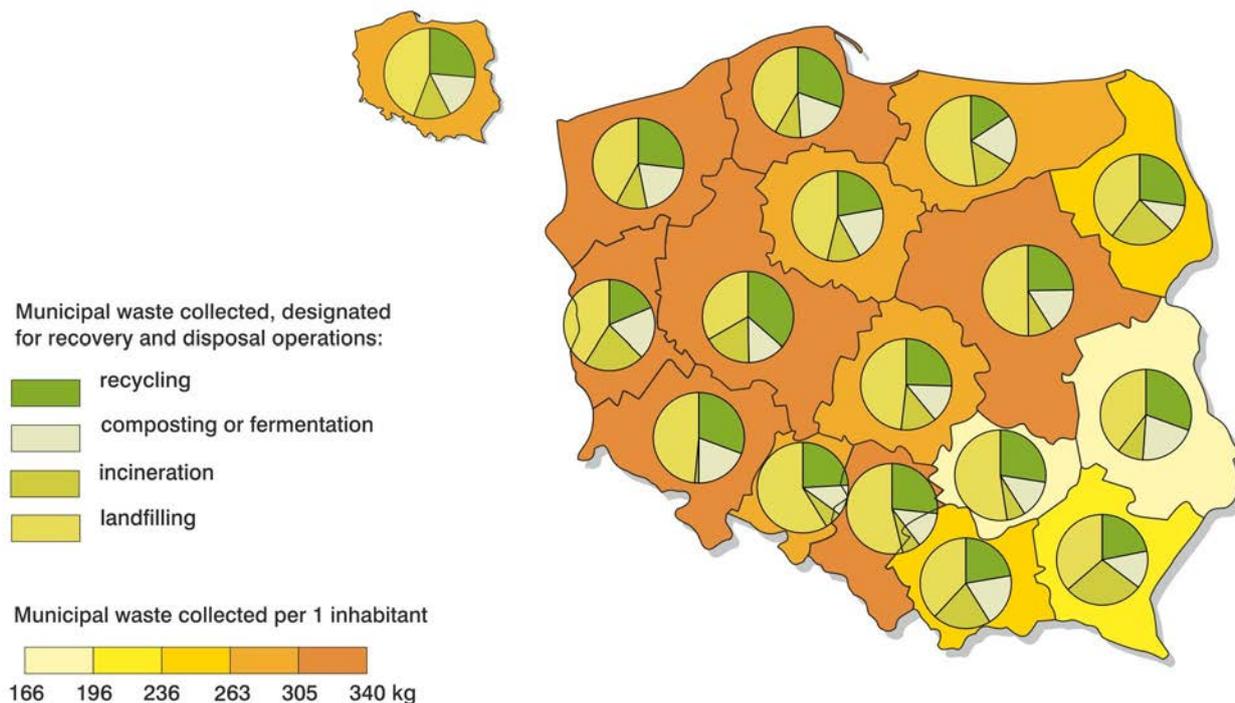
In 2015, a total of 10 863.5 thous. tonnes of municipal waste were collected, of which 5 934.3 thous. tonnes were designated for recovery operations (approx. 55% of the quantity of municipal waste collected). About 2 866.9 thous. tonnes of municipal waste were designated for recycling (26.4% of the quantity of municipal waste collected). These included both separately collected municipal waste and secondary raw material waste sorted out from mixed municipal waste. In the previous year, 2 179.9 thous. tonnes of waste were recycled (21.1%).

About 1 749.8 thous. tonnes of municipal waste were channelled to biological processes (composting or fermentation). These were mainly green waste from gardens, parks and cemeteries, waste from marketplaces, biodegradable kitchen waste, and waste from gastronomy. As compared with the previous year, the share of waste designated for such treatment in the total quantity of municipal waste collected grew by 4.9 percentage points to the level of 16.1%.

Almost 1 317.7 thous. tonnes of municipal waste (approx. 12.1%) were designated for incineration with energy recovery.

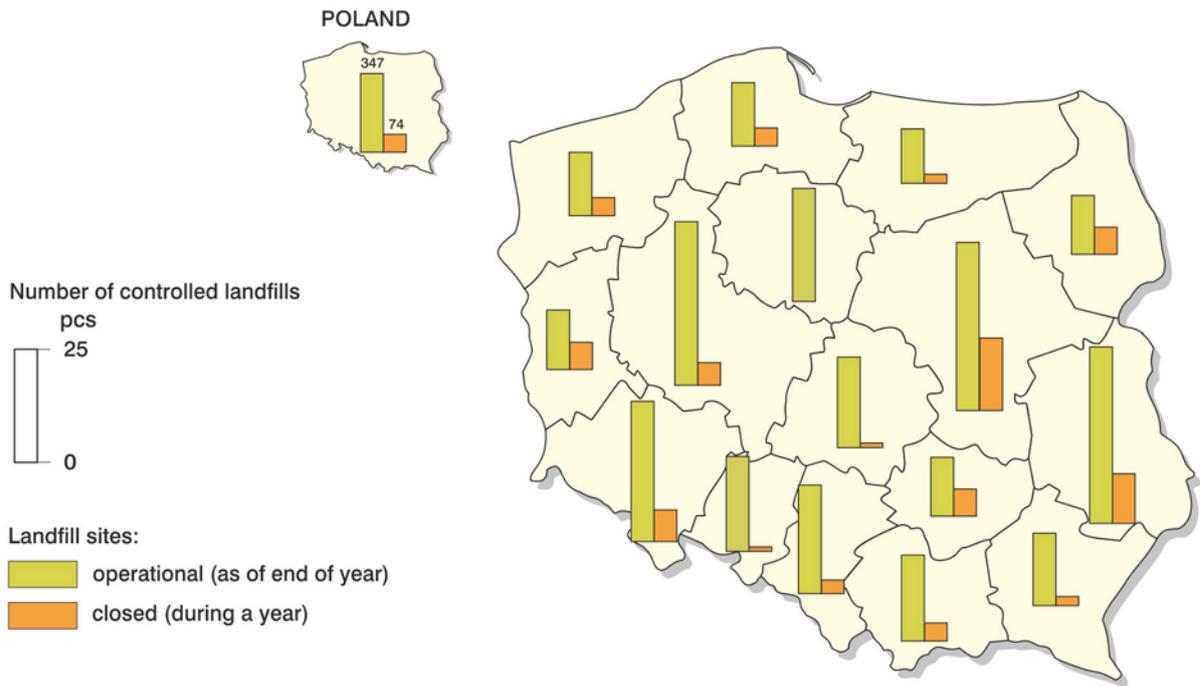
A total of 4 929.2 thous. tonnes of municipal waste was sent to disposal, of which 4 808.0 thous. tonnes (44.3% of total waste collected) was designated for landfilling, and 121.2 thous. tonnes (1.1% of total waste collected) – for disposal by incineration without energy recovery. In comparison with 2014, a decrease in the share of municipal waste designated for disposal by landfilling was recorded. In 2014, this waste accounted for 52.6% of the total amount of municipal waste collected (5 436.9 thous. tonnes).

**MANAGEMENT OF MUNICIPAL WASTE COLLECTED IN 2015**



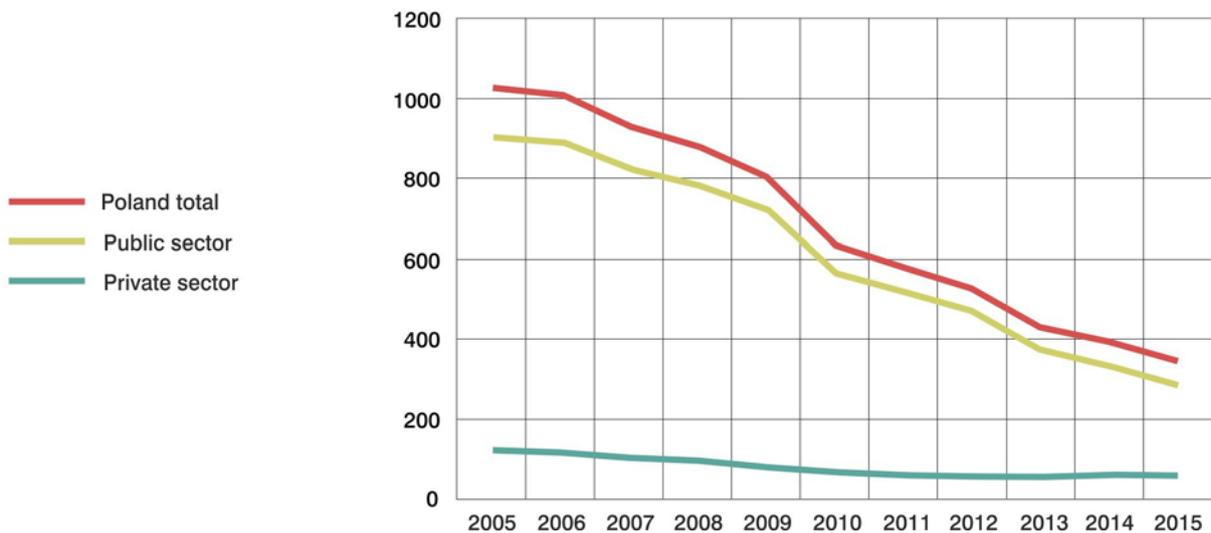
At the end of 2015, there were 347 operational landfill sites receiving municipal waste. These landfills occupied the total area of 1,860 ha. In 2015, a total of 77 such landfill sites were closed, with an area of approx. 246 ha.

**CONTROLLED LANDFILLS IN 2015**

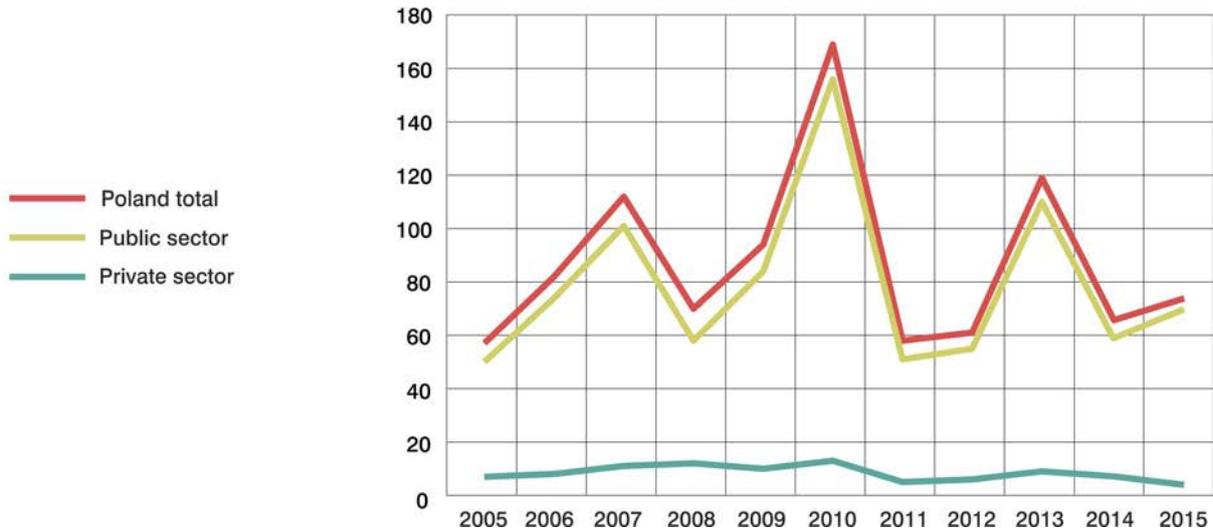


In order to adjust landfill sites to technical and organisational requirements resulting from legal regulations, the number of operating landfill sites has been consistently falling for over a dozen years now.

**LANDFILL SITES IN OPERATION IN 2005–2015**

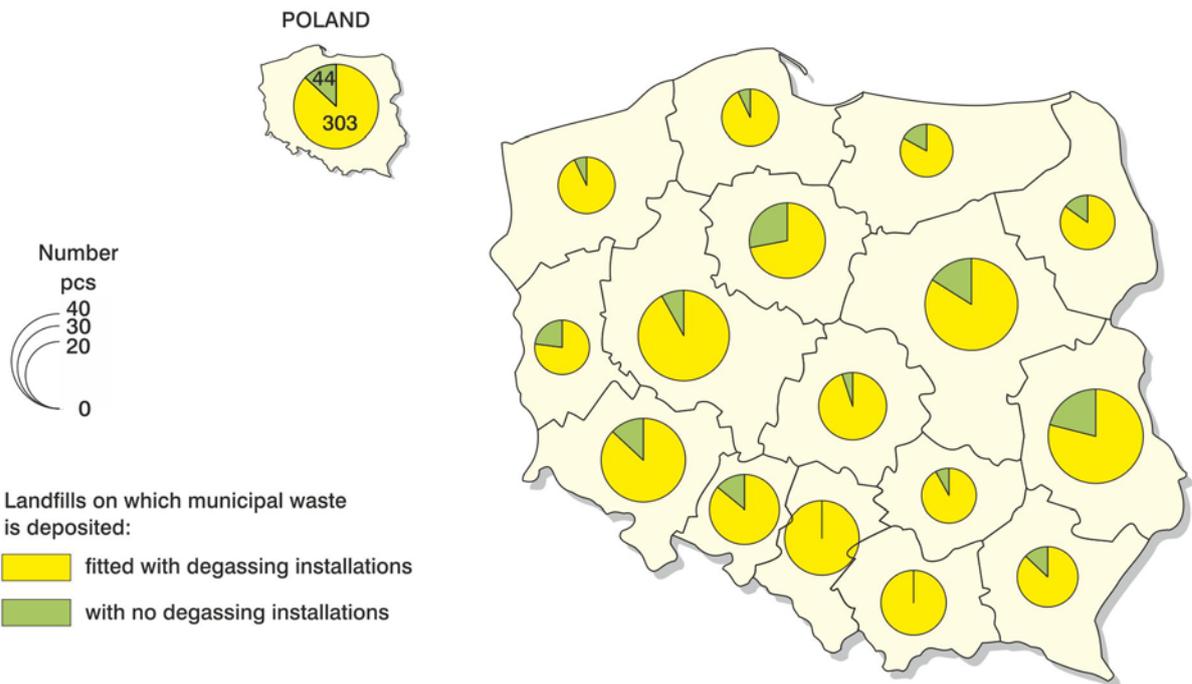


## LANDFILLS CLOSED IN 2005–2015



In 2015, in Poland there were 303 landfill sites with degassing installations, what accounted for 87.3% of all operational landfill sites where municipal waste was deposited (86.8% in the previous year).

## DEGASSING OF LANDFILLS IN 2015

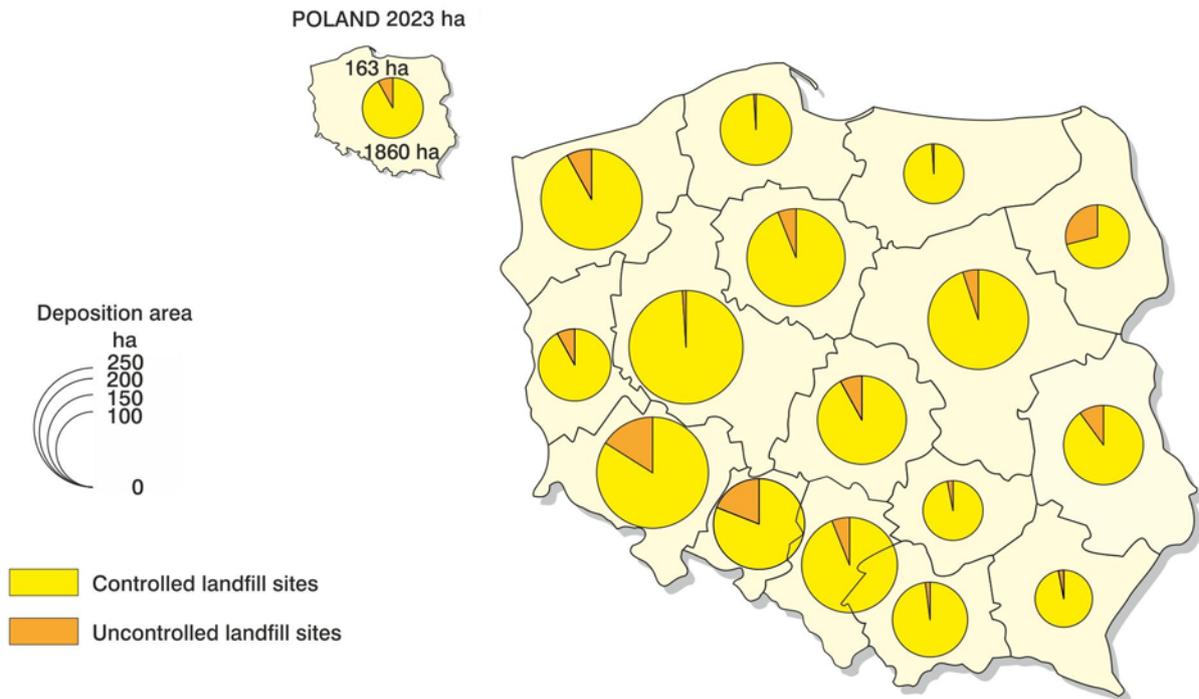


Approx. 37% degassing installations were installations where gas was channelled directly to the atmosphere (a drop of 4.9 percentage points as compared to 2014), while in 5.3% of installations landfill gas was neutralised with heat energy recovery (an increase of 1.1 percentage points). Over 19.3% were installations where landfill gas was used for production of electrical energy (a rise of 2.9 percentage points). In 2015, as a result of neutralisation of landfill gas by

incineration, about 74 072 thous. MJ of heat energy (9% less than in 2014) and approx. 133 462 thous. kWh of electrical energy (10% less than in 2014) was recovered.

Approx. 92% of the municipal waste deposition area in Poland in 2015 was the area of operational controlled landfill sites (the same as in 2014). The remaining part was the area of uncontrolled landfill sites, which are defined as places not intended for municipal waste deposition.

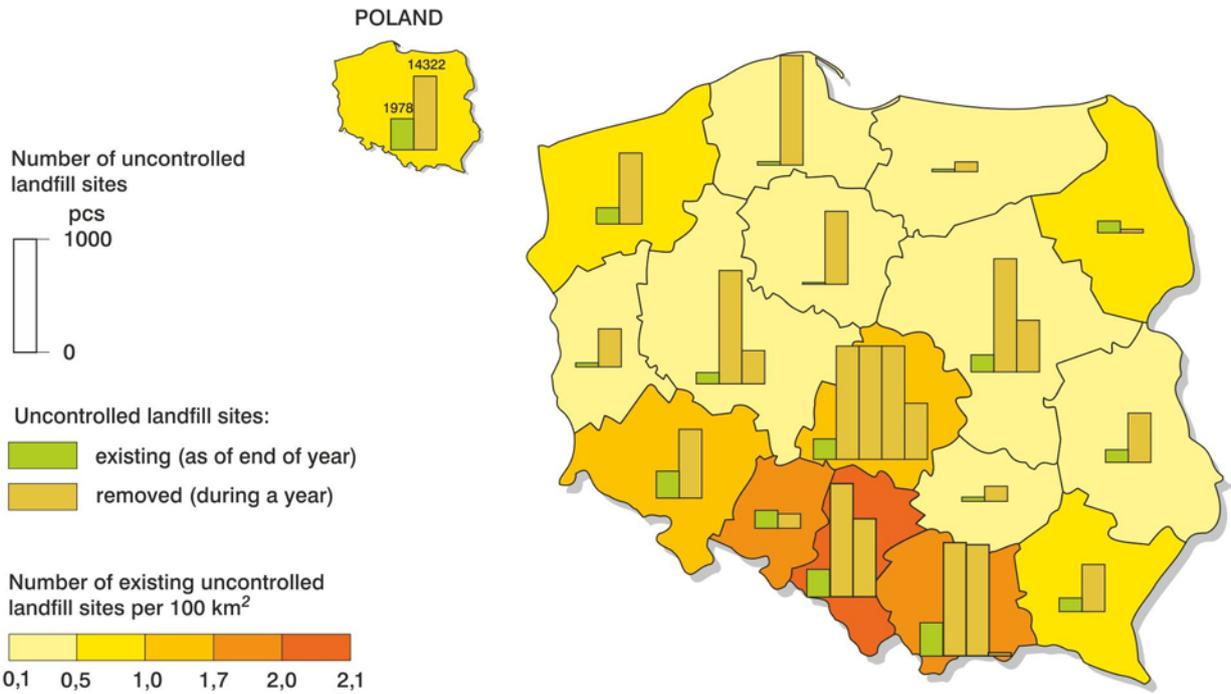
#### MUNICIPAL WASTE DEPOSITION AREA IN 2015



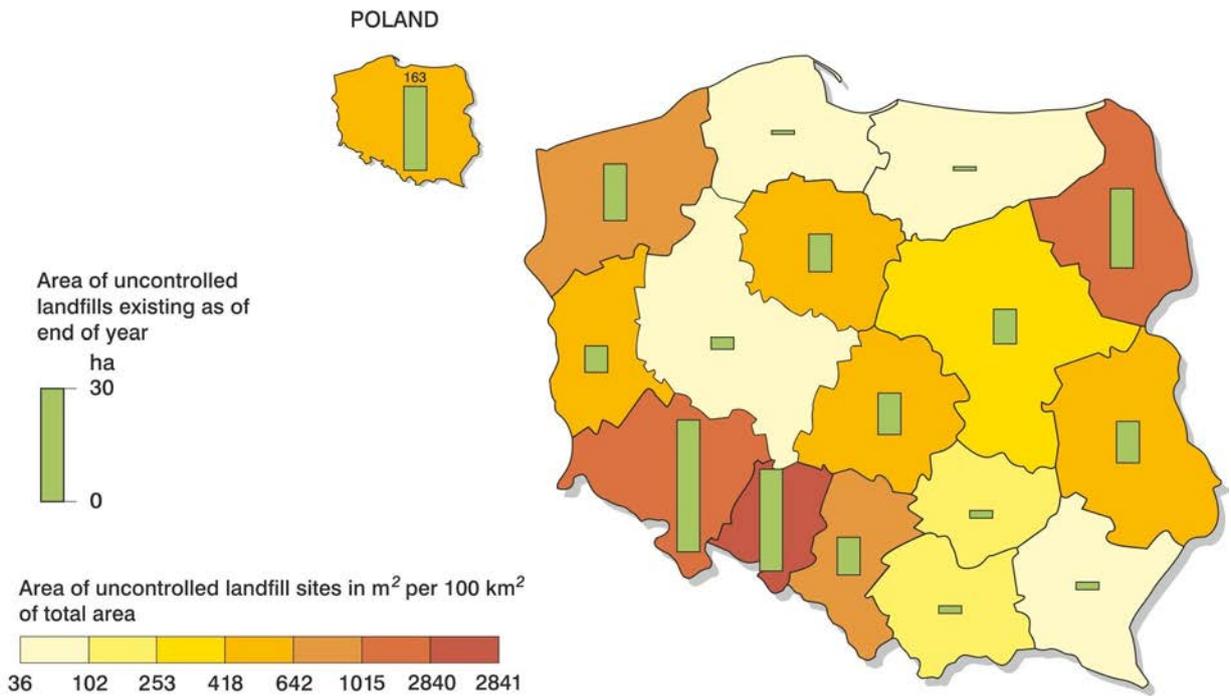
At the end of 2015, in Poland there were 1 978 illegal dumps i.e. 16.6% less than in the previous year. In urban areas, there were 483 of such dumps (a drop of 35.2% in comparison to 2014), and in rural areas – 1 495 (a decrease of 8.1% as compared to 2014).

In 2015, 14 322 illegal dumps were removed, of which 86.1% in urban areas. As compared to the previous year, the total number of illegal waste disposal sites removed increased by approx. 12.7% (in urban areas the rise amounted to 12.2%, and in rural areas – to 16.1%). During the removals of uncontrolled landfill sites, about 45.2 thous. tonnes of municipal waste were collected (3.1% less than in 2014), of which 84.2% in urban areas (a decrease of 3.4 percentage points as compared with the previous year).

**UNCONTROLLED LANDFILL SITES IN 2015**



**AREA OF UNCONTROLLED LANDFILL SITES IN 2015**



## GRAPHS AND MAPS

<b>NO.</b>	<b>TITLE</b>	<b>P.</b>
1.	Condition of water supply network in 2005, 2010 and 2015	11
2.	Change in length of water supply network in 2005-2015	12
3.	Density of water supply network in urban areas in 2015	13
4.	Condition of sewage network in 2005, 2010 and 2015	13
5.	Change in length of sewage network in 2005-2015	14
6.	Density of sewage network in urban areas in 2015	15
7.	Population using the water supply system and consumption of water per capita in 2005-2015	16
8.	Population using the sewage system and wastewater discharged from households in 2005-2015	17
9.	On-site systems for collection of liquid waste in 2015	18
10.	Dump stations and liquid waste removed to wastewater treatment plants to dump stations in 2015	18
11.	Sources of liquid waste in 2015	19
12.	Condition of gas supply distribution network in 2005- 2015	20
13.	Change in length of gas supply distribution network in 2005-2015	20
14.	Density of gas supply distribution network in urban areas in 2015	21
15.	Population using the gas supply system and consumption of gas per capita in 2005-2015	21
16.	Sale of gas to households in 2015	22
17.	Consumers and consumption of electricity in households in 2005-2015	23
18.	Thermic-line density in 2015	24
19.	Sales of heat energy in 2015	25
20.	Type of fuels used for production of heat energy in 2015	25
21.	Changes in number of entities collecting municipal waste from real estate owners in 2014 and 2015	26
22.	Collected municipal waste by ownership sector in 2005, 2014 and 2015	26
23.	Sources of municipal waste collected in 2015	27
24.	Municipal waste collected separately by fractions and sources in 2015	28
25.	Management of municipal waste collected in 2015	29
26.	Controlled landfills in 2015	30
27.	Landfill sites in operation in 2005-2015	30
28.	Landfills closed in 2005-2015	31
27.	Degassing of landfills in 2015	31

28.	Municipal waste deposition area in 2015	32
29.	Uncontrolled landfill sites in 2015	33
30.	Area of uncontrolled landfill sites in 2015	33